EPL2 Programmer's Manual

Eltron

Manual No. 980009-001 Rev. E

FOREWORD

This manual provides programming information for the Eltron brand printers, featuring Zebra's Eltron Programming Language (EPL2) command language, which are manufactured by Zebra Technologies Corporation, Camarillo, California.

COPYRIGHT NOTICE

TRADEMARKS

REVISION HISTORY

Rev. B – This version of the manual was for firmware version 2.23 and is available from Eltron in electronic form.

Rev.C - This version of the manual was for firmware version 3.18 and is available from Eltron in electronic form.

Rev.D - This version of the manual was for firmware version 3.20 and is available from Eltron in electronic form.

Rev.E - This manual version coincides with EPL2 firmware version 3.99 and is available from Eltron in electronic form.

See the Eltron web site at: www.eltron.com for an Adobe Acrobat file or call Zebra, Eltron Products Group, customer service.

Table of Contents

PROGRAMMING CONSIDERATIONS

This section contains information about the basic features, command syntax and terminology of the Eltron Programming Language 2 (EPL2).

Features The Eltron Programming Language 2 (EPL2) is a robust text (ASCII) based command language used to control most Eltron brand Zebra printer models. EPL2 takes advantage of the intelligent features built into the printer to reduce programming overhead and minimize data transmission time.

The command set includes features for printing labels directly or storing them, as forms, in non-volatile memory. Counters can be incorporated (e.g. for serialization) as well as variables that are supplied at print time. Graphics, such as logos, can be permanently downloaded into memory for fast recall. Soft fonts can also be permanently downloaded to memory for later recall.

The printer includes 2D bar codes, PDF417 and MaxiCode (PDF417 is an option in the TLP2046 printer). EPL2 provides extensive controls over the height, width, and other aspects of 2D bar codes.

If the printer includes the time & date option, EPL2 includes commands for setting as well as formatting the appearance of the time and date onto printed labels. See Appendix E for details.

Command Functions

The EPL2 printer has four (4) basic command functions:

- ❏ Image Control
- ❏ Print Control
- ❏ Memory Control
- ❏ Status Reporting

Image Control Commands

Image control commands directly affect the memory used by the printer for storing the print image prior to printing. The image commands assemble each of the individual elements of the print image, (i.e. text, bar codes, lines, graphics B&W PCX bitmaps, etc.), with small, compact data strings. The printer creates a bitmap from each command string element without the need to transfer a large amount of image data between the host and the printer.

Command	Description	Page
A	ASCII Text	2-4
B	Bar Code	2-7
b	2D Bar Code	4-15
LE	Line Draw Exclusive	2-30
LO	Line Draw Black	2-31
LS	Line Draw Diagonal	2-32
LW	Line Draw White	2-33
N	Clear Image Buffer *(Note 1)*	2-38
X	Box Draw	2-58

Note 1- A Line Feed (LF) issued prior to any commands will initialize the printer for commands. The N command should be the first command issued to erase/clear all available image buffer space in the printer.

Printer Control Commands

Printer control commands set the image (label) size, position of print area, speed, density (heat setting), control and positioning of label for cut, peel or presentation, and printer interface and control.

Command	Description	Page
D	Density	2-14
I	Character Set	2-28
JB	Disable Top of Form Backup	2-29
JF	Enable Top of Form Backup	2-29
O	Options Select: Thermal Transfer Direct Thermal Cut Peel (Present Label)	2-39
P	Print	2-42
PA	Print Automatic	2-43
Q	Set Form/Label Length	2-44
q	Set Form Width	2-48
R	Set Reference Point	2-49
S	Speed Select	2-51
W	Windows Mode (Enable/Disable for Windows printer driver)	G-31
Z	Print Direction (**ZB** & **ZT**)	2-61

Memory Control Memory control commands provide access to volatile (temporary) and nonvolatile (permanent) memory in the printer. Volatile memory is for storing variable data and counters. Nonvolatile memory is for storing form, graphic data (PCX) and soft fonts.

Volatile Memory Commands		
Command	Description	Page
C	Counters	2-11
V	Define Variable	2-57
rN	Disable Double Buffer	H-17
?	Download Variables	2-62

Nonvolatile Memory Commands		
Command	Description	Page
FE	End Form Store	2-17
FK	Delete Form	2-19
FR	Retrieve Form (and run commands within form)	2-20
FS	(Begin) Store Form	2-21
GG	Retrieve PCX Graphic (to image buffer)	2-23
GK	Delete Graphic	2-25
GM	Store Graphics	2-26
M	Memory Allocation (Clear data printer memory and format)	2-34

Memory management may be different from printer model to model. Zebra has been adding features and creating new products that have required minor functional differences in memory management.

Some EPL2 printers include a removable memory cartridge. Some printers have on-board memory only. While some printers have flash (nonvolatile) memory for storing data (graphics forms and soft fonts). Other printers use a battery to maintain stored data.

Printer memory is divided into three basic groups: SRAM for image buffer generation, nonvolatile storage memory and firmware (internal printer control programming). All EPL2 printers have SRAM for image generation. Printers with nonvolatile data storage maintained by battery, share the SRAM memory with the image buffer and have EPROM for firmware. Printers with flash memory share nonvolatile data storage with firmware.

Printers with SRAM for nonvolatile memory storage require the programmer to manage the memory by partitioning separate areas for image (buffer), forms, graphics and soft font storage to maximize printer performance.

Printers with Flash Memory for nonvolatile memory manage the storage of forms, graphics, and soft fonts, as well as printer firmware, within the printer's internal flash memory. The flash memory is partitioned into two areas: forms and a shared area for graphics and soft fonts. Printers with flash memory use SRAM memory for the image buffer only.

The following two tables help identify some of the basic printer memory related features and options.

SRAM Nonvolatile Memory	Internal (KB)	Standard Configuration (KB)	With Cartridge (KB)
LP2122	0	128	128-512
LP2142	0	128	128-512
LP2242	128	128	256-512
LP2622	128-256	128	N/A
LP2642	128	128	256-512
LP3642	128	256	256-512
TLP2242	128	128	256-512
TLP2622	128	128	N/A
TLP2642	128	128	256-512
TLP3642	128	256	256-512
TLP2046	0	128	128-512

Flash Nonvolatile Memory	Flash		SRAM	
	Standard	Maximum	Standard	Maximum
Orion	512 KB	1 MB	256 KB	512 KB
Strata	512 KB	1 MB	512 KB	1 MB
LP2722 / TLP2722	512 KB	1 MB	128 KB	256 KB
LP2742 / TLP2742	512 KB	1 MB	256 KB	512 KB
TLP 2746	512 KB	1 MB	512 KB	1 MB
Eclipse	512 KB	1.5MB	256 KB	384 KB
P2222	512 KB		128 KB	
P2242	512 KB		160 KB	

Printers with flash memory have a limited number of write cycles. Limiting the number memory writes is essential to maximize flash memory life and is a good practice in general. Some printers with flash memory chips have flash write cycles limited to 100,000 cycles before the storage of data may become unreliable.

All new Eltron brand printer models have flash memory to allow field upgrade of printer firmware by downloading firmware directly into the printer.

The programmer should discriminately use commands that write to memory. The following commands write to flash memory:

- **M** command - Formats/Erases Memory.
- **FS / FE / FK** commands - The commands initiates and enables form data writes to flash memory or delete form from memory.
- **ES / EK** commands - The commands stores soft font data writes to flash memory or deletes a soft font from memory.
- **GM / GK** commands - Sets and initiates PCX graphic data writes into flash memory or deletes a graphic from memory.
- **D / S / O** commands - Sets printer control parameters will only write into flash memory if the parameter has changed.

Status Reporting Status reporting commands provide the user and programmer with printer operational status, memory usage, and listings of forms and graphics loaded into printer memory. The status responses are for maintenance and program debugging.

Command	Description	Page
EI	Print Soft Font Information	2-15
FI	Print Form Information	2-18
GI	Print Graphic Information	2-24
U	Print (Printer) Configuration	2-52
Printer To Host Status - Serial Interface		
UF	Form Information Inquiry (Host)	H-22
UG	Graphics Information Inquiry (Host)	H-23
UI	Enable Host Prompts/Codepage Inquiry (Host)	H-24
UN	Disable Error Reporting	H-26
US	Enable Error Reporting (Host)	H-30

PROGRAMMING CAUTION:
Parallel Port Configurations and the* UF, UG, UI or US *Commands: The printer only communicates a detailed status to the host via the printer's serial port.

If the printer is only connected to the host via the parallel port, DO NOT send a **UF, UG, UI, or US** (Host) status reporting commands to the printer. The printer may appear to hang. The user may have to make a serial cable connection to the host or power cycle the printer to resume normal printing operations.

Command Conventions The manual uses the following typographic conventions to describe commands.

Example	**Description**
A	Commands (Case Sensitive)
p1,p2,p3	Required parameters
[p1, p2, p3]	Optional parameters
{Choice 1|Choice 2}	Indicates a mandatory choice between two or more items. You must include one of the items unless all of the items are also enclosed in square brackets.
This text should be → on one line	The line-continuation character (→) indicates that code is continued from one line to the next and should be typed all on one line.
↵	Line feed character.
"NAME"	The name of a form or graphic in double quote marks.
"DATA"	The text or bar code data in double quote marks. The (\) character designates that the character following is a literal and will encode into the data field. Refer to the following examples:

To Print	*Enter into Data Field*
"	*\"*
"Company"	*\"Company\"*
**	**
\code	*\\code*

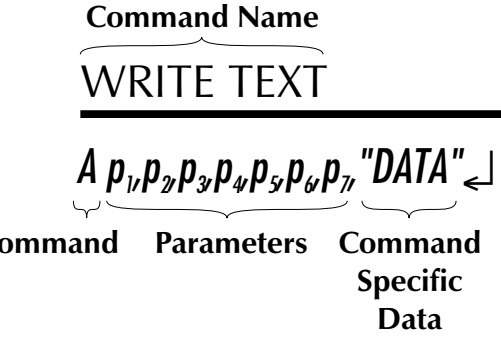
"PROMPT"	An ASCII text field that will be transmitted to the host (via the serial interface) each time this command is executed.

Attention!!
All commands and alpha character command parameters are case sensitive!

Basic Command Syntax

Each command consists of one or two ASCII (case sensitive) alpha characters to identify the specific command desired. Some commands require one or more additional parameters to supply the printer with sufficient information to complete the command. Refer to Figure 1-1 for the basic command syntax.

Figure 1-1 Basic Command Syntax



Each command line must be terminated with a Line Feed **(LF)** character (Dec. 10). Most PC based systems send **CR/LF** when the Enter key is pressed. The Carriage Return **(CR)** character is ignored by the printer and cannot be used in place of **LF**.

Command Editor One method to create command files is through an ASCII based text editor. In the DOS environment, MS-DOS EDIT or BRIEF are good choices. To execute the file, use the editor's print command or from the DOS prompt, use the COPY command to send the file directly to the printer. An example of the use of the COPY command is:

COPY "FILENAME.EXT" LPT1↵
or
COPY "FILENAME.EXT" COM1↵

For more information on the use of the COPY command, refer to your DOS software manual. Configure the COM port to match the printer's serial port setting (typically set to defaults). See the **Y** command in section 2 for details.

See Examples in Appendix H for more information on downloading forms or graphics to an EPL2 printer.

Printer Memory Organization

The EPL2 printers feature nonvolatile memory for storage of label forms, graphics and soft fonts. This memory can be located in the printer, in removable memory cartridges or both depending upon the printer model.

Many EPL2 printers require the use of the **M** command to specify the amount of memory allotted to memory storage groups: image buffer, forms, graphics and soft fonts. See the **M** command in Section 2, Command Reference, for memory management details by printer model.

Each time the memory allocation command **M** is used; forms, graphics and soft fonts stored in memory are erased. Because previously stored forms, graphics and fonts are deleted by the **M** command, extra care should be used when formatting printer memory.

Printers with Flash Memory
Printers with flash memory do not require memory partitioning for storage of forms, graphics, soft fonts or the image buffer as required by other EPL2 printers. However, the **M** command is required to format/clear existing memory. See the **M** command in Section 2 for details.

Forms

Form (or command) files can be downloaded to memory for storage and later recall. A form can contain fixed text, variable text (entered at print time), counters (recalled or entered at print time) and bar code symbols. A form can call a graphic from memory and use the graphic as part of the form.

The number of stored forms allowed is dependent on the amount of memory available in the nonvolatile printer memory

Graphics

Graphic image data and forms are stored in the nonvolatile memory. The number of graphics that printer memory can hold is strictly dependent upon print memory availability.

Soft Fonts Soft Font data is stored in nonvolatile memory. Up to 52 soft fonts, can be loaded into printer memory (and recalled as A-Z, a-z; see Section 2, Command Reference). The number of soft fonts that printer memory can hold is strictly dependent upon print memory availability. Easily download soft font data to the nonvolatile memory with programs such as Soft Font Downloader Utility, CAL Tools and Create-A-Label 3.

Image Buffer The Image Buffer is the assembly area for label elements (text, lines, bar codes, graphics, etc.), prior to printing. Each label element is added to the image (label) buffer, command by command, as processed by the printer.

The printer must have enough image buffer memory available to hold the largest label/form image to be printed. This depends on the label size (length and width). The image buffer length and width are set by the **Q** and **q** commands, respectively.

Image Buffer Addressing

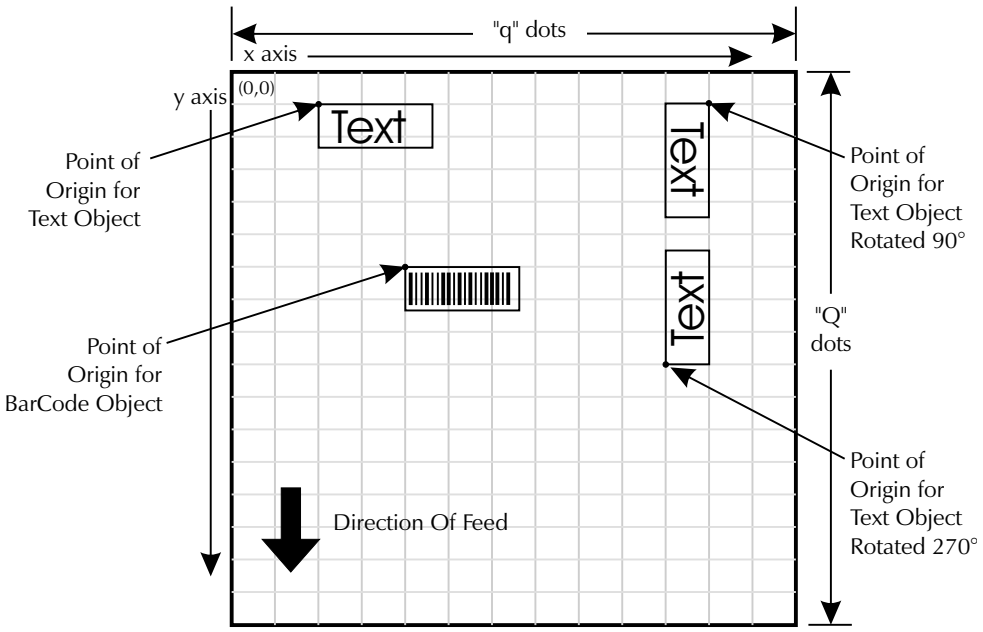
The printer allocates image buffer memory using the stored values for length and width. The default length of the image buffer is set by the EPL2 printer's AutoSense feature. The default image buffer width is the print head width in dots. The width of the print head is measured in dots per inch (dpi) or dot per millimeter (dot/mm).

- ❏ 2 inch printers - the maximum print width is 2.20 inches (54 mm) at 203 dpi (8 dot/mm) resolution.
- ❏ 4 inch printers - the maximum print width is 4.09 inches (104 mm) at 203 dpi (8 dot/mm) resolution.
- ❏ 4 inch printers (3642 models) - the maximum print width is 4.16 inches (106 mm) at 300 dpi (11.8 dot/mm) resolution.
- ❏ Strata - the maximum print width is 8.5 inches (216 mm) at 203 dpi (8 dot/mm) resolution.

When placing objects in the image buffer for printing, the address locations are expressed in dots on an X-Y grid. The X value represents the width and the Y value represents the height of the grid. The point of origin (the starting point) for a non-rotated object is the upper left corner. As an object rotates, the point of origin rotates with the object.

These image buffer properties are depicted graphically in the following illustration.

Sample Format



The minimum non printing margin on all edges of the label is 1mm. Printing closer than 1mm to the top or bottom edge of the label may cause the printer to advance unwanted labels or cause the printer to go into error condition.

Installed Memory vs. Form Length

The maximum size of an image buffer is dependent upon the amount of SRAM available to create a single image buffer. Increasing SRAM memory increases the total memory available for image buffer creation. Most EPL2 printers have memory expansion options. The recommended minimum amount of available image buffer memory is two (2) times the size of the largest label/form image to be printed (plus 10 Kbytes for internal printer operation).

Printers that have SRAM memory only, share memory with the storage of form, graphic and soft font data. Printers with flash memory use the SRAM for image creation and store data in flash memory.

A small amount of SRAM memory is used to operate and temporarily store variables (counters, text variables, control parameters, etc.) needed to print. See the formulas on page which account for this additional SRAM requirement.

The following tables outline the memory required to print two (2) images of various sizes.

203 dpi Printers

Width in inches	*q* value in dots	Height in inches	*Q* value in dots	Image Buffer Size (Kbytes)	
				Single	Double
1.20	244	0.85	173	6	12
1.25	254	1.00	203	7	14
2.25	457	0.75	152	10	19
2.25	457	1.25	254	15	30
2.25	457	2.00	406	24	47
2.25	457	3.00	609	35	70
2.25	457	4.00	812	47	93
4.00	812	1.00	203	22	43
4.00	812	1.50	305	32	64
4.00	812	3.00	609	63	125
4.00	812	4.00	812	83	165
4.00	812	5.00	1015	103	206
4.00	812	6.00	1218	124	247
8.50	1726	11.00	2233	479	957

300 dpi Printers

Width in inches	*q* value in dots	Height in inches	*Q* value in dots	Image Buffer Size (Kbytes)	
				Single	Double
1.25	375	1.00	300	15	29
2.25	675	0.75	225	20	40
2.25	675	1.25	375	33	65
2.25	675	2.00	600	51	102
2.25	675	3.00	900	76	152
2.25	675	4.00	1200	101	202
4.16	1248	1.00	300	48	96
4.00	1200	1.50	450	69	137
4.00	1200	3.00	900	135	270
4.00	1200	4.00	1200	180	359
4.00	1200	5.00	1500	224	448
4.00	1200	6.00	1800	269	537

Double Buffering EPL2 printers with firmware version 3.0 and higher (except TLP2046) support double buffering of print images to speed the printing process. The printer can print the image out of one buffer while loading an image into a second image buffer, if sufficient memory is available to load the second image. The printer will automatically test and enable double buffering. Double buffering allows the printer with most image formats, to print continuously.

If a sufficient amount of image buffer memory is not available to double buffer print images, then the printer will load a print image and then print, performing these functions one label at a time.

While operation of the Double Buffering feature is automatic, the following are requirements to enable the feature:

- ❑ The **Q** command must be used to establish the height of each label and initiate double buffering.
- ❑ The **q** command must be used to match the width of the image buffer to the width of the label. The **q** command will maximize and test the image buffer if sufficient memory is available to enable double buffering.
- ❑ The amount of (SRAM) memory allocated (with the **M** command) for the image buffer must be large enough to hold the two label images. Using the formulas below, calculate the memory requirements for each label. Add the memory requirements for each label to determine the total image buffer memory requirements.

Flash Memory Printers - The **M** command does not affect the image buffer size in flash memory based printers. The image buffer is a fixed size.

The **q** value affects the available print width. Minimizing the **q** value will maximize the print length and print speed (double buffering).

Use the appropriate dot measurement conversion to determine the image buffer size with the following formulas:

For 203 dots per inch (8 dots per mm) printers;
OR
For 300 dots per inch (11.8 dots per mm) printers:

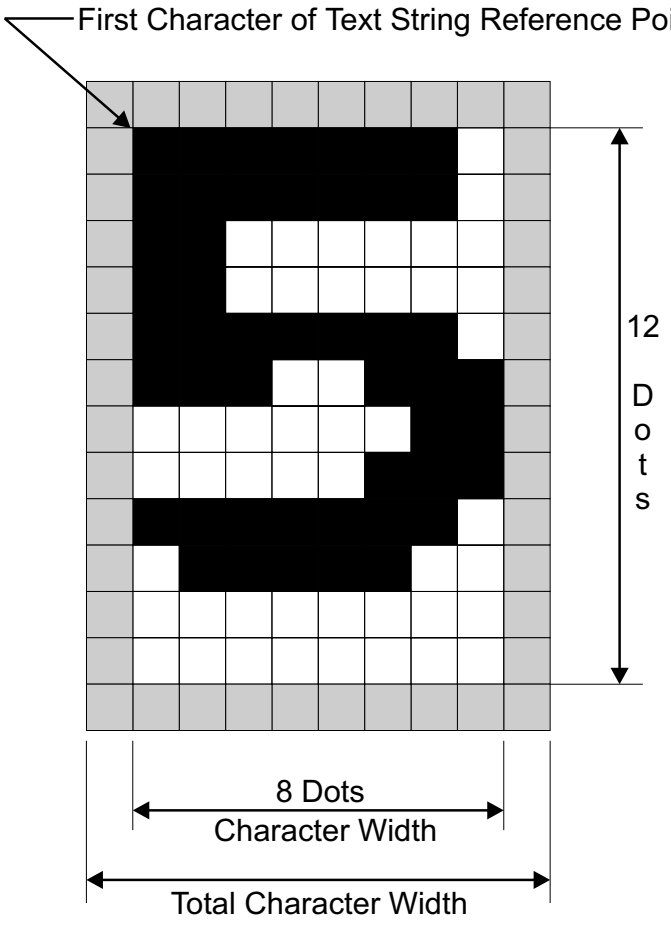
Single Buffer
(Height in dots[Q]+10) x Width in dots[q]/8096=KBytes required

Double Buffer
([Single Buffer Kbytes Required] x 2) + 0.5 =KBytes required

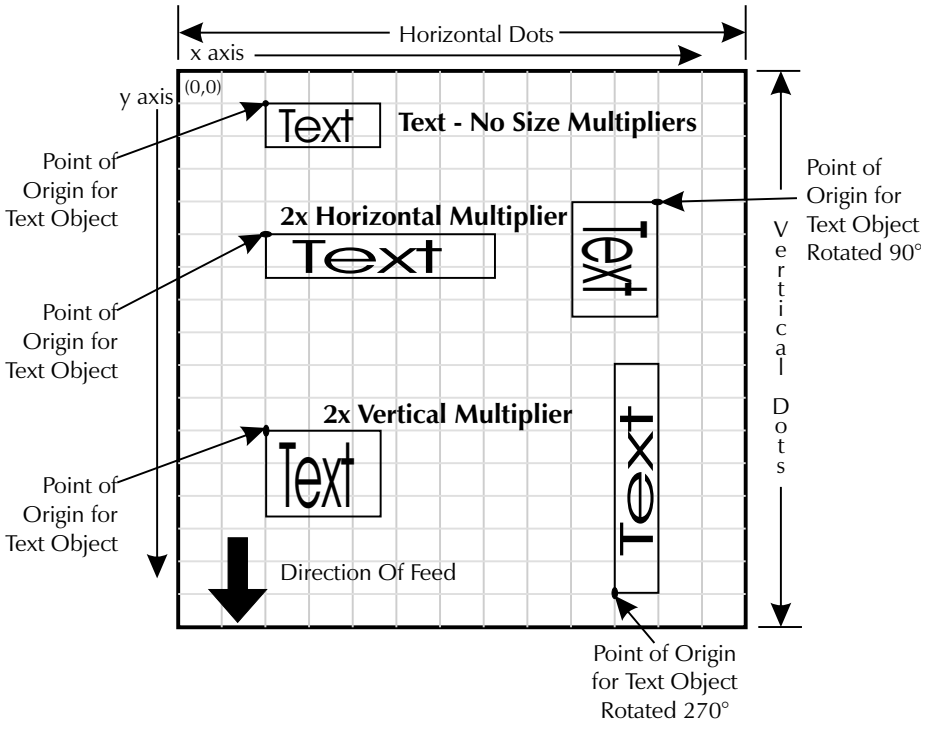
When receiving data for a new label, the printer checks the size of each new label and the previous label size to determine if both images will fit into the image buffer. If so, processing of the second label will continue even if the first label is printed.

To determine the maximum memory required to print labels continuously with double-buffering, the programmer should add the print buffer requirements of the two (2) largest consecutive print images together.

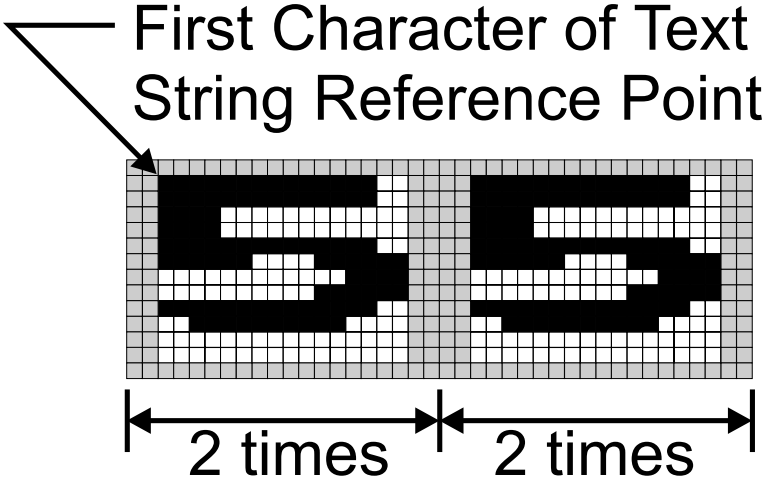
Text (Fonts) The standard EPL2 printer has five (1-5) resident mono-spaced dot fonts. Fonts A-Z and a-z (upper and lower case alpha characters) are reserved for downloading soft fonts.



Control text height (in horizontal dots) and width (in vertical dots) with the horizontal and vertical multipliers. The text is oriented first and then the **A** command's font multipliers are applied. The text is then placed into the image buffer. See the following example.



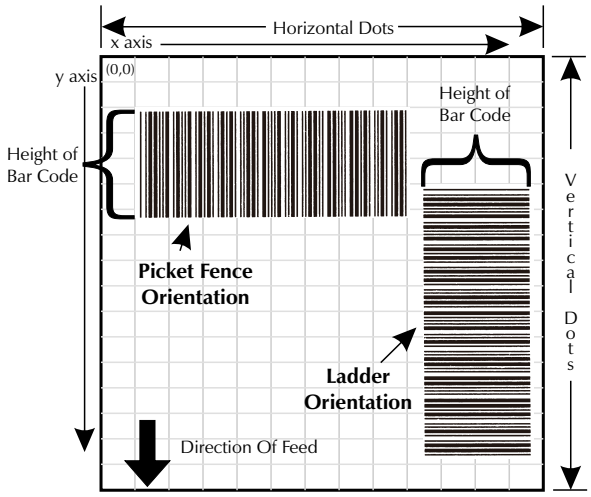
The reference point of the first character in a text string is not affected by the font size multiplier values.



Bar Codes All bar codes supported by the EPL2 language have associated industry specifications that the programmer should be aware of and adhere to. The programmer needs to consider bar code features and requirements when choosing and using a bar code for different applications. Some of the features and requirements that need consideration are listed below:

- ❏ Data used by the application are per the bar code specification (numbers only, alphanumeric, alphanumeric and special characters, etc.).
- ❏ Minimum and maximum number of characters allowed or required per bar code.
- ❏ Density or magnification of a given bar code type.
- ❏ White area required around bar codes (the "Quiet Zone").
- ❏ The bar code must print within the image buffer (printable area of the label).

Bar Code Orientation Tip
To help ensure that generated bar codes are readable by the widest variety of bar code readers, print bar codes in the "Picket Fence" orientation versus the "Ladder" orientation.



Programming Sequences Affect Graphic Results

Graphic elements can interact and the resultant image can be affected by other commands. Structure command sequences to reduce the chances of unexpected print results. The printer will process lines, text, boxes and most bar codes in command sequence. The printer then processes the printer control processes, counters, variable data, Postnet, and then graphics last. See the programming examples in Appendix H.

Media Detection

Media detection in EPL2 printers is a combination of programming and printer media sensing. The **Q** (Set Form Length) and **O** (Option) commands program the media detection method. The user must configure the printer for the media type and the programmed form in use.

The printer can detect the beginning and end of the printable area on the media by one of three methods: Gap, Notch (hole), or Black line. The Gap method detects the difference in optical density of a label on a liner from the liner only with the Transmissive (Gap) sensor. The Notch method uses the Transmissive sensor to detect a hole in the media (gap-less labels or tag stock). The Black line method uses the Reflective sensor to detect a preprinted black line on the media back (for gap-less labels or tag stock).

Printing on continuous media requires programming to control media positioning.

EPL2 printers also support a "Label Dispense" mode as a printer configuration option (for most models). The printers use a "Label Taken" sensor to detect the removal of a label.

One or more of these sensors may require user adjustment or configuration for proper operation. All EPL2 printers have an AutoSense feature to optimize label and label gap detection by the transimissive (gap) sensor. See the printer's user's manual for printer specific sensor adjustment control.

Determining Printer Firmware Version

The printer version numbers are a code used to document product function and the feature support level of the printer. To check the firmware version installed in your printer, perform the AutoSense procedure described in the printer's user's manual or via the printer interface by issuing a programming **U** command.

COMMAND REFERENCE

This section contains a complete listing of printer commands in alphabetical order and describes the basic commands.

EPL2 Command Set The command language controls most printer functions. Printer model differences have required minor functional differences to individual commands. A table of commands and command interpretation differences are outlined in the following table.

