

# CITIZEN

9 Pin Printer Emulation

Command Reference Manual

### **Trademark Acknowledgements**

**Citizen:** Citizen Watch Co. Ltd. Japan

**Epson:** Seiko Epson Corporation

**Epson FX:** Seiko Epson Corporation

**IBM Personal Computer, IBM PC, IBM Proprinter:** International Business Machines Corporation

**Microsoft, Windows:** Microsoft Corporation

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## EPSON 9 PIN EMULATION COMMAND REFERENCE INTRODUCTION

This reference provides a complete description of the Epson FX-series Emulation Commands. Citizen 9 pin printers emulate the Epson FX-series if the Epson emulation is selected. That is, programs and commands written for the Epson FX-series printers will work properly on these printers.

To select the Epson emulation, you can use the **ESC ~ 5** command, which is explained in this manual or select the Epson emulation within the Set-up or DIP switch settings.

This manual details the commands for the following Citizen printers:

<b>Swift 9</b>	<b>Swift 9x</b>
<b>Swift 90</b>	<b>Swift 90x</b>

All commands shown in this command reference include some or all of the following elements:

- ESC These letters represent the ASCII **Escape code** (27 decimal, 1B hexadecimal).
- n1 Highlighted lowercase letters (sometimes followed by a number) represent **variable data**.
- {0} A number enclosed in braces represents the decimal code for a **non printing** character.
- ... An ellipsis indicates that you can place additional data in its place.

Other characters--such as letters, numbers not enclosed in braces, and punctuation marks--included in command format statements should be sent just as shown. For instance, the command shown as ESC 5 should be sent as two characters: ASCII 27 followed by ASCII 53. However, a command such as ESC {14}, which also consists of two characters, should be sent as: ASCII 27 followed by ASCII 14. In addition, the decimal and hexadecimal **ASCII codes** are shown for each command sequence. Some application programs require you to enter the ASCII codes instead of the characters those codes represent.

### Non printing codes

Non printing codes (**ASCII codes** from 0 to 31) are shown as a number enclosed in braces. For instance, the line feed code (ASCII code 10) is shown as {10}. The one exception to this convention is the escape code (ASCII code 27). Because it is used in so many commands, it deserves special treatment: in this manual it appears as ESC.

### Variable data

Variable parameters are characters in the command format that should be replaced with another character that varies depending on what you want the command to do. The command to set the page length (ESC C n) is an example. You should replace n with the code for the number of lines that you want to use as a page length. You need to send the single character that has the value you want to use--don't use the ASCII number characters.

For example, let's suppose you want to set the page length to 33 lines. To do so, send three codes to the printer, which can be represented in any of the following ways:

<b>ASCII characters</b>	ESC	C	!
Decimal codes	27	67	33
Hexadecimal codes	1B	43	21

In the Remarks section of descriptions of commands that use variables, allowable values are shown using the same **format** used for the commands themselves: nonprinting codes are shown as decimal values enclosed in braces, and other characters should be sent exactly as shown. Strictly speaking, commands that use 1 and 0 as on and off switches use {1} and {0}. However, the printer also accepts the characters 1 and 0 (ASCII 49 and 48) in most cases.

### Using BASIC

In all versions of BASIC, including GW-BASIC, QBasic, and QuickBASIC, the CHR\$ function can be used to send **ASCII codes** to the printer--particularly the codes that are shown in this manual enclosed in braces. For example, {10} is expressed in BASIC as CHR\$(10).

The Escape code is shown in this manual as ESC, and is usually expressed in BASIC as CHR\$(27). Normal printing characters, such as letters, numbers, and punctuation, should be enclosed in double quotes in LPRINT statements. For example, ESC P is expressed in BASIC as CHR\$(27) "P".

## PRINTER CONTROL COMMANDS

### Master reset

<i>Format:</i>	ESC	@
Decimal	27	64
Hexadecimal	1B	40

*Remarks:*

This command resets **print style**, **line spacing** and **page length** to the settings of the Set-up menu. Master reset also clears any information in the print buffer. All **margins** and **tab settings** are cleared. The **top-of-form** is set to the current position. **Download characters** are not cleared.

If the reset command is in the same line as data, the preceding data will be deleted from the buffer without printing.

### Delete character

<i>Format:</i>	{127}
Decimal	127
Hexadecimal	7F

*Remarks:*

This command deletes the character previous to it in the print buffer. {127} must be received before any **paper movement command**, which starts printing and empties the print buffer.

### Cancel line

<i>Format:</i>	{24}
Decimal	24
Hexadecimal	18

*Remarks:*

This command clears the current line from the print buffer. The {24} command must be received before a **paper movement command**, which starts printing and empties the print buffer.

### Unidirectional print

	<i>On</i>			<i>Off</i>		
<i>Format:</i>	ESC	U	{1}	ESC	U	{0}
Decimal	27	85	1	27	85	0
Hexadecimal	1B	55	01	1B	55	00

*Remarks:*

This command causes each line to be printed from left to right, allowing very fine vertical alignment between lines. This reduces printing speed. Unidirectional print is useful when printing line graphics. Printing unidirectional improves the print quality.

Unidirectional or bi-directional graphics printing may be selected with the Set-up menu.

## Unidirectional print (one-line)

<i>Format:</i>	ESC	<
Decimal	27	60
Hexadecimal	1B	3C

### Remarks:

This command moves the print head to the leftmost position after the current line is printed. This has the same effect as using the **unidirectional print** command but only for the following line. Bi-directional printing resumes on the next line.

Unidirectional print is useful when printing **line graphics** which are normally printed bi-directionally. Printing unidirectional improves the print quality, although there will be a loss of speed.

## Half speed mode

	<i>On</i>			<i>Off</i>		
<i>Format:</i>	ESC	s	{1}	ESC	s	{0}
Decimal	27	115	1	27	115	0
Hexadecimal	1B	73	01	1B	73	00

### Remarks:

Half speed mode reduces the noise of printing. It does this by printing characters in two passes (fewer pins fire on each pass) instead of one. Therefore, print speed is reduced to about one-half. Print quality is not affected.

## Automatic sheet feeder

<i>Format:</i>	ESC	{25}	<b>n</b>
Decimal	27	25	<u>n</u>
Hexadecimal	1B	19	<u>n</u>

### Remarks:

This command should only be used when the optional automatic sheet feeder is installed. The following values can be used for n:

- 4 Turn on automatic sheet feeder
- 0 Turn off automatic sheet feeder
- R Ejects the sheet (without feeding a new sheet)

## Suspend/resume

	<i>Deselect</i>	<i>Select</i>
<i>Format:</i>	{19}	{17}
Decimal	19	17
Hexadecimal	13	11

### Remarks:

When {19} is received, the printer ignores any further communication from the computer until the code {17} is received.

## MSB control (MSB=1)

<i>Format:</i>	ESC	>
Decimal	27	62
Hexadecimal	1B	3E

### Remarks:

Sets the most significant bit to 1 which forces the printer to interpret all codes received (including command codes and character codes) as high-bit codes (**ASCII 128 to 255**). This command also sets the eighth bit for download characters or bit image print data. Cancel MSB control with **ESC #**.

## MSB control (MSB=0)

<i>Format:</i>	ESC	=
Decimal	27	61
Hexadecimal	1B	3D

### Remarks:

Sets the most significant bit to 0 which forces the printer to interpret all codes received as low-bit codes (**ASCII 0 to 127**).

Cancel MSB control with **ESC #**.

## MSB control (Cancel)

<i>Format:</i>	ESC	#
Decimal	27	35
Hexadecimal	1B	23

### Remarks:

Cancels control of the most significant bit set by **ESC >** or **ESC =**.

## Paper-out sensor

	<i>On</i>		<i>Off</i>	
<i>Format:</i>	ESC	9	ESC	8
Decimal	27	57	27	56
Hexadecimal	1B	39	1B	38

### Remarks:

When enabled, the paper-out sensor stops the printer when you run out of paper. If you use a parallel interface, the printer sends the PE (paper end) signal to the computer when the paper is out; most programs stop sending data to the printer when they receive this signal.

