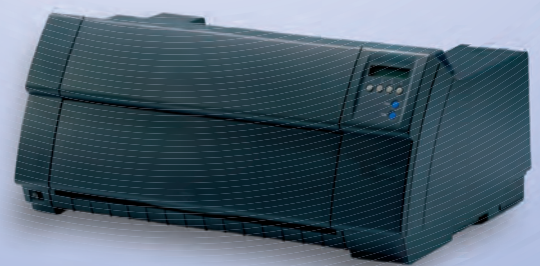# DASCOM

Tally®

User Guide   IGP for Dot Matrix Printers

Scope

This User Guide is to be considered as an enhancement to the standard documentation of your printer. Hence keep the printer's standard documentation ready as your particular printer model is pictured in detail.

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Chapter 1: Control Panel

The panel consists of 2 Function Keys (Online sets the printer to online/offline mode, Setup enters setup mode) and 4 situation dependent soft keys (1, 2, 3, 4). The function of the soft keys is denoted by the display. For further explanations of the control panel functions, please refer to the *User Guide* of the printer.

On some printer models the menu may be locked. In order to enter the menu in this case, press the Menu key (1) for approximately 5 seconds.

Basic Elements

2 x 16 Digit LCD

1	2	3	4
◯	◯	◯	◯

Online ◯

Setup ◯

1,2,3,4	"Soft Keys" The function is denoted by the display
Online	sets printer to online / offline
Setup	enters set-up mode
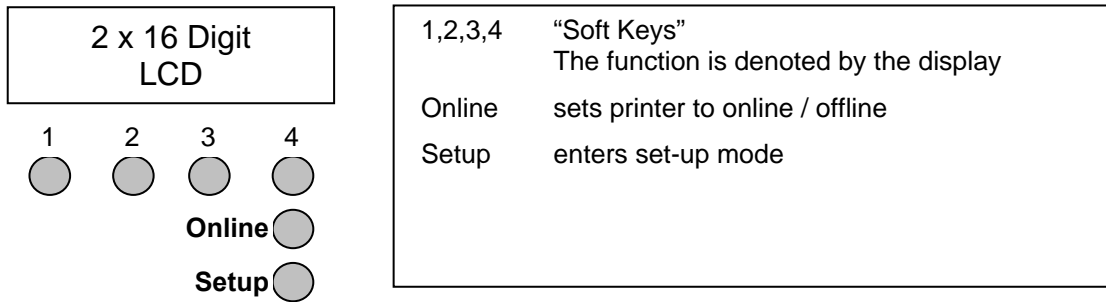
Figure 1 - Control Panel Elements

> *NOTE:* **For further informations on the control panel please refer to the printers Quick Start Guide or the User Guide on the Online CD-ROM.**

Menu Structure
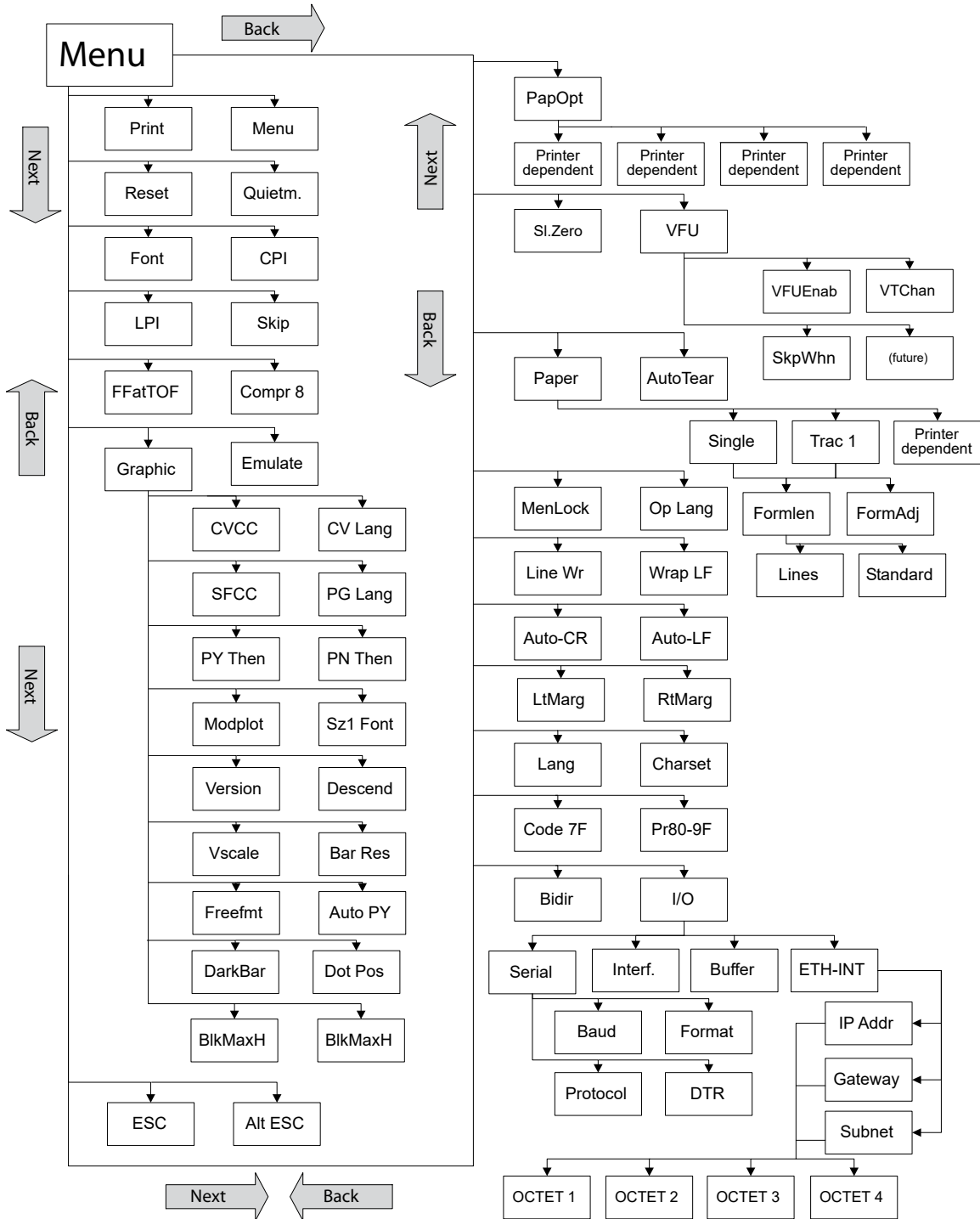
Figure 2 - Control Panel Menu Structure

Menu Parameters

Factory settings are marked with *

Parameter group	Parameter	Description
Print	(none)	A list of the menus with the current setting is printed.
Menu	Load Menu = 1* Load Menu = 2 Load Menu = 3 Load Menu = 4 Load Menu = 5	A menu is loaded. Selection between five menus can be made.
Reset	Reset Menu 1...5 No* Yes	The currently selected menu returns to the default values (factory settings).
Quietm.	Quietm. = On Quietm. = Off*	Switches between normal and quiet mode printing. For all printing modes, the print-out is made with the bidirectional method in quiet mode printing. In the first step the first row of pins is activated, during the second step the second row is used.
Font	Draft Roman NLQ Roman LQ Sans Serif NLQ Sans Serif LQ Courier NLQ Courier LQ OCR-B NLQ OCR-B LQ OCR-A NLQ OCR-A LQ	Selects the character style and its quality. The abbreviation NLQ stands for Near Letter print quality, which means that the printer works faster but with a slightly lower resolution. LQ stands for Letter Quality, which means that the resolution is higher at the expense of a slightly slower speed.
CPI	5 CPI, 6 CPI, 6.67 CPI, 7.5 CPI, 8.6 CPI, 10 CPI*, 12 CPI, 13.3 CPI, 15 CPI, 17.1 CPI, 20 CPI	Sets the characters per inch (character pitch).
LPI	1,5 LPI, 2 LPI, 3 LPI, 4 LPI, 5 LPI, 6 LPI*, 8 LPI, 9 LPI, 10 LPI, 12 LPI	Sets the lines per inch (line density).
Skip	Skip = 0.0 Inch* Skip = 0.5 Inch Skip = 1.0 Inch Skip = 1.5 Inch Skip = 2.0 Inch Skip = 2.5 Inch Skip = 3.0 Inch Skip = 3.5 Inch	Skips the perforation; 7 different values (in inches) can be defined.
FFatTOF	Off On*	Determines whether a Form Feed is invoked at Top Of Form. When set to Off, a host Form Feed command is ignored if the current position is at TOF.
Compr 8	Off* On	Compressed 8 LPI. When set to On, all text printed at 8 LPI or greater is printed in the compressed font.

Parameter group	Parameter	Description
Graphic CVCC	1 : 94* : 255	Defines the decimal ASCII character code for the Code V Command Character
CV Lang	US* UK Swe/Fin Nor/Dan Japan French Italian Spanish	Defines the language substitution set for Code V block characters.
SFCC	1 : 126* : 255	Defines the decimal ASCII character code between 1 and 255 for the PGL Command Character (called the Special Function Command Character by Printronix).
PG Lang	ASCII* German Swedish Danish Norway Finnish English Dutch French Spanish Italian Turkish	Defines the language substitution set for PGL block characters.
PY Then	None* All Term FreeFmt	Defines how data on the same line as the Code V ^PY command is treated. The possible settings are: None All data, plus the line terminator, are ignored. All All data is executed. Term All but the terminator is ignored. FreeFmt Characters on the ^PY line are ignored if the state of FreeFmt is On/Enabled in the Config Menu "Graphics" "FreeFmt".
PN Then	None* All Term FreeFmt	Defines how data on the same line as the Code V ^PN command is treated. The possible settings are: None All data, plus the line terminator, are ignored. All All data is executed. Term All but the terminator is ignored. FreeFmt Characters on the ^PN line are ignored if the state of FreeFmt is On/Enabled in the Config Menu "Graphics" "FreeFmt".

Parameter group	Parameter	Description
Graphic (continued) Modplot	On* Off	Determines whether text following graphics is re-aligned to the vertical spacing defined by the LPI setting, relative to Top of Form.
Sz1Font	Roman HS Sana Serif HS Courier HS OCRA HS OCRB HS* Block	Selects the character style of the size 1 block character. This font style will be used only for horizontal size 1 block characters that are not reverse image, all other orientations and reverse image will use the block character font. *Note: In order to make size 1 block characters work within PGL reverse fields, the font chosen must be "Block".*
Version	2* 1	Allows for the setting of Version 1 or Version 2 Code V (Default) compatibility.
Descend	Fixed* Auto	Parameter controls the line spacing when descenders are present.
Vscale	Off Style 1*	Parameter defines whether vertical block characters will be scaled to the same dimensions as horizontal block characters.
Bar Res	Low* High	This control panel option applies only to Code V Extended Mode bar code commands. If you want the 300 DPI bar codes, but elect not to use the EXTENDED graphics commands, this menu option can be used. If High is selected you will get 300 DPI bar codes. If you select Low, you will get the standard 60 by 72 bar codes that appear on line printers. This switch only changes bar code dpi while in Code V (not PGL, etc.). This switch has no effect in the case where ^IPARAM,EXTENDED has been activated.
Freefmt	On Off*	Option turns on free format in Code V graphics whenever a ^PY is encountered.
Auto PY	Off* On	If Auto-PY is On, the printer is automatically in Code V graphics mode, and a ^PY command is not needed in the file being sent to the printer to begin Code V graphics.
DarkBar	On* Off*	Barcodes can be printed in two densities. "on" means 180 dpi Full Space. "off" means 180 dpi Half Space.
Dot Pos	Baseline* Top of Cell	When set to "Baseline", the specified position is interpreted to be the baseline position of the character. Use this setting if you are upgrading from a line printer application. Use the "Top of Cell" setting if you are upgrading from a laser printer application.

Parameter group	Parameter	Description
Graphic (continued)		
BlkMaxH	0 to 136 Default: 40	Sets the maximum size black character (horizontally) that will be printed using the TrueType font. Characters above this maximum size will be printed using the previous vector style block characters.
BlkMaxV	0 to 136 Default : 40	Sets the maximum size black character (vertically) that will be printed using the TrueType font. Characters above this maximum size will be printed using the previous vector style block characters.
Emulate	MT660* P6000 EPSON FX IBM PROPRINTER HP2564C GENICOM	Selects the emulation.
ESC	On* Off	Turns on or off the recognition of the ESC character
Alt ESC	On Off*	Turns on or off the recognition of the Alternate ESC character (^ in column 1)
Bidir	Bidir = On* Bidir = Off	On: Printer prints bi-directional. Off: Printer prints left to right.