Command	Description	ALL	Specific	Exceptions	Not Supported	
A	ASCII Text	✔	✔	TLP3642 LP3642		2-4
B	Bar Code	✔	✔			2-7
b	2D Bar Code	✔	✔	TLP2046		D-15
C	Counter	✔	✔	Eclipse Orion Strata P2242 P2222		2-11
D	Density	✔	✔			2-14
EI	Print Soft Font Info.	✔				2-15
EK	Delete Soft Font	✔				H-3
ES	Store Soft Font	✔				H-4
f	Cut/Peel Position		✔			F-4
FE	End Form Store	✔				2-17
FI	Print Form Info.	✔				2-18
FK	Delete Form	✔				2-19
FR	Retrieve Form	✔				2-20
FS	Store Form	✔				2-21
GG	Retrieve Graphics	✔				2-23
GI	Print Graphics Info.	✔				2-24
GK	Delete Graphic	✔				2-25
GM	Store Graphic	✔				2-26
I	Character Set Selection	✔				2-28
JB	Disable Top Of Form Backup	✔				2-29
JF	Enable Top Of Form Backup	✔				2-29
LE	Line Draw Exclusive	✔				2-30
LO	Line Draw Black	✔				2-31
LS	Line Draw Diagonal	✔				2-32
LW	Line Draw White	✔				2-33
M	Memory Allocation		✔			2-34
N	Clear Image Buffer	✔				2-38

Command	Description	ALL	Specific	Exceptions	Not Supported	
O	Options Select	✔	✔			2-39
oB	Cancel Customize Bar Code	✔				G-12
oH	Macro PDF Offset	✔				D-27
oM	Disable Initial Esc Sequence Feed	✔				2-41
oW	Customize Bar Code Parameters	✔				G-12
P	Print	✔				2-42
PA	Print Automatic	✔				2-43
Q	Set Form Length Transmissive (Gap) Sensor	✔				2-44
	Black Line Sensor		✔			
	Continuous Stock	✔				
q	Set Form Width	✔				2-48
r	Buffer Mode		✔			G-17
R	Set Reference Point	✔				2-49
S	Speed Select	✔	✔			2-51
TD	Define Date Layout		✔		2022//2042 2622 P2222 Eclipse	E-5
TS	Set Real Time Clock		✔			E-6
TT	Define Time Layout		✔			E-7
U	Print Configuration		✔			2-52
Ux	Status, Debug & Inquiry (Serial Port Only) - **UA, UB, UE, UF, UG, UI, UM, UN, UP, US**	✔	✔		See Appendix G	G-18
V	Define Variable	✔	✔			2-57
W	Windows Mode	✔				G-31
X	Box Draw	✔				2-58
Y	Serial Port Setup	✔	✔			2-59
Z	Print Direction	✔				2-61
?	Download Variables	✔				2-62
^@	Reset Printer	✔				G-32
^ee	Status Report - Immediate		✔		See Appendix G	G-9
eR	User Definable Error Response		✔			G-10

ALL - Commands that function the same for all models.
Specific - Commands that require special programming considerations (other than print width) for printer model variations, such as dot per inch, printing speed or memory partitioning.
Exception - Model(s) listed are the exceptions to standard EPL2 command operation.
Not Supported - Are commands that are ignored by the model(s) listed.

A Command - ASCII Text

Description Prints an ASCII text string

Syntax **Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,"DATA"**

Parameters **p_1** = Horizontal start position (X) in dots.

p_2 = Vertical start position (Y) in dots.

p_3 = Rotation

Value	Description
0	No rotation
1	90 degrees
2	180 degrees
3	270 degrees

p_4 = Font selection

Value	Description	
	203 dpi	**300 dpi**
1	20.3 cpi, 6 pts, (8 x 12 dots)	25 cpi, 4 pts, (12 x 20 dots)
2	16.9 cpi, 7 pts, (10 x 16 dots)	18.75 cpi, 6 pts, (16 x 28 dots)
3	14.5 cpi, 10 pts, (12 x 20 dots)	15 cpi, 8 pts, (20 x 36 dots)
4	12.7 cpi, 12 pts, (14 x 24 dots)	12.5 cpi, 10 pts, (24 x 44 dots)
5	5.6 cpi, 24 pts, (32 x 48 dots)	6.25 cpi, 21 pts, (48 x 80 dots)
A - Z	Reserved for Soft Fonts	Reserved for Soft Fonts
Fonts 1 - 5 are fixed pitch. See Appendix A for standard character maps and Appendix B for printers with extended character map support. See Appendix C for Asian Character support.		

p_5 = Horizontal multiplier, expands the text horizontally. Values: 1, 2, 3, 4, 5, 6, & 8.

p_6= Vertical multiplier, expands the text vertically. Values: 1, 2, 3, 4, 5, 6, 7, 8, & 9.

p_7 = **N** for normal or **R** for reverse image

"DATA" = Represents a fixed data field.

A Command - ASCII Text

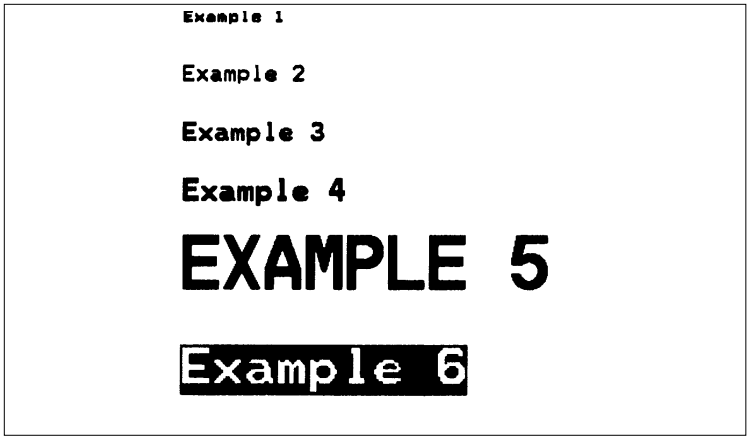
The backslash (\) character designates the following character is a literal and will encode into the data field. Refer to the following examples:

To Print	Enter into data field
“	\”
“Company”	\”Company\”
\	\\
\code\	\\code\\

Examples:

```
↵
N↵
A50,0,0,1,1,1,N,"Example 1"
A50,50,0,2,1,1,N,"Example 2"↵
A50,100,0,3,1,1,N,"Example 3"↵
A50,150,0,4,1,1,N,"Example 4"↵
A50,200,0,5,1,1,N,"EXAMPLE 5"↵
A50,300,0,3,2,2,R,"Example 6"↵
P1↵
```

Will Produce:



As shown in example 5 above, font 5 only supports upper case characters. Refer to Appendix A for a complete listing of available fonts and character sets supported.

A Command - ASCII Text

The data field can be replaced by or combined with the following commands:

Vnn= Prints the contents of variable "**nn**" at this position where **nn** is a 2 digit number from 00 to 99.

Cn= Prints the contents of counter "**n**" at this position where n is a one digit number from 0 to 9.

See Appendix E for additional **Data** parameters for printers with the RTC (real time clock) option installed.

Examples:

```
A50,0,0,1,1,1,N,"DATA"↵    : Writes Text
A50,50,0,2,1,1,N,V01↵      : Writes contents of variable 01
A50,100,0,3,1,1,N,C1↵      : Writes contents of counter 1
```

Use the **LE** command to create reverse print text instead of the "**R**" in the **A** command parameter **p7**. This is the recommend method because it provides the best size, position and centering of the black line (rectangle) bordering the reversed text.

B Command - Bar Code

Description This command is used to print standard bar codes.

Syntax **Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,"DATA"**

Parameters **p_1** = Horizontal start position (X) in dots

p_2 = Vertical start position (Y) in dots.

p_3 = Rotation

Value	Description
0	No rotation
1	90 degrees
2	180 degrees
3	270 degrees

p_4 = Bar Code selection (see Table 2-1 on next page).

p_5 = Narrow bar width in dots. (see Table 2-1 on next page).

p_6 = Wide bar width in dots. Acceptable values are 2-30.

p_7 = Bar code height in dots.

p_8 = Print human readable code.
Values: **B**=yes or **N**=no.

"**DATA**" = Represents a fixed data field. The data in this field must comply with the selected bar code's specified format. See Appendix D for more information on bar codes.

The backslash (\) character designates the following character is a literal and will encode into the data field. Refer to the following examples:

To Print	Enter into data field
"	\"
"Company"	\"Company\"
\	\\
\code\	\\code\\

B Command - Bar Code

Bar Codes

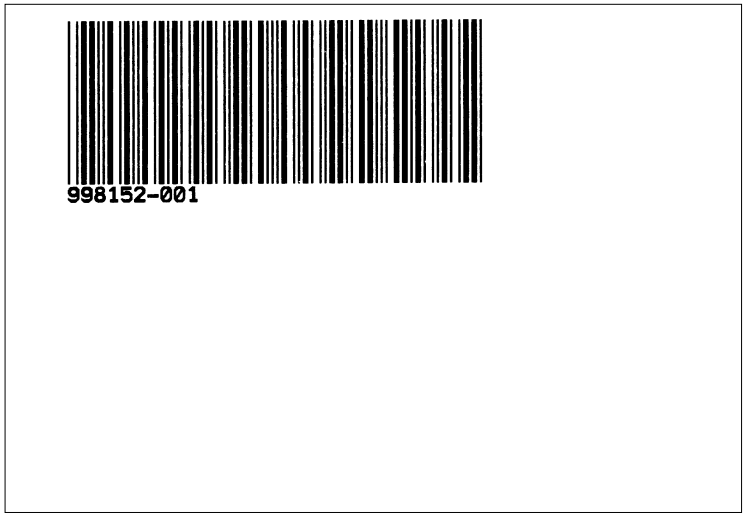
Description	P_4 Value	P_5 Value
Code 39 std. or extended	3	1-10
Code 39 with check digit	3C	1-10
Code 93	9	1-10
Code 128 UCC [3] Serial Shipping Container Code	0	1-10
Code 128 auto A, B, C modes[3]	1	1-10
Codabar	K	1-10
EAN8	E80	2-4
EAN8 2 digit add-on	E82	2-4
EAN8 5 digit add-on	E85	2-4
EAN13	E30	2-4
EAN13 2 digit add-on	E32	2-4
EAN13 5 digit add-on	E35	2-4
German Post Code	2G	3-4
Interleaved 2 of 5	2	1-10
Interleaved 2 of 5 with mod 10 check digit	2C	1-10
Interleaved 2 of 5 with human readable check digit[1]	2D	1-10
Postnet 5, 6, 8 & 9 digit	P	—
UCC/EAN 128	1E	1-10
UPC A	UA0	2-4
UPC A 2 digit add-on	UA2	2-4
UPC A 5 digit add-on	UA5	2-4
UPC E	UE0	2-4
UPC E 2 digit add-on	UE2	2-4
UPC E 5 digit add-on	UE5	2-4
UPC Interleaved 2 of 5	2U	1-10
Plessey (MSI-1) with mod. 10 check digit[2]	L	—
MSI-3 with mod. 10 check digit[2]	M	—
Note 1 - 2242 , 2642, 3642, Orion, Strata, 27XX only Note 2 - P2242 & P2222 only Note 3 - Manual selection of A,B or C modes is not supported		

B Command - Bar Code

Example:

↵
N↵
B10,10,0,3,3,7,200,B,"998152-001"↵
P1↵

Will Produce:



The data field can be replaced by or combined with the following commands:

Vnn =Prints the contents of variable "**nn**" at this position. Range of **nn** = 00 to 99[1].

Cn = Prints the contents of counter "**n**" at this position. Range of **n** = 0 to 9

See Appendix E for additional **Data** parameters for printers with the RTC (real time clock) option installed.

Examples:

B50,0,0,3,1,2,50,B,"DATA"↵: Writes bar code
B50,50,0,3,1,2,50,N,V01↵ : Writes contents of variable 01 as bar : code
B50,50,0,3,1,2,50,N,C1↵ : Writes contents of counter 1 as bar code

or a combination of several options:

B50,300,0,3,1,2,50,B,"Deluxe"V01C2"Combo"V01↵
:Writes the text "Deluxe" followed by the contents of variable 01 followed by the contents of counter 2 followed by the text "Combo" followed by the contents of variable 01 all as a code 39 bar code.

1 Version 2.23 and above.

b Command - 2D Bar Code

Description Print 2D Bar Code - This command will direct a printer equipped with the 2D bar code feature to print a two (2) dimensional bar code type.

This command is listed here for reference only. See Appendix D-15 for details about two dimensional (2D) bar codes and command structure supported by most Eltron printers.

Syntax **bp_1,p_2,p_3**, [code specific options]

Parameters **p_1** = Horizontal start position (X) in dots

p_2 = Vertical start position (Y) in dots

p_3 = 2-dimensional bar code type

Value	Code Type
M	MaxiCode[1]
P	PDF417
Note 1: The MaxiCode specification has been released.	

The following table outlines printer support of the **b** command for the 2D bar codes.

Model	MaxiCode	PDF417
2622	S	S
2642	S	S
3642	S	S
2722	S	S
2742	S	S
Eclipse	S	S
2046	S	O
2746	S	S
Strata	S	S
P2242	S	S
2122	S	O
2142	S	O
Orion	S	S

O = Option; **S** = Standard

C Command - Counter

Description The command defines one of 10 automatic counters used in consecutive numbering applications (i.e. serial numbers).

For Numeric Serialization Only. The counter function does not support Alpha or Alpha-Numeric Serialization.

Syntax **Cp_1, p_2, p_3, p_4, "[-][--]PROMPT"**

Parameters **p_1** = Counter number
Range: **0** to **9**

p_2 = Maximum number of digits for the counter.
Range: **1** to **29**

p_3 = Field Justification.
L = Left **R** = Right
C = Center **N** = No Justification

p_4 = Step Value.
+ or **-** sign followed by a single digit of **1 - 9**. Using a step value of **+0** allows the counter to be used as an additional variable data field.

"**PROMPT**" = An ASCII text field that will be transmitted to the KDU or host (via the serial interface) each time the command is executed. This prompt usually requests the operator to enter the starting value for the counter.

KDU Options ***[-]*** = A single minus sign as the first character of the prompt field will cause the prompt to be displayed only one time after the form is retrieved.

[--] = Two minus signs (with no space between) as the first two characters of the prompt field will cause the prompt to be suppressed . **The [--] prompt option is not supported by printer with nonvolatile flash memory.**

See "Saving and Protecting Consecutive Numbers in Nonvolatile Memory" for additional usage of the **-** and **- - PROMPT** options.

C Command - Counter

The **C** command is used in forms that require sequential numbering. When initializing counters, they must be defined in order (e.g. C0 first, C1 second...).

Field justification (p_3) affects the printing of counter data. When **L**, **R** or **C** are selected, the counter field is the width of p_2 value. Data will justify within the counter (p_2) field per the selected p_3. The **N** parameter will print the minimum number of characters. See programming example 13 in Appendix H.

To print the contents of the counter, the counter number is referenced in the "**DATA**" field of the **A** (ASCII text) or **B** (Bar Code) commands.

If the starting value of a counter is "**1**", then no leading zero padding will be added. If the starting value is "**01**", then the counter will be padded, up to the maximum number of digits (p_2), with zeros. Counters must be defined **after** variables.

Saving and Protecting Consecutive Numbers in Nonvolatile Memory

This feature is useful when the counter field represents a serial number (or others types of numbers) that should never be repeated. This feature allows for automatic retrieval and incrementing (or decrementing) of the previous counter value used every time a form is retrieved (and printed).

By placing one minus sign as the first character of the prompt, the prompt will appear only once after the form is retrieved, thereby protecting the integrity of the data.

For the Orion, Strata, Eclipse & P2242
Stored counter values (after power is cycled or a Reset) and the [**- -**] prompt option are not supported by printers with Flash memory.

C Command - Counter

Example: *C0,10,L,+1,"-Enter Serial Number:"↵*

By placing two minus signs as the first two characters of the prompt, the prompt will never be displayed.

Example: *C0,10,L,+1,"- -Enter Serial Number:"↵*

To edit or restart a protected consecutive number, the KDU's form edit function must be used. From the "***FORM - retrieve form prompt***", perform the following steps:

1. Press F1.
2. Press 4 9 1 6
3. Press the FORM key.
4. Key in the form name and press ENTER to retrieve.
5. Enter or modify the consecutive number.
6. When complete, print the form to store the new number in memory.

KDU Support: The following table outlines the **C** command counter data option of printer for support of stored data.

Model	Counter Data Storage Options		
	C	**-**	**- -**
2622	S	S	S
2642 (2242)	S	S	S
3642	S	S	S
Orion	Note 1	Note 1	N/A
2722 / 2742	Note 1	Note 1	N/A
Eclipse	Note 1	Note 1	N/A
2046 / 2044	S	S	S
2746	Note 1	Note 1	N/A
Strata	Note 1	Note 1	N/A
P2242 / P2222	Note 1	Note 1	N/A
2122	S	S	S
2142	S	S	S

O = Option; **S** = Standard; **N/A** = Not Supported
Note 1 – The counter values are reset after cycling printer power or sending a reset command or pressing the Cancel button.

D Command - Density

Description Use this command to select the print density.

Syntax **Dp_1**

Parameters **p_1** = Density setting. Acceptable values are:

Model	Acceptable Values[1]	Default Value
20X2	0 - 7	2
21X2	0 - 7	2
2622	0 - 15	7
2242	0 - 15	7
2642	0 - 15	7
3642	0 - 15	7
2722	0 - 15	7
2742	0 - 15	7
Orion	0 - 15	10
Eclipse	0 - 15	5
2046 / 2044	0 - 15	5
2746	0 - 15	7
Strata	0 - 15	10
P2222	0 - 15	8
P2242	0 - 15	6
Note 1: 0 is the lightest print and 7 or 15 is the darkest.		

The density command controls the amount of heat produced by the print head. More heat will produce a darker image. Too much heat can cause the printed image to distort.

The P2222 set to "0" density (**D0**) will automatically enable a 2.0ips speed if the battery power level will support the 2.0ips speed.

The density and speed commands can dramatically affect print quality. Changes in the speed setting typically require a change to the print density.

Example: *D5↵* *: selects density 5*

EI Command - Print Soft Font Information

Description This command will cause the printer to print a list of all soft fonts that are stored in memory.

Syntax **EI**↵

Soft fonts can be downloaded to and deleted from the printer from the Soft Font Downloader Utility, CAL Tools or CAL3.

See Appendix G, Advanced Programming, for details on the programming and commands to directly format, download and delete soft fonts.

Example: *EI*↵ *:prints soft font list*

Will Produce:

```
Ext. font information:
a:096char,022dots,0dir.
Ext font memory left: 050K
```

EK Command - Delete Soft Font

See Appendix G

ES Command - Store Soft Fonts

See Appendix G

FE Command - End Form Store

Description This command is used to end a form store sequence.

Syntax **FE**

Example:
```
FS"FORMNAME"↵
...
FE↵
```

The form store sequence is started with the **FS** command.

FI Command - Print Form Information

Description This command will cause the printer to print a list of all forms stored in memory.

Syntax **FI**

Example: **FI**↵ *:prints forms list*

Will Produce:

```
Form information:
1
TESTFORM
Form memory left:004.9K
```

FK Command - Delete Form

Description This command is used to delete forms from memory.

Syntax **FK {"FORMNAME"|"*"}**

Parameters **"FORMNAME"** = By entering the name of a form, that form will be deleted from memory.

- The name may be up to **8 characters** long.
- Form names stored by the printer are case sensitive and will be stored exactly as entered on the **FS** command line; i.e. **"FORM1"**, **"form1"** and **"FoRm1"** are three different forms when stored into the printer or when retrieved by the user.

"*" = By including an "*" (wild card), ALL forms will be deleted from memory.

Example:

```
FK"AFORM"↵          :deletes form "AFORM"
FK"*"↵              :deletes all forms
```

FR Command - Retrieve Form

Description Use this command to retrieve a form that was previously stored in memory.

Syntax **FR"FORMNAME"**

Parameters **"FORMNAME"** = This is the form name used when the form was stored.

- The name may be up to **8 characters** long.
- Form names stored by the printer are case sensitive and will be stored exactly as entered on the **FS** command line; i.e. **"FORM1"**, **"form1"** and **"FoRm1"** are three different forms when stored into the printer or when retrieved by the user.

Example: *FR"TEST1"* *:retrieves the form named TEST1*

To print a list of the forms currently stored in memory, use the **FI** command.

FS Command - Store Form

Description This command begins a form store sequence.

Syntax **FS"FORMNAME"**

Parameters **"FORMNAME"** =This is the form name that will be used when retrieving the stored form.

- The name may be up to **8 characters** long.
- Form names stored by the printer are case sensitive and will be stored exactly as entered on the **FS** command line; i.e. **"FORM1"**, **"form1"** and **"FoRm1"** are three different forms when stored into the printer or when retrieved by the user.
- Global commands such as **EI, EK, ES, FI, FK, GI, GK, GM, I, M, N, P, TS, U, UE, UF, UG, Y, W, ?, ^@** should not be used in a form store sequence.

Form name, **AUTOFR**, is reserved for automatic, single form recall, see Appendix G, Advanced Programming, for details on this programming feature.

All commands following **FS** will be stored in forms memory until the **FE** command is received, ending the form store process.

Delete a form prior to updating the form by using the **FK** command.

If a form (with the same name) is already stored in memory, issuing the **FS** command will result in an error and the previously stored form is retained.

To print a list of the forms currently stored in memory, use the **FI** command.

FS Command - Store Form

Example: ↵

```
FK"TESTFORM"↵          :delete form "TESTFORM"
FS"TESTFORM"↵          :begins the form store sequence of
                       :the form "TESTFORM"
V00,15,N,"Enter Product Name:"↵
B10,20,0,3,2,10,100,B,"998152.001"↵
A50,200,0,3,1,1,N,"Example Form"↵
A50,400,0,3,1,1,N,"Model Name: "V00↵

FE↵                    :ends form store sequence
FI↵                    :prints list of stored forms
```

A form will not store if sufficient memory is not allocated to form memory. See the **M** command for details on adjusting and configuring memory to store forms (graphics and soft fonts).

GG Command - Print Graphics

Description Use this command to print a PCX (format) graphic that has been previously stored in printer memory.

Syntax **GGp_1,p_2,"NAME"**

Parameters **p_1** = Horizontal start position (X) in dots.

p_2 = Vertical start position (Y) in dots.

"NAME" = This is the graphic name used when the graphic was stored.

- The name may be up to **8 characters** long.
- Graphic names stored by the printer are case sensitive and will be stored exactly as entered with the **GM** command line; i.e. **"GRAPHIC1"**, **"graphic1"** and **"graPHic1"** are three different graphics when stored into the printer or when retrieved by the user.

Example: *GG50,50,"LOGO1"↵*

GI Command - Print Graphics Information

Description This command will cause the printer to print a list of all graphics stored in memory.

Syntax **GI**

Example: *GI↵* *:prints graphics list*

Will Produce:

```
Graphics information:
ELTRON
Graphics memory left:003K
```

GK Command - Delete Graphics

Description Use this command to delete graphics from memory.

Syntax **GK {"NAME"|"*"}**

Parameters **"NAME"** = By entering the name of a graphic, that graphic will be deleted from memory.

- Graphic names stored by the printer are case sensitive and will be stored exactly as entered with the **GM** command line; i.e. **"LOGO1"**, **"logo1"** and **"LoGo1"** are three different graphics when stored into the printer or when retrieved by the user.

"*" = By including an "*" (wild card), ALL graphics will be deleted from memory.

Example:

```
GK"LOGO"↵          :deletes graphic "LOGO"
GK"*"↵             :deletes all graphics
```

GM Command - Store Graphics

Description Use this command to store PCX graphics files in memory.

Syntax **GM"NAME"p_1↵**

"DATA"

Parameters **"NAME"** = This is the graphic name that will be used when retrieving the stored graphic.

- The name may be up to **8 characters** long.
- Graphic names stored by the printer are case sensitive and will be stored exactly as entered with the **GM** command line; i.e. **"LOGO1"**, **"logo1"** and **"LoGo1"** are three different graphics when stored into the printer or when retrieved by the user.

p_1 = This is the file size in bytes. Use the DOS DIR command to determine the exact file size.

"DATA" = Graphic data in 1-bit (black & white) PCX (binary data) format file.

Example:

```
GK"LOGO1"↵          :deletes graphic "LOGO1" - Required
GM"LOGO1"584↵       :Prepares printer to receive graphic
                    :"LOGO1"
DATA                : Data string in PCX format
```

If using a DOS system, the PCX format file (binary data) portion can be sent to the printer using the DOS COPY command. For example, if you have a PCX file named LOGO1.PCX in your current directory, the appropriate command would be:

COPY LOGO1.PCX PRN /b

After downloading, the **GI** command can be used to verify that the graphic was successfully stored.

GM Command - Store Graphics

Example: First, create a text file "STOREIT.TXT" with an ASCII text editor, as follows:

↵
GK"WORLD"↵
GM"WORLD"2004↵

Where WORLD is the name of the graphic and 2004 is the size (in bytes) of the PCX file.

Next, at the DOS prompt, type:

COPY STOREIT.TXT + WORLD.PCX PRN /b

Verify the proper storage of the graphic with the **GI** command.

A graphic will not store if sufficient memory is not allocated to graphic memory. See the **M** command for details on adjusting and configuring memory to store graphics (forms and soft fonts).

I Command - Character Set Selection

Description Use this command to select the appropriate character set for printing and display (KDU).

Syntax **Ip_1,p_2,p_3**

Parameters **p_1** = number of data bits. Acceptable values are 8 for 8 bit data or 7 for 7 bit data.

p_2 = Printer Code page

Printer Code Page				
If using 8 bits (p_1 = 8)			If using 7 bits (p_1=7)	
p_2	Code Page	Language	p_2	Country
0	437	English	0	USA
1	850	Multilingual (Latin 1)	1	British
2	852	Slavic (Latin 2)	2	German
3	860	Portugese	3	French
4	863	Canadian (French)	4	Danish
5	865	Nordic	5	Italian
6-F	Printer Specific - See Appendix B for details on optional or extended code page sets.		6	Spanish
			7	Swedish
			8	Swiss

p_3 = KDU Country code (8 bit data only)

KDU Country Code (8 bit only)					
032	Belgium	049	Germany	027	S. Africa
002	Canada	031	Netherl'ds	034	Spain
045	Denmark	039	Italy	046	Sweden
358	Finland	003	Latin Am.	041	Swizerl'd
033	France	047	Norway	044	U.K.
		351	Portugal	001	U.S.A.

The default setting is **I8,0,001**. See Appendix A for EPL2 standard font character maps.

JB Command - Disable Top Of Form Backup

Description This command disables the Top Of Form Backup feature when printing multiple labels. At power up, Top Of Form Backup will be enabled.

Syntax **JB**

Example: *JB↵*

With the **JB** command enabled, the first label will backup to the Top Of Form before printing. This preserves the first label which has stopped approximately one-half inch from the print head. This is the label's tear away point as set by the previous print operation.

JF Command - Enable Top Of Form Backup

Description This command enables the Top Of Form Backup feature and presents the last label of a batch print operation. Upon request initiating the printing of the next form (or batch), the last label backs up the Top Of Form before printing the next label.

Syntax **JF**

Example: *JF↵*

LE Command - Line Draw Exclusive

Description Use this command to draw lines with an "Exclusive OR" function. Any area, line, image or field that this line intersects or overlays will be "reversed out" or inverted. In other words, all black will be reversed to white and all white will be reversed to black within the line's area (width and length).

Syntax **LEp_1, p_2, p_3, p_4**

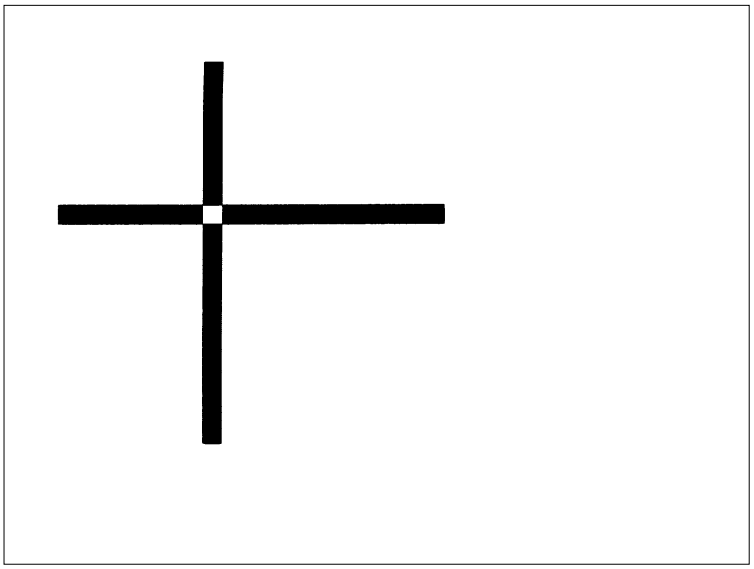
Parameters

p1 = Horizontal start position (X) in dots.
p2 = Vertical start position (Y) in dots.
p3 = Horizontal length in dots.
p4 = Vertical length in dots.

Example:

```
N↵                    :clear image buffer
LE50,200,400,20↵      :draw a line
LE200,50,20,400↵      :draw another line
P1↵                   :print one label
```

Will Produce:



LO Command - Line Draw Black

Description Use this command to draw black lines, overwriting previous information.

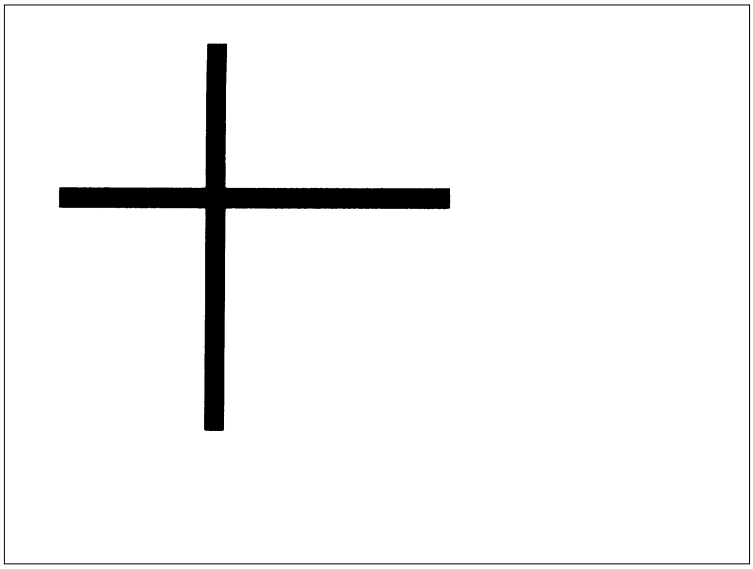
Syntax **LOp_1,p_2,p_3,p_4**

Parameters **p_1** = Horizontal start position (X) in dots.
p_2 = Vertical start position (Y) in dots.
p_3 = Horizontal length in dots.
p_4 = Vertical length in dots.

Example:

```
N↵                      :clear image buffer
LO50,200,400,20↵        :draw a line
LO200,50,20,400↵        :draw another line
P1↵                     :print one label
```

Will Produce:



LS Command - Line Draw Diagonal

Description Use this command to draw diagonal black lines, overwriting previous information.

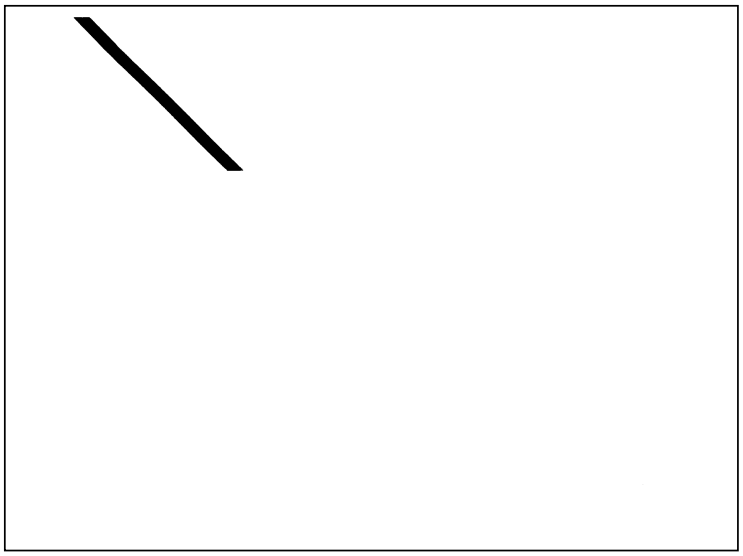
Syntax **LSp_1,p_2,p_3,p_4,p_5**

Parameters
- **p_1** = Horizontal start position (X) in dots.
- **p_2** = Vertical start position (Y) in dots.
- **p_3** = Line thickness in dots.
- **p_4** = Horizontal end position (X) in dots.
- **p_5** = Vertical end position (Y) in dots.