You can also enable or disable the paper-out sensor with the Set-up menu.

## Immediate mode

	<i>On</i>			<i>Off</i>		
<i>Format:</i>	ESC	i	{1}	ESC	i	{0}
Decimal	27	105	1	27	105	0
Hexadecimal	1B	69	01	1B	69	00

### Remarks:

Like a standard typewriter, this feature lets you send data immediately to the printer; it does not wait for the buffer to be full or for a **line feed** command.

After printing your text, the paper advances so that you can see what you've printed. When you send more text, the paper automatically retracts to its previous position before printing. The tractor should be in the "push" position to accommodate reverse paper movement.

## VERTICAL MOTION COMMANDS

### Advance paper (One line)

<i>Format:</i>	{10}
Decimal	10
Hexadecimal	0A

*Remarks:*

Returns the print head to the **left margin** and advances the paper to the next line after printing. Many computers automatically add a line feed to each carriage return **{13}**. If yours does not, you can add a line feed to each carriage return with this command or with the Set-up menu.

### Advance paper (To next top-of-form)

<i>Format:</i>	{12}
Decimal	12
Hexadecimal	0C

*Remarks:*

A form feed advances the paper to the top of the next page. If you are using continuous paper with the tractor in the push position, and TEAR OFF is set "ON" in the Set-up menu, the paper will advance so that the perforation is under the tear bar. It will immediately retract to the **top-of-form position** when you send more data. It will also retract to the top-of-form as soon as the power is turned on if it has been turned off.

For form feeds to work properly, the paper must be at the desired "top of the page" when the printer is turned on (unless you are using TEAR OFF as described in the previous paragraph). The page length can be set with the Set-up menu or with **ESC C** or **ESC C {0}** commands.

### Advance paper (n/216 inch)

<i>Format:</i>	ESC	J	<b>n</b>
Decimal	27	74	<u>n</u>
Hexadecimal	1B	4A	<u>n</u>

*Remarks:*

Advances the paper n/216 inch without changing the print head position. n can range from {0} to {255}. This command does not change the line spacing for subsequent lines.

### Advance paper (n lines)

<i>Format:</i>	ESC	f	{1}	<b>n</b>
Decimal	27	102	1	<u>n</u>
Hexadecimal	1B	66	01	<u>n</u>

*Remarks:*

Advances the paper n lines; it's equivalent to sending n **line feed** commands. n can range from {0} to {255}.

### Advance paper (To next vertical tab position)

<i>Format:</i>	{11}
Decimal	11
Hexadecimal	0B

*Remarks:*

This command will advance the paper to the next vertical tab position in the current **tab channel** after printing the contents of the print buffer. The paper advances one line when no vertical tabs are set.

No tabs are set at power-on. They must be set with the **tab-setting commands** before use.

## Retract paper

<i>Format:</i>	ESC	j	n
Decimal	27	106	<u>n</u>
Hexadecimal	1B	6A	<u>n</u>

### Remarks:

Reverses the paper  $\frac{n}{216}$  inch without changing the print head position. n can range from {0} to {255}. This command does not change the line spacing for subsequent lines.

The tractor should be installed in the push position to use this command.

## Set page length (n lines)

<i>Format:</i>	ESC	C	n
Decimal	27	67	<u>n</u>
Hexadecimal	1B	43	<u>n</u>

### Remarks:

Sets the page length to n lines (n can range from {1} to {127}). The actual page length is set internally in inches, determined by multiplying the lines per page by the line spacing in effect at the time. Later changes in line spacing, therefore, have no effect on the length of the page (they will change the number of lines per page, however).

The **top-of-form position** is set to the current line and the bottom margin set by **ESC N** is cleared.

Page length can also be set with the Set-up menu.

## Set page length (n inches)

<i>Format:</i>	ESC	C	{0}	n
Decimal	27	67	0	<u>n</u>
Hexadecimal	1B	43	00	<u>n</u>

### Remarks:

Sets the page length to n inches (n can range from {1} to {22}).

The **top-of-form position** is set to the current line and the bottom margin set by **ESC N** is cleared.

Page length can also be set with the Set-up menu.

## Skip-over-perforation

		<i>On</i>			<i>Off</i>
<i>Format:</i>	ESC	N	n	ESC	O
Decimal	27	78	<u>n</u>	27	79
Hexadecimal	1B	4E	<u>n</u>	1B	4F

### Remarks:

Sets a skip-over-perforation (bottom margin) of n lines (n = {1} to {127}) at the bottom of the page (above the perforation on continuous paper).

The skip is canceled by changing the form length, **ESC @**, **ESC C**, **ESC C {0}**, or **ESC O**.

A 6-line perforation skip can be set with the Set-up menu.

## Line spacing (1/6 inch)

<i>Format:</i>	ESC	2
Decimal	27	50
Hexadecimal	1B	32

### Remarks:

Line spacing for future line feeds is set to 1/6 inch, printing 6 lines per inch (lpi). The default line spacing can be set to 6 lpi with the Set-up menu.

## Line spacing (1/8 inch)

<i>Format:</i>	ESC	0
Decimal	27	48
Hexadecimal	1B	30

### Remarks:

Line spacing for future line feeds is set to 1/8 inch, printing 8 lines per inch (lpi). The default line spacing can be set to 8 lpi with the Set-up menu.

## Line spacing (7/72 inch)

<i>Format:</i>	ESC	1
Decimal	27	49
Hexadecimal	1B	31

### Remarks:

Line spacing for future line feeds is set to 7/72 inch, printing approximately 10.3 lines per inch (lpi). Because this is seven dots high, this spacing is sometimes useful for printing bit image graphics.

## Line spacing (n/72 inch)

<i>Format:</i>	ESC	A	<b>n</b>
Decimal	27	65	<u>n</u>
Hexadecimal	1B	41	<u>n</u>

### Remarks:

Line spacing is adjusted to n/72 inch. n can range from {0} to {85}.

## Line spacing (n/216 inch)

<i>Format:</i>	ESC	3	<b>n</b>
Decimal	27	51	<u>n</u>
Hexadecimal	1B	33	<u>n</u>

### Remarks:

Line spacing is adjusted to n/216 inch. n can range from {0} to {255}.

## Set vertical tabs in channel 0

<i>Format:</i>	ESC	B	<b>n1</b>	<b>n2</b>	...	{0}
Decimal	27	66	<u>n1</u>	<u>n2</u>	...	0
Hexadecimal	1B	42	<u>n1</u>	<u>n2</u>	...	00

### Remarks:

This command sets vertical tabs in channel 0. Up to 16 tabs can be set. Line numbers must be in ascending numeric order, and can range from {1} to {255}. Any line number less than the preceding one acts as an ending code for the sequence.

Tab positions are determined by the line spacing in effect when they are set. Later changes in line spacing do not affect their positions.

This command sets tabs in channel 0. There are eight channels where vertical tabs can be set using **ESC b**.

ESC B {0} can be used to clear the tab settings.

## Set vertical tabs every n lines

<i>Format:</i>	ESC	e	{1}	<b>n</b>
Decimal	27	101	1	<u>n</u>
Hexadecimal	1B	65	01	<u>n</u>

### Remarks:

Sets vertical tabs every n lines, based on the line spacing in effect when the command is sent. n can range from 1 to the page length (in lines). Later changes in the line spacing do not affect the vertical tab positions.

## Set vertical tabs in channel c

<i>Format:</i>	ESC	b	<b>c</b>	<b>n1</b>	<b>n2</b>	...	{0}
Decimal	27	98	<u>c</u>	<u>n1</u>	<u>n2</u>	...	0
Hexadecimal	1B	62	<u>c</u>	<u>n1</u>	<u>n2</u>	...	00

### Remarks:

Sets up to eight channels defined by the value of c, which can range from {0} to {7}. Up to 16 tabs can be set in each channel. Channel 0 is the power-on default. Tabs set with **ESC B** are placed in channel {0}.