I/O
  Serial
    Baud
	Baud = 600
	Baud = 1200
	Baud = 2400
	Baud = 4800
	Baud = 9600*
	Baud = 19200
		Selects the baud rate. Printer and computer must have the same baud rate

Format	7 Bit No 2 Stop 7 Bit Even 1 Stop 7 Bit Odd 1 Stop 7 Bit Even 2 Stop 7 Bit Odd 2 Stop 7 Bit Mark 1 Stop 7 Bit Spc 1 Stop 7 Bit Mark 2 Stop 7 Bit Spc 2 Stop 8 Bit No 1 Stop* 8 Bit No 2 Stop 8 Bit Even 1 Stop 8 Bit Odd 1 Stop 8 Bit Mark 1 Stop 8 Bit Spc 1 Stop	Sets the number of data bits. The parity test for received data bytes can be selected. NO causes transmission in both directions without parity bit. If EVEN or ODD is selected, the bytes are checked if they have even or odd parity. The selection of MARK or SPACE causes a data byte transmission with parity bit, but without checking the received data. Transmission data with parity bit is always marked with 1 (MARK) or 0 (SPACE). Selects one or two stop bits per data byte.
Protocol	XON/ XOFF* Robust XON/ XOFF ENQ/ STX ETX/ ACK ACK/NAK	Selects the protocol for data transmission

Parameter group	Parameter	Description
I/O (continued) DTR	DTR = DTR* DTR = READY	DTR signal is assigned to DTR line READY signal is assigned to DTR line DTR = Pin 20 (25- pin female connector) DTR = Pin 4 (9- pin female connector)
Interf.	Interf. = Share* Interf. = Parallel Interf. = Serial	Selects the interface. Printer is configured either for parallel or serial connection or in automatic change for both. Note: Serial is optional.
Buffer	Buffer = 0 KB … Buffer = 128 KB*	Selects the size of the interface buffer
ETH-INT		In this parameter group you can choose settings for the internal Ethernet interface.
IP Addr	IP Addr = OCTET1 … IP Addr = OCTET4	This menu level offers the possibility to set the IP address, which is divided into four digit groups (octet 1 to 4). Possible settings: 0 to 255
Gateway	Gateway = OCTET1 … Gateway = OCTET4	This menu level offers the possibility to set the Gateway address, which is divided into four digit groups (octet 1 to 4). Possible settings: 0 to 255
Subnet	Subnet = 0 … Subnet = 255	This menu level offers the possibility to set the Subnet mask address , which is divided into four digit groups (octet 1 to 4). Possible settings: 0 to 255
Code 7F	Fill* Ignore Del Chr Del Buf Space	Determines what to do when a 7F character is parsed in the data stream.
Pr80-9F	Off On*	Selects whether or not to print characters for codes 80-9F
Lang	US* UK French German Italian Swe/Fin Nor/Dan Spanish Japanese Portuguese Fren Eps UK Eps Nor/Dan Eps Ital Eps Span Eps Nor Eps Dan II Eps Span II Eps Lat Amer Eps	Selects the language set defined by character substitution within the ASCII character set in locations 20 Hex to 7F Hex.

Parameter group	Parameter	Description
Charset	CP437 CP850 CP852 CP857 CP860 CP861 CP863 CP865 CP866 CP1250 CP1251 CP1252 CP1254 Italic Latin1* Latin2 Latin9 Cyrillic Turkish SAP8859-1 HP Roman8	Selects the character set that defined the characters in location 80 Hex to FF Hex. Locations 20 Hex to 7F Hex will be the standard ASCII characters.
LtMarg	1 to CPI X 13.6	Sets the left margin column. The maximum value is a function of the CPI times the printable area (13.6 inches)
RtMarg	1 to CPI X 13.6	Sets the right margin column. The maximum value is a function of the CPI times the printable area (13.6 inches)
Auto-CR	Auto-CR = On Auto-CR = Off*	Switches the automatic carriage return on or off after receiving the signal CR
Auto-LF	Auto-LF = On Auto-LF = Off*	Switches the automatic line feed (LF) on or off after receiving the signal CR
Line-Wr	Line-Wr = Off* Line-Wr = On	Parameter will cause an automatic Carriage Return when attempting to print data past the right margin
Wrap-LF	Wrap-LF=Off* Wrap-LF=On	When this parameter and the Line Wrap parameter are both set to ON, an automatic Carriage Return and Line Feed will occur when attempting to print data past the right margin
MenLock	MenLock = Off MenLock = Menu* MenLock = All	MenLock = Menu : Menu-key is locked MenLock = All: Setup-, Paper-, Font, CPI locked. Printer power has to be toggled to activate locking The locked keys can only be re-activated by holding the Setup-key while switching the printer on.
Op Lang	English* German French Italian Spanish	The menu will be shown on the LC display in the selected language.

Parameter group	Parameter	Description

Paper
    Single
        Formlen
            Lines
		Selects the paper parameters for Formlen , FormAdj and Head, for the Single feed and Tractor feed forms.

	6 : 72* : 132	Sets the form length by No of lines of the actual LPI setting. (E.g. 72 lines at 6 LPI will result in 12 ins form length). Form length may be selected in the range of 3 ins to 21 ins. Form length selected will not be affected by changing LPI later on.
Standard	No format DIN A3 DIN A4 DIN A5 DIN B5 DIN B6 DIN C6 Executive Letter Legal	Selects the form length by standard formats. The LC display will indicate "No format" if a Form length is selected by the Line function or ESC sequence, which does not correspond to a standard format
FormAdj	FormAdj = 0/ 72" : FormAdj = 12/ 72"* : FormAdj = 220/ 72"	Sets the first print position of a form in n/72 inch, separately adjustable for each paper path. NOTE: "Single" does not apply to some printer models.

Trac1
         Formlen
         FormAdj
	(same as above)
	(same as above)	

AutoTear	View/Tear = Off* View = 1s View = 3s View = 6s	Selects the Auto View / Auto Tear function. If Auto View is selected, paper will be moved to make the last printed line visible (Auto View position). When data is received paper will move to last print position and printing continues. If no data is received for the selected interval paper will be moved to Auto View position
	Tear = 1s Tear = 3s Tear = 6s	If Auto Tear is selected, the perforation of the paper will be moved to the Tear-off position As soon as data is received the paper will move to the last print position and printing will continue. If no data is to be printed for the selected interval, paper will be moved to Tear-off position
	Tear at TOF	If the parameter Tear at TOF is set, the paper perforation is automatically positioned at the tear off edge as long as the current print position is TOF. Feeding takes place after approx. 1.5 sec (hold time). If any data is received during this period of time printing will continue and the paper will not be fed to the tear-off position. It must be noted that the printer may only be switched off when the print position is at TOF.

Parameter group	Parameter	Description
Sl.Zero	Off* On	Selects if normal zero (0) or the slashed zero (Ø) is printed.
VFU VFUEnab	Off* On	Selects whether VFU is active for use with Vertical Format Units
VTChan	1 : 12 Unused	Selects the Vertical tab channel
SkpWhn	Before* After	Sets up when paper movement happens on hitting bottom of form using VFUs
PapOpt	ASF-R ASF-F Trac2 Trac3 AutoTRA AutoASF	*T2150/T2250* Activation of optional Tractors and Sheet-Feeders: installed or not installed. *T2265+…T2380* These Parameters only appear if at least one optional Tractor (TRA) or Sheet Feeder (ASF) is installed. It regulates the activation of optional paper ways when there is no more paper left in one of them: T1=T2=T3 and/or: ASF1=ASF2 or: Off

Menu Printout Example

NOTE: The actual print out of your printer may differ from this example.

	Menu 1	Menu 2	Menu 3	Menu 4	Menu 5	Current
Font	Draft	Draft	Draft	Draft	Draft	Draft
CPI	10 CPI	10 CPI	10 CPI	10 CPI	10 CPI	10 CPI
LPI	6 LPI	6 LPI	6 LPI	6 LPI	6 LPI	6 LPI
LtMarg	1	1	1	1	1	1
RtMarg	136	136	136	136	136	136
Skip	0.0Inch	0.0Inch	0.0Inch	0.0Inch	0.0Inch	0.0Inch
Emulate	MT660	IBM Proprinter	MT660	MT660	MT660	MT660
Bidir	On	On	On	On	On	On
ESC	On	On	On	On	On	On
Alt ESC	Off	Off	Off	Off	Off	Off
Lang	US	US	US	US	US	US
CharSet	Latin 1	Latin 1	Latin 1	Latin 1	Latin 1	Latin 1
Code 7F	Fill	Fill	Fill	Fill	Fill	Fill
Pr80-9F	On	On	On	On	On	On
Sl.Zero	Off	Off	Off	Off	Off	Off
Auto-CR	Off	On	Off	Off	Off	Off
Auto-LF	Off	Off	Off	Off	Off	Off
Line Wr	Off	Off	Off	Off	Off	Off
Wrap LF	Off	Off	Off	Off	Off	Off
VFUEnab	Off	Off	Off	Off	Off	Off
VT Chan	2	2	2	2	2	2
Skp Whn	Before	Before	Before	Before	Before	Before
AutoTear	ViewTear=Off	ViewTear=Off	ViewTear=Off	ViewTear=Off	ViewTear=Off	ViewTear=Off
FFatTOF	On	On	On	On	On	On
Compr 8	Off	Off	Off	Off	Off	Off
CWCC	94	94	94	94	94	94
CW Lang	US	US	US	US	US	US
SFCC	126	126	126	126	126	126
PG Lang	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII
PY Then	None	None	None	None	None	None
PN Then	None	None	None	None	None	None
DarkBar	On	Off	On	On	On	On
Modplot	On	On	On	On	On	On
Sxl Font	Roman MS	Roman MS	Roman MS	Roman MS	Roman MS	Roman MS
Version	2	2	2	2	2	2
Descend	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Vscale	Style 1	Style 1	Style 1	Style 1	Style 1	Style 1
Bar Res	Low	Low	Low	Low	Low	Low
FreePat	Off	Off	Off	Off	Off	Off
Auto PY	Off	Off	Off	Off	Off	Off
DotPos	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
BlkMaxH	40	20	40	40	40	40
BlkMaxV	40	20	40	40	40	40
Paphand	On	On	On	On	On	On
Single						
Formlen	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"
Head	18	18	18	18	18	18
FormAdj	12/72"	12/72"	12/72"	12/72"	12/72"	12/72"
Tractor1	*	*	*	*	*	*
Formlen	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"	Fanfold 12"
Head	18	18	18	18	18	18
FormAdj	12/72"	12/72"	12/72"	12/72"	12/72"	12/72"

```
Interf.          Shared
Buffer           128 KB
CX-bid               On
Menu                  1
ColorOpt   Not installed
TearAdj Trac1     0/72"
AutoASF             Off
AutoTRA             Off
Quietm.             Off
AGA                  On
AGA offset            0
Pap.back         normal
PMS                 Low
APW                  On
AED                  On
Sound                On
Single               On
Wrap                 On
Rightzo             Off
Leftzon             Off
Head up             Off
Pagewid         136/10"
Physlm            0/10"
Hvy Form            Off
Sleepmod             On
GrSpeed          triple
Jobcntl             Off

Serial
Baud               9600
Format   8Bit No   1Stop
Protocol      XON/XOFF
DTR                 DTR
```

ETH-INT	OCTET 1	OCTET 2	OCTET 3	OCTET 4
IP Addr	172	20	10	116
Gateway	172	20	0	253
Subnet	255	255	0	0
IP Get Method	DHCP			
EthSpeed	Auto-Sense			
EthConnected	No			
MAC Adr BC-9D-A5-02-00-44				

ETH-EXT	OCTET 1	OCTET 2	OCTET 3	OCTET 4
IP Addr	172	20	10	75
Gateway	172	20	0	253
Subnet	255	255	0	0

WebPanel Enhancements

Enhancements have been made to the WebPanel embedded web server pages to provide management of the features provided by the printer.

The Graphics page, which is special to the IGP printer, is shown below.

NOTE: **Dependent on the printer model and the used Ethernet interface the menus may slightly differ from the images shown below.**
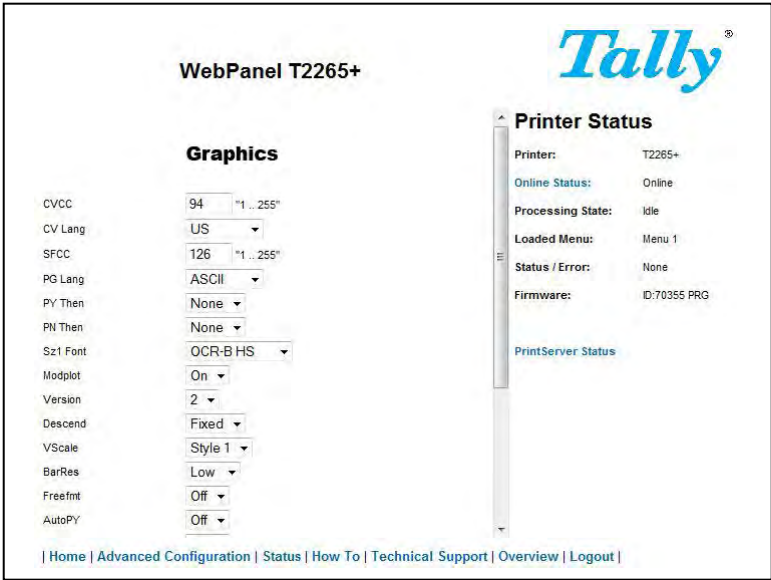
Figure 3 - WebPanel Enhancements

Advanced Menu

In order to enter the Advanced Menu you need to keep the key "Online" pressed while switching on the printer. Once "Testmode" is displayed the Advanced Menu mode is activated.