Example:

```
N↵                      :clear image buffer
LS10,10,20,200,200↵     :draw a diagonal line
P1↵                     :print one label
```

Will Produce:



LW Command - Line Draw White

Description Use this command to draw white lines, effectively erasing previous information.

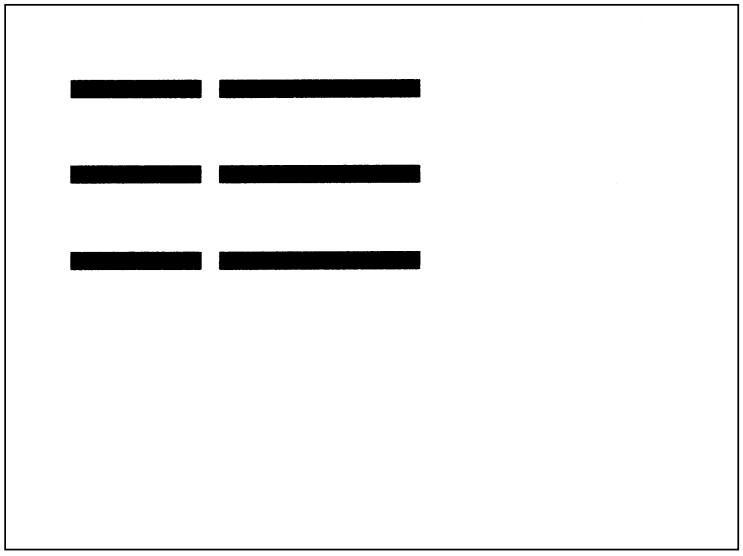
Syntax **LWp_1,p_2,p_3,p_4**

Parameters **p_1** = Horizontal start position (X) in dots.
p_2 = Vertical start position (Y) in dots.
p_3 = Horizontal length in dots.
p_4 = Vertical length in dots.

Example:

```
N↵                          :clear image buffer
LO50,100,400,20↵            :draw black line
LO50,200,400,20↵            :draw another black line
LO50,300,400,20↵            :draw another black line
LW200,50,20,400↵            :draw a white line over all 3 black lines
P1↵                         :print 1 label
```

Will Produce:



M Command - Memory Allocation

Description Use this command to reformat (clear) the nonvolatile memory used to store forms, graphics and soft fonts. See the Programming Considerations section starting at page 1-11 "Printer Memory Organization" for more information on printer memory.

The **M** command manipulates/allocates memory differently, depending on the hardware configuration of the printer.

SRAM (Nonvolatile) Memory Printers:
Use this command to clear/allocate/partition the printer memory into separate areas for image (buffer), forms, graphics and soft fonts storage.

Flash (Nonvolatile) Memory Printers:
Use this command to clear and partition flash memory into two (2) storage areas: one for forms and another area for graphics and soft fonts. The image buffer utilizes the SRAM memory and the **M** command does not have any effect on image buffer size.

See the memory tables on the following pages.

Syntax **Mp_1,p_2,p_3**

Parameters **p_1** = Image buffer size in whole KBytes.
p_2 = Forms memory size in whole KBytes.
p_3 = Graphics memory size in whole Kbytes.

EPL2 printers - Memory partition parameters (**p_1**, **p_2**, and **p_3**) are required to process the command, but may be ignored by some models.

SRAM Nonvolatile – All remaining memory (not allocated to **p_1**, **p_2**, and **p_3**) will be allocated as soft font memory.

SRAM with flash memory - **p_1** and **p_3** values are ignored. However, adjustment of **p_2** (forms sizes) inversely affects the size of the graphics/soft fonts memory in earlier models.

M Command - Memory Allocation

Sending the **M** command will reformat all memory, **erasing *ALL* forms, graphics and soft fonts.**

SRAM Nonvolatile Memory Printers
New memory cartridges or a SRAM upgrade require partitioning before the printer can use the memory for printing or storage of forms, graphics or soft fonts.

SRAM Non-Volatile Memory Models	Standard			Max. Config.			Default Usage			
	Total -Default (KB)	Internal (KB)	Cartridge (KB)	Total - Max. (KB)	Internal (KB)	Cartridge (KB)	Image (KB)	Forms (KB)	Graphics (KB)	Ext. Fonts (KB)
LP2122	128	0	128	512	0	512	45	5.1	10	58
LP2142	128	0	128	512	0	512	106	5	10	3
LP2242	128	128	0	512	128	384	106	5.1	5	3
LP2622	128	128	0	256	256	0	106	5.1	5	3
LP2642	128	128	0	512	128	384	106	5	10	3
LP3642	256	128	128	512	128	384	188	5.1	5	59
TLP 2242	128	128	0	512	128	384	106	5.1	5	3
TLP2622	128	128	0	256	256	0	106	5.1	5	3
TLP2642	128	128	0	512	128	384	106	5	10	3
TLP3642	256	128	128	512	128	384	188	5.1	5	59
TLP2046	128	0	128	512	0	512	106	5.1	5	3

M Command - Memory Allocation

Flash Memory Models	Standard		Max. Config.		Flash Usage		
	Flash (KB)	**SRAM (KB)**	**Flash (KB)**	**SRAM**	**Firmware (KB)**	**Forms (KB)**	Graphics/Ext. **Fonts(KB)**
2722	512	128	1 MB	256 KB	384	128	
2742	512	256	1 MB	512 KB	384	128	
Orion	512	256	1 MB	512 KB	384	128	
Strata	512	512	1 MB	1 MB	384	128	
Eclipse	512	256	1.5 MB	384 KB	256	20	236
P2242	512	160	512 KB	160 KB	256	20	236
P2222	512	128	512 KB	128 KB	384	128	

The early versions of the P2242 and Eclipse printer firmware required the **p2** parameter to modify available form memory.

M Command - Memory Allocation

Available memory and the current allocation of memory can be displayed with the **U** command or an AutoSense procedure, see the printer user's manual.

The **M** command should be sent whenever:

- ❑ The memory requirement for a label size is larger than the current image buffer memory area.
- ❑ You need to change the size of the form, graphic, or soft font memory area to accommodate more or less forms, graphics or soft fonts.
- ❑ You have added additional SRAM, replaced the firmware EPROM or battery.
- ❑ SRAM (nonvolatile) memory printers have the image buffer partition set to small to fit the label length (**Q**) and width (**q**). If the image buffer length is less than the label length, the printer's AutoSense label routine will not work properly. Repartition the image buffer size and/or increase SRAM memory in the printer.

Examples: *M104,5,10↵* *:104KB for image*
:5KB for forms
:10KB for graphics
:0KB for fonts

Note:1. These are the memory default values for the 2142, 2044, and 2046 printers.

N Command - Clear Image Buffer

Description This command clears the image buffer prior to building a new label image.

Syntax **N**

Do not use the **N** command within stored forms.

Example: *N↵* *:clears the image buffer*

Always send a Line Feed (LF) prior to the **N** command to ensure that the printer is initialized.

O Command - Options Select

Description Use this command to select various printer options. Options available vary by printer model.

Syntax **O[C[p_1], D, d, P, S]**

Parameters **D** = Enable ***Direct Thermal Mode***, use this option when using direct thermal media in a thermal transfer (TLP) printer.

P = Enable ***Label Dispense Mode - Standard*** The printer will present each label and wait for the label to be removed before continuing. On the P2242, the Feed switch must be tapped to print the next label.

L = Enable ***Label Dispense Mode - Tap to Feed***. The printer will present each label and wait for a tap of the feed switch before printing the next label. Use this mode when printing multiple copies of liner-free labels.

C = Enable optional ***Label Liner Cutter***. See Cutter Option, Appendix F for details.

d= Disable ***Diagnostic Dump Mode***. See Advanced Programming, Appendix G for details.

S = Reverse the ***Transmissive (Gap) Sensor Operation.*** See Advanced Programming, Appendix G for details.

O Command - Options Select

Options Command Availability						
Models \ Options	**C**	**D**	**d**	**P**	**L**	**S**
LP2122						
LP2142						
LP2242	✔					✔
LP2622	✔					✔
LP2642	✔					✔
LP2722	✔					✔
LP2742	✔					✔
Eclipse LP	✔					✔
Orion	✔			**A**		
Strata LP	✔			**A**		✔
P2222						
P2242			✔	✔	✔	✔
TLP2242	✔	✔				✔
TLP2622	✔	✔				✔
TLP2642	✔	✔				✔
TLP3642	✔	✔				✔
TLP2722	✔	✔				✔
TLP2742	✔	✔				✔
Eclipse TLP	✔	✔				✔
TLP2046	✔	✔		**A**		✔
TLP2746	✔	✔		**A**		✔
Strata TLP	✔	✔		**A**		✔

A = Label Dispense Mode is selected by Batch/Peel mode switch located on the printer. See the printer user's manual for details and switch location.

Examples: *0* *: disables all options.*

0D *: enables direct thermal mode on*
: thermal transfer printers,
: disables all other options

oM Command – Disable Initial Esc Sequence Feed

Description: This command disables the initial label form feed upon receiving the first escape (esc) sequence command issued to the printer. The printer normally measures a single label and sets the top of form prior to printing the first label after a power-up reset. The Zebra Eltron brand Windows™ printer driver issues escape sequences when printing.

This command's primary use is to save preprinted forms such as serialized labels, tags or tickets.

Syntax: **oM**

This command must be issued prior to printing with the Windows driver's or any other Escape (esc) mode printing operation.

P Command - Print

Description Use this command to print the contents of the image buffer.

Syntax **Pp_1, [p_2]**

Parameters **p_1** = Number of label sets.
Range = 1 to 65535

p_2 = Number of copies of each label (used in combination with counters to print multiple copies of the same label).
Range = 1 to 65535

The **P** command cannot be used inside of a stored form sequence. For automatic printing of stored forms, use the **PA** command.

Examples:

P1↵	*:prints one label set*
P2,1↵	*:prints 2 label sets of one label each*
P5,2↵	*:prints 5 label sets of 2 labels each*

PA Command - Print Automatic

Description Use this command in a stored form sequence to automatically print the form (as soon as all variable data has been supplied).

Syntax **PAp_1, [p_2]**

Parameters **p_1** = Number of label sets. Can be variable data.
Range: 1 to 9999

p_2 = Number of copies of the same label. Can be variable data.
Range: 1 to 9999
Sets the number of copies of each label (used in combination with counters) to print multiple copies of the same label. This value is only set when using counters.

Example:

```
FK"1"↲                          : delete form named "1"
FS"1"↲                          : start form store sequence
V00,10,N,"prompt:"↲             : define variable 00
V01,1,N,"prompt:"↲              : define variable 01
V02,4,N,"prompt:"↲              : define variable 02
A24,24,0,4,1,1,N,V00↲           : write a line of text including variable
PAV01,V02↲                      : print 1 label automatically
FE↲                             : end form store sequence

FR"1"↲                          : retrieve form "1"
?↲                              : get variables
This Is Text↲                   : data for V00
3↲                              : data for V01= p1 - number of sets
2↲                              : data for V02= p2 - number of copies
```

Q Command - Set Form Length

Description Use this command to set the form and gap length or black line thickness when using the transmissive (gap) sensor, black line sensor, or for setting the printer into the continuous media print mode.

Syntax **Qp_1,p_2[±p_3]**

Parameters **p_1** = Label length measured in dots
Default: Set by the AutoSense of media.

- Distance between edges of the label or black line marks.
- For continuous mode, the **p_1** parameter sets the feed distance between the end of one form and beginning of the next.

p_2 = Gap length or thickness of black line

Gap Mode - By default, the printer is in Gap mode and parameters are set with the media AutoSense.
Range: 12 (dots) or more for 203 dpi printers
[18 (dots) or more for 300dpi printers]

Black Line Mode - Set **p_2** to **B** plus black line thickness in dots. See Gap mode range.

Continuous Media Mode
Set **p_2** to 0 (zero)
The transmissive (gap) sensor will be used to detect the end of media.

±p_3 =Offset length measured in dots

- **Required for black line** mode operation.
- Optional for Gap detect or continuous media modes. Use only positive offset values.

AutoSense routine does not detect black line or continuous media.

Q Command - Set Form Length

All EPL2 printers have a transmissive (gap) sensor designed to detect the top of each label or tag. It does this in one of two ways:

- Sensing through the label liner at the gap between labels.
- Looking through a hole (notch) in the tag.

Printers equipped with a black line sensor can determine the top of each label or tag by sensing a "black line" preprinted on the media backing.

Sensor location is important when selecting the proper of label or tag type for printing. See the printer user's manual for specific information on alignment, adjustment, and position of the transmissive (gap) or reflective (black line) sensors.

If the label size is not set properly, the printer may print off the edge of the label or tag and onto the backing or platen roller. Repeated printing off the edge of the label can cause excessive print head wear.

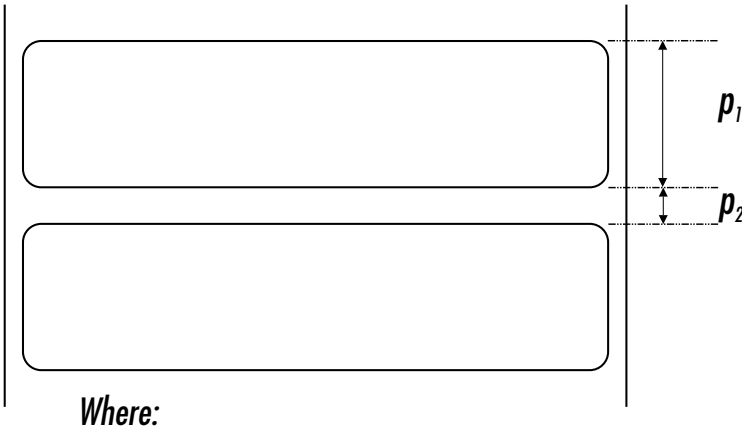
Maintain a minimum margin of 0.04 inches (1 mm) on all sides of the label.

Setting the label size to large can cause the printer to skip labels.

Q Command - Set Form Length

Examples:

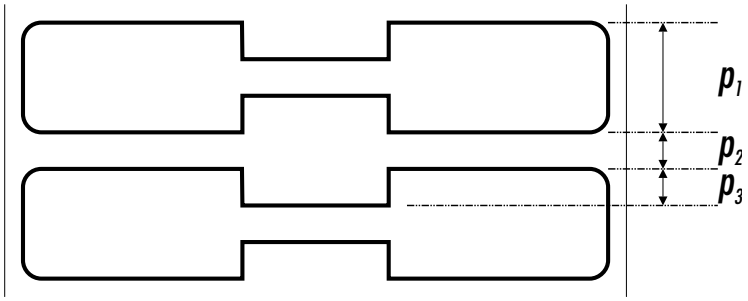
Standard Label



Where:
p_1 = 20.0 mm (160 dots)
p_2 = 3.0mm (24 dots)

The Q command would be:
Q160,24↵

Butterfly Label

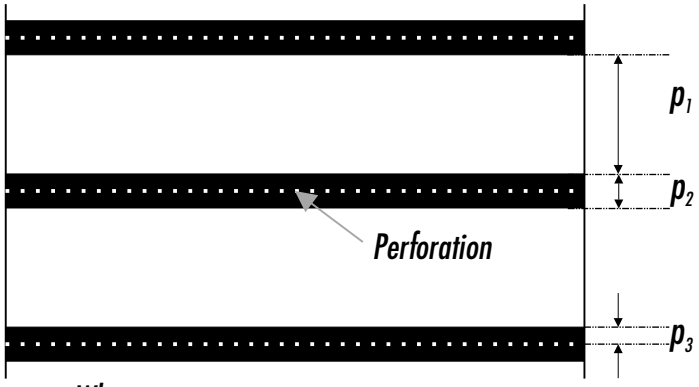


Where:
p_1 = 12.5 mm (100 dots)
p_2 = 3.0mm (24 dots)
p_3 = 3.0mm (24 dots)

The Q command would be:
Q100,24+ 24↵

Q Command - Set Form Length

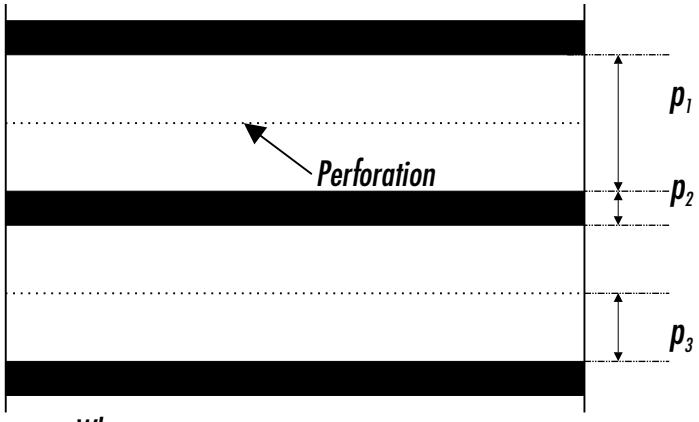
Black Line On Perforation



Where:
p_1 = 31.0 mm (248 dots)
p_2 = 7.0mm (56 dots)
p_3 = 0.5 mm (4 dots)

The Q command would be:
Q248,B56+ 4↵

Black Line Between Perforation



Where:
p_1 = 31.0 mm (248 dots)
p_2 = 7.0mm (56 dots)
p_3 = 17 mm (136 dots)

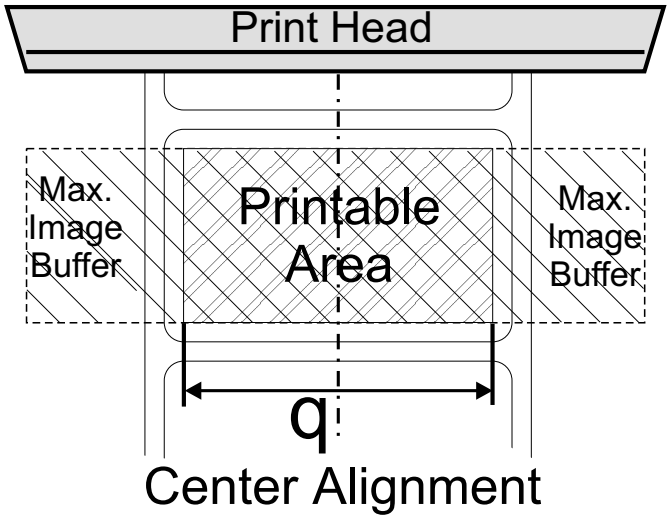
The Q command would be:
Q248,B56-136↵

q Command - Set Label Width

Description Use this command to set the width of the printable area of the media.

Syntax **qp_1**

Parameters **p_1** = The width of the label measured in dots. The **q** command will cause the image buffer to reformat and position to match the selected label width (**p_1**).



This command will automatically set the left margin according to the following rules:

(print head width - label width) / 2

The **q** value affects the available print width. Minimizing the **q** value will maximize the print length and print speed (double buffering).

If the **R** Command (Reference Point) is sent after this command, the image buffer will be automatically reformatted to match the width of the print head and is offset by the **R** command specified image buffer starting point, nullifying the **q** command.

Example: *q416↵* *:sets label width to 416 dots wide*

R Command - Set Reference Point

Description Use this command to move the reference point for the X and Y axes. All horizontal and vertical measurements in other commands use the setting for **R** as the origin for measurements. Use the **R** command as an alternative to sending the **q** command to position (center) labels that are narrower than the print head.

Syntax **Rp_1,p_2**

Parameters **p_1** = Horizontal (left) margin measured in dots.
p_2 = Vertical (top) margin measured in dots.

The **R** command interacts with image buffer setting, as follows:

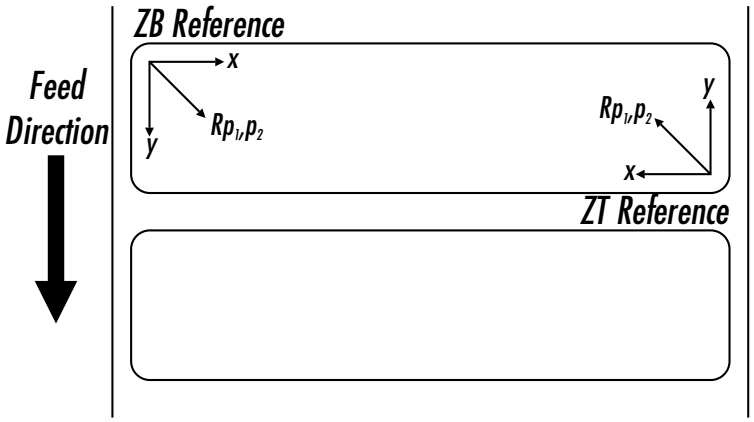
- The **R** command forces the printer to use the full width of the print head as the width of the image buffer. The **R** command overrides the **q** commands print width setting.
- Rotate the image buffer with the **Z** command to establish top and left margins (**ZT**) or the bottom and right margins (**ZB**).
- When positioned correctly, prevents printing off two (2) edges of the label opposite the **0,0** reference point.

Use the **Q** and **R** commands together for the easiest method of positioning form elements in the print image in left aligned printers: TLP2046 and Eclipse.

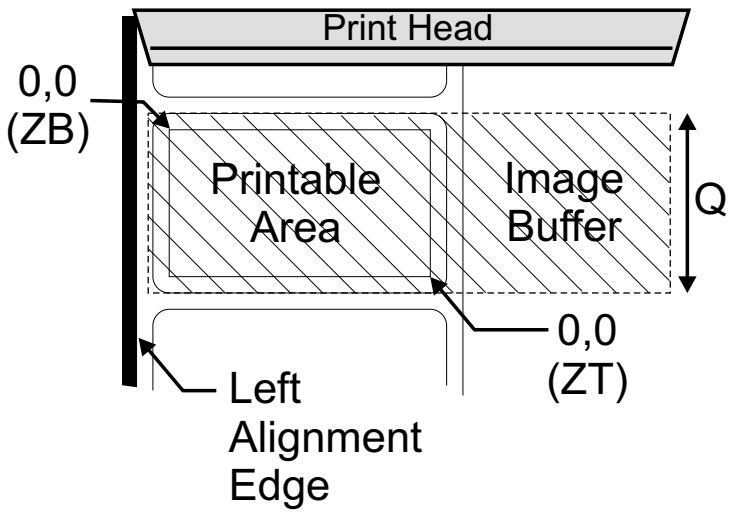
Repeated printing off the edge of the label can cause excessive print head wear.

R Command - Set Reference Point

Example of X and Y Positioning



Example of Left Aligned Printing



Example:

```
↵
Q609,24↵      : Sets label length
ZB↵           : Sets image buffer to the bottom right
              : corner (and left side of the print head).
R15,10↵       : Sets the margin
              : (See Left Aligned Example, above).
              : (Note the 0,0 reference points.)
```

S Command - Speed Select

Description Use this command to select the print speed.

Syntax **sp_1**

Parameters **p_1** = Speed select value.

Model	Value	Speed
LP2122 LP2142 LP/TLP2622 LP/TLP2242 LP/TLP2642 TLP3642 LP/TLP2722 LP/TLP2742 P2222/P2242*	 0 1 2	 1.0 ips (25 mmps) 1.5 ips (37 mmps) 2.0 ips (50 mmps)
TLP2044	2 3 4	2.0 ips (50 mmps) 3.0 ips (75 mmps) 4.0 ips (100 mmps)
TLP2046	2 3 4 5 6	2.0 ips (50 mmps) 3.0 ips (75 mmps) 4.0 ips (100 mmps) 5.0 ips (125 mmps) 6.0 ips (150 mmps)
Strata	1 2 3 4	1.0 ips (25 mm/s) 2.0 ips (50 mm/s) 3.0 ips (75 mmps) 4.0 ips (100 mmps)
Orion	0 1 2 3	1.0ips (25 mm/s) 1.5 ips (37 mm/s) 2.0ips (50 mm/s) 2.5 ips (63 mm/s)
Eclipse	2 3 4	2.0 ips (50 mm/s) 3.0 ips (75 mm/s) 4.0 ips (100 mm/s)

* - Portable printers will automatically adjust the speed to maximize battery usage and print quality.

Example: *S2↵* *:selects 2 ips (50 mmps)*

U Command - Print Configuration (General)

Description Use this command to print the current printer configuration.

Syntax **U**

The one page printout produced by this command includes the following:

- Printer Model #
- Image Buffer Size
- Firmware Version
- Serial Port Settings
- Print Head Test Pattern
- Amount of RAM Installed
- Memory Configuration
- Character Set Selected & Double Buffer Status
- Speed, Density, Reference Point, Print Direction and Error Status
- Label Size
- Options
- Current Sensor Values

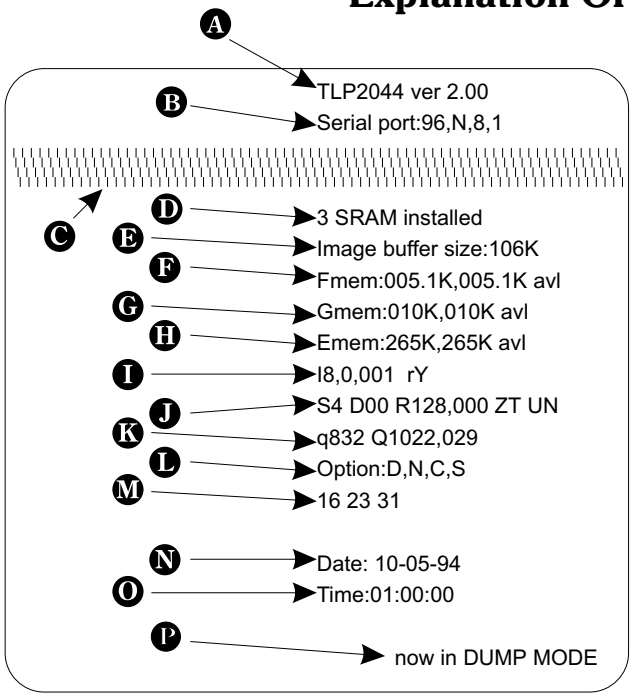
Example: UA

Will Produce:

```
4UKQ1733JPN V3.14
Serial port:96,N,8,1

4 SRAM installed
Image buffer size:106K
Fmem:005.1K,005.1K avl
Gmem:005K,001K avl
Emem:396K,396K avl
I8,0,001 rN
S2 D07 R000,000 ZT UN
q832 Q0613,028
Option:
04 10 17

Date:05-22-00
Time:09:02:02
now in DUMP
```

U Command - Print Configuration (General)

Explanation Of Printout - SRAM Printers



Dump Mode Print Sample

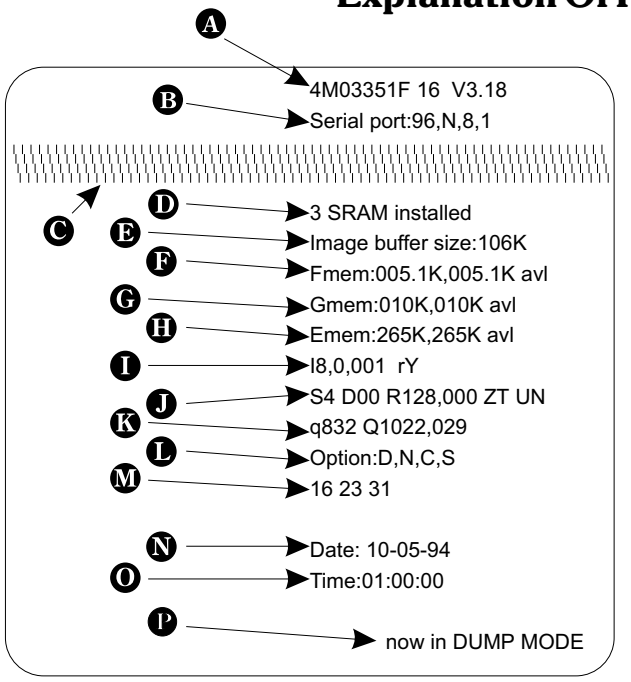
A. Printer model or code number and firmware version number.
B. Serial port configuration.
C. Print head test pattern.
D. Amount of SRAM installed.
E. Amount of memory allocated to the Image buffer.
F. Amount of memory allocated to the Form buffer and the amount available.
G. Amount of memory allocated to the Graphic buffer and the amount available.
H. Amount of memory allocated to the Soft Font buffer and the amount available.
I. Currently selected Character Set (**I**) and Image Buffer mode setting (**r**).
rY = Double Buffer Enabled
rN = Double Buffering Disabled
J. Currently selected Print Speed (**S**), Heat Density (**D**), Reference Point (**R**), Print Orientation (**Z**) and Error Status (**U**).
K. Currently selected Form Length (**Q**).
L. Current Options Select status .
M. Current AutoSense Through (Gap) Sensor values. The three numbers represent;
1. Backing Transparent point
2. Set point
3. Label Transparent point.

N. Current time set in Real Time Clock. This value will only be displayed if your printer is equipped with the Real Time Clock feature.
O. Current date set in Real Time Clock. This value will only be displayed if your printer is equipped with the Real Time Clock feature.
P. Current Dump Mode Status.

Note: TLP2046 printers - The serial port and double buffer status are not supported by this printer. Serial port configuration is a hardware setting. The double buffer mode is not supported.

U Command - Print Configuration (General)

Explanation Of Printout - Flash^{IT} Printers



Dump Mode Print Sample

A. Printer I.D. code number and firmware version number.
B. Serial port configuration.
C. Print head test pattern.
D. Amount of SRAM installed.
E. Amount of memory allocated to the Image buffer.
F. Amount of memory allocated to the Form buffer and the amount available.
G. Amount of memory allocated to the Graphic buffer and the amount available.
H. Amount of memory allocated to the Soft Font buffer and the amount available.
I. Currently selected Character Set (**I**) and Image Buffer mode setting (**r**).
rY = Double Buffer Enabled
rN = Double Buffering Disabled
J. Currently selected Print Speed (**S**), Heat Density (**D**), Reference Point (**R**), Print Orientation (**Z**) and Error Status (**U**).
K. Currently selected Form Width (**q**) and Length (**Q**).
L. Current Options Select status .
M. Current AutoSense Through (Gap) Sensor values. The three numbers represent;
1. Backing Transparent point
2. Set point
3. Label Transparent point.

N. Current time set in Real Time Clock. This value will only be displayed if your printer is equipped with the Real Time Clock feature.
O. Current date set in Real Time Clock. This value will only be displayed if your printer is equipped with the Real Time Clock feature.
P. Current Dump Mode Status.

V Command - Define Variable

Description Use this command to define variable data for the text and bar code data fields in stored forms. Variable data can be combined with fixed data or other data types (counter, date, etc..) in text or bar code data fields.