Channels are selected with the command **ESC /**.

ESC b c {0} can be used to clear the tab settings.

## Select vertical tab channel

<i>Format:</i>	ESC	/	<b>c</b>
Decimal	27	47	<u>c</u>
Hexadecimal	1B	2F	<u>c</u>

### Remarks:

Selects vertical tab channel c. The value of c can range from {0} to {7}. Tabs are set by **ESC b**.

## HORIZONTAL MOTION COMMANDS

### Move print head (To left margin)

<i>Format:</i>	{13}
Decimal	13
Hexadecimal	0D

*Remarks:*

A carriage return moves the print head to the left margin, but does not advance the paper to the next line. Therefore, many computers automatically add a line feed {10} to each carriage return.

You can add a line feed to each carriage return by turning on automatic line feed in the Set-up menu if your computer does not add line feeds for you.

### Move print head (Backspace)

<i>Format:</i>	{8}
Decimal	8
Hexadecimal	08

*Remarks:*

Moves the print head left one character. The print head can be moved as far as the **left margin** with multiple backspaces.

The backspace command is ignored if the print head is at the extreme left, the was the horizontal tab {9} command, or if the **absolute** or **relative print position** commands were given.

The backspace command will also be ignored if **ESC a** is selected, for all modes except left alignment.

### Move print head (To next horizontal tab position)

<i>Format:</i>	{9}
Decimal	9
Hexadecimal	09

*Remarks:*

Moves the print head to the next tab setting. At power-on, tabs are set at every eighth column in the default character pitch. The tabs can be reset as desired with **ESC D**. Tab settings are not affected by changes in character width.

This command is ignored if a justification style other than left alignment is selected with **ESC a**.

### Move print head (n columns)

<i>Format:</i>	ESC	f	{0}	<b>n</b>
Decimal	27	102	0	<u>n</u>
Hexadecimal	1B	66	00	<u>n</u>

*Remarks:*

Moves the print head n columns to the right; it's equivalent to sending n spaces. n can range from {0} to {127}.

## Move print head (Absolute position)

<i>Format:</i>	ESC	\$	<b>n1</b>	<b>n2</b>
Decimal	27	36	<u>n1</u>	<u>n2</u>
Hexadecimal	1B	24	<u>n1</u>	<u>n2</u>

### Remarks:

The values for n1 and n2 set the dot column to tab according to the following formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dot column}$$

The value of n1 can range from {0} to {255}; n2 can range from {0} to {3}. This is an absolute tab; no matter what the current position of the print head, it will tab to the specified column measured from the **left margin**.

There are 60 columns of dots per inch with a maximum of 480 dots per line. If the specified print position is beyond the **right margin**, the command is ignored.

## Move print head (Relative position)

<i>Format:</i>	ESC	\	<b>n1</b>	<b>n2</b>
Decimal	27	92	<u>n1</u>	<u>n2</u>
Hexadecimal	1B	5C	<u>n1</u>	<u>n2</u>

### Remarks:

Moves the print head to the right or left the specified number of units (a unit is 1/120 inch. This is a relative tab; the print head will move the specified distance counting from the current position. The values for n1 and n2 set the column to tab to according to the following formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{column}$$

If the movement is to the left, subtract the number of units from 65536 and then calculate the values of n1 and n2 in the same manner.

If the specified print position is beyond the **right** or **left margin**, the command is ignored.

## Margins (Left)

<i>Format:</i>	ESC	l	<b>n</b>
Decimal	27	108	<u>n</u>
Hexadecimal	1B	6C	<u>n</u>

### Remarks:

Sets a left margin of n columns (n can range from {0} to {255}). The actual width of the margin is determined by the **character width** in effect when the margin is set (10 pitch is used if **proportional spacing** is selected). Later changes in character width do not affect the width of the margin. If the margin setting exceeds eight inches, the setting is ignored.

There must be at least .2 inches between the left and **right margins**.

## Margins (Right)

<i>Format:</i>	ESC	Q	<b>n</b>
Decimal	27	81	<u>n</u>
Hexadecimal	1B	51	<u>n</u>

### Remarks:

This command sets the right margin at column n (n = {1} to {255}). This means that characters will print up to (and including) column n. The actual width of the margin is determined by the **character width** in effect when the margin is set (10 pitch is used if **proportional spacing** is selected). Later changes in character width do not affect the width of the margin. The setting is ignored if the right margin exceeds the maximum number of columns for the character width in effect.

There must be at least .2 inches between the **left** and right margins.

An automatic line feed **{10}** and carriage return **{13}** are executed when the specified right margin is reached.

## Set horizontal tabs

<i>Format:</i>	ESC	D	<b>n1</b>	<b>n2</b>	...	{0}
Decimal	27	68	<u>n1</u>	<u>n2</u>	...	0
Hexadecimal	1B	44	<u>n1</u>	<u>n2</u>	...	00

### Remarks:

Default horizontal **tabs** are cleared and tabs are set at column n1, n2, and so on. Column numbers must be in ascending numeric order, and can range from {1} to {255}. Any column number less than the preceding one acts as an ending code for the sequence. Up to 32 tabs can be set.

Tab positions are determined by the **character width** in effect when they are set. Later changes in character width do not affect their positions.

ESC D {0} can be used to clear all tab settings.

## Set horizontal tabs every n columns

<i>Format:</i>	ESC	e	{0}	<b>n</b>
Decimal	27	101	0	<u>n</u>
Hexadecimal	1B	65	00	<u>n</u>

### Remarks:

Default horizontal **tabs** are cleared and tabs are set every n columns. n can range from {0} to {21} in **pica** pitch, {0} to {25} in **elite** pitch, and {0} to {36} in **condensed** pitch.

Tab positions are determined by the **character width** in effect when they are set. Later changes in character width do not affect their positions.

## PRINT STYLE COMMANDS

### Select print quality

Format:	Near Letter Quality			Draft		
	ESC	x	{1}	ESC	x	{0}
Decimal	27	120	1	27	120	0
Hexadecimal	1B	78	01	1B	78	00

**Remarks:**

Near letter quality is compatible with all print styles.

### Select font

Format:	ESC	k	n
Decimal	27	107	<u>n</u>
Hexadecimal	1B	6B	<u>n</u>

**Remarks:**

Selects the font (type style). These fonts are available only when **near letter quality** printing is selected.

The value of n specifies the font as follows:

<i>n</i>	<i>Font selected</i>	<i>n</i>	<i>Font selected</i>
{0}	Roman	{3}	Prestige
{1}	Sans serif	{4}	Script
{2}	Courier	{7}	Orator

The font can also be selected with the control panel or with the Set-up menu.

### Select print style

Format:	ESC	!	n
Decimal	27	33	<u>n</u>
Hexadecimal	1B	21	<u>n</u>

**Remarks:**

Selects the print style and size, determined by the value of n. The **draft** or **near letter quality** and **superscript** or **subscript** settings are not affected by this command.

Each bit controls one attribute, as shown in the following table. To select a style, simply add up the values of the attributes you want, and substitute the sum for n in the format statement.

Bit	Feature	Value
0	<b>Pica/Elite</b>	{0}/{1}
1	<b>Proportional</b>	{2}
2	<b>Condensed</b>	{4}
3	<b>Emphasized</b>	{8}
4	<b>Doublestrike</b>	{16}
5	<b>Expanded</b>	{32}
6	<b>Italic</b>	{64}
7	<b>Underline</b>	{128}

## PRINT SIZE COMMANDS

### Select pitch (Pica)

<i>Format:</i>	ESC	P
Decimal	27	80
Hexadecimal	1B	50

*Remarks:*

Selects 10-pitch (or pica), printing 10 characters per inch. This command cancels **12-pitch** and **15-pitch** printing.