Parameter group	Parameter	Description
ASCII80 ASCIIa136	on off*	Prints self test 80 or 136 columns. Can be halted by pressing the Online key. Can only be exited by powering the printer off.
H-Dump	on off*	This test enables analyzing interface data sent from host to printer.
Formlen	11" 12"	Defines default form length.
AGA	always* off once on* off	*T2150/T2250* Determines how often the AGA (automatic gap adjustment = head to platen distance) is carried out. *T2265+ … T2380* Decides whether the AGA is on or the head gap needs to be set manually.
Paphand	Headup Pagewid Leftzone Rightzone Physlm	Settings to improve handling of critical paper.
Cx-Bid	on* off	Sets Parallel Interface to IEEE1284 on or off.
Wrap	on* off	Enables/disables line wrap.
Sound	on* off	Enable/disables sound.
Single	on off	Default setting depends on printer model. Enables/disables the manual single sheet mode.
Pap.back	normal* dark	Suitable to improve paper handling with gray or colored rear side.
HvyForm	on off*	Improves quality of carbon copies.
Sleepmod	on* off	Enables/disables Sleep mode.
Serial N Asset N	Variable	Settings for the serial and the asset no. of the printer.
GrSpeed	triple* normal double	normal = 180 dpi graphic full space. double = 180 dpi graphic half space. triple = 180 dpi graphic triple space. Choose triple for highest print speed.
GrFreq	normal high*	T2150/T2250/T2265+/T2365 only. Improves graphic performance.
Jobcntl	off* on	Job control disables/enables PJL commands.

PJL Functions

The following PJL commands are implemented:

Command	Short description	T2x80(+) T2x65(+) T2x50	Line printer
"ESC"%-12345X@PJL	Universal Exit Language (UEL) Commands	X	X
@PJL ECHO	ECHO Command	X	X
@PJL EOJ @PJL EOJ NAME=	EOJ (End of Job) Commands:	X X	X X
@PJL INFO STATUS	INFO (Information Request) Command	X	X
@PJL INFO CONFIG	INFO of the printer configuration	X	-
@PJL INFO VARIABLES	INFO of varibles which can be set by SET	X	-
@PJL INFO MEMORY	INFO about the Memory of the printer	X	-
@PJL RDYMSG DISPLAY =	RDYMSG (Ready Message) Command	-	X
@PJL USTATUS DEVICE = ON @PJL USTATUS DEVICE = OFF @PJL USTATUS DEVICE = VERBOSE @PJL USTATUS JOB = ON @PJL USTATUS JOB = OFF @PJL USTATUS PAGE = ON @PJL USTATUS PAGE = OFF @PJL USTATUSOFF	USTATUS (Unsolicited Status) Commands	X X X X X X X X	X X X X X X X X
@PJL JOB NAME = @PJL JOB FILE = @PJL JOB START = @PJL JOB END = @PJL JOB COPY =	JOB (Start of Job) Commands	X X X X -	X X X X X
@PJL ENTER LANGUAGE	Exit PJL and start normal parser	X	-
@PJL INFO USTATUS		X	X
@PJL USTATUS TIMED		X	X

The PJL functionality works with the internal and external (TallyCom III) ethernet interface and can be switched on/off via the new setting JobCntrl (in the online menu). Default is "off".

Blank
Page
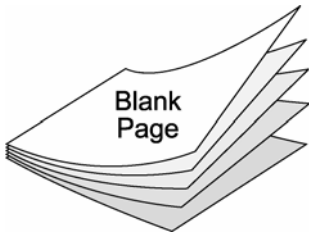
Chapter 2: Emulations

MT660 Emulation

This language is an emulation of the MT660 native language, which was based on the ANSI 3.64 standard. This language has been enhanced as needed throughout the development of the MT661 Series and T6000 Series printers. It is identified as the MT660 emulation on the control panel and in printer reports.

Character Definition and Format

This section presents and explains the Reserved Control Codes and Escape Sequences that control how printed output will look, where it will print, characters that are available, etc.

Attributes, Print Position, and Type Styles

This escape sequence is used for setting up fonts by allowing you to control the print attributes (boldface, underline, overline, etc.), print position (superscript and subscript), and type style selection. The basic sequence is:

ESC	[	n_1	;	n_2	;	nx	m	ASCII Command
1B	5B		3B		3B		6D	Hex Equivalent

This sequence changes both the primary and secondary fonts, but does not change the character set selected except when changing into or out of the OCR sets. In this command you may combine codes for attributes, print positions, and type styles. You may send all of the attributes available and the printer will act on all of them. However, when you send type style codes and super- and subscript codes, the printer will act only on the last type style code and whichever of the super- and subscript commands appears last.

The codes in the following lists may be listed in any order in the command. Each code must be separated from the following code by a semicolon.

Using this escape sequence, you can select such things as *Italicized Courier* font by sending a code to select the Courier type style along with a code to select *italic* printing (see the next section for an explanation of combining character definition and format codes).

Parameter Code		Parameter
ASCII	HEX	Description
Attribute Selections		
4	34	Underline
3	33	Italic
1	31	Boldface
60	3630	Overline
61	3631	Strikethrough
0	30	End Attribute
Print Position		
62	3632	Superscript printing
63	3633	Subscript printing
0	30	End Super-/subscript
Type Styles		
10	3130	Data Processing
11	3131	Gothic
12	3132	OCR-A
13	3133	OCR-B
14	3134	Draft
15	3135	Courier
100	313030	Roman
101	313031	San-Serif
102	313032	Prestige

Figure 4 – Character Definition and Format Codes

Combining Attributes

As we mentioned, any of the attributes discussed in the ESC [nm sequence may be included in a single escape sequence. The escape sequence begins the same as one requesting a single code but changes after the first attribute byte. A semicolon (;) must be inserted between each code listed in the sequence. For example, to print a single word in a sentence with the boldface and underline attributes, send the escape sequence

ESC	[	1	;	4	m
1B	5B	31	3B	34	6D

immediately before the word in the data stream and follow the word with the escape sequence:

ESC	[	0	m
1B	5B	30	6D

Example: To boldface and italicize the word "only" in the sentence:

Enter: Boldface and italicize the word ESC[1;3monlyESC[0m in this sentence.

Printer Output: Boldface and italicize the word *only* in this sentence.

Languages and Character Sets

The numerous language and character set selections are defined in the Character Sets section of this manual. The following commands can be used:

Language	Panel Display	MT660 G0	MT660 G1
ISO 4 – UK	UK	ESC(A	ESC)A
ISO 6 – US	US	ESC(B	ESC)B
ISO 11 – Swedish/Finnish	Swe/Fin	ESC(H	ESC)H
ISO 14 – Japanese	Japanese	ESC(J	ESC)J
ISO 15 – Italian	Italian	ESC(Y	ESC)Y
ISO 16 – Portuguese	Portuguese	ESC(L	ESC)L
ISO 17 – Spanish	Spanish	ESC(Z	ESC)Z
ISO 21 – German	German	ESC(K	ESC)K
ISO 60 – Nor/Danish	Nor/Dan	ESC('	ESC)'
ISO 69 – French	French	ESC(f	ESC)f
Character Set	**Panel Display**	**MT660 G0**	**MT660 G1**
Code Page 437 – IBM Proprinter	CP437	ESC(0x80	ESC)6 or ESC)0x80
Code Page 850 – Latin 1	CP850	ESC(0x82	ESC)0x82
Code Page 852 – Latin 2	CP852	ESC(0x87	ESC)0x87
Code Page 857 – Turkish	CP857	ESC(0x8D	ESC)0x8D
Code Page 860 – Portuguese	CP860	ESC(0x84	ESC)0x84
Code Page 861 – Icelandic	CP861	ESC(0x94	ESC)0x94
Code Page 863 – French Canadian	CP863	ESC(0x85	ESC)0x85
Code Page 865 – Nordic	CP865	ESC(0x86	ESC)0x86
Code Page 866 – Cyrillic	CP866	ESC(0x8E	ESC)0x8E
Code Page 1250 – Win 98 Latin 2	CP1250	ESC(p	ESC)p
Code Page 1251 – Win 98 Cyrillic	CP1251	ESC(q	ESC)q
Code Page 1252 – Win 98 Latin 1	CP1252	ESC(r	ESC)r
Code Page 1254 – Win 98 Turkish	CP1254	ESC(.	ESC).
ISO 8859-1 – Latin 1	Latin1	ESC,A or ESC(%	ESC-A or ESC)%
ISO 8859-2 – Latin 2	Latin2	ESC(& or ESC,B	ESC)& or ESC-B
ISO 8859-15 – Latin 9	Latin9	ESC(/	ESC)/
ISO 8859-5 – Cyrillic	Cyrillic	ESC(*	ESC)* or ESC-L
ISO 8859-9 – Turkish	Turkish	ESC(.	ESC).
HP Roman-8	HP Roman8	ESC(0x83	ESC)0x83
SAP 8859-1	SAP8859-1	ESC(+	ESC)+
Italic	Italic	ESC(Y or ESC (4	ESC)Y or ESC)4

Figure 5 – Language and Character Set Selections

Primary and Secondary Fonts and Languages

This escape sequence allows a font style and some language substitutions to be loaded into the primary (G0) and secondary (G1) areas. To load your primary and alternate character sets, use the sequence:

ESC		[	n_1	;	n_2	!	s
1B	5B			3B		21	73

Where:

n_1 = the value field for the primary (G0) character set.

n_2 = the value field for the alternate (G1) character set.

There are six groupings of Character Sets to select from on your printer.

	ASCII Values			
Language	**Gothic**	**Courier**	**Draft**	**DP**
(user default)	10	40	100 or 700	0
US	11	41	101 or 701	1
German	12	42	102 or 702	2
Norwegian/Danish–T6	13	43	103 or 703	3
French–T6	14	44	104 or 704	4
UK	15	45	105 or 705	5
Spanish	16	46	106 or 706	6
Swedish/Finnish–T6	17	47	107 or 707	7
Italian–T6	18	48	108 or 708	8
Special Characters	19	49	109 or 709	9

Character Set	ASCII
OCR-A	600
OCR-B	610

Figure 6 – Language and Font Selections

In the examples that follow, we show you how to use this escape sequence in a variety of ways.

Example 1:

To select US Data Processing as the primary set (n_1 = 1) and Italian Data Processing as the alternate set (n_2 = 8) use the escape sequence:

ESC		[	1	;	8	!	s
1B	5B	31	3B	38	21	73	

Example 2:

You may change to another primary set without changing the alternate set by omitting n_2 in the sequence. For example, the original escape sequence shown above can be modified to:

ESC		[	1	2	!	s
1B	5B	31	32	21	73	

This escape sequence would change the primary character set to German Gothic (n_1 = 12). The alternate character set remains unchanged.

Example 3:

To change the alternate character set to the Spanish Courier ($n_2 = 46$) without changing the primary set, modify the escape sequence to:

ESC	[	;	4	6	!	s
1B	5B	3B	34	36	21	73

Selecting Primary and Secondary Sets

There are two ways to access the primary and alternate character sets. Once the primary and alternate character sets are loaded, they can be accessed using the Shift In (**SI**, HEX 0F) and Shift Out (**SO**, HEX 0E) codes to select the sets for actual printing; **SI** selects the primary set, and **SO** selects the alternate set.

The second way to access the primary and alternate character sets uses the 8th bit to select either primary or alternate set. To use this method, set the **8th Bit** Parameter to **Data** in the **Configuration Menu**. With 8th Bit set to Data, when the 8th bit is high, it performs the same function as the **SO** Command; it selects the Alternate Character Set. When the 8th bit is low, it performs the same function as the **SI** Command; it selects the Primary Character Set.

Characters Per Inch

The following escape sequence selects the characters per inch (CPI):

ESC	[	n	w
1B	5B		77

Where:

n = A value from the table below.

CPI	ASCII	HEX
5 CPI	9	39
6 CPI	10	3130
6.5 CPI	14	3134
6.67 CPI	11	3131
7.5 CPI	12	3132
8.33 CPI	13	3133
8.57 CPI	15	3135
9 CPI	19	3139
10 CPI	4	34
12 CPI	5	35
12.5 CPI	16	3136
13.33 CPI	8	38
15 CPI	1	31
16.67 CPI	6	36
17.14 CPI	17	3137
18 CPI	18	3138
20 CPI	7	37

Figure 7 – CPI Selections

The CPI value may be changed at any time. However, selecting a new CPI value cancels a previous horizontal size selection (see the next escape sequence), and selecting a new horizontal size cancels the previous CPI value.

Character Height and CPI

This sequence allows you more control over how characters will look when they are printed out on the printer. With this command you can change both the character height and the character width. This allows you to print in wide characters for increased readability. To change character size, use the following escape sequence:

ESC	[	n_1	;	n_2	Sp	B
1B	5B		3B		20	42

Where:

n_1 = one of the values from the following table.

n_1 values			Char Height
ASCII	**HEX**		**amount of increase**
100	313030	=	normal height
200	323030	=	twice normal height

Figure 8 – Character Height Multipliers

Note: Changing the height of a character set will change the distance the paper moves in response to a Line Feed Command.

n_2 = a width multiplier in the range of 1 (.01x) to 1000 (10x). For example, a value of 50 would be .50 X 10 CPI = 5 CPI, and a value of 200 would be 2.00 X 10 CPI = 20 CPI. The result is variable to within a decipoint, so that a value of 128 would be 1.28 X 10 CPI = 12.8 CPI.

The table above lists all of the available CPIs on this emulation and the values used to select them. This command will work with any alphanumeric font.

A new CPI selection will cancel the horizontal size selected with this command, and selecting a new horizontal size cancels the previous CPI selection.

Page Formatting

Many of the parameters for formatting the print and page characteristics (such as LPI, Horizontal Tabs, etc.) can be set from your host computer using escape sequences. This section discusses and explains the Escape Sequences and Reserved Control Codes used for page formatting.

Lines Per Inch

The following escape sequence selects lines per inch (LPI):

ESC	[	n	z
1B	5B		7A

Where:

n = one of the values from the table below.