Syntax **Vp_1,p_2,p_3,"[-][—]PROMPT"**

Parameters **p_1** = Variable number.
Range: **00 to 99**, but not to exceed a total of 1500 bytes for all variables. Variable (reference) numbers are sequential and must be input into a form in ascending order.

p_2 = Maximum number of characters
Range: **1 to 99**, but not to exceed a total of 1500 bytes for all variables. This is the maximum number of characters allowed in the variable field.

p_3 = Field Justification.
L = Left **R** = Right
C = Center **N** = No Justification
***Note**: Right and center justification does not apply to soft fonts.*

"PROMPT" = An ASCII text field that will be transmitted to the host (via the serial interface) each time this command is executed. This prompt requests the operator to enter the value for the variable.

KDU Options ***[-]*** = A single minus sign as the first character of the prompt field will cause the prompt to be displayed only one time after the form is retrieved.

KDU Character Number Limit The KDU allows a maximum of 40 characters for entry into a variable data field and display.

KDU Range (**p_2**): **1 to 40** , but not to exceed a total of 1500 bytes for all variables.

V Command - Define Variable

Use this command in forms that require unique data on each label. When initializing variables:

- They must be defined in order (e.g. **V**00 first, **V**01 second...)
- They must be the next entries after the **FS"FORMNAME"** command
- They must be located before any counter variables.

To print the contents of the variable, the variable number is referenced in the **"DATA"** field of the **A** (ASCII text) or **B** (Bar Code) commands.

The field justification parameter affects the way the variable will be printed. When **L** of **R** are selected, the variable value will be printed left or right justified in an area with a width defined by **p_2** parameter.

For Flash Memory Printers

Storing variable data after power has cycled or a Reset has occurred is not supported by printers with flash nonvolatile memory.

V Command - Define Variable

KDU Support: The following table outlines the **V** command's variable data field option and printer support for the storage of data in nonvolatile memory.

Model	Counter Data Storage Options		
	C	**-**	**- -**
2622	S	S	S
2642 (2242)	S	S	S
3642	S	S	S
Orion	Note 1	Note 1	N/A
2722 / 2742	Note 1	Note 1	N/A
Eclipse	Note 1	Note 1	N/A
2046 / 2044	S	S	S
2746	Note 1	Note 1	N/A
Strata	Note 1	Note 1	N/A
P2242 / P2222	Note 1	Note 1	N/A
2122	S	S	S
2142	S	S	S

O=Option; **S**=Standard; **N/A**=Not Supported

Note 1 – The counter values are reset after cycling printer power or sending a reset command.

Example: *V00,15,N,"Enter Product Name:"↵*

X Command - Box Draw

Description Use this command to draw a box shape.

Syntax **Xp_1,p_2,p_3,p_4,p_5**

Parameters

p_1 = Horizontal start position (X) in dots.

p_2 = Vertical start position (Y) in dots.

p_3 = Line thickness in dots.

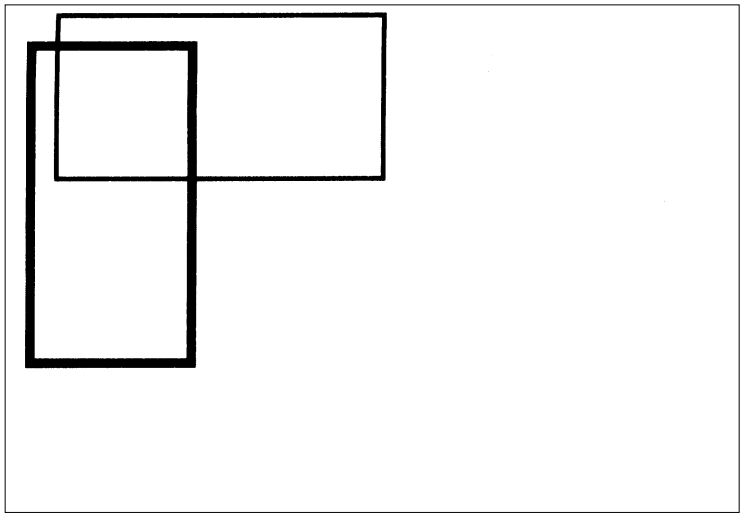
p_4 = Horizontal end position (X) in dots.

p_5 = Vertical end position (Y) in dots.

Example:

```
N↵
X50,200,5,400,20↵
X200,50,10,20,400↵
P1↵
```

Will Produce:



Y Command - Serial Port Setup

Description Use this command to establish the serial port communication parameters.

Syntax **Yp_1,p_2,p_3,p_4**

Parameters **p_1** = Baud rate

p_1	Description
11	115,000 baud (115K)
57	57,600 baud (57K)
38	38,400 baud (38K)
19	19,200 baud
96	9,600 baud
48	4,800 baud
24	2,400 baud
12	1,200 baud

p_2 = Parity.
Values: **O** = Odd parity
E = Even parity
N = No parity.

p_3 = # Data bits.
Values: **7** = Seven data bits
8 = Eight data bits

p_4 = # Stop bits.
Values: **1** = One stop bit
2 = Two stop bits.

After receiving this command, the printer will automatically reset enabling the new rate.

This command is not used for the TLP2044/46 printers. The serial port setup on these printers is performed by configuration switches on the rear of the printer.

Y Command - Serial Port Setup

Printer Serial Port Data Transfer Ranges

Model	Transfer Rate	
	Maximum	Minimum
2622	19,200 baud	1,200 baud
2642 (2242)		
3642		
2046		
Orion	38,400 baud	4,800 baud
2722		
2742		
Strata		
Eclipse		
P2222	115,000 baud	4,800 baud
P2242		
2122	19,200 baud	1,200 baud
2142		

To send commands and data to the printer, the host's serial port parameters must match the printer's serial port parameters. Verify the printer's configuration settings with the AutoSense/Dump Mode Printout, see the printer's user's manual for details.

The typical EPL2 printer's default serial port parameters are:

9600 baud, No Parity, 8 Data Bits, 1 Stop Bit

Change the printer's serial port parameters with the **Y** command <u>after</u> communication has been established with the host. The host parameters must then be changed to resume communication.

Example: *Y19,0,7,1↵* *:sets 19,200 baud, odd parity, :7 data bits and 1 stop bit.*

Z Command - Print Direction

Description Use this command to select the print orientation.

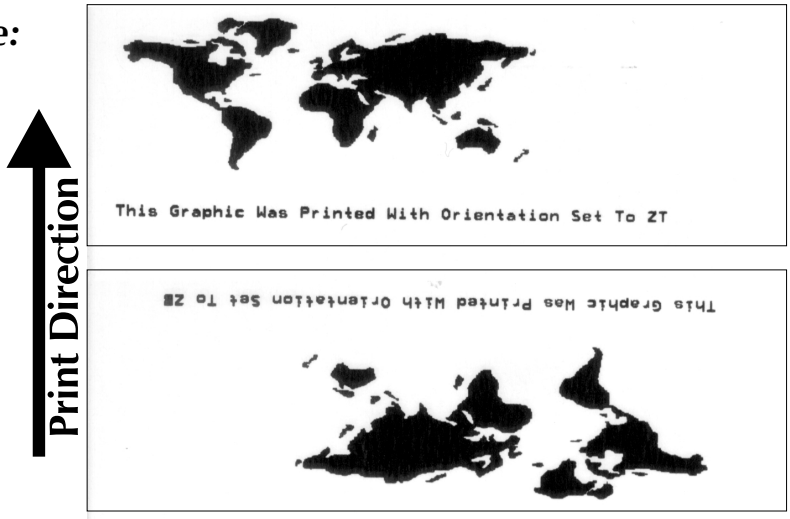
Syntax **Zp_1**

Parameters **p_1** = Print orientation.
T = Printing from top of image buffer.
B = Printing from bottom of image buffer.
Default Orientation = **T**

The top of the image buffer prints first and is viewed by the operator as printing up side down.

Example:
N↵
ZT↵
GG10,10,"WORLD"↵
A10,200,0,3,1,1,N,"This Graphic Was Printed With Orientation Set To ZT"↵
P1↵
N↵
ZB↵
GG10,10,"WORLD"↵
A10,200,0,3,1,1,N,"This Graphic Was Printed With Orientation Set To ZB"↵
P1↵

Will Produce:



? Command - Download Variables

Description This command signals the printer to "fill-in" variable or counter "prompt" data field.

The host system can send data representing variables and/or counters to the printer after a stored form containing variables and/or counters has been retrieved.

Syntax **?**
DATA

The amount of data following the question mark line must match exactly the order and total number of variables and/or counters for that specific form.

Data must be entered, as follows:

- Each **DATA** line represents a variable or counter data field fill-in.
- Variables in ascending order (e.g. **V**00 first, **V**01 second...)
- Counters in ascending order following Variables (e.g. **C**0 first, **C**1 second...)

Example

```
FK"form1"↵                  :delete form "form1"
FS"form1"↵                  :begins the form store
V00,15,N,"Enter Part Name:"↵
V01,5,N,"Enter Quantity:"↵
A50,10,0,3,1,1,N,V00↵
A50,400,0,3,1,1,N,"Quantity: "V01↵
FE↵                         :ends form store sequence


FR"form1"↵                  :retrieve for "form1"
?↵                          :variables follow
Screws↵                     :first variable
235↵                        :second variable
P1↵                         :print one label
```

Appendix A - Standard Character Sets

This section contains a listing of all standard EPL2 fonts, code pages & character sets supported by the EPL2 printers.

Resident Fonts The EPL2 programming language supports 5 different font sizes, numbered 1-5. Each font can be expanded both horizontally and vertically. EPL2 also supports 160 different characters for font sizes 1-4 and 80 characters for font size 5. All fonts are non-proportional, mono-spaced. The ASCII value of each character is dependent on the I command character set selection.

Font Sizes The following table displays the font sizes resident in the printer.

Font #	Size in Dots	Size of Characters (characters per inch, points)
1	8 x 12	20.3 cpi, 6 points
2	10 x 16	16.9 cpi, 7 points
3	12 x 20	14.5 cpi, 10 points
4	14 x 24	12.7 cpi, 12 points
5	32 x 48	5.6 cpi, 24 points

Fonts 1-5

1. ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
   0123456789 !@#$%^&*()_+<>?[]:;

2. ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
   0123456789 !@#$%^&*()_+<>?[]:;

3. ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
   0123456789 !@#$%^&*()_+<>?[]:;

4. ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrst
   0123456789 !@#$%^&*()_+<>?[]:;

5. ABCDEFGHIJKLMNOPQRST
   0123456789 #$% &

ASCII to Hexadecimal Reference Table

Hexidecimal - Most Significant Digit

Hexidecimal - Least Significant Digit	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00 0	▶ 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◀ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	∑ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	■ 223	∩ 239	256 255

Dump Mode Character Map Reference

Code Pages and Character Sets (8 bit)

Code Page 437 Sizes 1-4

```
  0 -
 16 -            ¶ §
 32 -    ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â ä à å ç ê ë è ï î ì Ä Å
144 - É æ Æ ô ö ò û ù ÿ Ö Ü ¢ £     ƒ
160 - á í ó ú ñ Ñ ª º ¿     ½ ¼ ¡
176 -
192 -
208 -
224 -   ß         µ
240 -                 °
```

Code Page 850 Sizes 1-4

```
  0 -
 16 -            ¶ §
 32 -    ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â ä à å ç ê ë è ï î ì Ä Å
144 - É æ Æ ô ö ò û ù ÿ Ö Ü ø £ Ø     ƒ
160 - á í ó ú ñ Ñ ª º ¿     ½ ¼ ¡
176 -           Á Â À           ¢
192 -             ã Ã
208 -     ð Ð È   Í Î Ï             ì
224 - Ó ß Ô Ò õ Õ µ     Ú   Ù
240 -     = ± ¶ §     °
```

Code Pages and Character Sets (8 bit)

Code Page 852 Sizes 1-4

```
  0 -
 16 -                ¶ §
 32 -    ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â ä      ç   ë     î   Ä
144 - É     ô ö          Ö Ü
160 - á í ó ú
176 -             Á Â
192 -
208 -         Ë     Í Î
224 - ó ß Ô                 Ú
240 -             §     °
```

Code Page 860 Sizes 1-4

```
  0 -
 16 -                ¶ §
 32 -    ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â ã à Á ç ê Ê è Í ô ì Ã Â
144 - É À È ô õ ò Ú ù Ì õ Ü ¢ £ Ù   ó
160 - á í ó ú ñ Ñ ª º ¿ Ò   ½ ¼
176 -
192 -
208 -
224 -   ß             µ
240 -                 °
```

Code Pages and Character Sets (8 bit)

Code Page 863 Sizes 1-4

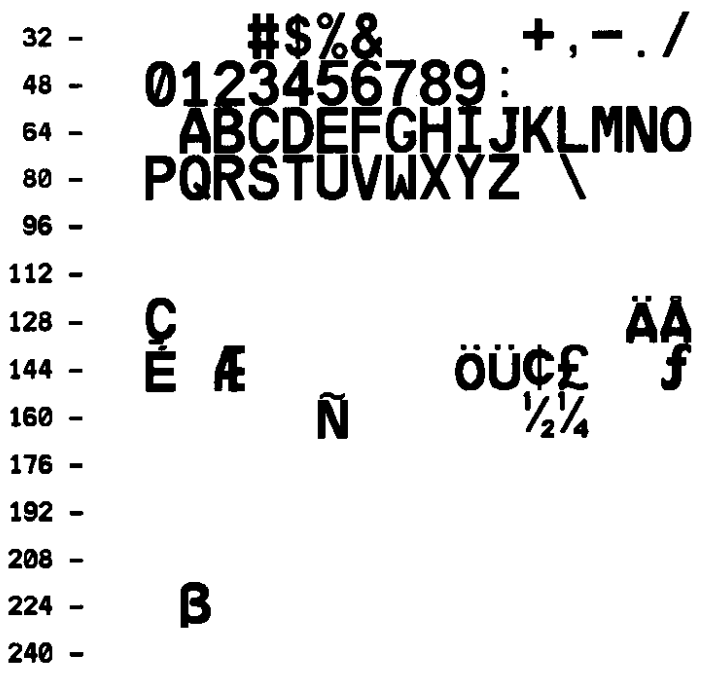
```
  0 -
 16 -          ¶ §
 32 -   ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â Â à ¶ ç ê ë è ï î = À §
144 - É È Ê ô Ë Ï û ù   Ô Ü ¢ £ Ù   ƒ
160 -     ó ú           ¿     ½ ¼ ¼
176 -
192 -
208 -
224 -   ß           µ
240 -                   °
```

Code Page 865 Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   ! " # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
128 - Ç ü é â ä à å ç ê ë è ï î ì Ä Å
144 - É æ Æ ô ö ò û ù ÿ Ö Ü ø £ Ø   ƒ
160 - á í ó ú ñ Ñ ª º ¿     ½ ¼
176 -
192 -
208 -
224 -   ß           µ
240 -                   °
```

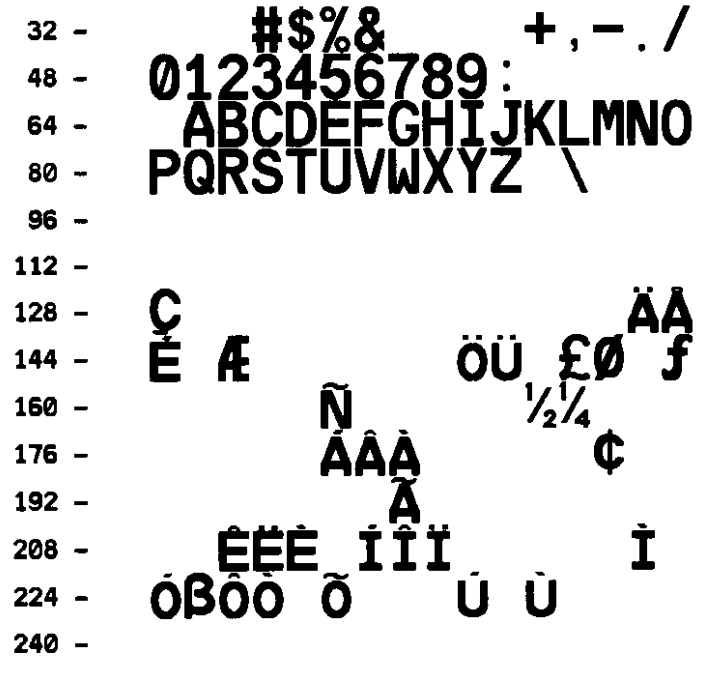
Code Pages and Character Sets (8 bit)

Code Page 437
Size 5



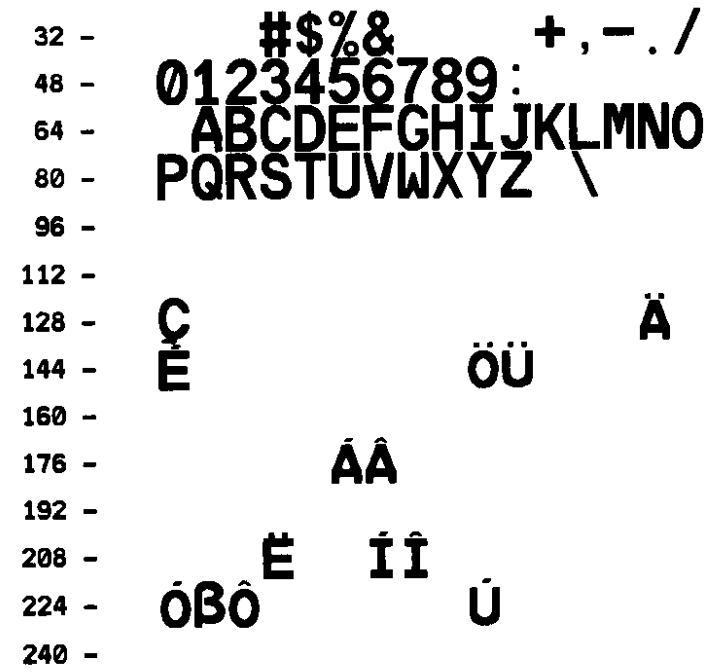
Code Pages and Character Sets (8 bit)

Code Page 850
Size 5



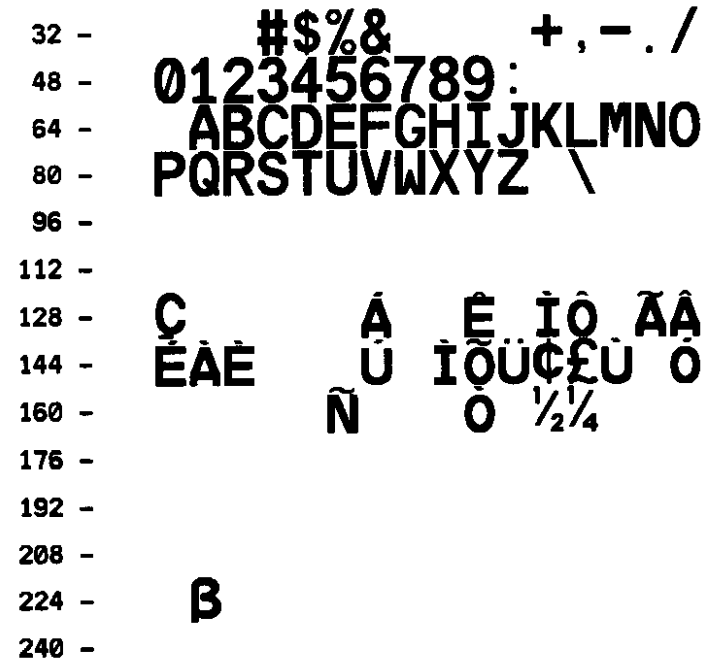
Code Pages and Character Sets (8 bit)

Code Page 852
Size 5



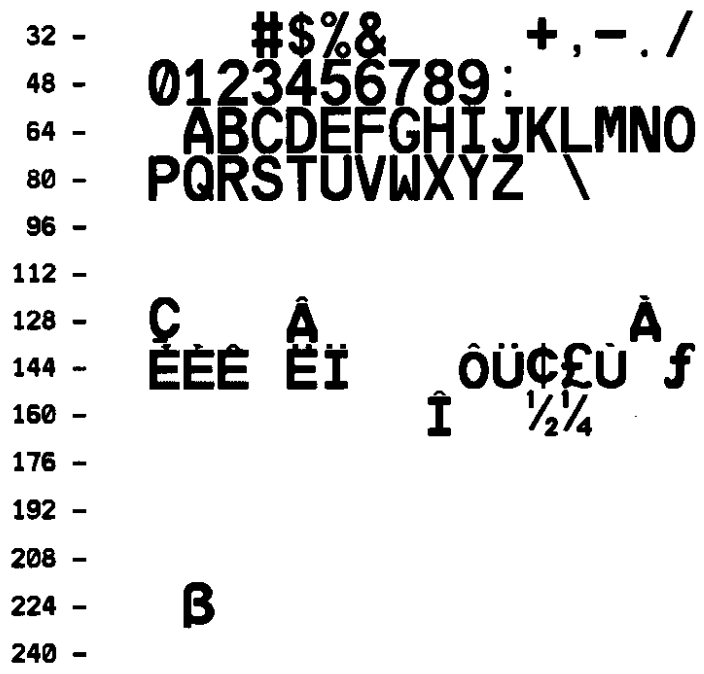
Code Pages and Character Sets (8 bit)

Code Page 860
Size 5



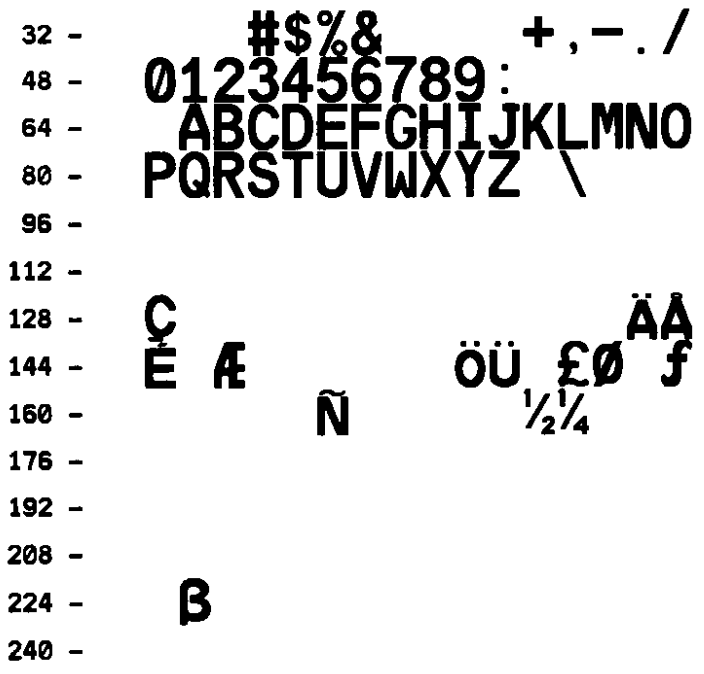
Code Pages and Character Sets (8 bit)

Code Page 863
Size 5



Code Pages and Character Sets (8 bit)

Code Page 865
Size 5



Code Pages and Character Sets (7 bit)

British
Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   £ $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ' a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
```

Size 5

```
 32 -      £$%&      +,-./
 48 -   0123456789:
 64 -    ABCDEFGHIJKLMNO
 80 -   PQRSTUVWXYZ \
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

Danish
Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z Æ Ø Å Ü _
 96 - ' a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z æ ø å ü
```

Size 5

```
 32 -      #$%&      +,-.
 48 -   0123456789:
 64 -    ABCDEFGHIJKLMN
 80 -   PQRSTUVWXYZÆØÅÜ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

French
Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   £ $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - à A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z ° ç § ^ _
 96 - ' a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z é ù è ¨
```

Size 5

```
 32 -      £$%&      +,-./
 48 -  0123456789:
 64 -   ABCDEFGHIJKLMNO
 80 -  PQRSTUVWXYZ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

German
Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - § A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z Ä Ö Ü ^ _
 96 - ' a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z ä ö ü ß
```

Size 5

```
 32 -      #$%&      +,-./
 48 -  0123456789:
 64 -   ABCDEFGHIJKLMNO
 80 -  PQRSTUVWXYZÄÖÜ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

Italian Sizes 1-4

```
  0 -
 16 -                ¶ §
 32 -    !   £ $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - § A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z ° ç é ^ _
 96 - ù a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z à ò è ì
```

Size 5

```
 32 -     £$%&      +,-./
 48 -  0123456789:
 64 -   ABCDEFGHIJKLMNO
 80 -  PQRSTUVWXYZ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

Spanish Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   ! $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - ¡ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z Ñ ñ ¿ ü _
 96 - á a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z é ¡ ó ú
```

Size 5

```
 32 -      $%&      +,-./
 48 -  0123456789:
 64 -   ABCDEFGHIJKLMNO
 80 -  PQRSTUVWXYZÑ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

Swedish Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - É A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z Ä Ö Å Ü _
 96 - é a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z ä ö ä ü
```

Size 5

```
 32 -      #$%&     +,-./
 48 -  0123456789:
 64 -  ÉABCDEFGHIJKLMNO
 80 -  PQRSTUVWXYZÄÖÅÜ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

Swiss Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   £ $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - § A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z à ç è ^ _
 96 - ' a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z ä ö ü é
```

Size 5

```
 32 -     £$%&      +,-./
 48 - 0123456789:
 64 -  ABCDEFGHIJKLMNO
 80 - PQRSTUVWXYZ
 96 -
112 -
```

Code Pages and Character Sets (7 bit)

USA
Sizes 1-4

```
  0 -
 16 -          ¶ §
 32 -   !   # $ % & ' ( ) * + , - . /
 48 - 0 1 2 3 4 5 6 7 8 9 : ; < = > ?
 64 - @ A B C D E F G H I J K L M N O
 80 - P Q R S T U V W X Y Z [ \ ] ^ _
 96 - ` a b c d e f g h i j k l m n o
112 - p q r s t u v w x y z
```

Size 5

```
 32 -     #$%&      +,-./
 48 - 0123456789:
 64 -  ABCDEFGHIJKLMNO
 80 - PQRSTUVWXYZ \
 96 -
112 -
```

Appendix B - Optional & Extended Character Sets

This section contains information on printer optional language character sets for EPL2 printers.

Fixed verses Flashed Program Firmware

The EPL2 printers have two different basic printer firmware configurations, the "Fixed" program PROM or the "Flash" programmed NOVRAM (non-volatile RAM) memory. See the table on the following page.

The fixed firmware printers support an optional character set by replacing the EPL2 standard character set, code page 850 (Latin1 / Multilingual), with another language code page. The printer's firmware can be changed in 4" ELP2 printer with a language specific memory cartridge or in 2" printer by changing the firmware in the printer.

The P2242 printer can be changed by re-flashing firmware. The code page 850 (Latin1 / Multilingual) set is replaced with another language code page set and acts like a fixed firmware printer.

The FLASH architecture printers and the P2222 printer support all of the extended EPL2 character sets shown in this section.

Fixed Firmware Optional Character Set Differences

The EPL2 optional language character set replace the EPL2 standard character set for code page 850 (Latin / Multilingual). This group includes the P2242 printer.

The optional character set physically replaces the firmware's memory location for code page 850, 8 bit font and access the character maps by using the following **I** command string:

```
I8,1
```

Flash Firmware Character Sets

The FLASH architecture printer supports 20 character sets. The flash printer character sets are complete code page sets listed below.

Extended Character Set Map Reference

Code Page	Description	Flash	PROM*
DOS 437	English - US	I8,0	I8,0
DOS 850	Latin 1	I8,1	I8,1
DOS 852	Latin 2 (Cyrillic II/Slavic)	I8,2	I8,1
DOS 860	Portuguese	I8,3	
DOS 863	French Canadian	I8,4	
DOS 865	Nordic	I8,5	
DOS 857	Turkish	I8,6	I8,1
DOS 861	Icelandic	I8,7	I8,1
DOS 862	Hebrew	I8,8	I8,1
DOS 855	Cyrillic	I8,9	
DOS 866	Cyrillic CIS 1	I8,10	I8,1
DOS 737	Greek	I8,11	
DOS 851	Greek 1	I8,12	I8,1
DOS 869	Greek 2	I8,13	
Windows 1252	Latin 1	I8,A	
Windows 1250	Latin 2	I8,B	
Windows 1251	Cyrillic	I8,C	
Windows 1253	Greek	I8,D	
Windows 1254	Turkish	I8,E	
Windows 1255	Hebrew	I8,F	

Character Maps

The extended character maps can be found on the our Internet site or from CD ROM. Click on the code page reference (in the electronic manual version) to display the code page.

The files to print character maps for 2", 4" and 8.5" printers are also on the Internet site or are provided on CD ROM.

Asian Language Character Maps

The Eltron flash based printers support three Asian language sets. Asian language support is an optional feature and requires a special version of the printer (PCBA) to support the large Asian characters.

The Asian character maps can be found on the our Internet site or from CD ROM. Click on the code page reference (in the electronic manual version) to display the Addendum and its code pages.

Chinese Addendum - P/N 980095-061

Japanses Addendum - P/N 980095-071

Korean Addendum - P/N 980095-081

Asian Character Printers can only support a single Asian language at a time.

See Appendix C for programming information for Asian characters.

Appendix C - Asian Character Printer Programming

This section contains information unique to the Asian character printers.

Asian Character Sets Fonts 8 & 9

The EPL2 programming language supports up to two (2) font sets of a single Asian language as well as the standard Latin (Multilingual) fonts. 1-5 and downloadable soft fonts (A-Z and a-z).

- ❑ All Asian character fonts (8 & 9) can be expanded both horizontally and vertically.
- ❑ Asian fonts can print from top to bottom or in the Latin character orientation from left to right.
- ❑ The Asian printers support the standard Latin fonts with a *single character map code page* 850 for all five (5) fonts.
- ❑ The Asian character fonts (8 & 9) are 16 bit (or double byte) mapped characters. The printed Asian character is dependent on the double byte ASCII values.
- ❑ Latin font sets are 8 bits per (or single byte) ASCII character.

Only One (1) Asian language is supported by a printer.

Each Asian language (character set) is a separate printer firmware version.

Asian printers with flash firmware can be reprogrammed for a different Asian language, but we do not recommend this for normal use.

Printers that support Asian languages and use a memory cartridge can be reconfigured by changing to a different Asian language memory cartridge.

Asian Print Memory Configuration

The Asian printer has a different memory configuration than the standard EPL2 printer of the same model type. See the **M** command, page 2-34, in the Command Reference section.

SRAM Non-Volatile Memory Models	Asian Configuration			Default Usage			
	Total - Max. (KB)	Internal (KB)	Cartridge (KB)	Image (KB)	Forms (KB)	Graphics (KB)	Ext. Fonts (KB)
LP2642	512	128	384	106	5.1	5	3
TLP2642	512	128	384	106	5.1	5	3
TLP2046	512	0	512	106	5.1	5	3

Flash Memory Models	Configuration		Flash Usage			**M** Command
	Standard Flash	SRAM	Reserved forAsian Characters	Forms (KB)	Graphics/Ext. Fonts(KB)	
2722	512 KB	256 KB	1 MB	128		Ignore
2742	512 KB	512 KB	2 MB	128		Ignore
Orion	512 KB	512 KB	2 MB	128		Ignore
Strata	512 KB	1 MB	2 MB	128		Ignore
Eclipse	512 KB	384 KB	1 MB	20	236	p2

A Command - ASCII Text

Description Prints a character string.

Syntax **Ap1,p2,p3,p4,p5,p6,p7,"DATA"**

Parameters **p1** = Horizontal start position (X) in dots.

p2 = Vertical start position (Y) in dots.

p3 = Rotation (Orientation)

Value	Description
0	No rotation, Left to Right
1	90 degrees, Left to Right
2	180 degrees, Left to Right
3	270 degrees, Left to Right
4*	No rotation, Top to bottom
5*	90 degrees, Top to bottom
6*	180 degrees, Top to bottom
7*	270 degrees, Top to bottom
*** - Fonts 8 & 9 only**	

p4 = Font selection

Value	Description
1	20.3 cpi, 6 pts, (8 x 12 dots)
2	16.9 cpi, 7 pts, (10 x 16 dots)
3	14.5 cpi, 10 pts, (12 x 20 dots)
4	12.7 cpi, 12 pts, (14 x 24 dots)
5	5.6 cpi, 24 pts, (32 x 48 dots)
8	Asian Fonts: 24 x 24 dots Chinese "Gobi"(GB) **or** Korean "Hangul" **or** Japanese "Kanji"
9	Japanese Font (only): 16 x 16 dots
A-Z; a-z	Reserved for Soft Fonts
Note 1: *Fonts 1-5 are the standard EPL2 expandable fixed pitch (size) dot fonts.* Note 2: The Asian character sets use the **(i)** command to set the inter-character space between printed characters of an **(A)** command text data string.	

p5 = Horizontal multiplier, expands printed text horizontally. Range: 1 - 9.

A Command - ASCII Text

p_6 = Vertical multiplier, expands printed text vertically. Range: 1 - 9.

p_7 = **N** for normal or **R** for reverse image

"DATA" = Represents a fixed data field.

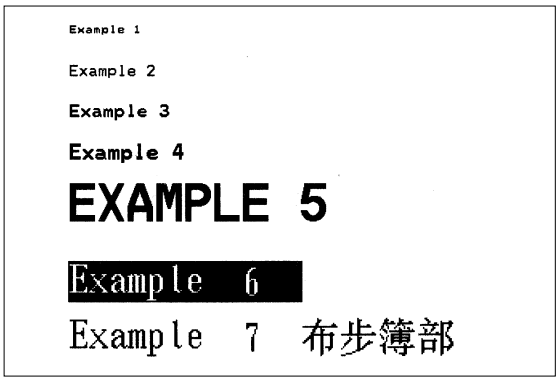
The backslash (\) character designates the following character is a literal and will encode into the data field. Refer to the following examples:

To Print	Enter into data field
"	\"
"Company"	\"Company\"
\	\\
\code\	\\code\\

Examples:

