



## AN-02

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### OVERVIEW OF THERMAL LINE PRINTER MODE

Line printer mode is the simplest protocol supported by the O'Neil thermal printers. Send a line of text as a sequence of characters down to the printer followed by a carriage return (0x0D), and/or a line feed (0x0A), or a form feed (0x0C) and the printer will print that line of text. Commands can be used to change the way the printout looks, and to select different fonts (fonts are available as the common IBM PC Code Page 437 mapping as well as many other mappings and international character sets – see AN-3 or AN-13)

Commands are usually either a single non-printable character, or a sequence of characters beginning with a non printable character such as ESCape (0x1b). Although these commands can be placed anywhere in the text, they will usually take effect exactly where they are placed. So you must be careful to place them where you want the effect to take place. For example, to change fonts you send ESC w n, where 'n' is the single character name of the font (seen AN-3 or AN-12). If you do this at the beginning of the line, it will affect the entire line. But if you place this in the center of a line, it will affect only those characters that come after. If you place this at the end of the line, it will have no effect on that line at all, but will affect the next line.

COMMAND	MEANING	ORIGINAL MF2/MF3/2t/4t	RADIO READY 2t/3l/4t
LF (0x0A) <sup>1</sup>	Print any characters received and advance to the next line	X	X
FF (0x0C)	Print any characters received and advance to the next page	X	Configurable option – default is OFF
CR (0x0D) <sup>1</sup>	Print any characters received and advance to the next line	X	X
SO (0x0E)	Sets double width printing	X	X
SI (0x0F)	Cancel double width printing	X	X
CAN (0x18)	Cancel any characters sent to the printer on the current line that have not yet been printed	X	X
ESC @ (0x1B '@')	Resets the printing engine - cancels any command currently in effect and resets the font as if the printer had just been turned ON	X	X
ESC ! n (0x1B '! n')	Sets double wide and double tall. The 'n' is a bit field where double wide is set if Bit 5 is set, and double high is set if Bit 4 is set	X	X
ESC A n (0x1B 'A' n')	Sets line spacing to add n dotlines between each text line. Default is zero	X	X
ESC B (0x1B 'B')	Beginning of Run Length Encoded graphics image (see ESC E and AN-5). This command is followed by the Run Length encoded graphic image data	X	X
ESC C n (0x1B 'C' n')	Set form length to n lines, each line is the height of the CURRENT font	X	X (Note FF must be ON to use)
ESC E	End of a Run Length Encoded graphics image (see ESC s n and AN-5)		
ESC EZ (0x1B "EZ")	Toggle to Easy Print mode	X	X



ESC H n (0x1B 'H' n)	Apply a vertical multiplier of n to the normal height of a character – n = 0x02 will give double high characters, n = 0x03 will give triple high characters etc.	X	
ESC I n (ESC 'I' n)	If n = 0x01 or n = '1' (0x31) will turn inverse (white on black printing) ON and if n=0x00 or n = '0' will turn inverse OFF	X	X
ESC Q n1n2 (0x1B 'Q' n1n2)	When this command is received, the printer stops imaging and starts advancing, looking for a "Q" mark, then going an additional n1n2 dotlines after the "Q" mark is found	X	X
ESC R n (0x1B 'R' n)	Remaps some international characters when used with a 224 character CP437 font (Values below in HEX) 0 – USA    1 – France    2 – Germany 3 – UK     4 – Denmark    5 – Sweeden 6 – Italy    7 – Spain	X	X
ESC V n1n2	Marks the beginning of a bitmap graphics image sent to the printer. The n1n2 are the number of dotlines in the image, the graphics image follows		
ESC e (0x1B 'e')	Marks the end of a print job for "Job Status Reporting" (see ESC s n for start)	X	X
ESC i (0x1B 'i')	Thrown away (for compatibility with another printer)	X	
ESC m (0x1B 'm')	Thrown away (for compatibility with another printer)	X	
ESC s n (0x1B 's' n)	Turns ON Job Status Reporting. The 'n' is a bit field that allows various status to be reported to the host automatically upon detection (e.g. paper out and end of job)	X	X
ESC t n	Can be used to cancel the printer system timeout. If n = 0x01 or '1' (0x31), then the timeout is cancelled. If n = 0x00 or '0' (0x30) then the timeout is enabled, which is the default	X	
ESC w n (0x1B 'w' n)	Selects the font with a single character name of 'n'. A list of the values of n for each font is given in the self test and in AN-3	X	X

1 Note: A single LF, CR, or combinations of CRLF or LFCR are all considered line terminations and cause the printer to print and advance

**Example 1**

To print a single line of data, send the string to print terminated by CR, LF, CRLF, or LFCR. For example, if you send the 8 ASCII characters A-H, followed by Carriage Return (0x0D) and Line Feed (0x0A) you will see a single printed line of text containing ABCDEFGH:

ABCDEFGH 0x0D 0x0A

**Example 2**

To change to a different font, send ESC w followed by the single character font name as indicated on the self test printout or in the documentation. For example, if you send the string from Example 1 followed by ESC w & IJKLMNOP you will see A-H on one line in the default font (or whatever font was active from the last print job) followed by a second line in a larger font. The ESC character is a single byte 0x1B

ABCDEFGH 0x0D 0x0A  
0x1B w & IJKLMNOP 0x0D 0x0A



**Example 3**

To print a portion of a line (or an entire line or multiple lines) double wide, send the SO character before the text to be printed double wide, then send the SI character to turn it off. For example, to print the text "This is DOUBLE WIDE" with the word double printed double wide, send:

This is 0x0E DOUBLE 0x0F WIDE 0x0D 0x0A

**Example 4**

To assure that any residual setting (e.g. font or double wide) send the reset print engine command ESC @ at the beginning of the print job. For example, when the following is sent you are assured that the text "This is my first line of text" will be printed using all the defaults, including the default font, regardless of what was printed before. This command does NOT reset the entire printer, only the print engine portion of the printer.

0x1B @This is my first line of text