LPI Selection	n Value	
	ASCII	HEX
1.5 LPI	7	37
2 LPI	8	38
3 LPI	9	39
4 LPI	10	3130
5 LPI	11	3131
6 LPI*	3	33
7 LPI	12	3132
8 LPI	4	34
9 LPI	13	3133
10 LPI	6	36
11 LPI	14	3134
12 LPI	15	3135
15 LPI	16	3136

*Default LPI value

Figure 9 – LPI Selections

The LPI may be changed anywhere on a form. The current LPI setting is used to compute the physical form length when loading a **VFU** or selecting a form length. Changing the LPI does not change the physical form length, bottom-of-form skip, vertical tab stops, or **VFU** channel positions. However, it does change the size of the units by which they are set and reported. For example, an 11 inch form at 6 LPI has 66 lines, but the same form length has 88 lines at 8 LPI.

Variable Line Spacing

You may set up these emulations to use variable line spacing in increments of n/720". To set up variable line spacing, use the sequence:

ESC	[	<	n	Sp	h
1B	5B	3C		20	68

space required before h

Where:
n = Desired line spacing in increments of n/720".

Horizontal Tabs

The MT660 sets default tabs at every eighth column. The following commands allow the user to manipulate Horizontal Tabs according to job requirements.

Setting Tabs

To set up to 16 horizontal tabs, use the sequence:

ESC	[	n_1	;	n_2	;	n_3	;	...n_{16}	u
1B	5B		3B		3B		3B		75

Where n_1–n_{16} = The column numbers assigned as tab stop locations (up to 16 may be specified).

Example:

To set horizontal tabs at columns 15, 30, and 45, use the sequence:

ESC	[	15	;	30	;	45	u
1B	5B	3135	3B	3330	3B	3435	75

Current Position

Horizontal tabs may also be set at the current position while sending a line of print data. To set a horizontal tab at the current position, use the sequence:

ESC	H
1B	48

Clearing Tabs

To clear tab stops at specific columns, use the sequence:

ESC	[	n_1	;	n_2	;	n_3	;	...n_{16}	q
1B	5B		3B		3B		3B		71

Where n_1–n_{16} = Previously selected tab stops that will be removed.

Clearing All Horizontal Tabs

To clear all horizontal tabs (including the default tab settings), use the sequence:

ESC	[	3	g
1B	5B	33	67

Clearing Current Horizontal Tab

To clear a horizontal tab at the current position, use the sequence:

ESC	[	0	g
1B	5B	30	67

Setting Left and Right Margins

This escape sequence allows the user to set the left and right margins from the host. However, instead of using column numbers, which change when the CPI setting is changed, this command sets absolute margins in increments of 1/120 of an inch that do not change location when the CPI selection is changed.

The basic margin setting sequence is:

ESC	[	LM	;	RM	"	s
1B	5B		3B		22	73

Each margin setting is calculated from the first dot position on the page. For example, if you want the left margin set 1 inch from the first dot position and the right margin set at 8 inches from the first dot position, multiply 120 x the desired inch setting and enter that amount in the proper location in the escape sequence.

To finish this example, you would finally enter margin values of 120/120 and 960/120, which would give you the escape sequence:

ESC	[	120	;	960	"	s
1B	5B	313230	3B	393630	22	73

Setting Vertical Format

The top of the first line of print on a page is called the top-of-form (TOF) position. Vertical position is measured from this point. The form length is the distance from one TOF to the next. The bottom-of-form (BOF) skip is the distance between the last line of print on the page and the next TOF. Once the TOF and form length have been set, the paper will automatically advance to the next TOF whenever the print position advances into the BOF skip area. Vertical formatting includes the following settings:

> Physical length of the total form.
>
> Position of the first printed line on a form (TOF).
>
> Position of bottom-of-form and/or bottom-of-form skip.
>
> Position of any other vertical stops on a form.

There are three ways to set vertical format. One way involves using the menus on the printer to set the desired parameter values through the control panel. The other ways involve sending escape sequences or control codes from the host computer.

Form Length Select

In the IEEE 1284 interface the form length can be selected through the control panel or by sending the Form Length Select (**FLS**) escape sequence from the host. The basic **FLS** escape sequence is:

ESC	[	n	t
1B	5B		74

> Where:
>
> **n =** Form Length
>
> > If n = :
> >
> > 0, form length is 11 inches.
> >
> > 1, form length is 12 inches.
> >
> > 2–255, form length is equal to the value of n (in lines).
> >
> > The FLS Command resets the current paper position as the TOF. Make sure the paper is aligned at the desired top-of-form before sending the FLS Command.
> >
> > To calculate form length, multiply the form length in inches by the lines per inch. For instance, a 15.5" form printed at 6 LPI has a form length of 93 lines:
> >
> > > 15.5" Form Length x 6 LPI = 93 (Total lines on form)
> >
> > To set the form length for a 15.5" form, send the sequence:

ESC	[	93	t
1B	5B	3933	74

Even though the form length can be set in number of lines, the printer divides the Form Length in lines by the LPI setting and stores the form length in inches, not number of lines. Subsequent changes in LPI will not change the physical form length.

VFU Download Commands

VFU download commands are used with the IEEE 1284 and serial interfaces only. The **VFU Load** not only sets values for the form length and bottom-of-form skip (see also, **Skp Whn** in Chapter 2), but also sets up vertical tabs on the page that are used by **VFU** Channel Commands. Load the printer **VFU** memory from your computer and then use **VFU** Channel Commands to move the paper to specific locations. Your printer uses electronic memory for its **VFU**, allowing the page format to be defined by commands from your computer up to a maximum storage of 255 lines.

Form lengths and vertical tab positions stored in the **VFU** memory are based on the Lines Per Inch (LPI) setting in effect at the time the **VFU** is loaded. Settings are not affected by changes in LPI or by entering Plot Mode.

VFU Load

To load the **VFU**, two escape sequences are needed, one to begin and one to end the load.

The VFU Load Command resets the current paper position as the top-of-form. Make sure the paper is aligned at the desired top-of-form before sending the VFU Load Command.

To begin a VFU download, use the sequence:

ESC	[	<	1	h
1B	5B	3C	31	68

To end a VFU download, use the sequence:

ESC	[	<	1	l		l = lower-case L
1B	5B	3C	31	6C		

After the Begin-load escape sequence, all data, except ASCII control codes, is treated as **VFU** formatting information and is placed in **VFU** memory. All ASCII control codes and Escape sequences are ignored except the End-load sequence.

VFU Load Errors

All data must be in the proper **VFU Load** format. If an error occurs during the load or a load overruns memory length, the load is canceled and any remaining **VFU** data is printed. Canceled loads default to the current form length setting (as set from the control panel or with the **FLS** Escape Sequence).

To use the Vertical Format Units you download you must send a Vertical Channel Command, discussed below.

VFU Data Format

The **VFU** Data Format includes two bytes of data for each line of the form, starting with line 1. The two bytes of data indicate channel number(s). Traditionally, Channel 1 is reserved for Top-Of-Form (**TOF**) and Channel 12 is reserved for Bottom-Of-Form (**BOF**). The Vertical Tab (**VT**) Control Code moves the paper forward to the next marked tab position on Channel 2. The format for the byte pair is:

Bit:	7	6	5	4	3	2	1	0	
Value:	x	1	C6	C5	C4	C3	C2	C1	Byte 1
	x	1	C12	C11	C10	C9	C8	C7	Byte 2

Where:

Bit 7 (x) = Not used.

Bit 6 = Always 1.

Bits 0–5 = VFU channels (C1–C12 = channels 1–12).

1 = channel present

0 = no channel

The byte-pairs for a sample load are shown below. The form length used for this example is 16 lines long; therefore, 16 byte-pairs are needed.

Byte #	Line #	Binary Value	HEX Value	Channel or Function	Byte #	Line #	Binary Value	HEX Value	Channel or Function
		ESC[<1h		Start Code					
1	1	x1000001	41	1	17	9	x1000000	40	
2		x1000000	40		18		x1000000	40	
3	2	x1000000	40		19	10	x1000000	40	
4		x1000000	40		20		x1000000	40	
5	3	x1000000	40		21	11	x1100100	64	6 and 3
6		x1000000	40		22		x1000000	40	
7	4	x1000000	40		23	12	x1000000	40	
8		x1000000	40		24		x1000000	40	
9	5	x1000000	40		25	13	x1000000	40	
10		x1000000	40		26		x1000000	40	
11	6	x1000000	40		27	14	x1000000	40	
12		x1000000	40		28		x1000000	40	
13	7	x1000010	42	2	29	15	x1000000	40	
14		x1000000	40		30		x1100000	60	12
15	8	x1000000	40		31	16	x1001000	48	4
16		x1000000	40		32		x1000010	42	8
							ESC[<1l		Stop Code

Figure 10 – Sample VFU Download

Paper and Print Position Movement

There are varieties of commands and escape sequences used to select paper and print movement functions. In this section, we present both the reserved commands and escape sequences.

When entering or exiting the Character or Plot modes, any data in the print buffer is printed. In Character Mode, the print position moves to the left margin of the current line, or to the current dot row in Plot Mode. If no paper motion command is issued, printing continues at the current print position. The following commands affect print position by moving the paper vertically or print position horizontally or both.

Reserved Control Codes

Horizontal Tab   HT   09

This control code moves the print position to the next horizontal tab stop on a line. For multiple tabs, string multiple **HT** Control Codes together. The printer ignores **HT** Control Codes if horizontal tabs are not set or if the command is placed in a line beyond the available tabs.

By default, the printer sets a tab stop every 8 columns. These default tab stops can be altered or cleared using the Horizontal Tab Escape Sequence, listed earlier in this chapter.

In the MT660 Emulation, horizontal tab stops change physical location with a change of the left margin or CPI. For example, if a stop is set at column 16, it will always be 15 columns from the left margin, but the **physical** distance will change for all CPIs.

Form Feed   FF   0C

The **FF** Control Code advances the paper to the first print position of the next form.

Vertical Tab   VT   0B

When the **VFU** is enabled, the **VT** Control Code is used to advance the paper to the next **VT** Channel location whether the printer is in Character Mode or Plot Mode.

The **VT** Channel is selected through the printer control panel. If the **VFU** is not enabled, a **VT** Command causes a single line feed. If **POPC** is enabled, the preceding buffer contents are printed before the **VT** Command is performed.

Carriage Return   CR   0D

The Carriage Return (**CR**) Control Code moves the print position back to the left margin.

In Automatic Line Feed Mode (**Auto LF**), when the printer encounters a **CR** Command, any printable data previously received is printed and the current print position (cursor) moves to the first column of the next line.

Line Feed   LF   0A

The Line Feed (**LF**) Control Code advances the paper one line in Character Mode or one dot-row in Plot Mode.

If the Auto Carriage Return Parameter is set to ON, the printer also moves the print position to the left margin when it receives a Line Feed Command.

If Print on Paper Command (POPC) is enabled, any character data previously received is printed before the move.

Character Mode

When a **LF** Command is issued in Character Mode, the actual distance the paper moves in response to a single **LF** Command depends on the LPI or the Variable Line Spacing setting.

Plot Mode

When a **LF** Command is issued in Plot Mode, the actual distance the paper moves depends on the plot density setting for vertical DPI. For example, with a density of 100 dots per inch the paper would advance 1/100", and with a density of 50 dots per inch the paper would advance 1/50".

Save Print Position

The Save Print Position (**SPP**) Command saves the current print position into the printer's memory. The **SPP** escape sequence is:

ESC	P	B
1B	50	42

Restore Vertical Print Position

The Restore Vertical Print Position Command moves the paper to the last saved vertical cursor position. If no vertical cursor position has been saved on the current form, the paper moves to the current top-of-form. In either case, the active print position is moved to the left margin. The escape sequence is:

ESC	P	A
1B	50	41

Relative Paper Motion

The Relative Paper Motion (**RPM**) Command moves the paper forward or backward a requested number of increments from its current print position. Movement distance is dictated by the print mode (Character or Plot).

Exceptions:

> Reverse paper motion stops at the Top-Of-Form (TOF) location on the current form.

> Forward motion into a Bottom-Of-Form (BOF) skip area advances the paper to the next TOF, then forward motion continues the remaining number of increments.

The relative paper motion escape sequence is:

ESC	[	c	n	n	!	v
1B	5B	63			21	76

Where:

c = Paper movement direction.

0 = forward paper motion

9 = reverse paper motion

nn = Number of increments the paper moves.

Range = 1 to 99 ASCII or 31 to 3939 HEX.

Example 1:

Moving the paper forward 5 lines.

ESC	[	0	0	5	!	v
1B	5B	30	30	35	21	76

Example 2:

Moving the paper backward 13 lines.

ESC	[	9	1	3	!	v
1B	5B	39	31	33	21	76

Reverse Form Feed

The Reverse Form Feed Command moves the paper backward to the top-of-form (TOF) position of the current form. If the paper is already positioned at the TOF when this command is received, no movement will occur. The Reverse Form Feed escape sequence is:

ESC	[	f
1B	5B	66

Forward Index

The Forward Index Command moves the paper forward one line with no change in horizontal position. This command is valid only in Character Mode; it is not allowed in Plot Mode. The Forward Index escape sequence is:

ESC	D
1B	44

Example:

Input: AESCDBESCDCESCDDCRLF

Output:

```
A
  B
    C
      D
```

After the CRLF, the print position would be on this line at the left margin.

Reverse Index

The Reverse Index Command moves the paper backward one line with no change in horizontal position. This command will not move the print location past the top of the current form and is valid only in Character Mode. The Reverse Index escape sequence is:

ESC	M
1B	4D

Example:

Input: AESCMBESCMCESCMDCRLFLFLFLF

Output:

```
      D
    C
  B
A
```

After the final **LF**, the print position would be on this line at the left margin.