```
↵
N↵
S1↵
D12↵
A50,0,0,1,1,1,N,"Example 1"↵
A50,50,0,2,1,1,N,"Example 2"↵
A50,100,0,3,1,1,N,"Example 3"↵
A50,150,0,4,1,1,N,"Example 4"↵
A50,200,0,3,2,2,R,"Example 5"↵
A50,280,0,8,2,2,N,"Example 6"↵
A50,350,0,8,1,1,N,"Example 7 ▒╝▒╝▒╝▒┐"↵
```

Will Produce:



Note: As shown in the example above, font 5 (example 5) only support the upper case characters.

A Command - ASCII Text

The data field can be replaced by or combined with the following commands:

Vnn =Prints the contents of variable "**nn**" at this position where **nn** is a 2 digit number from 00 to 99.

Cn = Prints the contents of counter "**n**" at this position where n is a one digit number from 0 to 9.

TT = Prints the current time at this position in the predefined format. See the **(TT)** command for format selection and is only available if the printer has the RTC (Time & Date) option installed. See Appendix E.

TD = Prints the current date at this position in the predefined format. See the **(TD)** command for format selection and is only available if the printer has the RTC (Time & Date) option installed. See Appendix E.

Examples:

```
A50,0,0,1,1,1,N,"DATA"↵    : Prints quoted string
A50,50,0,2,1,1,N,V01↵      : Insert variable and print
A50,100,0,3,1,1,N,C1↵      : Insert counter and print
A50,150,0,4,1,1,N,TT↵      : Insert current time and print
A50,200,0,5,1,1,N,TD↵      : Insert current date and print
```

or a combination of several options:

```
A50,300,0,3,2,2,R,"Deluxe"V01C2"Combo"TDV01TT↵
```

:Writes the text "Deluxe" followed by the contents of variable 01 followed by the contents of counter 2 followed by the text "Combo" followed by the current date followed by the contents of variable 01 followed by the current time.

A Command - ASCII Text

The following table outlines the **(A)** command data field option of printer stored or supplied data.

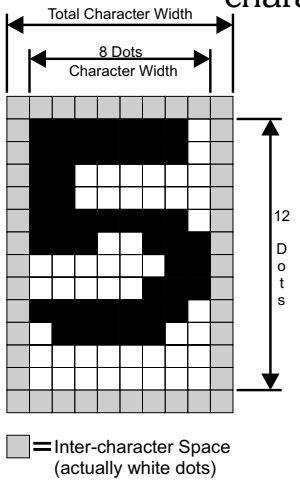
Model	Data Parameter Option Support		
	RTC		Counter
	TT	TD	Cn
2642	O	O	S
Eclipse	N/A	N/A	Note 1
TLP2046	O	O	S
Strata	N/A	N/A	Note 1
Orion	N/A	N/A	Note 1
Flash Printers	N/A	N/A	Note 1

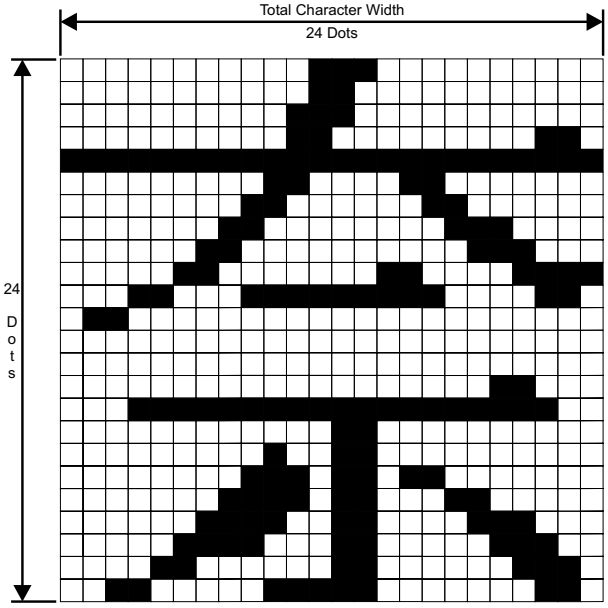
O = Option; **S** = Standard; **N/A** = Not Available

Note 1 – See the **(C)** command in the EPL2 programmer's manual for details.

A Command - ASCII Text

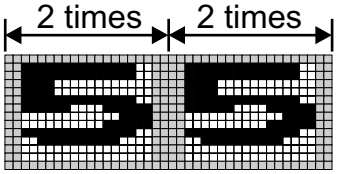
The English font (1-5) characters are dot mapped differently than the Asian font (8 & 9) characters. The Asian character does not have a built-in inter-character gap. The English characters include a single dot boarder around each character.

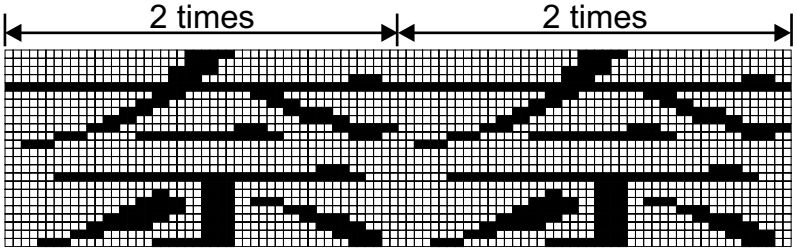




Fonts 1 (8 x 12 dots) **Font 8 (24 x 24 dots)**

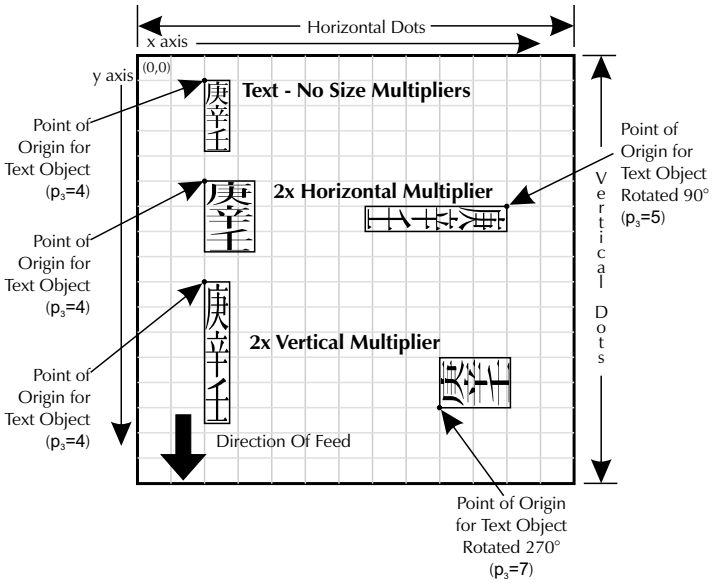
With the **(A)** command's horizontal multiplier (p_5) set to 2, the inter-character spacing will look like the following example.





A Command - ASCII Text

The Asian fonts can print character strings oriented from top to bottom (p_3 values 4-7), as well as the standard English word orientation from left to right (p_3 values 0-3). The characters will print in the sequence that they are entered into the **(A)** command's data field.



The printer automatically recognizes single byte characters and double byte characters.

The single byte font characters are mapped to hexadecimal address range 00 to 7F hex (0-127 decimal). Font 8 are ASCII, code page 850, single byte characters.

The double byte font characters are mapped to hexadecimal address range A0A0 to F7FF hex. First byte, 160 (A0h) and second byte 160 (A0h) to first byte, 247 (F7h) and second byte, 255 (FFh) is the decimal, grouped byte range.

i Command – Asian Character Spacing

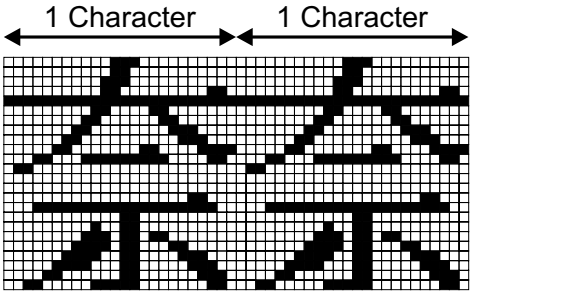
Description Places an adjustable inter-character space between Asian font characters, fonts 8 and 9, only.

Inter character spacing is multiplied with the font. An inter character spacing of 4 dots would become 12 dots when a font multiplier of 3 is applied to the text string.

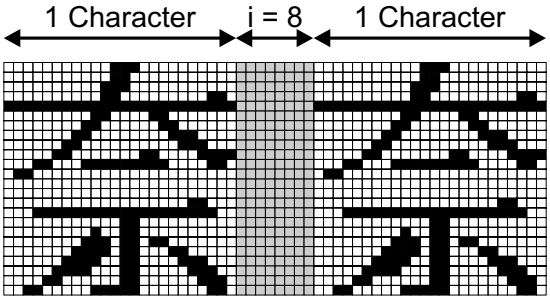
Syntax **ip$_1$**

Parameters **p$_1$** = Space in dots between Asian characters.
Range: 0-9 (dots)
Default: 0 (dots or no space)

(**i**) Command
Parameter Set to Default (0 dots)



(**i**) Command
Parameter Set to 8 (8 dots)



Appendix D - Bar Code Information

This section has answers to frequently asked questions about bar coding in general.

Frequently Asked Questions About Bar Codes

Q.What do I need to know about bar codes?

A. Listed below are characteristics that most bar codes have in common:

- **Bars and Spaces** - Each symbol has a defined pattern of bars and spaces which can be read or scanned by a bar code reader. The width of both bars and spaces vary and allow the representation of different characters. The height of the bars has interpretive information, yet provides data redundancy so that the scanner is not limited to a single scan path.
- **Character Set** - Each bar code symbology has its own defined character set. In some cases, these sets are alphanumeric with additional special characters, while other symbologies only allow encoding digits 0 through 9.

- ❑ **Human Readable Information** - The information encoded in a bar code may be represented in human-readable form below the printed bar code symbol. This human-readable representation is optional with some bar codes while mandatory with others.
- ❑ **Fixed vs. Variable Length** - Some bar code symbologies vary in length, contingent upon the amount of information that needs to be represented. Other symbologies have a fixed length and always contain the same amount of encoded information.
- ❑ **"X" Dimension** - Each bar code symbol has a defined "X" Dimension, or narrow bar. This bar is measured in thousandths of an inch (or "mils") and directly affects the physical size of bar code.
- ❑ **Modular vs. Binary** - With a modular bar code information is encoded using bars and spaces which vary from one to four.

Q.How can I find more information about bar codes?

A. A good resource of bar code information is "The Bar Code Book" by Roger C. Palmer .

ISBN 0-1911261-05-2

Q. What are the most common bar codes in use today?

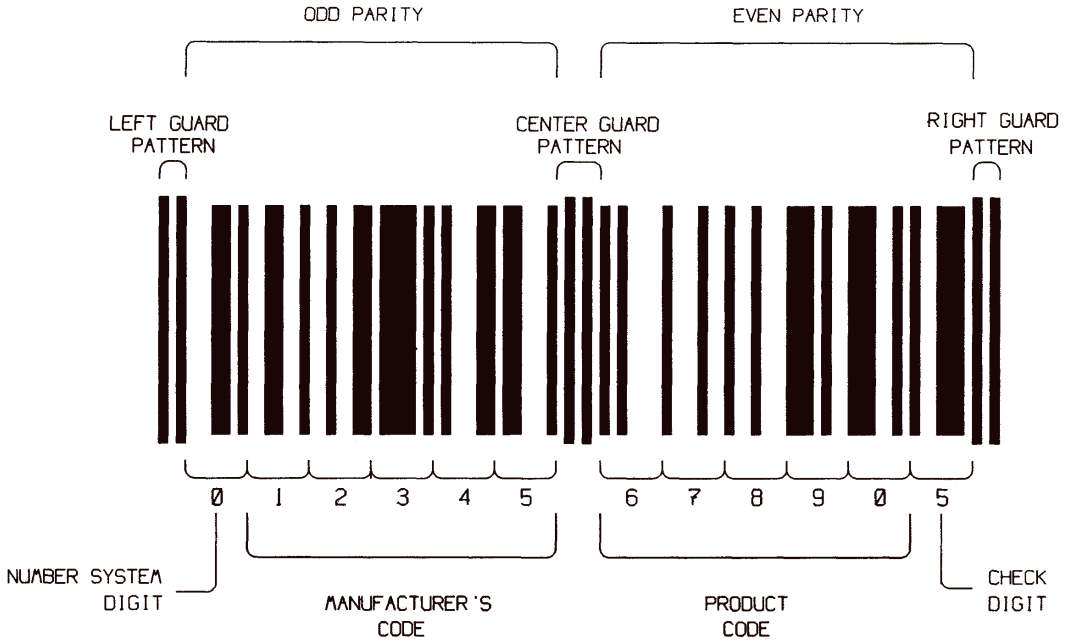
A. Listed below are seven bar codes that are in very common use:

The Universal Product Code (UPC)

The Universal Product Code, or UPC symbol is a standardized numbering system which provides unique identification of an item and is used widely in the retail community. The Uniform Code Council (UCC) is the administrator of the UPC and publishes the specifications for this symbology. Presently, there are two versions of the UPC symbol: Version A (UPC-A) and Version E (UPC-E). Both versions are designed for item level identification. The UPC-A is the more widely used. EAN 13 is the European version. The second version, UPC-E is a suppressed version of UPC-A, and is mostly used for packaging that is too small for the UPC-A bar code (i.e. package of chewing gum). Version E requires a Number System Character of Zero. EAN 8 is the European version of UPCE, but has a major difference, an additional digit found in the first two digits, being the country code designator. The rest of the data layout is the same between UPC and EAN codes.

- ❏ **Character Set: 0 - 9**
- ❏ **Encodation -** Two bars and two spaces are required to encode a character
- ❏ **Start/Stop Pattern**: Always starts and stop with 3 elements: a narrow bar, narrow space, and narrow bar.
- ❏ **Code Type** - Modular, fixed length (twelve digits with UPC-A, six explicitly encoded but eight illustrated human readable digits with UPC-E).

- ❑ **Human-Readable** - UPC-A all twelve digits required: UPC-E six digits required (the Number System Character and the Check Digit are implied), but the UCC promotes printing all eight digits.
- ❑ **Check Digit** - Required (modulus 10 calculation)
- ❑ **Encoded Information -**
  - Number System Character (one digit)
  - Manufacturer Identification Number (five digits)
  - Product Identification Number (five digits)
  - Check Digit (one digit)
- ❑ **Allowable Sizes** - Sizes for the UPC-E are determined by a "magnification" factor which is based on the "X" dimension size. These magnifications range from 80% to 200% of the nominal size, or 100% size (1.46 inches in width, 1.020 inches in height, "X" Dimension - 13 mils). However, as low as 75% (10 mil "X" dimension) has been allowed with thermal/transfer print technologies.



Interleaved 2 of 5 (I 2 of 5)

Interleaved 2 of 5, or I 2 of 5, is a bar code symbology used in industrial and retail applications. This symbol was invented by Dr. David Allais and the Uniform Symbology Specifications for this symbology were developed by AIM USA. The UCC recognizes this symbology for shipping container marking in the *Application Standard for Shipping Container Codes.*

- ❑ **Character Set** - 0 -9
- ❑ **Encodation** - I 2 of 5 pairs characters and encodes the first digit of the pair on five bars and the second digit of the pair on the five interleaving spaces. Two of the five spaces or bars used to encode a character are always wide. Below is an illustration of the interleaved encodation.
- ❑ **Start/Stop Pattern** - Starts with four narrow elements beginning with a bar, and stops with a wide bar followed by two narrow elements.
- ❑ **CodeType** - Binary, varying length. I 2 of 5 requires an even number of digits to encode information.
- ❑ **Human-Readable** - Optional, although it is typically used.
- ❑ **Check Digit** - Optional, however, Modulus 10 required when using the SCC-14 specification.
- ❑ **Encoded Information** - Contingent upon data requirements although an even number of digits is required. A leading zero is used if there is an odd number of digits available.

❑ **Allowable Sizes -**

- Minimum "X" Dimension: .0075 inches

❑ Wide to Narrow Ratio:

- 2:1 to 3:1 for "X" Dimension greater than .020 inches
- 2.2:1 to 3:1 for "X" Dimension less than .020 inches
- The SSC-14 specifications outline "magnifications" that are allowable.

❑ **Allowable Symbol Height -**

- The greater of .25 inches or 15% of the symbol length.

I 2 of 5 symbol encoding the data "1991".

Code 3 of 9 (Code 39)

Code 3 of 9, or Code 39, is a symbology used widely in industrial applications. This symbol was invented by Dr. David Allais and the Uniform Symbology Specification was developed by AIM USA. The Department of Defense, the health industry, and the automotive industry have also adopted Code 39 as their industry standard.

Character Set - 0 - 9, A - Z, -, ., %, /, $, space, +, *

Encodation - Five bars and four spaces are required to encode a character. Three of the nine bars and spaces are wide while the other six are narrow.

Start/Stop Pattern - Always the character "*".

Code Type - Binary, varying length.

Human-Readable - Optional, although it is typically used

Check Character - Optional (modulus 43 calculation)

Encoded Information - Contingent upon data requirements

Allowable Sizes -

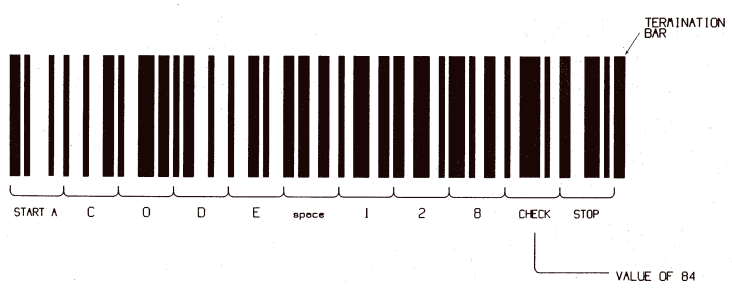
- Minimum "X" Dimension: .0075 inches
- Wide to Narrow Ratio:
- 2:1 to 3:1 for "X" Dimension greater than .020 inches
- 2.2:1 to 3:1 for "X" Dimension less than .020 inches

Allowable Symbol Height - The greater of .25 inch or 15% of the symbol length.

Code 128

Code 128 is frequently used in industrial, retail, and shipping applications. This symbology was invented by Ted Williams and the Uniform Symbology Specification for this symbology was developed by AIM USA.

- ❑ **Character Set** - The full ASCII set (128 characters). One of the advantages of this symbology is the ability to encode all 128 characters of the standard ASCII code chart.
- ❑ **Encodation** - Three bars and three spaces are required to encode a character.
- ❑ **Start/Stop Pattern** - One of three start characters A, B, or C shall be used at the beginning of the symbol to define initial code set. The stop pattern is seven elements comprised of four bars and three spaces. The Start/Stop pattern shall not be used within the symbol nor shown in human-readable interpretation.
- ❑ **Code Type** - Modular, varying length (UCC/EAN - 128 has several formats defined).
- ❑ **Human-Readable** - Optional; although it is typically used.
- ❑ **Check Character** - Required (modulus 103 calculation).
- ❑ **Encoded Information** - Contingent upon data requirements.
- ❑ **Allowable Sizes** - Minimum "X" Dimension: .0075 inches
- ❑ **Allowable Symbol Height** - The greater of .25 inch or 15% of the symbol length.



UPC Shipping Container Symbol (SCC-14)

The UPC Shipping Container Symbol, or the SCC-14, utilizes the I 2 of 5 symbology and is designed specifically for shipping carton marking in the retail industry. The UCC administers this standard.

- ❑ **Character Set** - O - 9
- ❑ **Encodation** - SCC-14 pairs characters and encodes the first of the pair on five bars and the second of the pair on the five interleaving spaces. Two of the five spaces or bars used to encode a character are always wide (same specification as I 2 of 5).
- ❑ **Code Type** - Binary, fixed length (14 digits)
- ❑ **Human-Readable** - Required (14 digits)
- ❑ **Check Digit** - Required (modulus 10 calculation)
- ❑ **Encoded Information -**
  - Packaging Indicator (one digit)
  - Number System Character (two digits)
  - Manufacturer Identification Number (five digits)
  - Product Identification Number (five digits)
  - Check Digit (one digit)

- **Allowable Sizes -** Sizes for the SCC-14 are determined by magnifications based on the nominal size (100%, "X" dimension equals .040 inches and height equals 1.25 inches). These magnifications range from 62.5% to 120%, although a size of 100% or greater should be used when printing directly on corrugated substrates. Results of a 1989 corrugated industry study by the Fibre Box Association on bar width variability showed that it is not currently feasible to print the 62.5% magnification factor of the shipping container bar code symbol directly on corrugated board within the dimensional specification of .005 inches using conventional techniques.

  Note: The bearer bar should be a minimum of two (2) times the width of a narrow element. The six digit symbol does not require the bearer bar if printed on a label, it does require a bearer bar if printed directly on the packaging material using conventional printing techniques.

UCC/EAN-128 Serial Shipping Container Symbol

The SSCC-18 is a popular format of the UCC/EAN-128 specification and is meaningful only when used in association with EDI and the Advance Shipping Notice (ASN). The UCC administers the specifications for this symbology.

- ❑ **Character Set** - The full ASCII set (128 characters).
- ❑ **Encodation** - Three bars and three spaces are used to encode a character.
- ❑ **Code Type** - Modular, fixed length (21 digits).
- ❑ **Human-Readable** - Required.
- ❑ **Check Character** - Required; a modulus 10 check digit in human-readable form; a modulus 103 check digit encoded, but not represented in human-readable form.
- ❑ **Encoded Information -**
  - Start Code "C" (not represented in human-readable form)
  - "Function 1" Character (not represented in human-readable form)
  - "00" Application Identifier
  - Packaging Level Indicator (one digit)
  - Number System Character (two digits)
  - Manufacturer Identification Number (five digits)
  - Serial Number (nine digits)
  - **Allowable Sizes -** "X" Dimension ranging from .010 inches to .035 inches
  - **Allowable Symbol Height** - Minimum of 1.25 inches

Codabar

Codabar is a bar code symbology used often in libraries, blood banks, and preprinted airway bills. The Codabar specification was invented by Monarch Marking Systems, a Pitney Bowes Company, and standardized in AIM USA.

- ❑ **Character Set** - 0 - 9, $, -, :, /, ., +
- ❑ There are also four unique start/stop characters designated A, B, C, and D.
- ❑ **Encodation** - Four bars and three spaces are required to encode a character.
- ❑ **Allowable Sizes -**

  Minimum "X" Dimension: .0075 inches

  Wide to Narrow Ration:
  2.1 to 3:1 for "X" Dimension greater than .020 inches
  2.2:1 to 3:1 for "X" Dimension less than .020 inches
- ❑ **Symbol Height** - The greater of .25 inches or 15% of the symbol length.

Q. What are Two Dimensional (2D) Bar Codes?

A. Two Dimensional bar code symbologies have high data densities and typically include error correction. Typically, a standard (one dimensional) bar code only encodes a single data field (e.g. a part number, a name, or P.O. no.). A two dimensional bar code can typically encode (store) all the fields in a data record up to the symbology's maximum character count (many times greater than standard bar code symbologies).

Q. What makes the two dimensional bar code different from standard, one dimensional, bar code?

A. Scanning (machine reading) of two dimensional bar codes is done in both vertical and horizontal directions. Some two dimensional bar codes are "stacked" (one dimensional) bar code lines and others are "matrix" bar codes.

Many two dimensional bar codes support error correction. This allows data to be read and recovered with less than optimal conditions (even with some damage to the bar code with some symbologies). Typically, the error correction level can be adjusted to favor the amount of data stored per symbol verses the ability to recover data.

Q. What two dimensional bar codes are included with Eltron Printers?

A. Eltron printers support MaxiCode, a matrix bar code, and PDF 417, a stacked bar code, with Macro PDF also included.

Q. What is MaxiCode?

MaxiCode is a two-dimensional symbology that can encode approximately 100 characters of data in a single one square inch symbol and up to eight symbols per data record.

The MaxiCode bar code was developed by a major freight shipper in conjunction with AIM (Automatic Identification Manufacturers) organization to provide a portable database record. The format allows for multiple data field entries into a single ship record (name, date, address, etc.). Each MaxiCode bar code when properly formatted, is a record with a defined format of separate data groups. The symbol includes error correction code (ECC), a targeting pattern, orientation independent format, and can have some symbol damage (as high as 25% of the symbol). The data format and symbol were designed to support sorting and tracking of unit loads and transport packges.

Q. What is PDF417?

PDF417 is a stacked (multi-row bar code) symbology that includes support for ASCII and ASCII extended character sets, data compression and data error correction (ECC).

PDF417 symbols are made from 4 bars and 4 spaces over 17 narrow bar widths (the "X" dimension) to make a codeword. Codewords are encoded by row with three mutually exclusive data encoding schemes for codewords. The symbol includes full length start and stop bar groups, row identifiers and error correction. The columns (codewords) range from 5 to 34 columns in width. The symbol height is from 3 to 90 rows with the row height adjustable. Error correction codewords per symbol range from 2 to 512.

b Command - 2D Bar Code - Overview

Description This command will direct a printer equipped with the 2D feature to print a bar code using a 2 dimensional code type. Most Eltron printers support two (2) two dimensional (2D) bar code formats, see the table below for details.

Syntax **bp_1,p_2,p_3**, [code specific options]

Parameters **p_1** = Horizontal start position (X) in dots

p_2 = Vertical start position (Y) in dots

p_3 = 2-dimensional bar code type

Value	Code Type
M	MaxiCode[1]
P	PDF417 / Macro PDF

The following table outlines printer support of the **b** command for the 2D bar codes.

Model	MaxiCode	PDF417
2622	S	S
2642	S	S
3642	S	S
2722	S	S
2742	S	S
Eclipse	S	S
2046	S	O
2746	S	S
Strata	S	S
P2242	S	S
2122	S	O
2142	S	O
Orion	S	S

O = Optional; **S** = Standard

b Command - 2D Bar Code - MaxiCode Specific Options

Description Use this commmand to generate one (1) to eight (8) MaxiCode bar code symbols with a single command. The printer will automatically interpret and encode data into MaxiCode symbols for data modes 2, 3, 4, and 6.

Syntax **bp_1,p_2,p_3,[p_4,][p_5,]"DATA"**

Parameters **p_1** = Horizontal start position (X) in dots

p_2 = Vertical start position (Y) in dots

p_3 = **M** - Must be "M" for MaxiCode

p_4 = Mode Selection

Value	Description
Not Used	Automatic Selection Mode 2 or 3
m2	Mode 2
m3	Mode 3
m4	Mode 4
m6	Mode 6

1. If **p_4** (**mX**) is not used, the printer will use the following rules to automatically format the "**DATA**" parameter. If the postal code (third parameter, PC) in the "**DATA**" is:

- All numeric characters, the printer will automatically select Mode 2.
- Alpha only or alpha-numeric character combinations will set the printer to Mode 3.
- Not used, the printer automatically selects Mode 3.

2. If **p_4** value is "**m2** or **m3**", the printer will use the following rules to format the "Data" parameter:

- **In Mode 2** - If a non-numeric character is entered in the Postal Code "Data" parameter field, then the MaxiCode barcode will not print.
- **In Mode 3** – If the Postal Code "Data" field exceed 6 characters, then the additional characters will be truncated from the bar code field.

b Command - 2D Bar Code - MaxiCode Specific Options

p_5= x,y
Associated MaxiCode symbol numbering where:
x = Symbol Number of
y = Total Number of Associated Symbols

Default: Not used
Range: 1-8 for both **x** or **y**

"**DATA**"= Mode Dependent Data Format
Mode dependent data is bounded by quotation marks. Maximum of 2 Kbytes of data.

Mode	Data Format
2 & 3	"cl,co,pc,lpm"
4 & 6	"lpm"

cl = **Class Code** (*3 digits required)*
co = **Country Code (***3 digits required)*
Mode 2 = Numeric Characters
Mode 3 = International Characters (up to 6 characters)
pc = **Postal Code**
Mode 2 = 5 or 9 characters (All Numeric, including USA Postal ZIP 5 or 9 char.) For less than 9 characters, the printer will pad the field with 0's.
Mode 3 (International)= Any alphanumeric character (up to 6 characters)
lpm = **Low priority message** (data)
ASCII printable characters (up to 84 characters per symbol), any 256 character map.

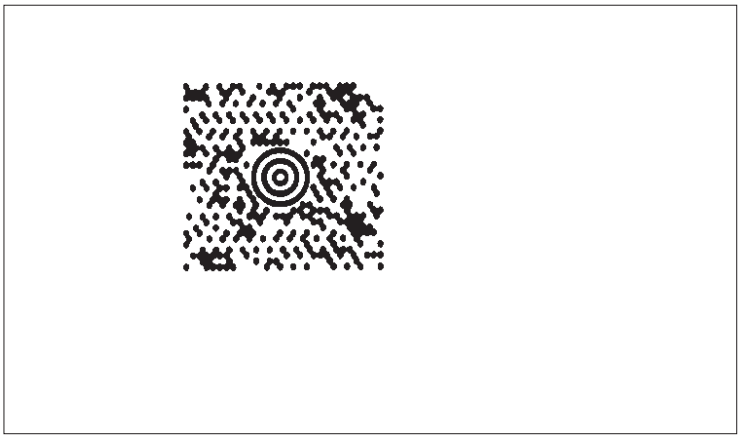
The programmer should rely on the symbology's specification to insure format compliance and proper implementation. See the AIM web site for specifications at:
http://www.aimi.org/

b Command - 2D Bar Code - MaxiCode Specific Options

Example:

```
N↵
b20,20,M,"300,840,93065,1692,This is MaxiCode, but not MaxiCode
formatted data"↵
P1↵
```

Will Produce:



Using AIM Specified MaxiCode Data Formatting

The EPL2 printer can use and automatically decode the AIM ITS (International Technical Standards) MaxiCode data format. The printer detects the message/start header (**[)>R_S**), field separator (**G_S**), and the end of message marker (**R_S E_{OT}**) data control strings.

The hexidecimal (ASCII) data control strings are in the following table. See the EPL2 dump mode character map in Appendix A.

Control String	Hexidecimal Code
Message/Start Header	
[ ) > R_S	5B 29 3E 1E
Field Separator	
G_S	1D
End Of Message Marker	
R_S E_{OT}	1E 04

Syntax

bp_1,p_2,M,p_4 "[AIM MaxiCode Data]"

Example

b20,400,M,m2"001,840,93065,1692,[)>R_S
*01*G_S*98XXXZZFDAAF*G_S*SHIP*G_S*309*$G_S$$G_S$*1/1*$G_S$*10*$G_S$
N$G_S$$G_S$*CAMARILLO*$G_S$*CA*$G_S$$R_S$$E_{OT}$*!!!!!!!!!!!!!!!!!!!!!!!!"*↵

Notes:
1) This programming example represents actual data used to format a single AIM compliant MaxiCode symbol as programmed by a major international and domestic shipping company.

2) The shipper has explicitly set the the MaxiCode symbol for Mode 2. This can be omitted by the programmer and the printer will auto-select the mode per the rules on page D-16.

3) The shipper has used the "**!**" character to pad the symbol's data. A scanner reads back all the **"Data"** within the quotation marks, including the "**!**" characters following the End Of Message Marker (**E_{OT}**).

4) All of the data fields in the Low Priority Message are not used in the example. Some are left empty with the field delimiting **G_S** character used as a format field holder.

b Command - 2D Bar Code - PDF417 Specific Options

Description Use this command to print PDF 417 and Macro PDF bar code symbols. The printer will auto select to Macro PDF bar code mode and print print one or more symbols when used in conjunction with the **oH** command to place addition symbols for continuation data.

Syntax **bp_1,p_2,p_3,p_4,p_5[,p_6][,p_7][,p_8][,p_9][,p_{10}] [,p_{11}][,p_{12}][,p_{13}][,p_{14}][,p_{15}],"DATA"**

Parameters The printer will automatically generate the PDF417 bar code using the following parameters.

p_1 = Horizontal start position (X) in dots

p_2 = Vertical start position (Y) in dots

p_3 = **P** - Must be "P" for PDF 417 bar codes

p_4 (www) =maximum print width in dots

p_5 (hhh) = maximum print height in dots

The programmer should rely on the symbology's specification to insure format compliance and proper implementation. See the AIM web site for specifications at:

http://www.aimi.org/

The printer will automatically optimize the symbol for readabilty of data (and use the minimum number of sysmbols when using Macro PDF). The symbol's geometry is adjusted (typically reducing the size of the symbol) per the defined parameters. The printer will use the largest module size (bar width and height) and minimize the number of rows and columns.

b Command - 2D Bar Code - PDF417 Specific Options

The following parameters may be omitted and default values will automatically be inserted. Each parameter value (data string) must be proceeded by its associated command prefix character.

p_6 (s) = sets error correction level
Error Correction (EC) codewords per symbol
Values: **s1** - **s8**
If level is not specified, a level will automatically be assigned as per the following table:

EC level	EC Codewords	Auto Select Level
0	2	—
1	4	0-31
2	8	32-63
3	16	64-127
4	32	128-255
5	64	256-511
6	128	512-928
7	256	—
8	512	—

p_7 (c) = selects data compression method
Values: **0** or **1**, default is **0**
c0 = Auto-encoding
c1 = Binary mode

Data Type	Compression (Byte by Byte)
Text	2 Characters per codeword
Numeric	2.93 Characters per codeword
Binary	1.2 Bytes per codeword

p_8 (pxxx,yyy,mm) = print human readable code
This paramenter is a non-standard implemention of the bar code and is only recommended for troubleshooting purposes.
Additional variables:
p = "**p**" - parameter identifer
xxx = horizontal start location
yyy = vertical start location
mm = maximum characters per line

b Command - 2D Bar Code - PDF417 Specific Options

p_9 (f) = Bar code origin point
Values: **0** or **1**, default is **1**
f1- Center of bar code as defined by the automatically adjusted symbol size, i.e. width and height. Parmaters **p_4** and **p_5** values are maximum values only.
f0- Upper left corner of barcode.

p_{10} (x) - module width (in dots)
Values: **2 - 9** (i.e. x2-x9)
Default: Auto selects **6** (dots). Tests data with maximum size limit with the **p_4** and **p_5** values, then the other optional parameters that are specified. The printer will then automatically reduce the module width by one dot increment until the data fits within the symbol's maximum dimensions (and other applied parameters) or until **3** dots has failed in which case the printer then will report an error.

p_{11} (**y**) - set bar height (in dots)
Range: **4 - 99** (i.e. y4-y99)
Default: 4 times module width (**p_{10}**)

p_{12} (**r**) - maximum row count
Sets a maximum limit for the number of rows to be used for auto selecting symbol features.

p_{13} (**l**) - maximum column count
Sets a maximum limit for the number of columns to be used for auto selecting symbol features.

p_{14} (**t**) - truncated flag - legal values are:
0 = not truncated, **1** = truncated
See the PDF 417 specification for details.

p_{15} (**o**) - rotation
Values: **0**= 0°, **1**= 90°, **2**= 180°, **3**= 270°
Setting this value to 90° and 270° will cause the symbols maximum height (**p_4**) and width (**p_5**) values to transpose when automatically calculating and generating the symbol, i.e. the height would affect column dimensions and width would affect row dimensions.

b Command - 2D Bar Code - PDF417 Specific Options

"DATA" = ASCII data or Binary data bytes
Represents a fixed data field.

The backslash (\) character designates the following character is a literal and will encode into the data field. Refer to the following examples:

To Print	Enter into data field
“	\”
“Company”	\”Company\”
\	\\
\code\	\\code\\
↵	\↵

PDF417: General Information

A PDF417 symbol is organized into minimum of 3 to a maximum of 90 rows and a minimum of 5 to a maximum of 34 columns of codewords.

Each codeword is 17 modules wide. There are 4 bars and 4 spaces per codeword.

Multiply the module width (in dots, $\mathbf{p_{10}}$) by 17 to get the codeword width.

Multiple the module height (in dots, $\mathbf{p_{11}}$) by the number of rows to get the symbol height.

Four of the codewords in each row are start, stop and two row indicators. The remaining codewords are referred to as the data region and contain symbol overhead and compacted data.

There can be no more than 928 codewords in the data region. **All combinations of rows and columns are not legal**; 90 rows times 30 columns would produce a data region of 2700 codewords which exceeds the 928 codeword maximum per symbol. See the following table (on the next page) that shows the maximum number of rows and the resulting number of codewords in the data region for each column count.

b Command - 2D Bar Code - PDF417 Specific Options

PDF417
Symbol Geometry

Columns	Maximum Rows	Codewords
5	90	90
6	90	180
7	90	270
8	90	360
9	90	450
10	90	540
11	90	630
12	90	720
13	90	810
14	90	900
15	84	924
16	77	924
17	71	923
18	66	924
19	61	915
20	58	928
21	54	918
22	51	918
23	48	912
24	46	920
25	44	924
26	42	924
27	40	920
28	38	912
29	37	925
30	35	910
31	34	918
32	33	924
33	32	928
34	30	900

b Command - 2D Bar Code - PDF417 Specific Options

Automatic PDF 417 Bar Code Generation

The printer automatically tests and changes the PDF 417 bar code geometry to maximize the readability of the bar code for a given maximum height and width, specified by $\mathbf{p_4}$ and $\mathbf{p_5}$.

The printer tests the PDF 417 parameters in this order for a given data string (error correction and compression included):

1. Module width $\mathbf{p_{10}}$ (for codeword width)
2. Symbol width $\mathbf{p_4}$
3. Symbol column maximum $\mathbf{p_{13}}$
4. Module height $\mathbf{p_{11}}$
5. Symbol height $\mathbf{p_5}$
6. Symbol row maximum $\mathbf{p_{12}}$

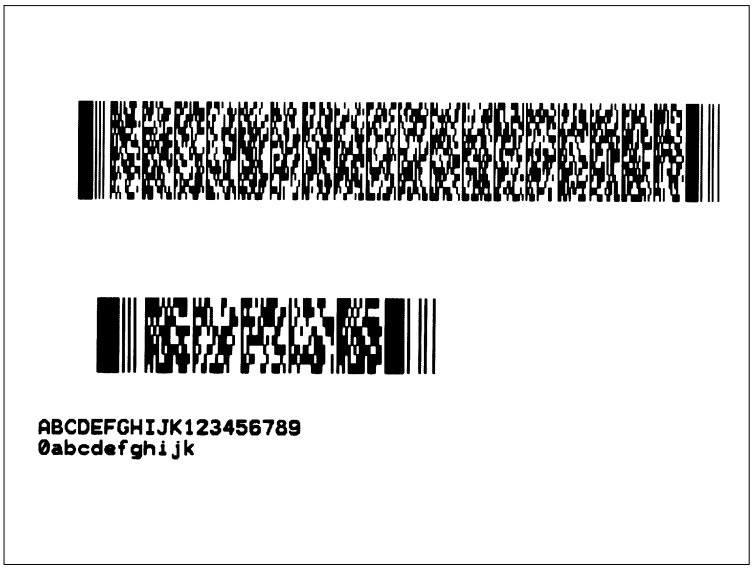
The printer will start with the maximum value (default or explicit) for these parameters. The printer reduces these values to get the module width and height to maximize readability.

b Command - 2D Bar Code - PDF417 Specific Options

Example:

N↵
b80,100,P,700,600,x2,y7,l100,r100,f0,s5,"\ ↵
Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation or any nation so conceived and so dedicated can long endure.
"↵
↵
b80,200,P,400,300,p40,440,20,f1,x3,y10,r60,l5,"ABCDEFGHIJK123 4567890abcdefghijk"↵
P↵

Will Produce:



oH Command - Macro PDF Offset

Description Use this command to place addition secondary, associated Macro PDF symbols for the continuation of data greater than a single PDF 417 bar code can store.

This command must preceed any PDF 417 bar code commands inorder to print Macro PDF (multiple bar code) symbols from a single **b** command's data field.

Syntax **oHp_1, p_2**

Parameters **p_1** = Horizontal offset position (X) in dots of the next Macro PDF bar code symbol.

p_2 = Vertical offset position (Y) in dots of the next Macro PDF bar code symbol.

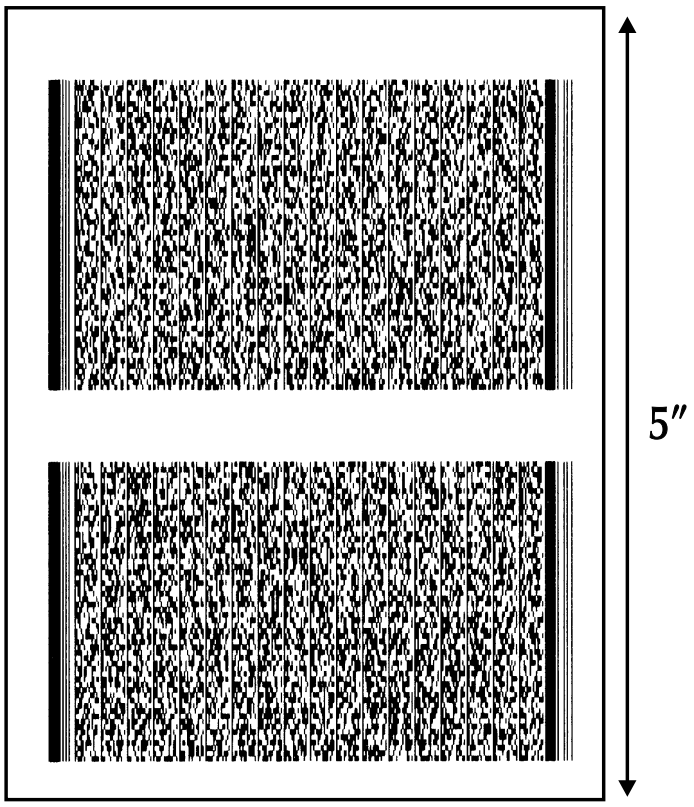
See the following page for an example.

oH Command - Macro PDF Offset

Example:

```
N↵
q784↵
Q1215,24↵
R0,0↵
oH0,500↵
↵
N↵
b80,100,P,700,600,x2,y7,l100,r100,f0,s5,"\
Fourscore and seven years ago our fathers...
 <<< the rest of Lincoln's Gettyberg Address HERE >>>
...  and that government of the people, by the people, for the people
shall not perish from the earth.
"↵
P↵
```

Will Produce:



Appendix E - Real Time Clock Option Programming

This section applies to printers with the RTC (Real Time Clock) option installed.

RTC Option Configurations

Support for the RTC option varies from printer model to model. Model variations are, as follows:

- ❑ **Memory Cartridge with RTC**
  Most EPL2 printers support the RTC with the SRAM memory cartridge. The printer can easily be field upgraded to a memory cartridge with a RTC.

- ❑ **Internal RTC**
  Some EPL2 printers only support the RTC option with an RTC integrated into the main circuit board and can not be field upgraded.

- ❑ **RTC Not Supported**
  Some basic EPL2 printers do not support RTC option in any configuration.

Memory Cartridge w/RTC	All EPL2 printers not listed below.
Internal RTC	Strata, Orion, P2242, TLP/LP 2X22
RTC Not Supported	Eclipse, LP2022, LP2042

RTC Commands

The following commands can use and control the RTC option features:

- **TS** - Set Time & Date
- **TT** - Define Time Layout as a command or Insert Time Function as a variable
- **TD** - Define Date Layout as a command or Insert Time Function as a variable
- **A** - ASCII Text (Time & Date variable within "**DATA**")
- **B** - Bar Code (Time & Date variable within "**DATA**")

Checking for Time & Date

Use the EPL2 printer's AutoSense procedure to generate a Dump Mode prints status printout. See the printer's user's manual for details. A **U** command can also be used for printing a status printout.

RTC Dump Mode Information:

- Use it to check for the RTC option in printer. When time and date are displayed, it shows that the RTC is installed in the printer.
- Display presently set Time & Date.

Printing the Time & Date

The Time and Date are "**DATA**" function variables that can be included as part of "**DATA**" parameter in a Text (**A** command) or Bar Code (**B** command). The format of the printed time or date must be set prior to calling the Time or Date function within a text or bar code **DATA** parameter field.

The Time and Date function variables can not be called from within a 2D (dimensional) bar code.

A Command - ASCII Text with RTC

The "**Data"** field can be replaced by or combined with the following variables:

TT = Prints the current time at this position in the predefined format. See the **TT** command for format selection. This variable is available only if the printer Time & Date option is installed.

TD = Prints the current date at this position in the predefined format. See the **TD** command for format selection. This variable is available only if the printer Time & Date option is installed.

Vnn = Prints the contents of variable "**nn**" at this position where **nn** is a 2 digit number from 00 to 99.

Cn = Prints the contents of counter "**n**" at this position where n is a one digit number from 0 to 9.

Examples:

A50,0,0,1,1,1,N,"DATA"↵ : Writes Text
A50,50,0,2,1,1,N,V01↵ : Writes contents of variable 01
A50,100,0,3,1,1,N,C1↵ : Writes contents of counter 1
A50,150,0,4,1,1,N,TT↵ : Writes current time
A50,200,0,5,1,1,N,TD↵ : Writes current date

or a combination of several options:

A50,300,0,3,2,2,R,"Deluxe"V01C2"Combo"TDV01TT↵

:Writes the text "Deluxe" followed by the contents of variable 01 followed by the contents of counter 2 followed by the text "Combo" followed by the current date followed by the contents of variable 01 followed by the current time.

B Command - Bar Code with RTC

The data field can be replaced by or combined with the following commands:

Vnn = Prints the contents of variable "**nn**" at this position where **nn** is a 2 digit number from **00 to 99**.

Cn = Prints the contents of counter "n" at this position where n is a one digit number from **0 to 9**.

TT = Prints the current time at this position in the predefined format. See the **TT** command for format selection.

TD = Prints the current date at this position in the predefined format. See the **TD** command for date format selection.

Examples: *B50,0,0,3,1,2,50,B,"DATA"↵*
: Writes bar code
B50,50,0,3,1,2,50,N,V01↵ : Writes contents of variable 01 as bar : code
B50,50,0,3,1,2,50,N,C1↵ : Writes contents of counter 1 as bar code
B50,50,0,3,1,2,50,N,TT↵ : Writes current time as bar code
B50,50,0,3,1,2,50,N,TD↵ : Write current date as bar code

or a combination of several options:

B50,300,0,3,1,2,50,B,"Deluxe"V01C2"Combo"TDV01TT↵

:Writes the text "Deluxe" followed by the contents of variable 01 followed by the contents of counter 2 followed by the text "Combo" followed by the current date followed by the contents of variable 01 followed by the current time all as a code 39 bar code.

TD Command - Define Date Layout

Description Use this command to define the date format when printing.

Use the variable **TD** in a Text or Bar Code (**A** & **B** commands) **DATA** parameter to print the date.

Syntax **TDp_1[|p_2|p_3]**

Parameters **p_1**, **p_2**, **p_3** = The parameters describe the format of the date display. At lease one parameter must be supplied. Each parameter can be any of the acceptable values listed below.

Value	Description
y2	Year displayed as 2 digits (95)
y4	Year displayed as 4 digits (1995)
me	Month displayed as 3 letters (JAN)
mn	Month displayed as 2 digits (01)
dd	Day displayed as 2 digits (15)

| = Separator character. The separator may be any ASCII character value between 032 and 063. The separator character is printed between the results of each of the supplied parameters.

This command only works in printers equipped with the Real Time Clock time and date option.

Examples: If the current date is January 15, 1995:

TDy2/me/dd↵ *:95/JAN/15*
TDdd-me-y4↵ *:15-JAN-1995*
TDdd,mn,y4↵ *:15,01,1995*

TS Command - Set Real Time Clock

Description Use this command to set the time and date in printers equipped with the Real Time Clock option.

Syntax **TSp_1,p_2,p_3,p_4,p_5,p_6**

Parameters

p_1 = Month
Range: **01 to 12**

p_2 = Day
Range: **01 to 31**

p_3 = Year
Last two digits of Year (e.g. 95)
Range: Years 1991- 1999 = **90-99**
Years 2000- 2090 = **00-89**

p_4 = Hour in 24 hour format
Range: **00 to 23**

p_5 = Minutes
Range: **00 to 59**

p_6 = Seconds
Range: **00 to 59**

Example:

TS01,01,95,01,00,00 : sets the date to Jan. 1, 1995 : and the time to 1:00 a.m.

TS12,31,01,15,31,00 : sets the date to Dec. 31, 2001 : and the time to 3:31 p.m.

TT Command - Define Time Layout

Description Use this command to define the time format when printing.

Syntax **TTp_1[|p_2|p_3][+]**

Parameters **P_1**, **P_2**, **P_3** = **h, m,** or **s**

These parameters describe the format of the time display.

- At lease one parameter must be supplied.
- Each parameter can be any of the values **h**, **m**, or **s** and are described below.

Value	Description
h	Hours displayed as 2 digits (e.g. 01)
m	Minutes displayed as 2 digits (e.g. 15)
s	Seconds displayed as 2 digits (e.g. 00)

[+] = Enable 12 Hour clock format
Appending a + to the end of the command string selects 12 hour clock mode. The times will display with an "AM" or "PM" indicator.
Default (no **+**) = **24 hour clock mode**

| = Separator character
The separator may be any ASCII character value between 032 and 063. The separator character is printed between the results of each of the supplied parameters.

This command works only in printers equipped with the Real Time Clock time and date option.

Examples: If the current time is 1:25 p.m.:

TTh:m:s+↵ : *01:25:00*
TTh,m↵ : *13,25*
TTh+↵ : *01 PM*

Appendix F - Cutter Option Programming

This section applies to printers with the Cutter option installed.

Cutter Option Configurations

Support for the Cutter option varies from printer model to model. Model variations are, as follows:

- ❑ **Desktop printers**
  Most desktop printer models can be ordered with the cutter installed. The cutter circuit is integrated into the main circuit board and can not be field upgraded.

- ❑ **Industrial Printers**
  Most industrial printers can be ordered with a cutter installed (preferred) or field upgraded by a qualified service technician.

- ❑ **Portable Printers - No Cutter Option**

Cutter Models

Desktop	
TLP2622 / TLP2722	Thermal Transfer, 2”, 203 dpi
TLP2642 / TLP2742	Thermal Transfer, 4”, 203 dpi
TLP3642	Thermal Transfer, 4”, 300dpi
Orion	Direct Thermal, 4”, 203 dpi
Tabletop - Industrial	
TLP2046	Thermal Transfer, 4”, 203 dpi
Eclipse LP	Direct Thermal, 4”, 203 dpi
Eclipse TLP	Thermal Transfer, 4”, 203 dpi
Wide Web - Industrial/Desktop	
Strata LP	Direct Thermal, 8.5”, 203 dpi
Strata TLP	Thermal Transfer, 8.5”, 203 dpi

C Command – Cut Immediate

Description: This command allows the advanced programmer to initiate an immediate media cut without a form print operation. The printer must have the cutter option installed.

- ❏ The **C** command – Cut Immediate **can not** be used inside of a form.
- ❏ The initial character **C** in a command string is used for both the Counter function (**Cp$_1$**), which can only be used within a form and for the Cut Immediate function (**C**), this command, which can not be used in a form.
- ❏ The **C** command – Cut Immediate can not be used with the KDU.

Syntax: **C**

Parameters: None

Example: **C**↵

Only cut label liner (backing) or tag stock. Label adhesive will built up on the cutter blade and cause the cutter to operate poorly or jam if the labels are cut along with the label liner.

Use the **C** command - Cut Immediate 5 times without media loaded, to perform a self cleaning of the cutter blade.

f Command - Cut Position

Description Use this command on an individual printer to provide precision cut placement.

- Compensate sensor to cutter position differences on a printer by printer basis.
- Fine-tune cut position to compensate for differences in media.

Syntax **fp_1**

Parameters **p_1** = cut position index measured in dots. Acceptable values: 070 to 130. The default value is 100.

When using the label liner cutter option, the printer will advance each printed label to the appropriate programmed offset cut position, between labels, before cutting. Due to media differences, the printer may not accurately position the labels before cutting, causing the cutter to cut the label instead of the liner.

The printer's cutter is not designed to cut labels. Labels have adhesive that may interfere with the proper operation of the cutter.

Only cut label liner and tag stock and do not exceed the specified media density and thickness of the cutter.

If the cut position causes the label just printed to be cut, increase the cut position index value (>100). If the cut position causes the label following the one just printed to be cut, decrease the cut position index value (<100).

OC Command - Cutter Option Select

Description This sub-command is used to enable the cutter option feature when installed. This sub-command set of the **O** command works with other **O** Option commands.

See the Command Reference, Section 2, and the Advanced Programming, Appendix G, for additional **O** (Option) command parameters.

Syntax **OC[p_1]**

Enables the label liner cutter. The cutter will cut at the end of each form as specified by the **Q** command.

Some options are model specific. Refer to Options Availability Table on page 40, for option command availability for each printer model.

Parameters **p_1** = Sets the number of labels to print prior to cut.

If a number between 1 - 255 is specified for p1, the printer will cut after the specified number of labels have been printed.

If **b** is specified for p1, the "batch print & cut" feature is enabled. This feature uses the **P** command to control cutter operation. (The **OCb** command option is not supported by the TLP2046 printer).

When using direct thermal media in a TLP series printer, the proper option command to enable the cutter is *OD,C*.

OC Command - Cutter Option Select

Examples:	*0*	*:disables all options.*
	OC	*:enables cutter only, labels are cut after each :label is printed, disables all other options*
	OC125	*:labels are cut after the 125th label has printed, :disables all other options*
	OCb	*:labels are cut after a batch of five has printed,*
	...	*:disables all other options*
	P5	*:*

Appendix G - Advanced Programming

This section applies to commands and procedures that use atypical media, various printer options and unique operating conditions by the advanced user and programmer.

Introduction The commands (and sub-commands) in this section require the programmer to pay extra attention to the printer's operational state and conditions prior to, during and after issuing one or more of these commands.

Soft Fonts Overview Soft fonts allow the programmer and user to have a wide variety of font and small graphic recall. Some of the advantages and disadvantages are listed below.

Advantages

- ❏ Programmer can design and generate unique font sets that are licence free fonts.
- ❏ Generate small graphics that can be recalled as font. Graphics less than 256 dots high and 2048 dots wide (255 bytes x 8).
- ❏ Graphics as fonts can be enlarged in horizontal and vertical multiples, just like fonts.
- ❏ Increase printer's flexibility.
- ❏ Minimize memory requirements for uses that require only partial font sets.
- ❏ Utilities available to download third party fonts.

Soft fonts can be downloaded to and deleted from the printer from the Soft Font Downloader Utility, CAL Tools or CAL3..

Disadvantages

- ❏ Soft fonts are slower to image than resident fonts. Soft fonts are processed by the printer in a manner similar graphics.
- ❏ Licencing issues with downloaded soft fonts.
- ❏ Requires programming tools to implement some fonts. Typical text editors are not capable of programming raw data code.

Downloading some third party soft fonts may require a vendor's licence. Zebra actively discourages copyright infringement and strongly suggests that all user's obtain required copyright licenses.

EK Command - Delete Soft Font

Description This command is used to delete soft fonts from memory.

Soft fonts can be downloaded to and deleted from the printer from the Soft Font Downloader Utility, CAL Tools or CAL3..

Syntax **EK {"FONTNAME"|"*"}**

Parameters "FONTNAME" = By entering the name of a font, that font will be deleted from memory.

"*" = By including an "*" (wild card), ALL fonts will be deleted from memory.

Example:

```
EK"A"↵          :deletes font "A"
EK"*"↵          :deletes all fonts
```

ES Command - Store Soft Font

Description This command is used to download and store soft fonts in memory.

Soft fonts can be downloaded to and deleted from the printer from the Soft Font Downloader Utility, CAL Tools or CAL3..

Syntax **ES"FONTNAME"$p_1p_2p_3a_1b_1c_1$"DATA$_1$"$a_2b_2c_2$"DATA$_2$"** ... **$a_nb_nc_n$"DATA$_n$"**

Parameters **"FONTNAME"** = One letter font name
Range: a-z, Lower Case

- Lower Case named fonts minimize soft font memory usage to only store fonts downloaded and have 256 character limit.

The following use hexadecimal coding for parameter values.

p_1: Number of characters to be downloaded
Range: 00 - FF hex. (0-255 decimal)
for 1 to 256 fonts per soft font set.

p_2: Character Rotation

- 00 hex. = 0 and 180 degrees
- 01 hex. = 90 and 270 degrees (clockwise)
- 02 hex. = Both 0 and 180 degree rotation pair and the 90 and 270 degree rotation pair

p_3: Font Height
Range: 00 to FF hex.
Measured in dots and expressed as a hexadecimal number, i. e. 1B hex. = 27 dots
Font height includes accentors and dissenters of characters and need to fit in the character cell

- 203 dpi printers =
256 dots = 1.26 inches = 32.03 mm
- 300 dpi printers = 00 to FF hex.
256 dots = 0.85 inches = 21.67 mm

ES Command - Store Soft Font

a_1: (1^{st}) Download Character (map position)
Range: 00 to FF hex.

b_1: (1^{st}) Spacing To Next Print Character
Downloaded character's next printed character position in dots, i.e. Character tracking - the space between characters. Must be greater than or equal to the character width, see parameter **c_1**.
Dots in a decimal number converted to a hexadecimal number.
Range: 00 to FF hex.

c_1: (1^{st}) Downloaded Character's Width
Dots in a decimal number converted to a hexadecimal number.
Range: 00 to FF hex.

"DATA$_1$" : (1^{st}) Character Bitmap
p_3 × **c_1** = bit map data (in bytes)
Data is received in bytes, on a line by line basis. The font character's 0,0 cell map position is in the top left corner of the map as viewed in the 0 degree rotation. See the examples on the following pages.

a_2: (2^{nd}) Download Character (map position)

b_2: (2^{nd}) Spacing To Next Print Character

c_2: (2^{nd}) Downloaded Character's Width

"DATA$_2$" : (2^{nd}) Character Bitmap
p_3 × **c_2** bytes = bit map data

Repeat for each character until the last character in the set is downloaded.

a_n: (Last) Download Character (map position)

b_n: (Last) Spacing To Next Print Character

c_n: (Last) Downloaded Character's Width

"DATA$_n$" : Character Bitmap
p_3 × **c_n** bytes = bit map data

ES Command - Store Soft Font

For fonts with the rotation parameter set for "both" (p_2 = 02 hex.):

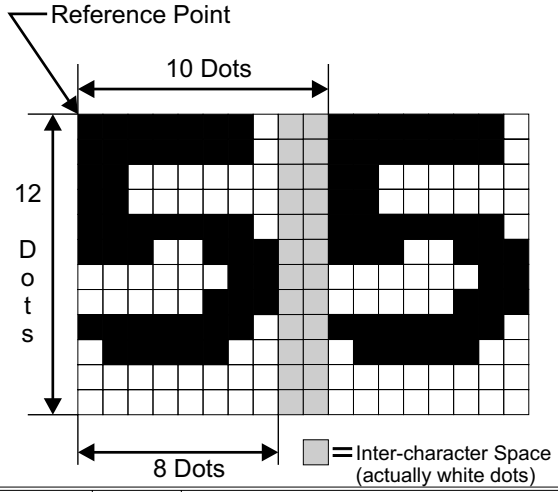
Repeat the individual font character download for each 90° rotated character from the start of the character set until the last rotated character in the set is downloaded.

$a_{1\text{-}90°}$ $b_{1\text{-}90°}$ $c_{1\text{-}90°}$ "DATA$_{1\text{-}90°}$"
$a_{2\text{-}90°}$ $b_{2\text{-}90°}$ $c_{2\text{-}90°}$ "DATA$_{2\text{-}90°}$"
$a_{3\text{-}90°}$ $b_{3\text{-}90°}$ $c_{3\text{-}90°}$ "DATA$_{3\text{-}90°}$"

$a_{n\text{-}90°}$: (Last) Download Character
$b_{n\text{-}90°}$: (Last) Spacing To Next Print Character
$c_{n\text{-}90°}$: (Last) Downloaded Character's Width
"DATA$_{n\text{-}90°}$" : Character Bitmap
p_3 × **c_n** bytes = bit map data

The number of individual character maps downloaded will be double the characters in the font set (**p_1**).

Example of Measuring Soft Font Size



Parameter	Dots	Data Entered as Hexadecimal
p_3	12	0C hex.
b	10	0A hex.
c	8	08 hex.

ES Command - Store Soft Font

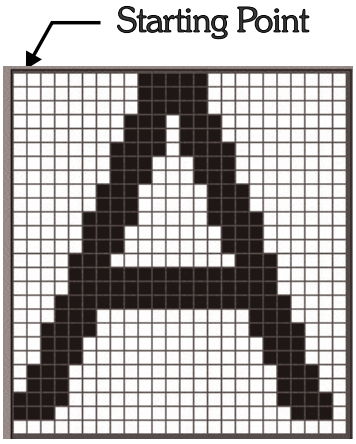
Soft Fonts Programming Code Example The typical soft font download command strings to the printer. The following example was generated with the CAL3WIN software.