Pica pitch can also be selected with the master print mode command **ESC !**, with the control panel or with the Set-up menu.

<i>Pitch</i>	<i>Characters Per Inch</i>
Normal Pica	10
<b>Expanded</b> Pica	5
<b>Condensed</b> Pica	17
Condensed Expanded Pica	8.5

### Select pitch (Elite)

<i>Format:</i>	ESC	M
Decimal	27	77
Hexadecimal	1B	4D

*Remarks:*

Selects 12-pitch (or elite), printing 12 characters per inch. This command cancels **10-pitch** and **15-pitch** printing.

Elite pitch can also be selected with the master print mode command **ESC !**, with the control panel or with the Set-up menu.

<i>Pitch</i>	<i>Characters Per Inch</i>
Normal Elite	12
<b>Expanded</b> Elite	6
<b>Condensed</b> Elite	20
Condensed Expanded Elite	10

### Select pitch (15-pitch)

<i>Format:</i>	ESC	g
Decimal	27	103
Hexadecimal	1B	67

*Remarks:*

Selects 15-pitch, printing 15 characters per inch. This command cancels

**10-pitch** and **12-pitch** printing. 15-pitch cannot be combined with **condensed** print.

15-pitch can also be selected with the master print mode command **ESC !**, with the control panel or with the Set-up menu.

## Expanded print

	On			Off		
<i>Format:</i>	ESC	W	{1}	ESC	W	{0}
Decimal	27	87	1	27	87	0
Hexadecimal	1B	57	01	1B	57	00

### Remarks:

Sets the **character width** to double whatever width is in effect when the command is sent. The table below compares the characters per inch (cpi) between normal and expanded print.

	Normal	Expanded
<b>Pica</b>	10 cpi	5 cpi
<b>Elite</b>	12 cpi	6 cpi
<b>Condensed Pica</b>	17 cpi	8.5 cpi
Condensed Elite	20 cpi	10 cpi

Expanded print can also be selected with the master print mode command **ESC !**.

## Expanded print (one-line)

	On	Off
<i>Format:</i>	{14}	{20}
Decimal	14	20
Hexadecimal	0E	14

### Remarks:

Sets the **character width** to double whatever width is in effect when the command is sent. Expanded print is automatically canceled at the end of the line. It can be canceled before the end of the line with {20}.

Expanded print set by **ESC !** and **ESC W** are not canceled by {20}.

The use of ESC with {14} is optional; ESC {14} and the single code {14} are equivalent commands.

## Condensed print

	On	Off
<i>Format:</i>	{15}	{18}
Decimal	15	18
Hexadecimal	0F	12

### Remarks:

Compresses the **character width** to 60% of the width in effect when the command is sent. Condensed print cannot be combined with **15-pitch**. The table below compares the characters per inch (cpi) between normal and condensed print.

	Normal	Condensed
<b>Pica</b>	10 cpi	17 cpi
<b>Elite</b>	12 cpi	20 cpi
<b>Expanded Pica</b>	5 cpi	8.5 cpi
Expanded Elite	6 cpi	10 cpi

Condensed print can also be selected with the master print mode command **ESC !**.

The use of ESC with {15} is optional; the command ESC {15} and the single code {15} are equivalent.

## Proportional spacing

	On			Off		
<i>Format:</i>	ESC	p	{1}	ESC	p	{0}
Decimal	27	112	1	27	112	0
Hexadecimal	1B	70	01	1B	70	00

### Remarks:

The width each printed character occupies is proportional to its shape. (With fixed spacing, the width is the same for all characters, regardless of size.) Characters printed with proportional spacing are always printed in **near letter quality** and are compatible with all print styles. If the current font is **Draft** when proportional spacing is selected, the font will automatically change to the previously selected NLQ font. This command will override the previous pitch setting.

Proportional spacing can also be set with the control panel or the Set-up menu.

## Double-high print

	On			Off		
<i>Format:</i>	ESC	w	{1}	ESC	w	{0}
Decimal	27	119	1	27	119	0
Hexadecimal	1B	77	01	1B	77	00

### Remarks:

This command doubles the height of all characters. Remember to adjust the **line spacing** to allow for the additional height.

## PRINT ENHANCEMENT COMMANDS

### Emphasized print

	On		Off	
<i>Format:</i>	ESC	E	ESC	F
Decimal	27	69	27	70
Hexadecimal	1B	45	1B	46

#### Remarks:

Emphasized print increases character density by striking each dot twice, with the second dot offset horizontally. Emphasized print can be used in combination with all **print style commands**, including **doublestrike**.

Emphasized print can also be selected with the master print mode command

**ESC !**.

### Doublestrike print

	On		Off	
<i>Format:</i>	ESC	G	ESC	H
Decimal	27	71	27	72
Hexadecimal	1B	47	1B	48

#### Remarks:

Doublestrike print increases character density by striking each dot twice, with the second dot offset vertically. Doublestrike print reduces the print speed.

Doublestrike can be used in combination with all **print style commands**. Doublestrike print can also be selected with the master print mode command **ESC !**.

### Italic print

	On		Off	
<i>Format:</i>	ESC	4	ESC	5
Decimal	27	52	27	53
Hexadecimal	1B	34	1B	35

#### Remarks:

Italics can be used with all **print styles**. This command can be used even if graphic characters have been selected with **ESC t**.

Italic characters can also be selected with the master print mode command

**ESC !**.

### Underlining

	On			Off		
<i>Format:</i>	ESC	-	{1}	ESC	-	{0}
Decimal	27	45	1	27	45	0
Hexadecimal	1B	2D	01	1B	2D	00

#### Remarks:

Underlines everything--including spaces, but not **tabs**--from the point that underlining is turned on to the point that underlining is turned off.

Underlining can also be selected with the master print mode command **ESC !**.

## Superscript

		On			Off	
<i>Format:</i>	ESC	S	{0}	ESC	T	
Decimal	27	83	0	27	84	
Hexadecimal	1B	53	00	1B	54	

### Remarks:

Superscript characters print at 2/3 normal height in the upper half of the character space.

If you also select **underlining**, superscript characters are underlined with the line in the normal position.

## Subscript

		On			Off	
<i>Format:</i>	ESC	S	{1}	ESC	T	
Decimal	27	83	1	27	84	
Hexadecimal	1B	53	01	1B	54	

### Remarks:

Subscript characters print at 2/3 normal height in the lower half of the character space.

If you also select **underlining**, subscript characters are underlined with the line in the normal position.

## Select colour

<i>Format:</i>	ESC	r	n
Decimal	27	114	<u>n</u>
Hexadecimal	1B	72	<u>n</u>

### Remarks:

When the optional colour unit and colour ribbon cartridge is installed, this command selects the print colour according to the value of n. Valid values are {0} to {6}, corresponding to the seven available colours as shown in the following table. The default print colour at power-on is black.

<i>n</i>	<i>Colour</i>	<i>n</i>	<i>Colour</i>
{0}	Black	{4}	Yellow
{1}	Magenta (red)	{5}	Orange
{2}	Cyan (blue)	{6}	Green
{3}	Violet		

Colour can also be selected with the control panel.

## Justification

<i>Format:</i>	ESC	a	n
Decimal	27	97	<u>n</u>
Hexadecimal	1B	61	<u>n</u>

### Remarks:

Prints lines that are justified in one of four ways specified by the value of n:

<i>n</i>	<i>Justification style</i>
{0}	Flush against the left margin (default)
{1}	Centred between the left and right margins
{2}	Flush against the right margin
{3}	Flush against both margins (fully justified)

Justification is performed whenever a carriage return **{13}**, line feed **{10}**, form feed **{12}**, or vertical tab **{11}** is sent, or when the print buffer is full. Justified printing is available in **draft**, **near letter quality**, and **proportional** modes.