Partial Line Advance

The Partial Line Advance Command moves the paper up or down a partial line for use in superscripting and subscripting. A parameter of 0 moves the paper up; 1 moves the paper down.

ESC	[	n	Sp	p
1B	5B		20	70

VFU Channel Commands

After the **VFU** Memory is loaded, the format is set. To use the **VFU** Format, you must select **VFU** Mode on the printer. After selecting **VFU** Mode, you can send **VFU** Channel Commands to move the paper either forward or backward to the desired location. All reverse moves stop at the TOF if the requested channel is not found. The escape sequence for moving the paper to a desired channel is:

ESC	[	c	nn	!	p
1B	5B	63		21	70

Where:

c = Paper motion direction.

0 = forward paper motion.

9 = reverse paper motion.

nn = **VFU** channel to which the paper will move. The value for each channel is shown below:

Channel	ASCII	HEX
1	00	3030
2	01	3031
3	02	3032
4	03	3033
5	04	3034
6	05	3035
7	06	3036
8	07	3037
9	08	3038
10	09	3039
11	10	3130
12	11	3131

Figure 11 – VFU Channel Values

The following examples give the format for forward and backward moves.

Example 1:

To move the paper forward (c = 0) to channel 4 (nn = 03), the escape sequence is:

ESC	[	0	0	3	!	p
1B	5B	30	30	33	21	70

Example 2:

To move the paper backward (c = 9) to channel 1 (nn = 00), the escape sequence is:

ESC	[	9	0	0	!	p
1B	5B	39	30	30	21	70

Plot Mode

When Plot Mode is selected, all input data is treated as plotting data. All graphics in Plot Mode are designed and printed one dot-row at a time.

In Plot Mode the data stream dictates each dot to be printed. Data bytes are either bit images of the dots to be printed, or they are commands to repeat the previous bit image one or more times. Both the density of dots in the horizontal row, and the density of rows can be varied.

When switching from Character Printing to Plot Mode and vice versa, any data in the print buffer is printed. After the data prints out in Character Mode, the print position moves to the left margin of the current line. In Plot Mode it stays at the current dot row. If no paper motion command is issued, printing continues at the current print position.

When the printer enters Plot Mode, it starts plotting at the left margin, at the top row of the character dot matrix. When the printer exits Plot Mode, the position of the next print location depends on the setting of the **ModPlot** Parameter.

Plot Mode Commands

In Plot Mode, all control codes and escape sequences may be used. All of the commands work the same except the following:

Line Feeds advance by the dot-row instead of line distances.

Horizontal Tabs are not recognized.

Forward Index commands are not recognized.

Reverse Index commands are not recognized.

Entering Plot Mode

To enter Plot Mode, use the escape sequence:

ESC	[	<	3	h
1B	5B	3C	33	68

You need to use this escape sequence only once. After entering Plot Mode, you simply send Plot Data, instructions, and the usual control codes and escape sequences.

Exiting Plot Mode

To exit Plot Mode and enter Character Mode, use the escape sequence:

ESC	[	<	3	l		l = lower-case L
1B	5B	3C	33	6C

When the **Modplot** Parameter is set to **ON,** the printer automatically performs an **Align to Line Boundary** function and moves the print position to the next line down instead of the next dot row down. The default for this parameter is **ON**. The examples that follow show the actual results of both **Modplot ON** and **Modplot OFF** in MT660 Emulation.

Figure 12 – Alignment Using ModPlot
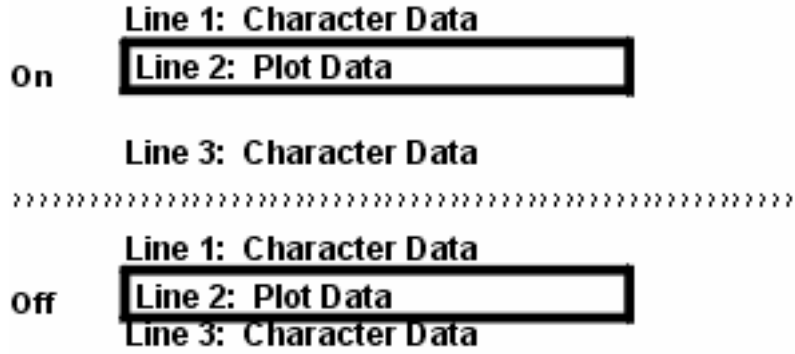
Align to Line Boundary

When you are exiting from the Plot Mode and the **ModPlot** Parameter is **OFF** it is necessary to send an Align to Line Boundary Command to advance the paper to the next line down (as measured from the current TOF). Without this command, characters and graphics would touch. The escape sequence is:

ESC	P	@
1B	50	40

Plot Data

Two types of information are needed for plot data. The first is an ASCII character (or numerical equivalent in whatever base number system your host requires; octal, decimal, hexadecimal, etc.) that designates which dot pattern you want to print. The second is a one or two byte numeric equivalent (oct., dec., or hex.) of the number of repetitions of the dot pattern you require. This information is converted into the following binary equivalents by the host for transmission to the printer.

Plot	Bits							
Data	7	6	5	4	3	2	1	0
Dot Pattern Code	x	1	d	d	d	d	d	d
Repeat 1–15 Times	x	0	1	0	m	m	m	m
Repeat 16–240 Times	x	0	1	1	n	n	n	n

Figure 13 – Plot Data Format

Where:

   x = Not used for Plot Data.

   dddddd = Binary representation of the desired dot pattern.

      0 = no dot

      1 = dot

   mmmm =Binary equivalent of 1–15 repetitions.

   nnnn = Binary equivalent of 16–240 repetitions in multiples of 16.

A sample Dot Pattern Code is shown below. Six bits represent the dot pattern.
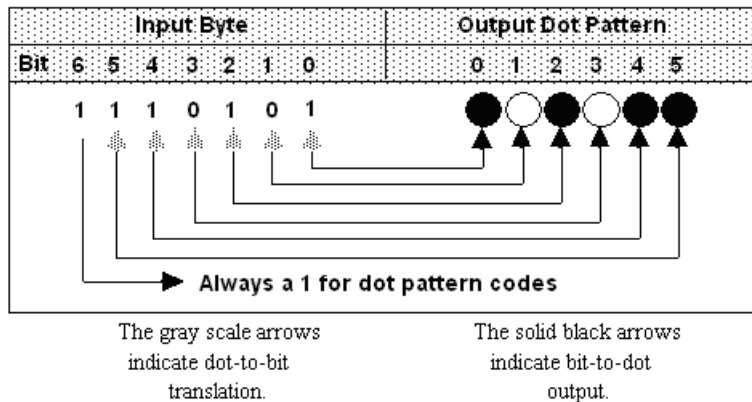
Figure 14 – Sample Dot Pattern Code

Plot data is received as binary code that represents the dot pattern to be printed, as shown above. If you do not have a table of the various dot patterns possible with their decimal and hexadecimal equivalents, you can use the following method to compute the numeric equivalents.

First, plot out the dot pattern, then convert the six dot pattern to a six-bit binary number (0 for no dot and 1 for a dot). For example:

Figure 15 – Sample Bit Pattern

Now reverse the order of the binary digits. The leftmost dot position (most significant bit) becomes the least significant bit and so on.

101011 ⇨ 110101

Convert the new binary number, 110101, to whatever number system you use (octal, decimal, hexadecimal, etc.) to send the code to the printer. The host computer then retranslates the numbers you use back to their binary equivalents for transmission to the printer.

Plotting Dot Patterns

To construct the data code for a specific dot pattern and have the printer print that dot pattern, refer to the table below and perform the procedure that follows.

Dot Pattern	CODE			Dot Pattern	CODE		
	ASCII	HEX	DEC		ASCII	HEX	DEC
○○○○○○	@	40	64	○○○○○●	`	60	96
●○○○○○	A	41	65	●○○○○●	a	61	97
○●○○○○	B	42	66	○●○○○●	b	62	90
●●○○○○	C	43	67	●●○○○●	c	63	99
○○●○○○	D	44	68	○○●○○●	d	64	100
●○●○○○	E	45	69	●○●○○●	e	65	101
○●●○○○	F	46	70	○●●○○●	f	66	102
●●●○○○	G	47	71	●●●○○●	g	67	103
○○○●○○	H	48	72	○○○●○●	h	68	104
●○○●○○	I	49	73	●○○●○●	i	69	105
○●○●○○	J	4A	74	○●○●○●	j	6A	106
●●○●○○	K	4B	75	●●○●○●	k	6B	107
○○●●○○	L	4C	76	○○●●○●	l	6C	108
●○●●○○	M	4D	77	●○●●○●	m	6D	109
○●●●○○	N	4E	78	○●●●○●	n	6E	110
●●●●○○	O	4F	79	●●●●○●	o	6F	111
○○○○●○	P	50	80	○○○○●●	p	70	112
●○○○●○	Q	51	81	●○○○●●	q	71	113
○●○○●○	R	52	82	○●○○●●	r	72	114
●●○○●○	S	53	83	●●○○●●	s	73	115
○○●○●○	T	54	84	○○●○●●	t	74	116
●○●○●○	U	55	85	●○●○●●	u	75	117
○●●○●○	V	56	86	○●●○●●	v	76	118
●●●○●○	W	57	87	●●●○●●	w	77	119
○○○●●○	X	58	88	○○○●●●	x	78	120
●○○●●○	Y	59	89	●○○●●●	y	79	121
○●○●●○	Z	5A	90	○●○●●●	z	7A	122
●●○●●○	[	5B	91	●●○●●●	{	7B	123
○○●●●○	\	5C	92	○○●●●●			7C	124
●○●●●○	]	5D	93	●○●●●●	}	7D	125
○●●●●○	^	5E	94	○●●●●●	~	7E	126
●●●●●○	_	5F	95	●●●●●●	DEL	7F	127

Figure 16 – Dot Patterns and Identifiers

Step 1.

Find the desired dot pattern from the two dot pattern columns. For example, use the dot pattern from Figure 16. It is located in the right-hand column (it's the one inside the oval).

Step 2.

Look to the right of the dot pattern and determine the number for this particular dot pattern. In the Figure we have provided the ASCII, Hexadecimal, and Decimal equivalent. Whatever code you use, this number becomes the dot-pattern designator.

Step 3.

Send the Enter Plot Mode escape sequence followed by the dot-pattern designator (ASCII = u), like this:

ESC	[	<	3	h	u
1B	5B	3C	33	68	75

The desired dot pattern will print one time.

Repeating a Pattern

To repeat a dot pattern, add the desired number of repetitions after the dot-pattern designator. When no repetitions are designated, the printer defaults to 1 and the dot pattern will be printed 1 time. For repetitions of 15 or fewer, the ASCII codes used to designate the number of repetitions begin with **Sp** (0) and continue through to the **/** (15).

In the example that follows the table, we show the sequence of actions required to compose an ASCII data code.

Repetitions 1—15	ASCII Value	Multiples Of 16	ASCII Value
0	Sp	00	0
1	!	16 x 1 = 16	1
2	"	16 x 2 = 32	2
3	#	16 x 3 = 48	3
4	$	16 x 4 = 64	4
5	%	16 x 5 = 80	5
6	&	16 x 6 = 96	6
7	'	16 x 7 = 112	7
8	(	16 x 8 = 128	8
9	)	16 x 9 = 144	9
10	*	16 x 10 = 160	:
11	+	16 x 11 = 176	;
12	,	16 x 12 = 192	<
13	–	16 x 13 = 208	=
14	.	16 x 14 = 224	>
15	/	16 x 15 = 240	?

Figure 17 – Repetition Conversion Table

For example, if you wanted to print a pattern 10 times you would look up 10 in the repetition column above; the ASCII character that corresponds to 10 is an asterisk (*). Therefore, placing an asterisk after a dot-pattern designator would cause the printer to repeat the pattern 10 times.

For numbers greater than 15, you must send a **two-byte** code:

Byte 1   = (the remainder of the number of desired repetitions) ÷ 16

Byte 2   = (number of desired repetitions)
              — (largest possible multiple of 16 that will result in a positive integer or 0)

The maximum number of times a dot pattern may be repeated per request is 255. The ASCII characters that are used to represent multiples of 16 are 0–? (HEX 30–3F).

Example:

To send 70 repetitions, you must first find the largest multiple of 16 that is less than or equal to 70, then subtract that number from 70 to find the remainder. From the above table you can see that the largest multiple of 16 that is less than or equal to 70 is 64. Subtracting 64 from 70 gives us a result of 6. To find the ASCII equivalent of 6, use Figure 17. To compile the 2-byte code for 70 repetitions, remember, the remainder comes first. The result will be **&** for the remainder of 6, followed by **4** for the multiple of 16 (64).

To print the previous dot pattern 70 times you would send the following escape sequence:

ESC	[	<	3	h	u	&	4
1B	5B	3C	33	68	75	26	34

Stringing Commands Together

Different dot-pattern designators may be strung together in a single escape sequence to enable printing special graphics. To illustrate stringing designators together, we will use a single dot-pattern command repeated eight times and string together 6 of these commands. That escape sequence is:

ESC [<3h	A	(	A	(	A	(	A	(	A	(	A	(	CRLF
1B5B3C3368	41	28	41	28	41	28	41	28	41	28	41	28	0D0A

Where:

A = The dot pattern. ●○○○○○

**(** = 8 repetitions of the dot pattern. (se Figure 17)

This would result in the selected dot pattern being printed 48 times across the page. Or you may send just a single command that specifies that the selected dot pattern is to be printed 48 times:

ESC	[	<	3	h	A	SP	3	CR	LF
1B	5B	3C	33	68	41	20	33	0D	0A

The second escape sequence format is more economical and easier to use when stringing commands together, but either of the above commands would result in a horizontal line of 48 dots across the page.