Justified printing will not perform correctly if text is combined with bit image printing. Also, you should not use horizontal **tabs**, **backspaces**, or **intercharacter spacing** when full justification is selected.

## Set intercharacter spacing

<i>Format:</i>	ESC	(space)	<b>n</b>
Decimal	27	32	<u>n</u>
Hexadecimal	1B	20	<u>n</u>

*Remarks:*

Sets proportional spacing by adding n dots of extra space between each character (n can range from {0} to {63}). Intercharacter spacing is increased in units of 1/120 of an inch by this command.

## CHARACTER TABLE COMMANDS

### Select character set

	<i>Italics</i>			<i>Graphics</i>		
<i>Format:</i>	ESC	t	{0}	ESC	t	{1}
Decimal	27	116	0	27	116	1
Hexadecimal	1B	74	00	1B	74	01

*Remarks:*

Selects a character set to be used by **codes 128-255**.

### Characters 128-159

	<i>Control codes</i>		<i>Characters</i>	
<i>Format:</i>	ESC	7	ESC	6
Decimal	27	55	27	54
Hexadecimal	1B	37	1B	36

*Remarks:*

When the graphic character table is selected with **ESC t**, high-bit ASCII codes 128 to 159 are normally control codes identical to **ASCII 0 to 31**. When ESC 6 is selected, **ASCII codes 128 to 159** are interpreted as printable characters.

### Expand printable code area

	<i>Control codes</i>			<i>Characters</i>		
<i>Format:</i>	ESC	l	{0}	ESC	l	{1}
Decimal	27	73	0	27	73	1
Hexadecimal	1B	49	00	1B	49	01

*Remarks:*

This command provides more available codes in which **download characters** can be defined. User-defined (download) characters can only be assigned to ASCII codes that are used for printable characters; the codes that are blank or used for control codes (**ASCII 0 to 31** and **ASCII codes 128 to 159**) cannot be used.

This command expands the printable code area to include all blank characters except {7} and {135}.

Therefore, codes {0} through {6}, {16}, {21} through {23}, {25}, {26}, and {28} through {31} can be used to store user-defined characters. If you precede this command with **ESC 6**, you can also use all the codes from {128} through {160} (except {135}).

### Select international character set

<i>Format:</i>	ESC	R	<b>n</b>
Decimal	27	82	<u>n</u>
Hexadecimal	1B	52	<u>n</u>

*Remarks:*

Selects international character set n:

<i>n</i>	<i>Country</i>	<i>n</i>	<i>Country</i>
{0}	U.S.A.	{8}	Japan
{1}	France	{9}	Norway
{2}	Germany	{10}	Denmark II
{3}	U.K.	{11}	Spain II
{4}	Denmark I	{12}	Latin America
{5}	Sweden	{13}	Korea
{6}	Italy	{64}	Legal
{7}	Spain I		

International character sets can be selected with the Set-up menu.

## DOWNLOAD CHARACTER COMMANDS

### Define download character

<i>Format:</i>	ESC	&	{0}	<u>n</u>	<u>m</u>	<u>a</u>	<u>data</u>
Decimal	27	38	0	<u>n</u>	<u>m</u>	<u>a</u>	<u>data</u>
Hexadecimal	1B	26	00	<u>n</u>	<u>m</u>	<u>a</u>	<u>data</u>

#### Remarks:

This command is used to define your own characters. The values for n and m specify the **ASCII codes** of the first and last defined characters (characters with codes from {0} to {127} can be re-defined). n and m are the same when only one character is defined.

<u>n</u>	ASCII code of first defined character
<u>m</u>	ASCII code of last defined character
<u>a</u>	Attribute byte

The variable a describes characteristics of the character to be defined. If the high-order bit (bit 7) is on, the character is printed as an ascender (it uses the top eight wires of the print head); if it is off, the character is a descender (it uses the bottom eight wires). the bottom pin of descender characters prints below the character baseline (for example, "g").

The remaining bits of the attribute byte are used for proportional spacing information. Bits 6, 5, and 4 specify the starting dot column; the last four bits specify the ending dot column. If proportional spacing is selected, the columns outside this range are not printed. In bits 6, 5, and 4, specify the binary value of the starting column minus one (for example, to start in column 4, use the binary value of 3: 011). In bits 3, 2, 1, and 0, specify the binary value of the ending column minus one (for example, to end in column 10, use the binary value of 9: 1001).

The character matrix for all characters is 9 dots high and 11 dots wide. The vertical dot spacing is 1/72"; horizontal spacing is 1/144". Following the attribute byte there are eleven data bytes. The first byte defines the first column of dots, the second byte defines the second column, and so on. Their value is calculated in the same way as data bytes for bit image graphics are calculated (see **ESC K**). Each wire in the print head is assigned a value. Add the values of each of the wires that you want to print in a given column, and the total for the column is the value of that data byte. The last two columns should be blank for the space between characters.

Adjacent horizontal dots cannot be printed in **draft** mode; if you specify them they will be ignored. In **NLQ** mode, however, adjacent dots will be printed. In addition, the printer will add dots between adjacent vertical and diagonal dots to improve print quality.

## Copy ROM to RAM

<i>Format:</i>	ESC	:	{0}	<b>n</b>	{0}
Decimal	27	58	0	<u>n</u>	0
Hexadecimal	1B	3A	00	<u>n</u>	00

### Remarks:

Characters are loaded to the download character set area (RAM) from the internal character set area (ROM). n is the number of the ROM font:

<i>n</i>	<i>Font</i>	<i>n</i>	<i>Font</i>
{0}	Roman	{3}	Prestige
{1}	Sans serif	{4}	Script
{2}	Courier	{7}	Orator

This command will wipe out any existing character definitions and replace them with one of the standard character sets.

## Select/Cancel download characters

		<i>Select</i>			<i>Cancel</i>		
<i>Format:</i>	ESC	%	{1}	ESC	%	{0}	
Decimal	27	37	1	27	37	0	
Hexadecimal	1B	25	01	1B	25	00	

### Remarks:

The download character set is selected with ESC % {1} and the standard character set is selected with ESC % {0}. Download characters can be printed in all **print styles** available in the print quality (**near letter quality** or **draft**) that the characters were defined in. Therefore, characters defined in draft can only be printed in draft quality; characters defined in near letter quality can only be printed in near letter quality. It is possible to combine download and standard characters on one line.

## GRAPHICS COMMANDS

### Bit image graphics (single-density)

Format:	ESC	K	n1	n2	data
Decimal	27	75	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	4B	<u>n1</u>	<u>n2</u>	<u>data</u>

#### Remarks:

Prints 8-bit single-density bit image graphics (60 dots per inch horizontal, 72 dots per inch vertical). The values for n1 and n2 set the image width in dots according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

The number of data characters following the command is the same as the image width. The least significant bit controls the bottom dot; the most significant bit controls the top dot. A value of {1} prints a dot; {0} does not print.

ESC K command can be redefined by **ESC ?**. 8-bit single-density bit image graphics can also be selected with the master graphics command **ESC \***.

### Bit image graphics (double-density)

Format:	ESC	L	n1	n2	data
Decimal	27	76	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	59	<u>n1</u>	<u>n2</u>	<u>data</u>

#### Remarks:

Prints 8-bit double-density bit image graphics (120 dots per inch horizontal, 72 dots per inch vertical). The values for n1 and n2 set the image width in dots according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

The number of data characters following the command is the same as the image width. The least significant bit controls the bottom dot; the most significant bit controls the top dot. A value of {1} prints a dot; {0} does not print.

ESC L command can be redefined by **ESC ?**. 8-bit double-density bit image graphics can also be selected with the master graphics command **ESC \***.

### Bit image graphics (hi-speed dbl-density)

Format:	ESC	Y	n1	n2	data
Decimal	27	89	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	59	<u>n1</u>	<u>n2</u>	<u>data</u>

#### Remarks:

Prints 8-bit high-speed double-density bit image graphics (120 dots per inch horizontal, 72 dots per inch vertical). The values for n1 and n2 set the image width in dots according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

The number of data characters following the command is the same as the image width. In high-speed graphics horizontally adjacent dots will not print; the second dot will be eliminated. The least significant bit controls the bottom dot; the most significant bit controls the top dot. A value of {1} prints a dot; {0} does not print.

ESC Y command can be redefined by **ESC ?**. 8-bit high-speed double-density image graphics can also be selected with the master graphics command **ESC \***.

## Bit image graphics (quadruple-density)

Format:	ESC	Z	n1	n2	data
Decimal	27	90	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	5A	<u>n1</u>	<u>n2</u>	<u>data</u>

### Remarks:

Prints 8-bit quadruple-density bit image graphics (240 dots per inch horizontal, 72 dots per inch vertical). The values for n1 and n2 set the image width in dots according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

The number of data characters following the command is the same as the image width. In quadruple-density graphics horizontally adjacent dots will not print; the second dot will be eliminated. The least significant bit controls the bottom dot; the most significant bit controls the top dot. A value of {1} prints a dot; {0} does not print.

ESC Z command can be redefined by **ESC ?**. 8-bit quadruple-density image graphics can also be selected with the master graphics command **ESC \***.

## Bit image graphics (graphics mode)

Format:	ESC	*	m	n1	n2	data
Decimal	27	42	<u>m</u>	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	2A	<u>m</u>	<u>n1</u>	<u>n2</u>	<u>data</u>

### Remarks:

This command selects graphics densities according to the value of m as shown in the table below.

<i>m</i>	<i>Horizontal density</i>	<i>Graphics Mode</i>
{0}	60	Same as ESC K
{1}	120	Same as ESC L
{2}	120	*Same as ESC Y
{3}	240	*Same as ESC Z
{4}	80	CRT graphics I
{5}	72	Plotter I (1:1)
{6}	90	CRT graphics II
{7}	144	Plotter II (2:1)

\* In modes 2 and 3, horizontally adjacent dots cannot be printed; the second dot is eliminated.

The values for n1 and n2 set the image width in dot columns according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

The number of data characters following the command is the same as the image width.

## Bit image graphics (9-pin)

Format:	ESC	^	m	n1	n2	data
Decimal	27	94	<u>m</u>	<u>n1</u>	<u>n2</u>	<u>data</u>
Hexadecimal	1B	5E	<u>m</u>	<u>n1</u>	<u>n2</u>	<u>data</u>

### Remarks:

Prints 9-pin bit image graphics in either single-density (m=0) or double-density (m=1). The values for n1 and n2 set the image width in dots according to the formula:

$$\underline{n1} + (256 \times \underline{n2}) = \text{dots}$$

Each dot column requires two bytes of data. The first byte determines the pattern of the top eight wires in the same manner as the other graphics commands: the least significant bit controls the bottom dot; the most significant bit controls the top dot. A value of {1} prints a dot; {0} does not print. The second byte determines whether the bottom wire prints; a value of 7Fh ({128}) or greater causes it to print.

## Reassign graphics mode

<i>Format:</i>	ESC	?	<b>n</b>	<b>m</b>
Decimal	27	63	<u>n</u>	<u>m</u>
Hexadecimal	1B	3F	<u>n</u>	<u>m</u>

### *Remarks:*

This command changes one graphics mode to another. Any of the four graphics commands, **ESC K**, **ESC L**, **ESC Y**, or **ESC Z** can be changed to any available density. Put the letter of the command that you want to change (K, L, Y or Z) in place of the variable n, and the value of the bit image mode ({0}-{7}) in m as shown in the previous table (see **ESC \***).



## CITIZEN 9 PIN EMULATION COMMANDS

### PRINTER CONTROL COMMANDS

#### Select high-speed printing

	On				Off			
<i>Format:</i>	ESC	~	8	{1}	ESC	~	8	{0}
Decimal	27	126	56	1	27	126	56	0
Hexadecimal	1B	7E	38	01	1B	7E	38	00

*Remarks:*

This command selects between high-speed and high-density (i.e., better print quality) draft printing.

#### Top-of-form position

	Normal (7/16")				Alternate (0")			
<i>Format:</i>	ESC	~	T	{0}	ESC	~	T	{1}
Decimal	27	126	84	0	27	126	84	1
Hexadecimal	1B	7E	54	00	1B	7E	54	01

*Remarks:*

This command allows you to select between two top-of-forms. Normal top-of-form will start 7/16 inch from the top of the page; alternate top-of-form will start 0" from the top of the page. Top-of-form is measured from the top of the page to the top of a normal height character in the first line.

This command overrides the current top-of-form setting made by control panel selection or the **ESC ~ V** command.

#### Top-of-form adjustment

<i>Format:</i>	ESC	~	V	<b>n</b>	<b>p</b>
Decimal	27	126	86	<u>n</u>	<u>p</u>
Hexadecimal	1B	7E	56	<u>n</u>	<u>p</u>

*Remarks:*

This command adjusts the top-of-form in increments of 1/72" using the following formula:  $7/16" + \underline{n}/72"$  for each type of paper--continuous ( $\underline{p}=\{0\}$ ) or single sheet ( $\underline{p}=\{1\}$ ). The printer recognizes the type of paper by the position of the paper select lever. Top-of-form is measured from the top of the page to the top of a normal height character in the first line.

This command overrides the current top-of-form setting made by control panel selection or the **ESC ~ T** command.

#### Paper tear-off

	On				Off			
<i>Format:</i>	ESC	~	C	{1}	ESC	~	C	{0}
Decimal	27	126	67	1	27	126	67	0
Hexadecimal	1B	7E	43	01	1B	7E	43	00

*Remarks:*

This feature allows the printer to feed the perforated edge between a printed page and the next page up to the paper tear-off bar so that you can remove the sheet without wasting a sheet of paper. This action occurs after the printer receives a **form feed** and no additional data follows the form feed code. The next time the printer receives data, the paper is repositioned at the **top-of-form**, ready to start printing.

This feature is only available with the tractor in the "push" position.

The default value of this command is on. If you want to override this feature, you can turn it off with **ESC ~ C {0}**.

## Emulation

<i>Format:</i>	ESC	~	5	<b>n</b>
Decimal	27	126	53	<u>n</u>
Hexadecimal	1B	7E	35	<u>n</u>

### Remarks:

Selects one of the available printer command sets depending on the value of n. After executing this command, the **character sets** and commands will be changed to emulate a different type of printer. In addition, **vertical** and **horizontal tabs** are reset to the power-on default positions.

With automatic selection, the printer detects whether Epson or IBM commands are being sent, and switches emulations accordingly.

<i>n</i>	<i>Emulation</i>
{0}	Epson FX-series
{1}	IBM Proprinter III
{255}	Auto

## Copy mode

	<i>On</i>				<i>Off</i>			
<i>Format:</i>	ESC	~	!	{1}	ESC	~	!	{0}
Decimal	27	126	33	1	27	126	33	0
Hexadecimal	1B	7E	21	01	1B	7E	21	00

### Remarks:

This command selects or cancels copy mode, which should be used for printing multipart forms. (In addition, you might need to adjust the paper thickness lever.)

Copy mode can also be selected with the control panel or with the VuePrint menu.

## VERTICAL MOTION COMMANDS

### Line spacing (n/144 inch)

<i>Format:</i>	ESC	~	0	<b>n</b>
Decimal	27	126	48	<u>n</u>
Hexadecimal	1B	7E	30	<u>n</u>

*Remarks:*

Line spacing is adjusted to n/144 inch. n can range from {0} to {255}.

### Park paper

<i>Format:</i>	ESC	~	{12}
Decimal	27	126	12
Hexadecimal	1B	7E	0C

*Remarks:*

Equivalent to pressing the control panel's PARK/LOAD key while the printer is offline, this command retracts continuous form paper to its "parked" position so you can load a single sheet of paper. The next time you send this command, it reloads the parked paper and advances it to the top-of-form position.