Repeating either of the above command/CRLF sequences would cause printing of vertical bars across the page. For example, repeating either of the above sequences 100 times would result in:
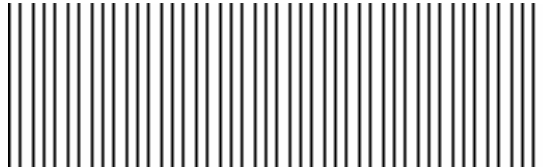
The advantage of being able to string commands together is that it enables you to put commands for different dot patterns together in one escape sequence for designing special graphics to be printed on your printer. In the next example, the plot density has been set to 60 DPI by 60 DPI in order to show the dot pattern clearly. Sending the following escape sequence 20 times,

ESC[<3hA$1CRLFB$1CRLFD$1CRLFH$1CRLFP$1CRLF`$1CRLF

will result in the following graphic:
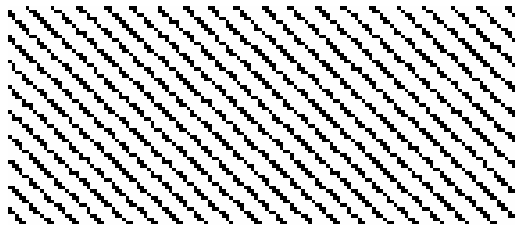
Plot Density

In Plot Mode, your printer will print in a variety of dot densities, both horizontally and vertically. The default density in Plot Mode is 100 dots per inch (DPI) in both the horizontal and vertical directions. To select a different density, use the escape sequence:

ESC	[	n_1	;	n_2	!	q
1B	5B		3B		21	71

Where:

n_1 = Horizontal density in DPI in the range of 40 to 240, scaled to 180 DPI.

n_2 = Vertical density in DPI in the range of 40 to 240, scaled to 180 DPI.

When you change the plot densities, they remain active until the printer is turned off or they are changed again.

To determine the number of dot patterns necessary to print a full line, multiply the line length by the horizontal DPI, then divide the total by 6 (each dot pattern = 6 bits).

Example:

If line length = 13.2" and DPI = 100, then

Total dots per line = 13.2 x 100=1320, and

Total dot patterns per line = 1320/6 = 220

Therefore, to print a full 13.2 inch line at 100 DPI you would have to send 220 dot patterns.

Shading effects can be created by printing different dot patterns in subsequent rows.

Paper Path Selection

The following commands are used to select the paper input for your T3116 printer. Some of these capabilities may require the purchase of optional components.

Select Tractor 1

ESC	[	5	{
1B	5B	35	7B

Select Tractor 2

ESC	[	6	{
1B	5B	36	7B

Select Tractor 3

Requires the "2T" model.

ESC	[	7	{
1B	5B	37	7B

Select Single Sheet Feeder

ESC	[	0	{
1B	5B	30	7B

Select Auto Sheet Feeder Bin 1

ESC	[	2	1	{
1B	5B	32	31	7B

Select Auto Sheet Feeder Bin 2

ESC	[	2	2	{
1B	5B	32	32	7B

Postal Bar Code Printing

POSTNET Bar Codes

POSTNET Bar Code Mode allows you to make use of the mail handling systems that the United States Postal Service (USPS) has implemented. In addition, POSTNET Bar Codes allow you to take advantage of postal discounts available through USPS for mail pieces using POSTNET Bar Codes for regular 5 digit, Zip+4, and Advanced Bar Code (ABC) zip codes. The basic sequence is:

ESC	P	b	data
1B	50	62	data

After entering POSTNET Mode, any ASCII characters can be sent. However, only the characters 0–9 will be printed. All others, except the reserved control codes and the Space character (Hex 20) are ignored. All reserved control codes, except the **ESC** (HEX 1B) and the **HT** (HEX 09) control codes, cancel POSTNET Mode. After POSTNET Mode is canceled, the printer will perform the requested function, such as Line Feed or Form Feed.

The **Space** character can be used to space between bar codes. If placed inside a bar code, it will terminate the current bar code and cause the framing bar to print. Then the cursor will move the equivalent of one space. Additional spaces can be sent and the cursor position will move the requested number of spaces, then another bar code can be printed. **Use the Space character between bar codes only.**

The **ESC** Control Code is used in some applications to select different parameters while in POSTNET Mode.

The **HT** Control Code is used while in POSTNET Mode to control horizontal space between bar codes. To use the **HT** Control Code, the procedure is:

If you are NOT going to use the Default Tabs, begin here:

>   Clear all current Horizontal Tab settings.

>   Set desired Horizontal Tabs.

If you ARE going to use the Default Tabs, begin here:

>   3.   Enter POSTNET Mode.

>   4.   Send data + HT....data + HT....

>   5.   Exit POSTNET Mode.

Example:

ESC	P	b	9	9	9	9	9	HT	9	8	9	8	9	CR
1B	50	62	39	39	39	39	39	09	39	38	39	38	39	0D

The above sequence would cause bar codes representing the digits 99999 and 98989 to print on the same line, spaced at whatever distance the Horizontal Tabs designate, then the printer would exit the POSTNET Mode.

Four-State Bar Codes

Four-State Bar Codes are similar to POSTNET bar codes, except they have four states instead of two. In addition to the tall bar and short bare, there is an ascending bar and a descending bar. Four-state bar codes are supported for the UK Postal Service and the Dutch Postal Service.

The syntax for the UK Postal Service Four-State Bar code is:

ESC	P	c	data
1B	50	63	data

The syntax for the Dutch Postal Service KIX Bar code is:

ESC	P	d	data
1B	50	64	data

Once in the Four-State Bar Code Mode, the rules are the same as those described in POSTNET Mode, above.

PLANET Bar Codes

PLANET is similar to POSTNET in "look and feel", and is intended to complement the use of POSTNET for mass mailers. For more information, see the PLANET Bar Code website, http://www.planetcodes.com/. The escape sequence for printing PLANET bar codes is:

ESC	P	f	data
1B	50	66	data

Once in the PLANET Bar Code Mode, the rules are the same as those described in POSTNET Mode, above.

Miscellaneous Functions

Reset Printer to Powerup Settings

You can reset the printer to all its powerup settings by sending the escape sequence:

ESC	[	6	~
1B	5B	36	7E

~ = tilde

Alternate Escape Sequences

Since some systems will not allow ESC (1B hex) to be sent as the escape function, you can substitute the following codes:

^	CR
5E	0D

OR

^	CR	LF
5E	0D	0A

But they must be placed in Column 1 (the left margin), and **Alt ESC** must be set to **ENABLED** through the control panel (see the **Codes** Category of the **Configuration Menu**).

Emulation and Configuration Switching

In addition to being able to change emulations or configurations through the printer control panel, you can use this escape sequence to change emulations or configurations from your host computer.

Unlike changing emulations through the control panel, when this escape sequence is used to change emulations, it does not change the Powerup or Alternate configurations that are currently loaded on the printer. The only configuration that is affected is the Current Configuration. The basic switching sequence is:

ESC	[	<	n	h
1B	5B	3C		68

Where:

n = One of the selections from the list below.

10 = Powerup Emulation
13 = Epson Emulation
14 = MT660 Emulation
15 = IBM Proprinter Emulation
16 = Genicom ANSI
18 = HP 2564C Emulation
20 = WinEmul
30 = Config 1
31 = Config 2
32 = Config 3

Reserved Control Codes

In this emulation there are different combinations of reserved control codes you may use to control various aspects of printer operations. In addition, there are reserved control codes that are used "behind the scenes" in communication between the host computer and the printer, and in data handling protocols.

The table below lists the codes for the MT660 Emulation. In addition, we show in which interface they are valid and give a basic explanation of their function.

Interface Key:

S = Serial

C = IEEE 1284

In the Serial and IEEE 1284 interfaces, when an invalid control code is received, it is discarded.

ASCII	Interface	Function
ETX*	S	Signals the End of Text to the Printer.
ENQ*	S	Enquiry code sent by the computer to the printer.
ACK*	S	Sent by the printer to indicate that there were no errors in the data transmission.
BEL	S, C	Sounds printer alarm for .5 seconds.
HT	S, C	Moves the print position to the next horizontal tab stop.
LF	S, C	Advances paper one line for printing or one row for plotting (see also, POPC parameter in Chapter 2, Configuration Menu).
VT	S, C	Advances paper to the next selected VFU Vertical Tab channel (see also, POPC parameter in Chapter 2, Configuration Menu).
FF	S, C	Advances the paper to the top of the next form (see also, POPC parameter in Chapter 2, Configuration Menu).
CR	S, C	Moves the print position to the left margin of the current line.
SO	S, C	Selects the alternate character set for printing.
SI	S, C	Selects the primary character set for printing.
DC1* (XON)	S, C	When the data buffer is ready to accept more data, XON allows new data to be sent from the host computer.
DC3* (XOFF)	S, C	XOFF stops data transmission from the host computer when the data buffer signals it is full.
NAK	S	Printer warns host that there was an error in the data transmission.
ESC	S, C	Tells the printer that the data that follows is not to be printed but is to be interpreted as a control function.
DEL	S, C	The Delete Control Code defaults to the Rubout character. It can be used to delete characters in the buffer if your printer is setup properly. Call your Tech. Rep. for set up procedure.

*Actual function depends on Interface Protocol being used.

Figure 18 – MT660 Control Codes

Escape Sequence Summary

The following escape sequences are supported:

Sequence	Function	Description
ESC D	Index Forward	Moves the paper forward one line with no change to the horizontal position.
ESC H	Set Tab	Sets a tab stop at the current horizontal position.
ESC M	Index Reverse	Moves the paper backward one line with no change to the horizontal position.
ESC P@	Align to Line Boundary	Moves the vertical position to the next line relative to top of form as defined by the current LPI setting.
ESC PA	Restore Cursor Position	Moves the print position to the beginning of the saved vertical position.
ESC PB	Save Cursor Position	Saves the current vertical position.
ESC PC	Save Powerup Configuration	Saves the current configuration into the Powerup Configuration.
ESC Pb	POSTNET Mode	Causes the following digits to be printed as POSTNET bar codes.
ESC Pc or ESC Pe	UK Post Mode	Causes the following digits to be printed as UK postal bar codes. Special for Tally UK.
ESC Pd	KIX Mode	Causes the following digits to be printed as Dutch KIX postal bar codes. Special for Tally UK.
ESC Pf	PLANET Mode	Causes the following digits to be printed as PLANET postal bar codes.
ESC , A ESC (xx	Select G0 Character Set	Selects the G0 character set.
ESC - A ESC) xx	Select G1 Character Set	Selects the G1 character set.
ESC [n z	Select LPI	Selects lines per inch.
ESC [n w	Select CPI	Selects characters per inch.
ESC [n m	Select Attributes	Selects bold, italics, overline, strikethrough, underline, subscript and superscript attributes. Also DP, Draft, Gothic, Courier, OCR-A and OCR-B font styles and downloaded font.
ESC [n t	Select Form Length	Select form length. 2 to 255 lines, or 11 inches or 12 inches.
ESC [n u	Set Tabs	Sets horizontal tab stops.
ESC [n q	Clear Tabs	Clears horizontal tab stops.
ESC [3 g	Clear All Tabs	Clear all tab stops.
ESC [0 g	Clear Current Tab	Clear a tab stop at the current horizontal position.
ESC [n {	Select Paper Path	Activates the selected paper input path.
ESC [6 ~	Reset	Resets to Powerup Configuration.
ESC [cn !p	VFU Channel Command	Performs a VFU channel move.
ESC [cn !v	Relative Paper Motion	Performs a relative paper move.

Sequence	Function	Description
ESC [n !s	Select Character Sets	Selects the primary (G0) and alternate (G1) fonts and character sets (languages).
ESC [n sp B	Select Character Size	Selects the character height and width.
ESC [n1;n2 !q	Select Plot Density	Selects the horizontal and vertical plot densities. Also selects shuttle speed and spacing (speed and spacing options are undocumented).
ESC [n "s	Set Margins	Sets the left and right margins in 1/120ths.
ESC [n sp p	Partial Line	Performs a partial (half) line advance up or down.
ESC [f	Reverse FF	Backs paper up to the previous TOF.
ESC [< 1 h ESC [< 1 l	VFU Download	Begins and ends a VFU download.
ESC [< 2 h ESC [< 2 l	Font Download	Begins and ends a font download.
ESC [< 3 h ESC [< 3 l	Plot Mode	Begins and ends plot mode.
ESC [< n h	Emulation & Configuration Switching	Changes emulations when n = 10 - 39
ESC [< n sp h	Variable Line Spacing	Sets the line advance distance in 1/720ths.

Figure 19 – MT660 Escape Sequence Summary

IBM Proprinter III XL Emulation

This is an emulation of the IBM Proprinter III XL as defined by IBM document SA34-2065-1, *IBM Proprinter III and Proprinter III XL Guide to Operations.*

Exceptions

The following escape sequences are not supported:

ESC 8	Disables the paper out sensor.
ESC 9	Enables the paper out sensor.
ESC <	Turns unidirectional mode ON for one line.
ESC U	Turns unidirectional mode ON.
ESC i	Immediate mode, prints 1 character at a time.
ESC s	Half speed mode.
ESC =	Font Download
ESC P	Proportional printing

Enhancements

The following enhancements to the Proprinter II XL emulation exist:

Various font styles, plus POSTNET and PLANET bar codes, can be selected with the **ESC x n** command:

n (ASCII)	n (Hex)	Selection
0	00 or 30	Draft
1	01 or 31	Gothic
2	02 or 32	Courier
3	03 or 33	Draft
4	04 or 34	OCR-A
5	05 or 35	OCR-B
@	10 or 40	POSTNET
C	43	PLANET

There are a number of control panel selections, such as Language, CPI, and LPI, not provided by the emulated printer that can be used in this emulation.

Epson FX-1180 Emulation

This emulation is defined in the *Epson ESC/P Reference Manual.* The version of the manual used for the emulation development was dated December 1997.

Exceptions

1. Printing & Sensors   Any commands related to unidirectional or single-pass printing, or disabling of sensors, are not supported.

2.Spacing   ESC sp n – Variable intercharacter spacing – Not supported.

3. Proportional Spacing ESC p n – Not supported.

4. Font Selection: ESC k – Select Typeface (0 = Courier; 1 = Gothic)
                           ESC t and ESC (t – Select Character Set

Supported Epson Character Sets	Tally Equivalent Character Sets	Unsupported Epson Character Sets
ISO8859-1 (Latin 1)	Latin 1 8859-1	Abicomp
OCR-B	OCR-B	BRASCII
PC437 (US)	Code Page 437	Bulgaria
PC850 (Multilingual)	Code Page 850	Code MJK (CSFR)
PC863 (Canada-French)	Code Page 863	Estonia
Roman 8	Roman-8	Hebrew 7, Hebrew 8
		ISCII
		KU42, TIS11, TIS13, TIS16, TIS17, TIS18, TSM/WIN (Thai)
		MAZOWIA (Poland)
		PC708
		PC720
		PC774 (Lithuania)
		PC853 (Turkish)
		PC860 (Portugal)
		PC861 (Iceland)
		PC862 (Hebrew)
		PC864 (Arabic), PCAR864
		PC865 (Norway)
		PC Aptec
		ISO8859-2 (Latin 2)
		ISO8859-7 (Latin/Greek)
		ISO Latin 1
		ISO Latin 1T (Turkish)
		ISO Latin 7 (Greek)
		PC437 Greek
		PC851 (Greek)
		PC852 (East Europe)
		PC855 (Cyrillic)
		PC857 (Turkish)
		PC866 (Russian)

Figure 20 – FX-1180 Supported Character Sets

Enhancements

The following enhancements to the Epson FX-1180 emulation exist:

1. Various font styles, plus POSTNET and PLANET bar codes, can be selected with the **ESC x n** command:

n (ASCII)	n (Hex)	Selection
0	00 or 30	Draft
1	01 or 31	Gothic
2	02 or 32	Courier
3	03 or 33	Draft
4	04 or 34	OCR-A
5	05 or 35	OCR-B
@	10 or 40	POSTNET
C	43	PLANET

2. There are a number of control panel selections, such as Language, CPI, and LPI, not provided by the emulated printer that can be used in this emulation.

Printronix P6000 Emulation

The Printronix P6000 emulation is defined by *P6000 Series Multifunctional Line Printer Pedestal Models, Printronix Part Number 108534-001 REV B*. With the exception of one control code (Hex 01), the P6000 emulation is a superset of the P600 emulation.

There are no exceptions or enhancements for this emulation.

HP 2564C Emulation

The HP 2564C emulation is defined by HP 256x Printer Family Technical Reference Manual, HP Manual Part No. 02564-90905.

This emulation supports the following HP PCL Level 1, PCL Level 2, some PCL Level 3 commands (mainly in the area of font selection), and PCL extensions unique to line matrix printers. These extensions provide for raster graphics, bar code printing, and VFUs.

Command	Description	Command	Description
ESC E	Reset	ESC 9	Reset Margins
ESC *b<0-1056>W	Raster Download	ESC *b<0-1056>Y	Move Raster Amount of Lines
ESC *rA	Raster Start Sequence	ESC *r1A	Raster Start Sequence
ESC *rB	Raster Stop Sequence	ESC *r60L	Set Horizontal 60 DPI
ESC *r70L	Set Horizontal 70 DPI	ESC *r120L	Set Horizontal 120 DPI
ESC *r140L	Set Horizontal 140 DPI	ESC *r72V	Set Vertical 72 DPI
ESC *r144V	Set Vertical 144 CPI	ESC &dD	Enable Underline
ESC &d0D	Enable Underline	ESC &d@	Disable Underline
ESC &k0S	Select 10 CPI	ESC &k2S	Select 16.7 CPI
ESC &k4S	Select 12 CPI	ESC &k8S	Set Dbl Size
ESC &l1L	Enable Perf Skip	ESC &l0L	Disable Perf Skip
ESC (0U	Set Primary Lang ASCII	ESC (8U	Set Primary Lang Roman8
ESC (0@	Set Primary Lang Default	ESC (0L	Set Primary Lang Line
ESC (0E	Set Primary Lang Roman8	ESC (1E	Set Primary Lang UK
ESC (0G	Set Primary Lang German	ESC (0F	Set Primary Lang French
ESC (0D	Set Primary Lang Danish	ESC (0S	Set Primary Lang Swedish
ESC (1K	Set Primary Lang Katakana	ESC (0K	Set Primary Lang Japanese
ESC (0O	Set Primary Lang OCRA	ESC (1O	Set Secondary Lang OCRB

Command	Description	Command	Description
ESC (s0S	Set Primary Attributes to Upright	ESC (s1S	Set Primary Attributes to Italics
ESC (s0Q	Set Primary font Data Processing	ESC (s1Q	Set Primary font NLQ
ESC (s-1Q	Set Primary font Draft	ESC)0@	Set Secondary Lang Default
ESC)0L	Set Secondary Lang Line	ESC)0E	Set Secondary Lang Roman 8
ESC)0U	Set Secondary Lang ASCII	ESC)1E	Set Secondary Lang UK
ESC)0G	Set Secondary Lang German	ESC)0F	Set Secondary Lang French
ESC)0D	Set Secondary Lang Danish	ESC)0S	Set Secondary Lang Swedish
ESC)1K	Set Secondary Lang Katakana	ESC)0K	Set Secondary Lang Japanese
ESC)00	Set Secondary Lang OCRA	ESC)10	Set Secondary Lang OCRB
ESC)s10H	Set Secondary CPI 10	ESC)s12H	Set Secondary CPI 12
ESC)s13.3H	Set Secondary CPI 13.3	ESC)s15H	Set Secondary CPI 15
ESC)s16.7H	Set Secondary CPI 16.7	ESC)s0S	Set Secondary Upright
ESC)s1S	Set Secondary Italics	ESC)s0Q	Set Secondary Data Processing
ESC)s1Q	Set Secondary NLQ	ESC)s-1Q	Set Secondary Draft
ESC (s<1-9999>.<1-9999>H	Set Primary CPI	ESC &l<0-16>V	Do VFU Move
ESC *z<0-128>C	Bar Column Size	ESC *t<0-600>R	Set Density
ESC &a<1-128>L	Set Left Margin	ESC *z<0-128>H	Select Bar Height
ESC &l<0-128>P	Set Page Length	ESC &a<1-128>M	Set Right Margin
ESC &l<0-128>F	Set Text Length	ESC &a<1-128>R	Move Absolute Row
ESC *z<0-128>Q	Select Human Readable Characters (in Bar Code)	ESC *z<0-128>V	Select Bar Code Type

Command	Description	Command	Description
ESC &l<1-256>W	VFU Download	ESC &l<1-9999>.<1-9999>D	Set LPI
ESC &a<1-128>C	Bar Column	ESC *z*Z	Get Bar Data

Enhancements

The following escape sequences have been added:

POSTNET bar codes   ESC * z 20 V

PLANET bar codes   ESC * x 23 V

Genicom ANSI Emulation

The Genicom ANSI emulation is defined by the *Genicom 4810 / 4840 Programmer's Manual, GEK-89025*. This emulation supports many standard ANSI escape sequences as well as extended commands for bar codes and oversize characters.

The following escape sequences are supported:

Command	Description	Command	Description
ESC c	Reset Printer	ESC \	Exit Special Modes
ESC K	Move Partial Line Down	ESC L	Move Partial Line Up
ESC [p1 a	Move Relative Horizontal Position Right	ESC [p1 d	Move Absolute Vertical Position
ESC [p1 e	Move Relative Vertical Position Down	ESC [p1;p2 f	Move Absolute Horizontal and Vertical Positions
ESC [p1 j	Move Relative Horizontal Position Left	ESC [p1 k	Move Relative Vertical Position Up
ESC [p1 '	Move Absolute Horizontal Position	ESC H	Set Horizontal Tab at Current Position
ESC J	Set Vertical Tab at Current Position	ESC [p1;p... g	Set and Clear Horizontal and Vertical Tabs
ESC [p1;p2;p3 r	Set Form Length, Top Margin, and Bottom Margin	ESC [0 g	Clear Horizontal Tab at Current Position
ESC [p1;p2 s	Set Left and Right Margins	ESC [1 g	Clear Vertical Tab at Current Position
ESC [p1;p... u	Set Horizontal Tabs	ESC [3 g	Clear Horizontal Tabs
ESC [p1;p... v	Set Vertical Tabs	ESC [4 g	Clear Vertical Tabs
ESC [p1;p2 SP B	Modify Character Size	ESC [p1;p2 SP G	Set LPI and CPI
ESC [p1;p... m	Set Font Style and Enhancements	ESC [p1 x	Select Character Set
ESC [0 m	Cancel Font Enhancements	ESC [p1;p... h	Set Mode
ESC [1 m	Enable Bold	ESC [11 h	Set Position Unit Mode
ESC [4 m	Enable Underline	ESC [20 h	Set Line Feed New Line Mode

Command	Description	Command	Description
ESC [22 m	Disable Bold	ESC [>1 h	Set Proportional Print Mode
ESC [24 m	Disable Underline	ESC [>3 h	Set C1 Control Code Mode
ESC [10 m	Select Data Processing Font	ESC [>5 h	Set Character Set 2 Mode
ESC [11 m	Select Data Processing Font	ESC [p1;p... l	Reset Mode
ESC [12 m	Select Character Graphics Font	ESC [11 l	Reset Position Unit Mode
ESC [13 m	Select Gothic Font	ESC [20 l	Reset Line Feed New Line Mode
ESC [14 m	Select Courier Font	ESC [>1 l	Reset Proportional Print Mode
ESC [15 m	Select Draft Font	ESC [>3 l	Reset C1 Control Code Mode
ESC [16 m	Select OCR-A Font	ESC [>5 l	Reset Character Set 2 Mode
ESC [17 m	Select OCR-B Font	ESC P	Begin Dot Graphics Mode
ESC [18 m	Select Italic Gothic Font	ESC [p1 b	Repeat Character
ESC [19 m	Select 13.3 CPI Gothic Font	ESC [p1;p2;p3 q	Select Horizontal and Vertical Graphics Dot Densities
ESC]!	Begin EVFU Table Loading	ESC [p1 ! p	Move to EVFU Channel
ESC [0 t	Select Bar Code Mode	ESC [3 t	Deselect Bar Code Mode
ESC [p1;p...;p10 }	Select Bar Code Parameters	ESC [0 |	Exit Oversize Printing
ESC [1 |	Select Oversize Character Font (No Rotation)	ESC [2 |	Select Oversize Character Font (90-Degree Rotation)
ESC [3 |	Select Oversize Character Font (180-Degree Rotation)	ESC [4 |	Select Oversize Character Font (270-Degree Rotation)

Exceptions

The following are discrepancies between the Genicom 4840 printer and Genicom manual:

ESC [p1 d	AVM beyond 15840 decipoints is ignored
ESC [p1 e	RVM uses the decipoint parameter exactly (no round off to 1/144ths) RVM greater than 15840 decipoints is ignored
ESC [p1;p... m	p1 = 11 - Data Processing
ESC [p1 !p	Syntax not ESC[p1;p2 !p
ESC [p1;p2;p3 q	p3 = 0-4 - ignored p2 and p3 are not ignored in any p1 mode
ESC [p1;p2;p3 r	p3 is measured from BOF, not TOF

Differences between the T3116 IGF Option's Genicom ANSI emulation and the Genicom 4840 printer:

ESC [p1;p... m	p1 = 19 - Gothic
ESC [p1;p2;p3 q	p1 = 0 - 60H x 72V p1 = 1 - 144H x 72V p1 = 2 - 144H x 144V p3 = 5 - 144H p3 = 8-10 - 72H
ESC Q	Self-test command is not supported
ESC] 5	Font download is not supported
ESC [p1 SP }	Font download control is not supported
ESC [p1;p2 sp G	Line heights greater than 9 inches are not supported
ESC [> 1 h	Proportional spacing is not supported

ESC [p1 x — Supported as follows:

p1 =	
0	US
1	German
2-3	French
6, 23	Italian
7, 20	UK
8, 24	Spanish
9-10	Norwegian/Danish
11-12	Norwegian/Danish II
13-16	Swedish/Finnish
437	Code Page 437 USA
850	Code Page 850 Multilingual
863	Code Page 863 French Canadian
8575	Roman 8
Latin 1	

ESC [p1;p...;p10 }   Bar code ratios greater than 85 are not supported

Enhancements

The following escape sequences have been added:

POSTNET bar codes   ESC [50 ; … }

PLANET bar codes   ESC [53 ; … }

Graphics Language Emulations

Graphics languages are a set of commands used to create graphic images such as large characters, lines, boxes, and bar codes. A graphics language is run on top of any of the above underlying control language emulations.