## PRINT STYLE COMMANDS

### Select font

<i>Format:</i>	ESC	~	x	<b>n</b>
Decimal	27	126	120	<u>n</u>
Hexadecimal	1B	7E	78	<u>n</u>

*Remarks:*

Selects the font (type style). These fonts are available only in **near letter quality** printing. The value of n specifies the font as follows:

<i>n</i>	<i>Font selected</i>	<i>n</i>	<i>Font selected</i>
{0}	Roman	{3}	Prestige
{1}	Sans serif	{4}	Script
{2}	Courier	{7}	Orator

### Font lock mode

	<i>On</i>				<i>Off</i>			
<i>Format:</i>	ESC	~	F	{1}	ESC	~	F	{0}
Decimal	27	126	70	1	27	126	70	0
Hexadecimal	1B	7E	46	01	1B	7E	46	00

*Remarks:*

This command selects or cancels font lock mode. When font lock mode is selected, the printer ignores font-selection commands sent by your computer. Instead, it uses the font selected with the control panel or the VuePrint menu.

Font lock mode can also be selected with the control panel or with the VuePrint menu.

## PRINT SIZE COMMANDS

### Select pitch

<i>Format:</i>	ESC	~	3	<b>n</b>
Decimal	27	126	51	<u>n</u>
Hexadecimal	1B	7E	33	<u>n</u>

*Remarks:*

Selects the pitch according to the value of n:

<i>n</i>	<i>Pitch</i>
{0}	10 cpi (pica)
{1}	12 cpi (elite)
{2}	17.1 cpi (condensed pica)
{5}	13.3 cpi
{6}	15 cpi
{7}	20 cpi (condensed elite)

### Enlarged print

<i>Format:</i>	ESC	~	1	<b>n</b>
Decimal	27	126	49	<u>n</u>
Hexadecimal	1B	7E	31	<u>n</u>

*Remarks:*

This command selects enlarged text. Text can be enlarged in height, width, or both. Enlarged text can be combined with all **print styles** except that **superscript** and **subscript** characters cannot be enlarged vertically.

<i>n</i>	<i>Enlargement</i>
{0}	Normal width and height
{1}	Double height
{2}	Quadruple height
{3}	Double width
{4}	Quadruple width
{5}	Double height and width
{6}	Quadruple height and width

## PRINT ENHANCEMENT COMMANDS

### Reverse print

	<i>On</i>				<i>Off</i>			
<i>Format:</i>	ESC	~	2	{1}	ESC	~	2	{0}
Decimal	27	126	50	1	27	126	50	0
Hexadecimal	1B	7E	32	01	1B	7E	32	00

*Remarks:*

This command selects reverse printing text (that is, white letters on a black background). Reverse text works with all **print styles** except **doublestrike** printing and **superscript** and **subscript** characters.

## CHARACTER TABLE COMMANDS

### Select code page

<i>Format:</i>	ESC	~	R	<b>n</b>
Decimal	27	126	82	<u>n</u>
Hexadecimal	1B	7E	52	<u>n</u>

*Remarks:*

This command selects IBM code page n as follows:

<i>n</i>	<i>Code page</i>	<i>n</i>	<i>Code page</i>
0	U.S.A. (437)		
1	Multilingual (850)		
2	Portugal (860)		
3	Canada-French (863)		
4	Norway (865)		
5	Scandinavia		
12	Turkish		
13	Icelandic (861)		
100	ABICOMP (Brazilian)		
101	BRASCI (Brazilian)		

### Select Windows ANSI character set

<i>Format:</i>	ESC	~	s	<b>n</b>
Decimal	27	126	115	<u>n</u>
Hexadecimal	1B	7E	73	<u>n</u>

*Remarks:*

This command uses the selected ANSI character set for **codes 128-255** instead of the standard Epson or IBM character sets (unless you have selected the Epson **Italics character set**; in that case, this command has no effect). To return to the standard character sets, use **ESC t** or **ESC R** (Epson **emulation**) or **ESC ~ R** (IBM **emulation**).

<i>n</i>	<i>Character set</i>
0	US ANSI

### Slashed zero

	<i>On</i>				<i>Off</i>			
<i>Format:</i>	ESC	~	4	{1}	ESC	~	4	{0}
Decimal	27	126	52	1	27	126	52	0
Hexadecimal	1B	7E	34	01	1B	7E	34	00

*Remarks:*

This command causes zeros to be printed with a slash mark through them to distinguish them from the letter O.

The slashed zero feature can also be selected with the VuePrint menu.

### Print character set tables

<i>Format:</i>	ESC	~	S	<b>n</b>
Decimal	27	126	83	<u>n</u>
Hexadecimal	1B	7E	53	<u>n</u>

*Remarks:*

This command prints a table showing all the available character sets in each emulation. (You can also use the CharSet program, furnished with this program, to see this information in a different form.)

<i>n</i>	<i>Character set</i>
0	Epson mode character sets ( <b>ESC t</b> , <b>ESC R</b> )
1	IBM mode character sets ( <b>ESC 7</b> , <b>ESC 6</b> , <b>ESC ~ R</b> , <b>ESC ~ s</b> )



## PRINTER CONTROL COMMANDS REFERENCE

Master reset		<b>ESC @</b>
Delete character		<b>{127}</b>
Cancel line		<b>{24}</b>
Unidirectional print	On	<b>ESC U {1}</b>
	Off	<b>ESC U {0}</b>
	One line	<b>ESC &lt;</b>
Half speed mode	On	<b>ESC s {1}</b>
	Off	<b>ESC s {0}</b>
Select high-speed printing	On	<b>ESC ~ 8 {1}</b>
	Off	<b>ESC ~ 8 {0}</b>
Top-of-form position	7/16"	<b>ESC ~ T {0}</b>
	0"	<b>ESC ~ T {1}</b>
Top-of-form adjustment	Continuous forms	<b>ESC ~ V <u>n</u> {0}</b>
	Single sheets	<b>ESC ~ V <u>n</u> {1}</b>
Paper tear-off	Enable	<b>ESC ~ C {1}</b>
	Disable	<b>ESC ~ C {0}</b>
Automatic sheet feeder	A.S.F. on	<b>ESC {25} 4</b>
	A.S.F. off	<b>ESC {25} 0</b>
	Eject sheet	<b>ESC {25} R</b>
Suspend/resume	Deselect	<b>{19}</b>
	Select	<b>{17}</b>
MSB control	MSB = 1	<b>ESC &gt;</b>
	MSB = 0	<b>ESC =</b>
	Cancel	<b>ESC #</b>
Paper-out sensor	On	<b>ESC 9</b>
	Off	<b>ESC 8</b>
Immediate mode	On	<b>ESC i {1}</b>
	Off	<b>ESC i {0}</b>
Emulation	Epson FX-series	<b>ESC ~ 5 {0}</b>
	IBM Proprinter III	<b>ESC ~ 5 {1}</b>
	Auto	<b>ESC ~ 5 {255}</b>
Copy mode	On	<b>ESC ~ ! {1}</b>
	Off	<b>ESC ~ ! {0}</b>

## VERTICAL MOTION COMMANDS

Advance paper	One line	<b>{10}</b>
	To next top-of-form	<b>{12}</b>
	<u>n</u> /216 inch	<b>ESC J <u>n</u></b>
Retract paper	<u>n</u> lines	<b>ESC f {1} <u>n</u></b>
	<u>n</u> /216 inch	<b>ESC j <u>n</u></b>
Set page length	<u>n</u> lines	<b>ESC C <u>n</u></b>
	<u>n</u> inches	<b>ESC C {0} <u>n</u></b>
Skip-over-perforation	<u>n</u> lines	<b>ESC N <u>n</u></b>
	Cancel	<b>ESC O</b>
Line spacing	1/6 inch	<b>ESC 2</b>
	1/8 inch	<b>ESC 0</b>
	7/72 inch	<b>ESC 1</b>
	<u>n</u> /72 inch	<b>ESC A <u>n</u></b>
	<u>n</u> /144 inch	<b>ESC ~ 0 <u>n</u></b>
	<u>n</u> /216 inch	<b>ESC 3 <u>n</u></b>
Set vertical tabs	In channel 0	<b>ESC B <u>n1</u> <u>n2</u> ... {0}</b>
	Every <u>n</u> lines	<b>ESC e {1} <u>n</u></b>
	In channel <u>c</u>	<b>ESC b <u>c</u> <u>n1</u> <u>n2</u> ... {0}</b>
Select vertical tab channel		<b>ESC / <u>c</u></b>
Park paper		<b>ESC ~ {12}</b>

## HORIZONTAL MOTION COMMANDS

Move print head	To left margin	{13}
	Backspace	{8}
	To next horizontal tab position	{9}
	<u>n</u> columns	<b>ESC f</b> {0} <u>n</u>
	Absolute position	<b>ESC \$</b> <u>n1</u> <u>n2</u>
Margins	Relative position	<b>ESC \</b> <u>n1</u> <u>n2</u>
	Left	<b>ESC I</b> <u>n</u>
	Right	<b>ESC Q</b> <u>n</u>
Set horizontal tabs	Column <u>n1</u> , <u>n2</u> , etc.	<b>ESC D</b> <u>n1</u> <u>n2</u> ... {0}
	Every <u>n</u> columns	<b>ESC e</b> {0} <u>n</u>

## PRINT STYLE COMMANDS

Select print quality	Near letter quality	<b>ESC x</b> {1}	
	Draft	<b>ESC x</b> {0}	
Select font	Roman	<b>ESC k</b> {0}	
	Sans serif	<b>ESC k</b> {1}	
	Courier	<b>ESC k</b> {2}	
	Prestige	<b>ESC k</b> {3}	
	Script	<b>ESC k</b> {4}	
	Orator	<b>ESC k</b> {7}	
	Roman	<b>ESC ~ x</b> {0}	
	Sans serif	<b>ESC ~ x</b> {1}	
	Courier	<b>ESC ~ x</b> {2}	
	Prestige	<b>ESC ~ x</b> {3}	
	Script	<b>ESC ~ x</b> {4}	
Select print style	Orator	<b>ESC ~ x</b> {7}	
	<u>n</u> = sum of attributes	<b>ESC !</b> <u>n</u>	
	Elite	1	
	Proportional	2	
	Condensed	4	
	Emphasised	8	
	Doublestrike	16	
	Expanded	32	
	Italic	64	
	Underline	128	
	Font lock mode	On	<b>ESC ~ F</b> {1}
		Off	<b>ESC ~ F</b> {0}

## PRINT SIZE COMMANDS

Select pitch	Pica	<b>ESC P</b>
	Elite	<b>ESC M</b>
	15 pitch	<b>ESC g</b>
	Pica	<b>ESC ~ 3</b> {0}
	Elite	<b>ESC ~ 3</b> {1}
	13.3 pitch	<b>ESC ~ 3</b> {5}
	15 pitch	<b>ESC ~ 3</b> {6}
	17.1 pitch	<b>ESC ~ 3</b> {2}
	20 pitch	<b>ESC ~ 3</b> {7}
	Expanded print	On
Off		<b>ESC W</b> {0}
Expanded print (one line)	On	{14}
	On	<b>ESC</b> {14}
	Off	{20}

Condensed print	On	{15}
	On	ESC {15}
	Off	{18}
Proportional spacing	On	ESC p {1}
	Off	ESC p {0}
Double-high print	On	ESC w {1}
	Off	ESC w {0}
Enlarged print	Double-high	ESC ~ 1 {1}
	Quadruple-high	ESC ~ 1 {2}
	Double-wide	ESC ~ 1 {3}
	Quadruple-wide	ESC ~ 1 {4}
	Dbl-high and dbl-wide	ESC ~ 1 {5}
	Quad-high and quad-wide	ESC ~ 1 {6}
	Off	ESC ~ 1 {0}

## PRINT ENHANCEMENT COMMANDS

Emphasised print	On	ESC E
	Off	ESC F
Doublestrike print	On	ESC G
	Off	ESC H
Italic print	On	ESC 4
	Off	ESC 5
Underlining	On	ESC - {1}
	Off	ESC - {0}
Superscript/subscript	Superscript	ESC S {0}
	Subscript	ESC S {1}
	Off	ESC T
Select colour	Black	- {0}
	Magenta	ESC r {1}
	Cyan	ESC r {2}
	Violet	ESC r {3}
	Yellow	ESC r {4}
	Orange	ESC r {5}
	Green	ESC r {6}
Reverse print	On	ESC ~ 2 {1}
	Off	ESC ~ 2 {0}
Justification	Flush left	ESC a {0}
	Centred	ESC a {1}
	Flush right	ESC a {2}
	Justified left and right	ESC a {3}
Set intercharacter spacing		ESC {32} <u>n</u>

## CHARACTER TABLE COMMANDS

Characters 128-255	Italics	ESC t {0}
	Epson graphics characters	ESC t {1}
Characters 128-159	Control codes	ESC 7
	Printable characters	ESC 6
Expand printable code area	Control codes	ESC I {0}
	Printable characters	ESC I {1}
Select character set	USA	ESC R {0}
	France	ESC R {1}
	Germany	ESC R {2}
	United Kingdom	ESC R {3}
	Denmark I	ESC R {4}
	Sweden	ESC R {5}
	Italy	ESC R {6}
	Spain I	ESC R {7}

	Japan	<b>ESC R {8}</b>
	Norway	<b>ESC R {9}</b>
	Denmark II	<b>ESC R {10}</b>
	Spain II	<b>ESC R {11}</b>
	Latin America	<b>ESC R {12}</b>
	Korea	<b>ESC R {13}</b>
	Legal	<b>ESC R {64}</b>
Select code page	USA (437)	<b>ESC ~ R {0}</b>
	Multilingual (850)	<b>ESC ~ R {1}</b>
	Portugal (860)	<b>ESC ~ R {2}</b>
	Canada-French (863)	<b>ESC ~ R {3}</b>
	Norway (865)	<b>ESC ~ R {4}</b>
	Scandinavia	<b>ESC ~ R {5}</b>
	Turkish	<b>ESC ~ R {12}</b>
	Icelandic (861)	<b>ESC ~ R {13}</b>
	ABICOMP (Brazilian)	<b>ESC ~ R {100}</b>
	BRASCI (Brazilian)	<b>ESC ~ R {101}</b>
Select Windows ANSI set	US ANSI	<b>ESC ~ s {0}</b>
Slashed zero	Slashed	<b>ESC ~ 4 {1}</b>
	Not slashed	<b>ESC ~ 4 {0}</b>
Print character set tables	Epson	<b>ESC ~ S {0}</b>
	IBM	<b>ESC ~ S {1}</b>

## DOWNLOAD CHARACTER COMMANDS

Define download character	<b>ESC &amp; {0} <u>data</u></b>
Copy ROM to RAM	<b>ESC : {0} <u>n</u> {0}</b>
Select download characters	<b>ESC % {1}</b>
Cancel download characters	<b>ESC % {0}</b>

## GRAPHICS COMMANDS

Bit image graphics	Single-density	<b>ESC K <u>n1 n2 data</u></b>
	Double-density	<b>ESC L <u>n1 n2 data</u></b>
	Hi-speed dbl-density	<b>ESC Y <u>n1 n2 data</u></b>
	Quadruple-density	<b>ESC Z <u>n1 n2 data</u></b>
	Graphics mode <u>m</u>	<b>ESC * <u>m n1 n2 data</u></b>
Reassign graphics mode	9-pin	<b>ESC ^ <u>m n1 n2 data</u></b>
		<b>ESC ? <u>n m</u></b>