QMS Code V Emulation

This graphics language is an emulation of QMS Code V Version 1 and 2. It is accessible from all underlying control languages.

The emulation is based on QMS Manual Number 1720155B, *QMS Code V Version II Programming Manual*. The commands are defined in Manual Number 079697, *Graphics Applications Manual, Line Printers.*

Command	Description	Inside Pass	Outside Pass
^#n	Compressed Fonts		✓
^@Cnn	Draft Fonts	✓	✓
^@Hn	Dump Mode		✓
^@Lnn	Lines Per Inch (LPI)	✓	✓
^[nnn	Data Field, Buffered Forms	✓	✓
^A	Ignore Data Off	✓	✓
^B^-<data>^]	Buffered Formatting, Version 1		✓
^B{B,N,O,S,T,Y}9x<ratio><data>^G	Bar Code Style 1, Horz. Ver. Ratio	✓	
^B{B,N,O,S,T,Y}x<data>^G	Bar Code Style 1, Horizontal	✓	
^Cnn<data>^Z	Buffered Form Copy		✓
^C{B,N,O,S,T,Y}9x<ratio><data>^G	Bar Code Style 1, Vert Var. Ratio	✓	
^C{B,N,O,S,T,Y}x<data>^G	Bar Code Style 1, Vertical	✓	
^D	Descender Mode	✓	
^~Dhhhvvv	Pass Density	✓	✓
^Dnn	Dot Slew		✓
^Ehhwwjjd<data>	Graphics Pass, Vertical Left	✓	✓
^F	Free Format		✓
^~FF	Full Space Font Mode	✓	✓
^~FH	Half Space Font Mode	✓	✓
^~FQ	Quality Font Mode	✓	✓
^G	Command Terminator	✓	✓
^Hnn	Form Length		✓
^Hnn	Pass Length	✓	

^IBARC,x,R<ratio>,{N,E,B},<data>^G	Bar Code Style 2, Var. Ratio	✓	
^IBARC,x,{N,E,B},<data>^G	Bar Code Style 2	✓	
^IFONT,S,n^G<data>	Default Font		✓
^IFORM,C...	Buffered Form Create		✓
^IFORM,D<name>^G	Buffered Form Delete		✓
^IFORM,E<form name>^G<data>^G	Buffered Form Execute		✓
^IFORM,L	Buffered Form List		✓
^IFORM,R	Buffered Form Memory Reset		✓
^IHEX,nn	Hex Command	✓	✓
^ILOGO,nn^G	Logos	✓	✓
^Innn	Interrupt Function	✓	✓
^IPEXP,h,v^G	Pixel Exppansion	✓	✓
^IREPE	Repeat Terminator		✓
^IREPH,n,hhd^G	Horizontal Repeat, Version 2		✓
^IREPV,n,vvvd^G	Vertical Repeat, Version 2		✓
^IISO,n^G	ISO Character Set	✓	✓
^Jvvd	Vertical Justification	✓	
^KF	Half-Dot Mode	✓	
^KH	Half-Tone Toggle	✓	
^KLnn	Half-Tone	✓	
^Knn	Line Slew		✓
^LBhhhdvvvdhv	Boxes	✓	
^LDhhhdvvvd	Dashed Lines	✓	
^LFhhhdvvvdhvllldt...^G	Form Drawing	✓	
^Lnn	Form Length		✓
^LShhhdvvvd	Solid Lines	✓	
^Mhhwwjjd<data>	Graphics Pass, Horizontal	✓	✓
^Nx	Command Change		✓
^O	Free Format Off		✓
^PN	Graphics Mode Off		✓
^PY	Graphics Mode On		✓
^Q<plot data>^G	Plot Mode	✓	
^R	Reverse Image Toggle	✓	

^R^-	Buffered Form Repeat		✓
^Rnnnn^-<data>^-^Z^-	Vertical Repeat, Version 1		✓
^Sn	NLQ Fonts	✓	
^Snntt^-<data>^-^S^-	Horizontal Repeat, Version 1		✓
^Thhhd	Horizontal Tab	✓	
^Uhhwwjjd<data>	Graphics Pass, Upside Down	✓	✓
^Vhhwwjjd<data>	Graphics Pass, Vertical Right	✓	✓
^Wnn	Line Slew		✓
^Wnn	Pass Width	✓	
^X	Ignore Data On		✓
^Yx{+,-}z	Automatic Increment/Decrement	✓	✓
^Z	Buffered Copy/Repeat Terminator		✓
^_	Carriage Return (CR)		✓
^*	Line Feed (LF)		✓
^,	Form Feed (FF)		✓

Printronix Graphics Language Emulation

The Printronix Graphics Language (PGL) emulation provides a graphics language that is compatible with the Printronix IGP 100/200/400 language. It is accessible from all underlying control languages.

The emulation is based on IGP-100 Firmware Version 2.19A (Part Number 148771,) and the Printronix IGP-100 Manual (Part Number 141331-001 Revision A.) In cases where the function of the firmware differs from the manual, the emulation follows the function of the firmware. The commands are defined in Manual Number 079697, *Graphics Applications Manual, Line Printers.*

Command	Normal Mode	Create Mode	Execute Mode	Description
AFn			✓	Executes the dynamic alphanumeric data provided after the (cc) EXECUTE command.
ALPHA		✓		Defines size, location, and content of alphanumeric characters and dynamic alphanumeric data fields.
BARCODE		✓		Each bar code type has its own command to define size, location, orientation, and data as described in the "Bar Codes" chapter.
BFn			✓	Executes the dynamic bar code data provided after the (cc)EXECUTE command.
BOX		✓		Defines size, location, and thickness of boxes.
CORNER		✓		Defines vertical and horizontal length, location, and thickness of a set of four corners.
CREATE	✓			Places the IGP/PGL in the Create Form mode where all the Create Form mode commands are available to design form elements.
DELETE FORM	✓			Deletes a selected form name from the directory and IGP/PGL memory.
DELETE LOGO	✓			Deletes a selected logo name from the directory and IGP/PGL memory.
DENSITY	✓		✓	Defines the horizontal print density in characters per inch (cpi).
DIRECTORY	✓			Provides a list of all defined forms and logos, logo assignments to forms, and memory usage and availability.
END		✓		Terminates the Create Form mode.

EXECUTE	✓			Executes a previously created form.
EXPAND	✓		✓	Expands fonts vertically and horizontally.
HDUP		✓		Defines the number of horizontal duplications of an element and the spacing between duplications.
HORZ-		✓		Defines the location, size, and thickness of horizontal lines.
IAFn			✓	Executes the incremental dynamic alphanumeric data provided after the (cc) EXECUTE command.
IBFn			✓	Executes the incremental dynamic bar code data provided after the (cc)EXECUTE command.
IGOFF	✓	✓	✓	Disables the IGP/PGL to ignore all characters after the Ignore Sequence Off command is sent until the Ignore Sequence On command is sent.
IGON	✓	✓	✓	Enables the IGP/PGL to ignore all characters after the Ignore Sequence On command is sent until the Ignore Sequence Off command is sent.
ISET	✓	✓		Selects one of the multinational character sets.
LFORM		✓		Specifies form length by total number of lines at 6 or 8 lpi.
LISTEN	✓			Removes IGP/PGL from the Quiet state and enables IGP/PGL operation.
LOGO (Call)		✓		Specifies the location of a previously defined logo.
LOGO (Create)	✓			Places the IGP/PGL in the Create Logo mode, where logos can be defined using the appropriate dot placements.
LPI	✓		✓	Defines the lines per inch (lpi) printing format.
NORMAL	✓		✓	Places the IGP/PGL in the Normal mode, where it does not change the data stream but awaits the SFCC followed by an IGP/PGL command.
PAGE		✓		Defines the location for automatically incremented page numbers.

QUIET	✓			IGP/PGL operation is disabled until a Listen command is received. Any data sent to the LinePrinter Plus Emulation is unaffected by IGP/PGL commands.
RESET	✓		✓	Deletes all forms and logos from the IGP/PGL memory or the printer flash memory.
REVERSE		✓		Defines the location for white-on-black printing and selects the background shade.
SCALE		✓		Defines the vertical spacing and horizontal pitch for data positioning in character or dot columns and rows.
SFCC	✓		✓	Changes the Special Function Control Code character.
SFOFF	✓	✓	✓	Ignores all host-generated paper movement commands.
SFON	✓	✓	✓	Disables SFOFF.
USET	✓			Use a custom user-defined character set. Creates custom character sets (except OCR) from existing printer characters in memory.
VDUP		✓		Defines the number of vertical duplications of an element and the spacing between duplications.
VERT		✓		Defines the location, size, and thickness of vertical lines.

Graphics Language Exceptions

Exceptions from the T6215 implementation are noted below. All unsupported emulation commands are parsed and ignored. All other capabilities, exceptions, and nuances are defined by the *Line Printer Graphics Applications Manual*.

Exceptions from the T6215 Printer	**Emulations Affected**
The human readable attribute of a bar code is not supported above the bar code.	PGL – BARCODE
Reverse fields do not reverse standard text.	PGL – REVERSE
Block character patterns and reverse fields are not supported.	Code V - ^KL, ^KH
Control of whether or not descending block characters descend is not supported. All block characters with descending components (i.e. g, j, q, y) will descend below the baseline.	Code V – ^D
The human readable characters of the Code 39 bar code are bounded by asterisks.	PGL, Code V, and Genicom
Check digits are not printed in the human-readable portion of UPC bar codes	PGL, Code V, and Genicom
Long bars are not supported for Code 39 bar codes.	PGL, Code V, and Genicom
The Industrial 2 of 5 bar code is not supported.	PGL, Code V, and Genicom
The size vertical bar codes (top to bottom as printed) are slightly smaller due to the printer resolution.	PGL, Code V, and Genicom
Style 2 is not supported by the Vscale control panel option because that block character capability is unavailable.	PGL, Code V, and Genicom
Block character size and position within a cell is slightly different.	PGL, Code V, and Genicom
Multi-high human-readable in a bar code is not supported.	Code V
Embedded human-readable is only available for UPC and EAN bar codes, and is always on.	PGL, Code V, and Genicom
Block character reverse acts like reverse fields.	PGL
Dark barcodes and block characters are not supported	PGL
Items that start before the current paper position are not printed.	PGL

Chapter 3: TrueType Fonts

The "block character" text printed by the Code V and PGL industrial graphics languages is generated using TrueType font outlines. There is one TrueType font embedded in the printer as a resident font used for generating these characters. This font is:

Resident Font Name	Font Number
MonoBlock Bold	93779

Maximum Character Size

The parameters BlkMaxH and BlkMaxV allow to set the maximum size block character horizontally and vertically that will be printed using the TrueType font. Characters above this maximum size will be printed using the previous vector style block characters.

Parameter	Setting options
BlkMaxH	0 to 136 (Default: 40)
BlkMaxV	0 to 136 (Default: 40)

The PGL FONT Command

The FONT command has been added to the PGL emulation contained in the printer to provide increased flexibility and compatibility when printing forms designed for laser printers. This command allows the form designer to choose from a variety of fonts when creating or printing a form. The format of the FONT command is described below.

Mode: NORMAL, CREATE, EXECUTE.

Format: <SFCC>FONT;FACE n

          <SFCC>   Enter the Special Function Control Character as set in the SFCC menu option. When in the CREATE mode, do not include the SFCC.

          FONT   The font command.

          FACE n   Specifies the typeface. Enter FACE, then a space, then the 5 digit number of the desired typeface. For the resident font, the following number applies:

                              93779 –MonoBlock Bold

Notes: The FACE SMODE, BOLD, BLOCK, SLANT, SYMSET, POINT, SPACE, and ZERO parameters are not currently supported.

             Use of the FONT command in the Create mode affects only the current form being created. It will have no effect on other forms or the font used for Normal or Execute mode text. Similarly, use of the FONT command in the Execute and Normal modes does not affect the fonts used in forms that have already been created.

> *NOTE:* **Currently download of fonts is not supported.**

Chapter 4: Miscellaneous

Driver

This printer model is provided without driver. The IGP printer model basically is delivered with the standard Online CD-Rom.

The Driver located on this CD rom requires MTPL and Epson LQ emulations. These emulations are not included in the firmware of an IGP printer model.

> *NOTE:* **However the Plug&Play string is identical to that of the standard printer this means that the standard driver would be installed by accident. This driver is not functional!**

Cutting Device

Basically the optional cutting device will work.

As in IGP the form is defined by the "Create" command, and printing is normally done by the "Execute" command without a formfeed, the form will not be cut using the "Cut on Formfeed" setting. Instead it is recommended to use the "Cut on Tof" setting (See printer's menu: ViewCut).

> *NOTE:* **The function "cutting" is not determined as there is no support from the emulations. Hence we recommend to test the proper function of the cutter in the particular environment.**

Standard Documentation

The IGP printer model is provided with its standard printer documentation.

It is intended to being used to describe the basic functions of your printer. Only the special IGP functions which differ from the standard are described in this manual.
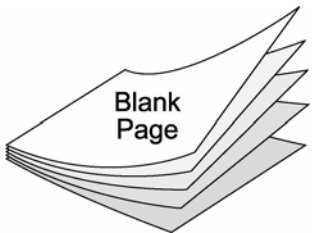
Blank
Page

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