```
00000000  0D 0A 45 4B 22 61 22 0D 0A 45 53 22 61 22 03 00   ..EK"a"..ES"a"..
          CR & LF              CR & LF                 p1 p2

00000010  1A 41 17 03 00 7C 00 00 7C 00 00 7C 00 00 EE 00   .A...|..|..|....
          p3 a1 b1 c1

00000020  00 EE 00 01 EF 00 01 C7 00 01 C7 00 03 83 80 03   ................
00000030  83 80 07 83 C0 07 01 C0 07 01 C0 0E 00 E0 0F FF   ................
00000040  E0 0F FF E0 1F FF F0 1C 00 70 3C 00 78 38 00 38   .........p<.x8.8
00000050  38 00 38 70 00 1C 70 00 1C F0 00 1E E0 00 0E 00   8.8p..p.........
00000060  00 00 42 17 03 1F FF 00 1F FF C0 1F FF E0 1C 01   ..B.............
             a2 b2 c2

00000070  E0 1C 00 F0 1C 00 70 1C 00 70 1C 00 70 1C 00 E0   ......p..p..p...
00000080  1C 01 E0 1F FF C0 1F FF C0 1F FF E0 1C 00 F0 1C   ................
00000090  00 70 1C 00 38 1C 00 38 1C 00 38 1C 00 38 1C 00   .p..8..8..8..8..
000000A0  38 1C 00 70 1C 00 F0 1F FF E0 1F FF C0 1F FF 00   8..p............
000000B0  00 00 00 43 19 03 00 7F 00 01 FF C0 03 FF E0 07   ...C............
                a3 b3 c3

000000C0  C1 F0 0F 00 78 1E 00 38 1C 00 3C 1C 00 18 3C 00   ....x..8..<...<.
000000D0  00 38 00 00 38 00 00 38 00 00 38 00 00 38 00 00   .8..8..8..8..8..
000000E0  38 00 00 38 00 00 1C 00 0C 1C 00 0E 1C 00 1C 0E   8..8............
000000F0  00 3C 0F 00 7C 07 C0 F8 03 FF F0 01 FF E0 00 7F   .<..|...........
00000100  80 00 00 00 0D 0A                                 ......
                      CR & LF
```

ES Command - Store Soft Font

Font Bitmap Data Format

The black and white bitmap that represents the font must be converted into ASCII hexadecimal code. The 0° font format has dot converted to data bytes reading from left to right and the last byte in a line is padded with zeros to complete the line and data byte.

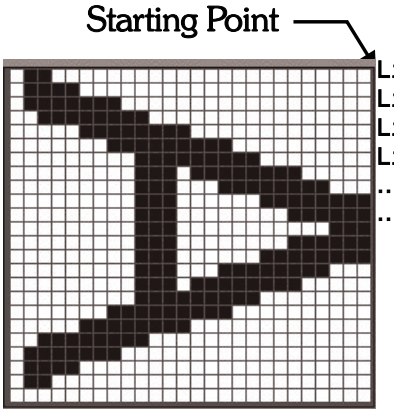



```
Line 1 - 00000000 01111100 00000000 = 00 7C 00
Line 2 - 00000000 01111100 00000000 = 00 7C 00
Line 3 - 00000000 01111100 00000000 = 00 7C 00
Line 4 - 00000000 11111110 00000000 = 00 FE 00
…
…
```

The 0° and 90° font data is then sent to the printer in line order.

0° Data

```
00 7C 00 00 7C 00 00 7C 00 00 FE 00 …
```




```
Line 1 - 01 10000000 00000000 00000000 = 01 80 00 00
Line 2 - 01 11100000 00000000 00000000 = 01 E0 00 00
Line 3 - 01 11111100 00000000 00000000 = 01 FC 00 00
Line 4 - 00 11111111 00000000 00000000 = 00 FF 00 00
…
…
```

90° Data

```
01 80 00 00 01 E0 00 00 01 FC 00 00 00 FF 00 00 …
```

^ee Command – Error Report - Immediate

Description: Use this command to get printer error and status report immediately. The **^ee** command must be sent via the RS-232 serial interface.

The printer will report 4 bytes back to host in the following format:

XX<CR><LF>

XX = Error/Status code
<CR> = Carriage Return (ASCII 13 dec.)
<LF> = Lin Feed (ASCII 10 dec.)

Syntax: **^ee**

Parameters: **None**

Code	Error/Status Description
00	No Error
01	Syntax Error
02	Object Exceeded Label Border
03	Bar Code Data Length Error (eg.: ENA-13 is a 12 or 13 digit only)
04	Insufficant Memory to Store Data
05	Memory Configuration Error
06	RS-232 Interface Error
07	Paper or Ribbon Empty
08	Duplicate Name: Form, Graphic or Soft Font
09	Name Not Found: Form, Graphic or Soft Font
10	Not in Data Entry Mode (See **?** Command)
11	Print Head Up (Open)
12	Pause Mode or Paused in Peel mode
50	Printer Busy - Processing Print Job
80*	Unknown
81*	Cutter Jammed or Not Installed
82*	AutoSense or Sensor Failure
83*	Illegal Interrupt occurred
84*	Excessive Media Feeding

* - Requires Intervention: Press Feed or Reset (**^@** command)

eR Command – User Defined Error/Status Character

Description: This command allows the advanced programmer to specify the printer's error/status report character for error reporting via the RS-232 serial interface.

Syntax: **eRp_1,p_2**

Parameters: **p_1** = Any single ASCII character
Range: 0-255 decimal (00-FF hexidecimal)

p_2 = Error/Status Response Mode

p_2	**Mode Descriptions**
0	**Standard (default):** **XON** (17 dec. / 11 hex.) on Error **XOFF** (19 dec. / 13 hex.) on Recovery
1	**Character Only**: Reports the selected error/status character followed by a Carriage Return and Line Feed.
2	**Character & Error/Status Code:** Reports the selected error/status character, error/status code (see page G-9 for codes), and then by a Carriage Return and Line Feed.

Example: *For Mode 2 Error and Status Reporting:*

eR$,2↵	*: Sets Error Character to "$" and* *: Sets Error Mode to "2".*
	: User operates and prints with printer. *: User opens print head.*
$11↵	*: Reports Print Head Open*
	: User closes print head
$00↵	*: Reports No Error* *: Printer Ready for next command.* *: (Status report for Print Head Closed)*

O Command - Options Select

Description Use this command to select various printer options. Options available vary by printer model.

Syntax **O[C[p_1], D, d, P, S]**

Parameters **d**= Disable ***Diagnostic Dump Mode***. P2242 only - Disables the printer's AutoSense Dump Mode Printout. The setting is stored in nonvolatile memory. Sending a **0** command without the **d** will reset the Dump Mode operation.

S = Reverse the ***Transmissive (Gap) Sensor Operation.*** This option is designed to allow use of transparent media and liner with a opaque mark between labels. The transmissive (gap) sensor is used to detect this mark which can be on the top or back side of the transparent liner.

C = Enable optional ***Label Liner Cutter***. See Appendix F, page F-E for more details.

See Section 2, page 2-39 for more details on the following.

D = Enable ***Direct Thermal Mode.***

P = Enable ***Label Dispense Mode - Standard***

L = Enable ***Label Dispense Mode - Tap to Feed***.

Examples:

```
O          :disables all options.
OC         :enables cutter only, labels are cut after each
           :label is printed, disables all other options
OD         :enables direct thermal mode on thermal transfer
           :printers, disables all other options
Od         :disables diagnostic dump mode and disables
           :all other options

OCb        :labels are cut after a batch of five has printed,
...        :disables all other options
P5         :Sets the number of labels to print before the cut
```

oW Command – Customize Bar Code Parameters
oB Command - Cancel Customized Bar Code

Description: This command allows the advanced programmer to modify specific bar code parameters to exceed the specified bar code's design tolerances, i.e. reduce the bar code size.

Using the **oW** command may cause bar codes to become unreadable by some or all bar code scanners.

Syntax: **oWp_1,p_2,p_3,p_4,p_5**

oB

Parameters: **p_1** = Initial width narrow white bar.
Default value is 2

p_2 = Initial width narrow black bar.
Default value is 2

p_3 = Initial width wide white bar.
Default value is 4

p_4 = Initial width wide black bar.
Default value is 4

p_5 = Initial bar code gap.
Default value is 3

The **oW** and oB commands are global printer commands.

- ❏ They can not be issued inside of a form.
- ❏ They must be issued prior to issuing a bar code command (and printing).
- ❏ Use only one bar code format. Using more than one bar code may cause unpredictable results or operation.
- ❏ Issue all 5 command parameters (p1-5). Use the default parameter values as place holders.
- ❏ Bar code printed with this command should be printed in the picket fence orientation (0° & 180° rotations) to maximize scanning.

oW Command – Customize Bar Code Parameters
oB Command - Cancel Customized Bar Code

Reset the printer with a **^@** command with flash firmware printers or cycle printer power to clear the **oW** command and return the printer to normal operation.

The **oW** command has been tested for parameter functionality for Bar Code 39 only. The **oW** command may also function with Codabar and Interleaved 2 of 5 bar code, but they have not been functionally verified for this command.

Zebra does not warrant, support, or endorse the use of bar codes generated by the printer after a **oW** command has been issued.

Zebra does not support this feature other than with the information supplied in this document.

oR Command –Character Substitution (Euro)

Description: This command allows the advanced programmer to substitute the Euro currency character for any ASCII character in printer resident fonts 1-5.

The original character can be restored by sending the **oR** command without a parameter. Example of Euro Currency Symbol is shown below.

Syntax: **oR**[$\mathbf{p_1}$, $\mathbf{p_2}$]

Parameters: $\mathbf{p_1}$ = E
If the $\mathbf{p_2}$ parameter is not provided, then the Euro character will map to code page position 213 decimal (D5 hexadecimal) for all code pages.

p_2 = Decimal number, Range 0 to 255
The active code page's ASCII character map position to be replaced by the Euro character. The Euro character will be active in this map position for all code pages.
See the I command for details on code page selection.

None = No Parameters ($\mathbf{p_1}$/$\mathbf{p_2}$) resets to all code pages to original default character mapping.

The **oR** command is a global printer command.

- ❑ It can not be issued inside of a form.
- ❑ It must be issued prior to issuing a text command (and printing).
- ❑ Effects a single character on a single code page. Changing the character position will restore the original character.
- ❑ The character substitution is saved like printer configuration parameters (Density, Serial Port Data Rate, Options, etc.).

oR Command –Character Substitution (Euro)

- ❑ Flash memory printer parameter data is preserved until it is changed by the **oR** command or reprogramming of the printer.
- ❑ SRAM memory storage printer parameter data is lost when the memory cartridge is formatted or the battery power is removed. The character substitution will remain until it is changed by the **oR** command or the memory cartridge is exchanged.

Example:

oRE↵	*: Places the Euro character into character* *: map position 213 decimal* *: (D5 hexadecimal)*
oRE,128↵	*: Places the Euro into character map* *: position 128 decimal (80 hexadecimal)*
oR↵	*: Clears Character Substitution,* *: Restores default character maps*

p Command – Reset Top of Form Sensing

Description: This command allows the advanced programmer to reset the default parameters for top of form sensing. The command resets the tear, peel, gap, black line, and cut positions that are stored in the printer.

Syntax: **pp$_1$,p$_2$,p$_3$,p$_4$,p$_5$**

Parameters: **p$_1$** = 0 (Default Value)
p$_2$ = 0 (Default Value)
p$_3$ = 0 (Default Value)
p$_4$ = 0 (Default Value)
p$_5$ = 0 (Default Value)

The **p** command is a global printer command.

- ❑ It can not be issued inside of a form.
- ❑ It must be issued prior to any other form control command.
- ❑ Used for troubleshooting purposes only.
- ❑ Issue all 5 command parameters (**p$_{1-5}$**). Use the default (0) parameter values only!

Example: *p0,0,0,0,0↵*

Zebra does not support this feature other than the information supplied in document. Do not use this command to change control printer control parameters.

Flash Programmed Printers - If this command was used to correct printer operation, the printer may need the printer's firmware reloaded to help ensure proper operation. The printer's firmware may be corrupted.

r Command – Buffer Mode

Description: Use this command to disable or reenable the double buffer image (label) printing. The double buffer feature is a automatically tested and set by the **q** command.

Syntax: **rp_1**

Parameters: **p_1** = **N** - Disable Double Buffer Mode
Y - Re-enable the Double Buffer Mode if the printer memory supports the image buffer size set by **Q** and **q** parameters

The **rN** command must follow the **q** command in a form (label) program.

Verify the image buffer status with the **U** command(s). See the **U** command on page 2-52, for samples of the Dump Mode Printout.

U Commands - Advanced Status Commands

Description These commands allow the advanced programmer to request and control specific printer status conditions, print process controls and printer configuration.

Syntax **Up$_1$**

p1	Description
A	Enable Clear Label Counter Mode
B	Reset Label Counter Mode
E	External Font Information Inquiry
F	Form Information Inquiry
G	Graphics Information Inquiry
I	Enable Host Prompts/Codepage Inquiry
M	Codepage & Memory Inquiry
N	Disable Error Reporting
P	Codepage & Memory Inquiry/Print
Q	Configuration Inquiry
S	Enable Error Reporting

UA Command - Enable Clear Label Counter Mode

Description Use this command to clear the label counter if a paper empty occurs. The EPL2 printer, by default, will resume printing if the empty roll is replaced with new roll (or ribbon) and finish a batch print job

Syntax **UA**

A power cycle, reset, or **UB** command will clear this setting.

Example: **UA**↵

UB Command - Reset Label Counter Mode

Description Use this command to clear the **UA** command and restore the default setting to allow the printer to resume printing a batch job if a paper empty occurs. The EPL2 printer, by default, will resume printing if the empty roll is replaced with new roll (or ribbon) and finish a batch print job

Syntax **UB**

Example: **UB**↵

UE Command - External Font Information Inquiry

Description This command will cause the printer to send information about external fonts currently stored in the printer back to the host.

Syntax **UE**
The printer will send the number of external fonts stored and each font's name, height and direction, to the host through the RS-232 port.

Example: **UE**↵

Will Produce:

###	*:number of external fonts*
A,xxx,y	*:first font*
...	*:A=fontname*
...	*:xxx=font height in dots*
...	*:y=direction (0=0 , 1=90 , 2=both)*
A,xxx,y	*:last font*

UF Command - Form Information Inquiry

Description This command will cause the printer to send information about forms currently stored in the printer back to the host.

Syntax **UF**
The printer will send the number of forms stored and each form's name to the host through the RS-232 port.

Example: **UF**↵

Will Produce:

###	*:number of forms*
FORMNAME1	*: first form name*
FORMNAME2	*:second form name*
...	
FORMNAMEn	*:last form name*

UG Command - Graphics Information Inquiry

Description This command will cause the printer to send information about graphics currently stored in the printer back to the host.

Syntax **UG**
The printer will send the number of graphics stored and each graphic's name to the host through the RS-232 port.

Example: **UG**↵

Will Produce:

###	*:number of graphics*
GRAPHICNAME1	*: first graphic name*
GRAPHICNAME2	*::second graphic name*
...	
GRAPHICNAMEn	*:last graphic name*

UI Command - Host Prompts/Codepage Inquiry

Description This command will cause the printer to enable prompts to be sent to the host and it will send the currently selected codepage to the host through the RS-232 port.

Syntax **UI**
The printer will send information about the currently selected code page back to the host in the following format:.

UIp_1,p_2,p_3

p_1 = Number of data bits.
p_2 = Code page.
p_3 = Country code.

The KDU automatically sends this command each time power is applied. The **UI** command is disabled by removing power from the printer for 60 seconds.

Example: **UI**↵

See Also: **I** and **U** commands.

UM Command - Codepage & Memory Inquiry

Description This command will cause the printer to **send to the host** of the currently selected codepage and memory status through the RS-232 port.

Syntax **UM**

The printer will send information about the currently selected code page and memory status back to the host in the following format:.

UMp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,p_9

p_1 = Image buffer size in KBytes.

p_2 = Form memory allocation size in KBytes.

p_3 = From memory free in KBytes.

p4 = Graphic memory allocation size in KBytes.

p_5 = Graphic memory free in KBytes.

p_6 = External font memory allocation size in KBytes.

p_7 = External font memory free in KBytes.

p_8 = Number of data bits.

p_9 = Code page.

p_{10} = Country code.

Example: **UM**↵

See Also: **I, M, U, UI** and **UP** commands.

UN Command - Disable Error Reporting

Description Cancels **US** command

Syntax **UN**

UP Command - & Memory Inquiry/Print

Description This command will cause the printer to **print and send** the currently selected codepage and memory **status to the host** through the RS-232 port.

Syntax **UP**

The printer will send information about the currently selected code page and memory status back to the host followed by printing the current printer configuration. For an example of the configuration printout, see the **U** command.

The format of the data sent to the host is as follows:

UPp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,p_9

- **p_1** = Image buffer size in KBytes.
- **p_2** = Form memory allocation size in KBytes.
- **p_3** = From memory free in KBytes.
- **p_4** = Graphic memory allocation size in KBytes.
- **p_5** = Graphic memory free in KBytes.
- **p_6** = External font memory allocation size in KBytes.
- **p_7** = External font memory free in KBytes.
- **p_8** = Number of data bits.
- **p_9** = Code page.
- **p_{10}** = Country code.

Example: **UP**↵

See Also: **I, M, U, UI** and **UM** commands.

UQ Command - Configuration Inquiry

Description Use this command to send the printer configuration information back to the host via the serial port.

Syntax **UQ**

The printer will send the printer configuration, line by line, in ASCII to the host through the RS-232 port. The information matches the configuration information printed in final phase of the printer's AutoSense routine, the Dump Mode Printout or the **U** command printout.

The information and number of lines of data sent by the printer will vary from printer to printer depending upon the type of printer and options installed.

Example: **UQ**↵

US Command - Enable Error Reporting

Description Use this command to enable the printer's status reporting feature.

- **Serial Port** - If an error occurs, the printer will send a NACK(0x15), followed by the error number, to the computer. If no errors occur, the printer will echo ACK(0x6) after each **P** command.
- **Parallel Port** - If an error occurs, the printer will print the error number and the printer's indicator(s) LED will indicate an error condition. See the individual printer user's manual for details.
- If paper or ribbon empty occurs, the printer will send, through the serial port, a"-07" and "Pnnn" where nnn is the number of labels remaining to print.

Syntax **US[p_1]**
The printer's default setting is off.

Parameters **p_1 = Optional** - If no errors occur, the printer will echo ACK(0x6) after each label that is successfully printed.

Error codes on following page

US Command - Enable Error Reporting

Code	Error/Status Description
00	No Error
01	Syntax Error
02	Object Exceeded Label Border
03	Bar Code Data Length Error (eg.: ENA-13 is a 12 or 13 digit only)
04	Insufficant Memory to Store Data
05	Memory Configuration Error
06	RS-232 Interface Error
07	Paper or Ribbon Empty
08	Duplicate Name: Form, Graphic or Soft Font
09	Name Not Found: Form, Graphic or Soft Font
10	Not in Data Entry Mode
11	Print Head Up (Open)
12	Pause Mode or Paused in Peel mode
50	Does not fit in area specified
51	Data length to long
93	PDF-417 coded data to large to fit in bar code

W Command - Windows Mode

Description This command is used to disable/re-enable the Windows command mode.

Syntax **Wp_1**

Parameters **p_1** = Windows Mode Enabled.
Values = **Y** for enabled (default)
N for disabled

When enabled, the printer will accept Windows mode escape sequences to print data. When disabled, escape sequences will be ignored.

The Windows mode escape sequences are only used by the optional Windows printer driver. When working with a main frame or other non-Windows host, this mode can be disabled to prevent erratic operation.

^@ Command - Reset Printer

Description This command is used to reset the printer.

Syntax ^@↵ *:where ^is 94 decimal*

This command emulates Power Off and then Power On; thus reinitializing the printer.

- The reset command is unavailable during the operation of storing PCX graphics, soft fonts or while the printer is in dump mode.
- The reset command cannot be used in a stored form.
- The reset command can be sent to the printer during all other printing operations.
- The printer will ignore all commands sent while the reset command is executing, up to 2 seconds.

Example: ^@↵ *:The printer will reset*

AUTOFR - Automatic Form Printing Feature

Description: This special form process allows you to detach the printer from the computer and print in a standalone mode. The EPL2 printer reserves the form name **AUTOFR** to allow the printer to automatically start a form when the printer is initialized power-up. This feature can be used in many ways:.

- Feed a single in peel mode and printing multiple labels set to the number of labels on the roll.
- Have a form with a variable and enter the variable with a scanner, terminal, weight scale, circuit analyzer or any other device capable of sending ASCII character data.

Using AUTOFR: Download a form to the printer with the name **AUTOFR**.

Example:

```
↵                          :Line Feed to initialize the printer
FK"AUTOFR"↵                :Form Kill (delete any existing AUTOFR)
FS"AUTOFR"↵                :Form Save (save file from here to FE at
                           : the bottom)
V00,8,L,""↵                :Variable field definition
Q254,20↵                   :Label height followed by gap width
S2↵                        :Speed (2ips)
D7↵                        :Density setting
ZB↵                        :Print direction (ZT flips it 180 degrees)
A340,20,0,4,1,2,N,"QUANTITY"↵
                           :Fixed text line
B265,75,0,3,2,4,101,B,V00↵
:Bar code definition
PA1↵                       :Print 1 label Automatically *
FE↵                        :Form End (Line Feed)
```

* - If using the CAL TOOLS, CAL WIN, etc. programs to generate label files (files with **.ejf** extensions), then the **PA** command must be added manually by editing the .ejf file.

AUTOFR - Automatic Form Printing Feature

AUTOFR treats any incoming data as a variable intended for printing. This means if you send the printer a memory partition command, the label will print, if you send a delete command - the label will print! So, while you are testing **AUTOFR** it is best to use another name for the form. Once you are satisfied with the form, rename it **AUTOFR** before you download it. There is no need to specify a file extension.

Isolating Data From the Input Device

Place the printer in the diagnostic dump mode and send from your data input device. All characters the device sends will be printed on the label.

- If nothing prints, nothing is arriving - check pin-outs and serial settings.

Disabling AUTOFR

Serial Port

Send a XOFF data character (19 hex. or ASCII 13) to the printer.

The form may now be deleted from the printer.

dump Command – Enable Dump Mode

Description: This command allows the advanced programmer to force a user diagnostic "data dump" mode. Sending the dump command to the printer allows the programmer to compare actual data sent to printer with the host program.

Send data to the printer after the dump command has been issued to evaluate program and printer control data. The printer will process all data bytes into ASCII character data , range 0-255 decimal (00-FF hexadecimal).

Press the printer's Feed button until "Out of Dump" is printed or power cycle the printer to terminate the dump mode.

Syntax: **dump**

Parameters: None

Use the "Dump Mode" character map in Appendix A of the EPL2 programmer's manual to interpret the dump mode data (characters printed on the labels) back into ASCII data.

Graphics data dump may be large and require multiple labels to print.

Set the image buffer width with the **q** command to match the media width prior to issuing the dump command.

Flash based printer models require that the Feed button to be pressed to view dump data that exceeds a single label's print area. Press the Feed button again to view more dump data. Pressing the Feed button after the dump data is finished printing will cause the printer to exit the dump mode.

Example: dump↵

Appendix H - Programming Examples

This section has examples that outline the basic steps needed to program various form/label elements. The examples cover three areas: printing immediately, storing forms (labels) and recalling forms (labels).

- ❑ **Printing Immediately** is primarily used to create and test label/form formats prior to storage in the printer's (nonvolatile) memory or into the host's application program.

- ❑ **Storing and Recalling Forms** is used to minimize label download time and external programming requirements. This also allows the user to operate the printer with the Eltron KDU (Keyboard Display Unit).

The examples in this appendix have been created with a TLP2642 printer, unless noted otherwise.

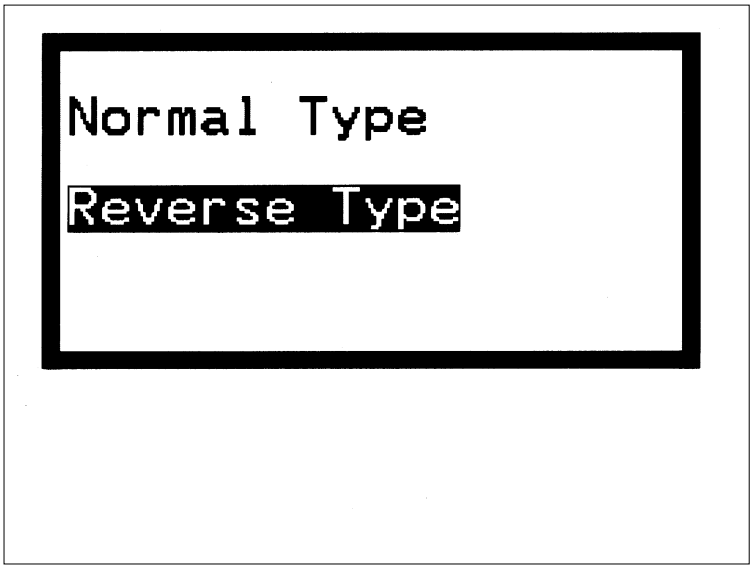
The TLP2642 is a thermal transfer/direct thermal printer with a 203dpi print resolution and 4 inch print width. The printer memory configuration is set to default and is SRAM memory.

Example 1 - Text and Line Graphics This label has basic text and line graphics.

Example 1:

```
↵
OD↵
N↵
D7↵
S2↵
ZT↵
Q609,24↵
q784↵
X30,30,20,750,400↵
A60,100,0,2,3,3,N,"Normal Type"↵
A60,200,0,2,3,3,R,"Reverse Type"↵
P1↵
```

Will Produce:



Programming Breakdown:

Programming	Description
↵	Initialize printer
OD↵	Set option for direct thermal printing
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D7↵	Density - Recommended, interacts with speed
S2↵	Speed - Recommended, interacts with density
ZT↵	Image Buffer Direction - Optional
Set Label Parameters	
Q609,24↵	1) Sets Label (Image Buffer) and Gap Lengths 2) Sets media detection to Transmissive (Gap) sensor
q784↵	Sets Image Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
X30,30,20,750,400↵	Box Graphic
A60,100,0,2,3,3,N,"Normal Type"↵	Normal Text, No Rotation
A60,200,0,2,3,3,R,"Reverse Type"↵	Reverse Text, No Rotation
Label/Form Completion	
P1↵	Print one label

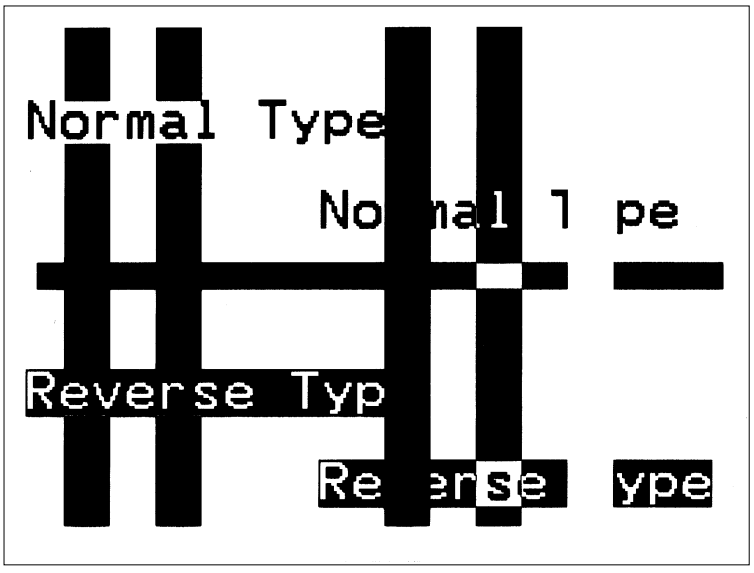
Example 2 - Text and Line Graphic Interactions

This label demonstrates text and line graphic interaction. The print mode has been reset to the default "thermal transfer" mode with the **O** command to guarantee thermal transfer operation.

Example 2:

```
↵
O↵
N↵
D8↵
S2↵
Q609,24↵
q784↵
LO50,20,50,550↵
LE150,20,50,550↵
LW250,20,50,550↵
LO20,280,750,30↵
A10,100,0,2,3,3,N,"Normal Type"↵
A330,200,2,3,3,N,"Normal Type"↵
A10,400,0,2,3,3,R,"Reverse Type"↵
A330,500,0,1,3,3,R,"Reverse Type"↵
LO400,20,50,550↵
LE500,20,50,550↵
LW600,20,50,550↵
P1↵
```

Will Produce:



Programming Breakdown:

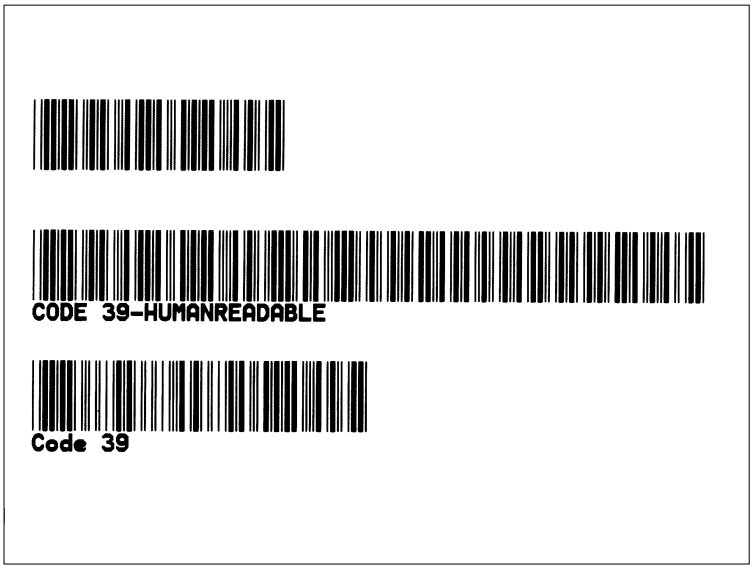
Programming	Description
↵	Initialize Printer
O↵	Resets print method to thermal transfer
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D8↵	Density - Changed from default to 8 for optimum print quality with the selected transfer ribbon and media
S2↵	Speed - Recommended, interacts with density
ZT↵	Image Buffer Direction - Optional
Set Label Parameters	
Q609,24↵	1) Sets Label (Image Buffer) and Gap Lengths 2) Sets media detection to Transmissive (Gap) sensor
q784↵	Sets Image Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
Bottom group - lines	
LO50,20,50,550↵	Simple Line Graphic - Vertical (Left)
LE150,20,50,550↵	Exclusive OR Line - Vertical (Left)
LW250,20,50,550↵	White Line Graphic - Vertical (Left)
Middle group - text & lines	
LO20,280,750,30↵	Simple Line Graphic - Horizontal
A10,100,0,2,3,3,N,"Normal Type"↵	Text - Top Left
A330,200,2,3,3,N,"Normal Type"↵	Text - Top Right
A10,400,0,2,3,3,R,"Reverse Type"↵	Text - Bottom Left
A330,500,0,1,3,3,R,"Reverse Type"↵	Text - Bottom Right
Top group - lines	
LO400,20,50,550↵	Simple Line Graphic - Vertical (Right)
LE500,20,50,550↵	Exclusive OR Line - Vertical (Right)
LW600,20,50,550↵	White Line Graphic - Vertical (Right)
Label/Form Completion	
P1↵	Print one label

Example 3 - Bar Code Variables This label demonstrates bar code implementations using Code 39 (with automatic extended character set).

Example 3:

```
↵
OD↵
N↵
D7↵
S2↵
Q609,24↵
q784↵
B10,150,0,3,2,6,80,N,"CODE 39"↵
B10,300,0,3C,2,6,80,B,"CODE 39 - HUMANREADABLE"↵
B10,450,0,3,2,6,80,B,"Code 39"↵
P1↵
```

Will Produce:



Programming Description:

Programming	Description
↵	Initialize printer
OD↵	Set direct thermal mode
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D8↵	Density
S2↵	Speed
Set Label Parameters	
Q609,24↵	Label and Gap Lengths and selects Transmissive (Gap) sensor
q784↵	Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
B10,150,0,3,2,6,80,N,"CODE 39"↵	Bar Code - No human readable text
B10,300,0,3C,2,6,80,B,"CODE 39 - HUMAN READABLE"↵	Bar Code with human readable text below bar code and check digit. The Code 39 check digit does not display in human readable text.
B10,450,0,3,2,6,80,B,"Code 39"↵	Code 39 Extended set is applied automatically to lower case characters .
Label/Form Completion	
P1↵	Print one label

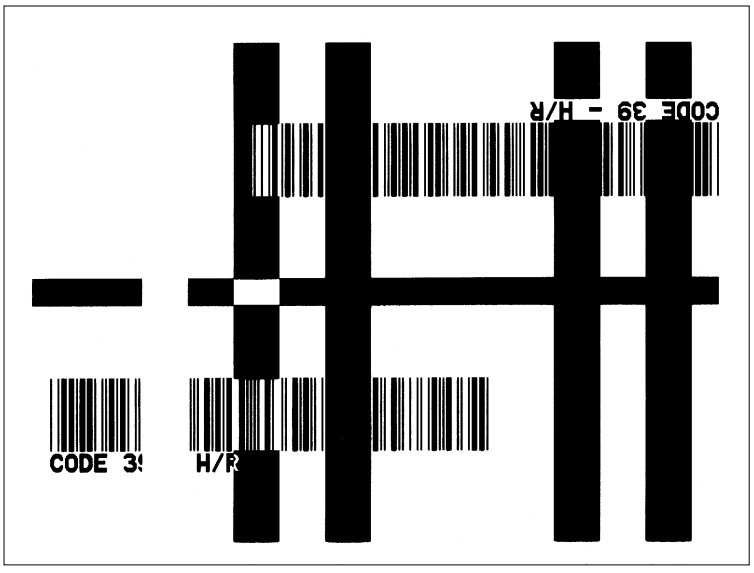
Example 4 - Bar Code and Line Graphics Interaction

This label demonstrates bar code and line graphic interaction.

Example 4:

```
↵
O↵
N↵
D5↵
S1↵
Q609,24↵
q784↵
LO50,20,50,550↵
LE150,20,50,550↵
LW250,20,50,550↵
LO20,280,750,30↵
B750,200,2,3,2,6,80,B,"CODE 39 - H/R"↵
B20,400,0,3C,2,6,80,B,"CODE 39 - H/R"↵
LO400,20,50,550↵
LE500,20,50,550↵
LW600,20,50,550↵
P1↵
```

Will Produce:



Programming Breakdown:

Programming	Description
↵	Initialize printer
O↵	Reset printer defaults - set thermal transfer mode
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D5↵	Density - Adjust to match printing method
S1↵	Speed - Adjust to match printing method
Set Label Parameters	
Q609,24↵	Label and Gap Lengths and selects Transmissive (Gap) sensor
q784↵	Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
LO50,20,50,550↵	Simple Line Graphic - Vertical (Left)
LE150,20,50,550↵	Exclusive OR Line - Vertical (Left)
LW250,20,50,550↵	White Line Graphic - Vertical (Left)
LO20,280,750,30↵	Simple Line Graphic - Horizontal
B750,200,2,3,2,6,80,B,"CODE 39 - H/R"↵	Bar Code, Rotation 180° - Bottom Left
B20,400,0,3C,2,6,80,B"CODE 39 - H/R"↵	Bar Code w/Check Digit - Top Right
LO400,20,50,550↵	Simple Line Graphic - Vertical (Right)
LE500,20,50,550↵	Exclusive OR Line - Vertical (Right)
LW600,20,50,550↵	White Line Graphic - Vertical (Right)
Label/Form Completion	
P1↵	Print one label

Example 5 - Sequencing Graphic Elements

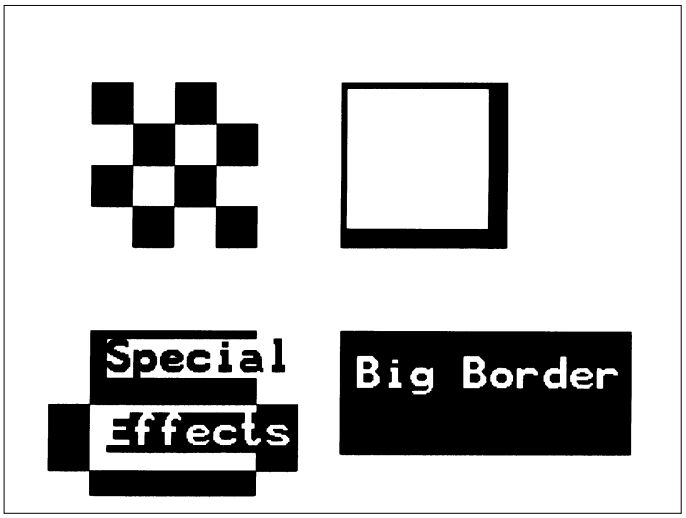
The order that graphic elements get placed in the image (buffer) effect the print results.

- Standard black graphics (text, lines, boxes, PCX graphics, etc.) should be placed first.
- **LW** command ,White lines (rectangles), elements should be placed next.
- **LE** command, Exclusive-ORed (reverse image) color should be placed last.

Example 5:

```
↵
N↵
D8↵
S2↵
Q609,24↵
q784↵
LO100,100,200,200↵
LO400,100,200,200↵
LO100,400,200,200↵
A420,430,0,4,2,2,N,"Big Border"↵
A120,475,0,4,2,2,N,"Effects"↵
A120,410,0,4,2,2,N,"Special"↵
LW100,150,200,50↵
LW100,250,200,50↵
LW407,107,170,170↵
LE150,100,50,200↵
LE250,100,50,200↵
LE50,450,300,100↵
LE400,400,350,150↵
P1↵
```

Will Produce:



Using the **LE** line element for creating Reversed Text is the most versatile and recommend) method of generating this type of text.

Programming Breakdown:

Programming	Description
↵ *N*↵	Initialize printer Clear the image buffer
Set Printer Control Parameters and Options	
D8↵ *S2*↵	Density - Adjust to match printing media & speed Speed - Adjusted to match print quality & density
Set Label Parameters	
Q609,24↵ *q784*↵	Label and Gap Lengths and selects Transmissive (Gap) sensor Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
LO100,100,200,200↵ *LO400,100,200,200*↵ *LO100,400,200,200*↵ *A420,420,0,4,2,2,N,"Big Bor - der"*↵ *A120,410,0,4,2,2,N,"Special"*↵ *A120,500,0,4,2,2,N,"Effects"*↵	Simple Line Graphic - Box for check pattern Simple Line Graphic - Box for offset border Simple Line Graphic - Box for check pattern Text inside the inverse image line (box) Text placed over line (square) Text placed over line (square) and inverted with **LE** line below
LW100,150,200,50↵ *LW100,250,200,50*↵ *LW407,107,170,170*↵	White Line - Bar of check pattern White Line - Bar of check pattern White Line (box) - Offset border
LE150,100,50,200↵ *LE250,100,50,200*↵ *LE50,450,300,100*↵ *LE400,400,350,150*↵	Exclusive OR Line -Inverts bars for check pattern Exclusive OR Line -Inverts bars for check pattern Exclusive OR Line -Invert bar across line & text “Effects” Exclusive OR Line -Invert bar across text “Big Border”
Label/Form Completion	
P1↵	Print one label

Example 6 - Steps for Downloading a PCX Graphic

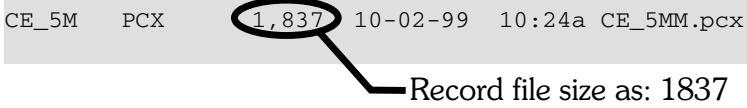
Use the following steps for downloading a PCX graphic file to a printer with a flash (nonvolatile) memory card installed with DOS operating system commands. This procedure may also be done from within a MSDOS™ window from a Windows® operating system. See the **M**, **EI**, **FI**, **GI** & **U** commands to manage the printer's memory.

Step 1 Generate the PCX graphic file with the following considerations:

- Black and White (Bitmap) only.
- Set Dot Density (Resolution) of the bitmap to match the printer's print head resolution. All EPL2 printers have a 203 dpi (dots per inch) resolution except the TLP3642 has a 300 dpi resolution.
- Crop the image as small as possible to speed printing and maximize memory usage.
- The file's name should be 1 to 7 characters long followed by the PCX DOS file extension. Examples: WORLD.PCX
- Graphic file size can not exceed available printer memory.

Step 2 Type DIR *.PCX at the DOS prompt (example A:>), in the disk/directory that the PCX graphic file is stored in. Read and record the file size for the file(s) to be downloaded.

```
A:\>DIR *.PCX

 Directory of A:\

WORLD   PCX      4,398  10-01-99  12:01p World.pcx
CE_5M   PCX      1,837  10-02-99  10:24a CE_5MM.pcx
```



Step 3 Generate an program (ASCII text) file for each PCX graphic file to be downloaded.

Example:
```
GK"WORLD"↵
GM"WORLD"4398↵
```

Save the file as a 1-8 character file name and include a 1-3 character extension that the text editor can recognize. Always save files in ASCII text format.

Example: *STOREIT1.TXT*

Step 4 Verify that printer has memory available to download the graphics. See the **M**, **FI**, **GI** & **U** commands to verify and manage the printer's memory.

Step 5 Use the DOS COPY command to download files to printer memory.

Example:
```
COPY STOREIT1.TXT + WORLD.PCX  LPT1  /b
```

Step 6 Repeat process for each PCX graphic.

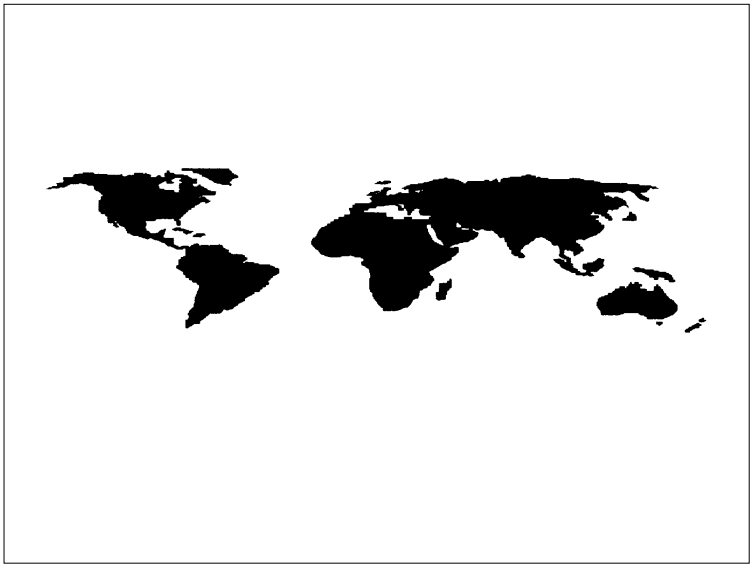
Example 7 - Printing A PCX Graphic

This example demonstrates printing a label with a graphic, immediately, by importing a preloaded PCX graphic from memory. This is the easiest method to layout and test a label prior to downloading it as a form. The PCX graphic should be pre-sized for the printer resolution, orientation and print dimensions.

Example 7:

```
↵
OD↵
N↵
D8↵
S2↵
Q609,24↵
q784↵
GG50,50,"WORLD"↵
P1↵
```

Will Produce:



Programming Breakdown:

Programming	Description
↵	Initialize the printer
OD↵	Set direct thermal mode
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D8↵	Set Density
S2↵	Set Speed
Set Label Parameters	
Q609,24↵	Label Length and Gap
q784↵	Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
GG50,50,"WORLD"↵	Loads PCX graphic stored as WORLD, directly into image buffer from the printer memory.
Label/Form Completion	
P1↵	Print one label

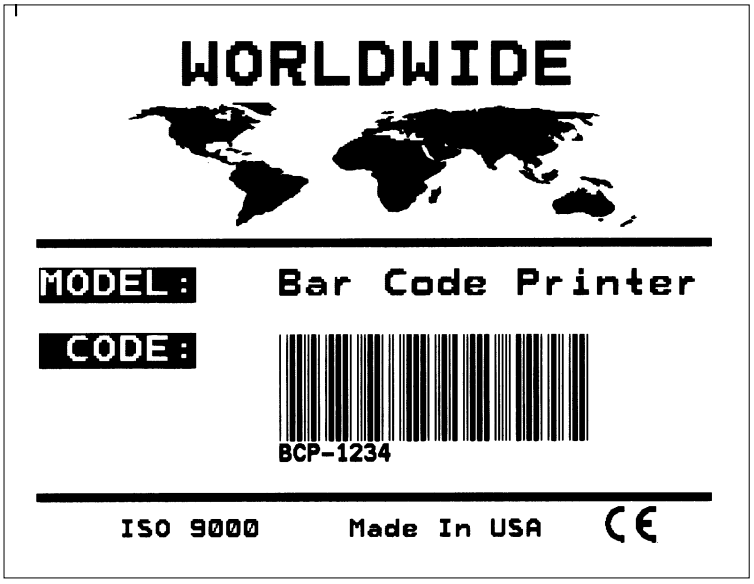
Example 8 - Printing Immediately: Putting It All Together

This example demonstrates printing a complete label with text, bar code, and graphic elements. The label uses preloaded PCX graphics from printer memory for fast label download.

Example 8:

```
↵
OD↵
N↵
D5↵
S2↵
Q609,24↵
q784↵
GG100,70,"WORLD"↵
A170,5,0,1,5,5,N,"WORLDWIDE"↵
LO5,230,765,10↵
A10,265,0,1,3,3,R,"MODEL:"↵
A280,265,0,1,3,3,N,"Bar Code Printer"↵
A10,340,0,1,3,3,R," CODE: "↵
B280,340,0,3C,2,6,120,B,"BCP-1234"↵
LO5,520,765,10↵
A100,550,0,1,2,2,N,"ISO 9000    Made In USA"↵
GG650,535,"CE_5M"↵
P100↵
```

Will Produce:



Programming Breakdown:

Programming	Description
↵	Initialize printer
OD↵	Set direct thermal mode
N↵	Clear the image buffer
Set Printer Control Parameters and Options	
D8↵	Set Density
S2↵	Set Speed
Set Label Parameters	
Q609,24↵	Label Length and Gap
q784↵	Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
GG100,70,"WORLD"↵	Loads stored PCX graphic WORLD.
A170,5,0,1,5,5,N,"WORLDWIDE"↵	Normal text.
LO5,230,765,10↵	Simple line 10 dots thick.
A10,265,0,1,3,3,R,"MODEL:"↵	Reverse text.
A280,265,0,1,3,3,N,"Bar Code Printer"↵	Normal text in line with “MODEL:” text.
A10,340,0,1,3,3,R," CODE:"↵	Reverse text with leading spaces.
B280,340,0,3C,2,6,120,B,"BCP-1234"↵	Code 39 bar code with human readable and check digit.
LO5,520,765,10↵	Simple line 10 dots thick.
A100,550,0,1,2,2,N,"ISO 9000 Made In USA"↵	Normal text with spaces separating text.
GG650,535,"CE_5M"↵	Loads stored PCX graphic CE_5M
Label/Form Completion	
P100↵	Prints 100 labels

Example 9 - Creating A Form

This example demonstrates form creation and downloading to printer's nonvolatile memory. The form has simple text, bar code, and graphic elements. The label uses a preloaded PCX graphic from printer memory. See Example 6 for graphic downloading.

Example 9:

```
FK"EXAM-09"↵
FS"EXAM-09"↵
D8↵
S2↵
Q609,24↵
q784↵
GG90,80,"WORLD"↵
A180,5,0,4,3,3,N,"WORLDWIDE"↵
A130,250,0,4,2,2,N,"Bar Code Printer"↵
B65,350,0,3,4,12,120,B,"BCP-1234"↵
FE↵
```

Will Produce: (when printed)

Programming Breakdown:

Programming	Description
FK"EXAM-09"↵ *FS"EXAM-09"↵*	Queue form to save to memory. Start form store sequence.
Set Printer Control Parameters and Options	
D8↵ *S2↵*	Set Density Set Speed
Set Label Parameters	
Q609,24↵ *q784↵*	Label Length and Gap Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
GG90,80,"WORLD"↵ *A180,5,0,4,3,3,N,"WORLDWIDE"↵* *A130,250,0,4,2,2,N,"Bar Code Printer"↵* *B65,350,0,3,4,12,120,B,"BCP-1234"↵*	Loads stored PCX graphic WORLD. Normal text. Normal Text Code 39 bar code with human readable.
Label/Form Completion	
FE↵	End form store sequence

Example 10 - Steps for Downloading a Form

Use the following steps for downloading a Form file to printer memory with DOS operating system commands. This procedure may also be done from within a MSDOS™ window from a Windows® operating system. See the **M**, **FI**, **GI** & **U** commands to manage the printer memory.

Step 1 Generate the Form (ASCII text) file. See Example 9.

Step 2 Use the DOS COPY command to download the Form file to the printer memory.

Example: `COPY EXAM-09.TXT LPT1: /b`

Step 3 Continue printer operations or downloading more graphics or forms.

Step 4 Repeat process for each Form to be downloaded.

Example 11 - Creating a Form with Basic Variables

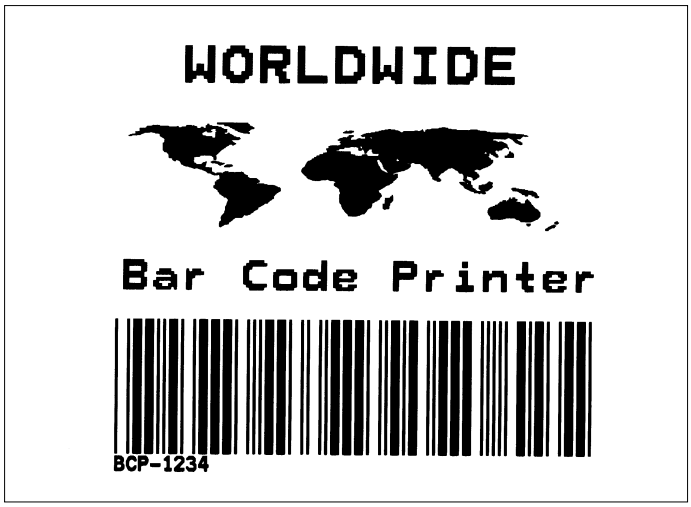
This example demonstrates variable data fields. The variable data fields must be loaded immediately following the **FS** command and prior to any counter variables. Variable data fields are entered when printing the label.

The variables are entered by operator via a terminal device or EPL2 program with the Download Variables (**?**) command. The terminal/printer operator enters the data in after each prompt.

Example 11

```
FK"EXAM-11"↵
FS"EXAM-11"↵
V00,15,C,"Enter company name"↵
V01,17,C,"Enter product name"↵
V02,8,N,"Enter product code"↵
D8↵
S2↵
Q609,24↵
q784↵
GG80,100,"WORLD"↵
A160,1,0,1,5,5,N,V00↵
A0,290,0,1,4,4,N,V01↵
B70,370,0,3,4,12,180,B,V02↵
FE↵
```

Will Produce: (when the form is recalled and printed)



User or Program supplied variables for:
V00 *(prompt= Enter company name) - WORLDWIDE*
V01 *(prompt= Enter product name) - Bar Code Printer*
V02 *(prompt= Enter product code) - BCP-1234*

Programming Breakdown:

Programming	Description
FK"EXAM-11"↵ *FS"EXAM-11"↵*	Queue form to save to printer memory. Start form store sequence.
Set Variables (00-99)	
V00,15,C,"Enter company name"↵ *V01,17,C,"Enter product name"↵* *V02,8,N,"Enter product code"↵*	Set variable "00", max. 15 characters, centered. Set variable "01", max. 17 characters, centered. Set variable "02", max. 8 characters, no justification.
Set Printer Control Parameters and Options	
D8↵ *S2↵*	Set Density Set Speed
Set Label Parameters	
Q609,24↵ *q784↵*	Label Length and Gap Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
GG80,100,"WORLD"↵ *A160,1,0,1,5,5,N,V00↵* *A0,290,0,1,4,4,N,V01↵* *B70,370,0,3,4,12,120,B,V02↵*	Loads PCX graphic. Inserts variable data (V00) when printing label Inserts variable data (V01) when printing label Inserts variable data (V02) when printing label
Label/Form Completion	
FE↵	End form store sequence

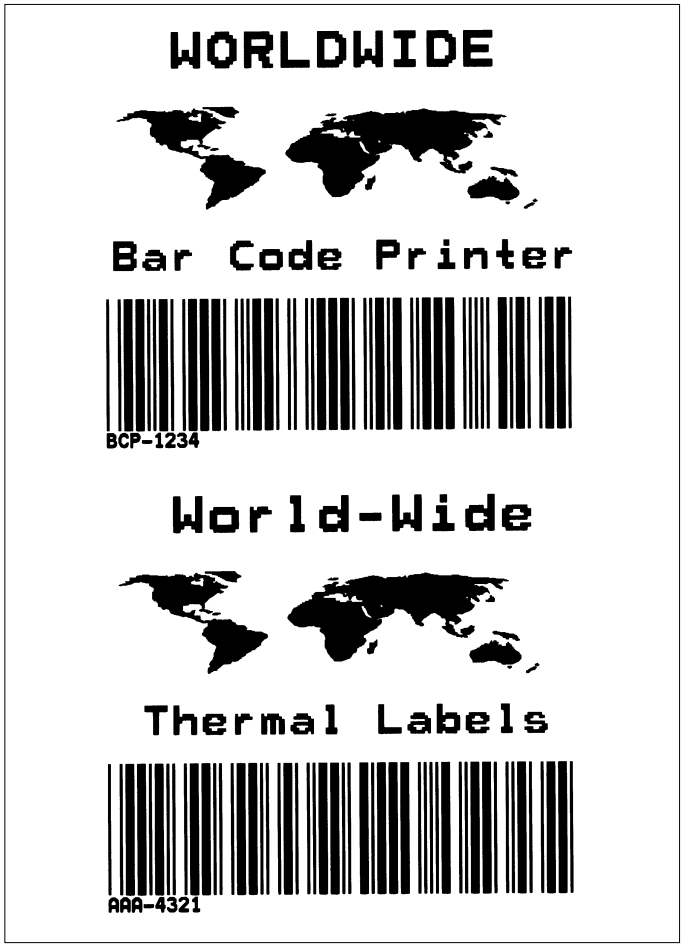
A form can print without a called (**GM**) graphic being present in printer memory. The form will print less any graphics not loaded in memory.

Example 12 - Printing Forms with Variables This example demonstrates access and control of individual forms by programming. The **?** (Download Variables) command is used to directly fill-in data fields.

Example 12:

```
↵
OD↵
FR"EXAM11"↵
?↵
WORLDWIDE↵
Bar Code Printer↵
BCP-1234↵
P1↵
↵
?↵
World-Wide↵
Direct Thermal Media↵
AAA-4321↵
P1↵
```

Will Produce:



Programming Breakdown:

Programming	Description
↵	Initialize printer
OD↵	Set direct thermal print mode Do not place an **O** command inside forms.
FR"EXAM-11"↵	Recall form from the printer memory.
Variables (00-99) and Counters (0-9) - Label #1	
?↵ *WORLDWIDE*↵ *Bar Code Printer*↵ *BCP-1234*↵	Initiates Variable and Counter Download, in sequence Set variable "00", max. 15 characters, centered. Set variable "01", max. 20 characters, centered. Set variable "02", max. 8 characters, no justification.
Print Label	
P1↵	Print Label - Wait for next label's download
Form Break	
↵	Required to separate multiple form (**?** - variable and counter) entry processes for programming compatibility between all EPL2 printers
Variables (00-99) and Counters (0-9) - Label #2	
?↵ *World-Wide*↵ *Direct Thermal Media*↵ *AAA-4321*↵	Initiates Variable and Counter Download, in sequence Set variable "00", max. 15 characters, centered. Set variable "01", max. 20 characters, centered. Set variable "02", max. 8 characters, no justification.
Print Label	
P1↵	Print one label

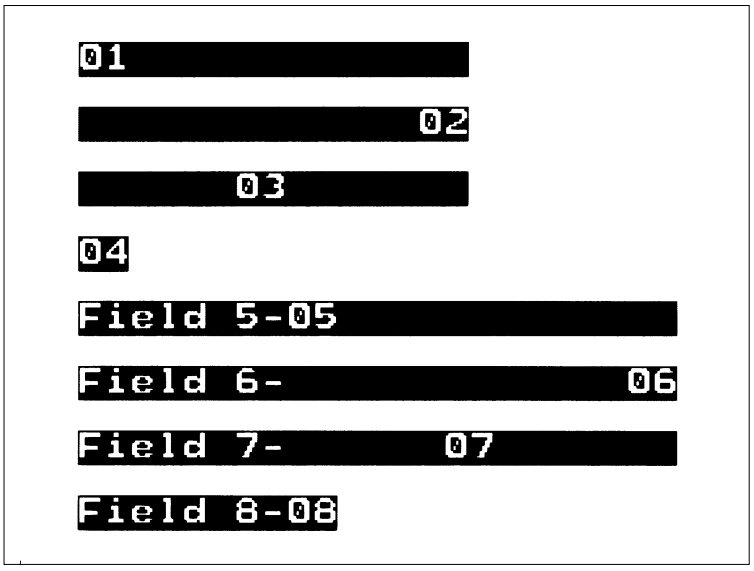
Example 13 - Variable Justification This example demonstrates the variable data justification setting (**p_2=L,R,C and N**) for printing of the data field (**p_3** = variable data field size parameter).

The example uses the **A** (Text) command's reversed text data field to show how the printer treats the different justification options.

Example 13:

```
↵
FK"EXAM-13"↵
FS"EXAM-13"↵
V00,15,L,"Text Field 1"↵
V01,15,R,"Text Field 2"↵
V02,15,C,"Text Field 3"↵
V03,15,N,"Text Field 4"↵
V04,15,L,"Text Field 5"↵
V05,15,R,"Text Field 6"↵
V06,15,C,"Text Field 7"↵
V07,15,N,"Text Field 8"↵
D8↵
Q609,24↵
q784↵
A50,25,0,1,2,2,R,V00↵
A50,100,0,1,2,2,R,V01↵
A50,175,0,1,2,2,R,V02↵
A50,250,0,1,2,2,R,V03↵
A50,325,0,1,2,2,R,"Field 5-"V04↵
A50,400,0,1,2,2,R,"Field 6-"V05↵
A50,475,0,1,2,2,R,"Field 7-"V06↵
A50,550,0,1,2,2,R,"Field 8-"V07↵
FE↵
↵
FR"EXAM-13"↵
?↵
01↵
02↵
03↵
04↵
05↵
06↵
07↵
08↵
P1↵
```

Will Produce:



Example 14 - Creating a Form with Basic Counters

This example demonstrates counter data fields. The counter data fields must be loaded immediately following the **FS** command and all variables, if any are used. Counter data fields are entered at the time of printing the label.

The counter starting values are entered by operator via a terminal device or EPL2 program with the Download Variables (**?**) command. The terminal/printer operator enters the data in after each prompt.

Example 14:

```
FK"EXAM-14"↵
FS"EXAM-14"↵
C0,4,L,+1,"Starting Registration Number:"↵
D8↵
S2↵
Q609,24↵
q784↵
A50,50,0,1,3,3,N,"Registration No.:"C0↵
FE↵
↵
FR"EXAM-14"↵
?↵
1↵
P3↵
↵
?↵
01↵
P3↵
```

Will Produce:

```
Registration No.:1

Registration No.:2

Registration No.:3

Registration No.:0001

Registration No.:0002

Registration No.:0003
```

Programming Breakdown:

Programming	Description
FK"EXAM-14"↵ *FS"EXAM-14"↵*	Queue form to save to printer memory. Start form store sequence.
Set Counters (0-9)	
C0,4,L,+1,"Starting Registration Number:"↵	Set counter "0", max. 4 numbers, left justified
Set Printer Control Parameters and Options	
D8↵ *S2↵*	Set Density Set Speed
Set Label Parameters	
Q609,24↵ *q784↵*	Label Length and Gap Buffer Width (center aligned)
Label Elements (Text, Lines, Bar Codes and Graphics)	
A50,50,0,1,3,3,N,"Registration No.:"C0↵	Inserts counter data (C0) when printing label
Label/Form Completion	
FE↵	End form and save
Load Form/Label	
FR"EXAM-14"↵	Recall form from printer memory
Insert Variables (00-99) and Counters (0-9)	
?↵ *1↵*	Initiates Variable and Counter download, in sequence Insert counter "0" (C0)
Print Label	
P3,1↵	Print 3 Labels - Wait for next command
Form Break	
↵	Required to separate multiple form (**?** - variable and counter) entry processes for programming compatibility between all EPL2 printers
Insert Variables (00-99) and Counters (0-9)	
?↵ *1↵*	Initiates Variable and Counter download, in sequence Insert counter "0" (C0)
Print Label	
P3,1↵	Print 3 Labels - Wait for next command

Example 15 - Numeric Counting and Printing

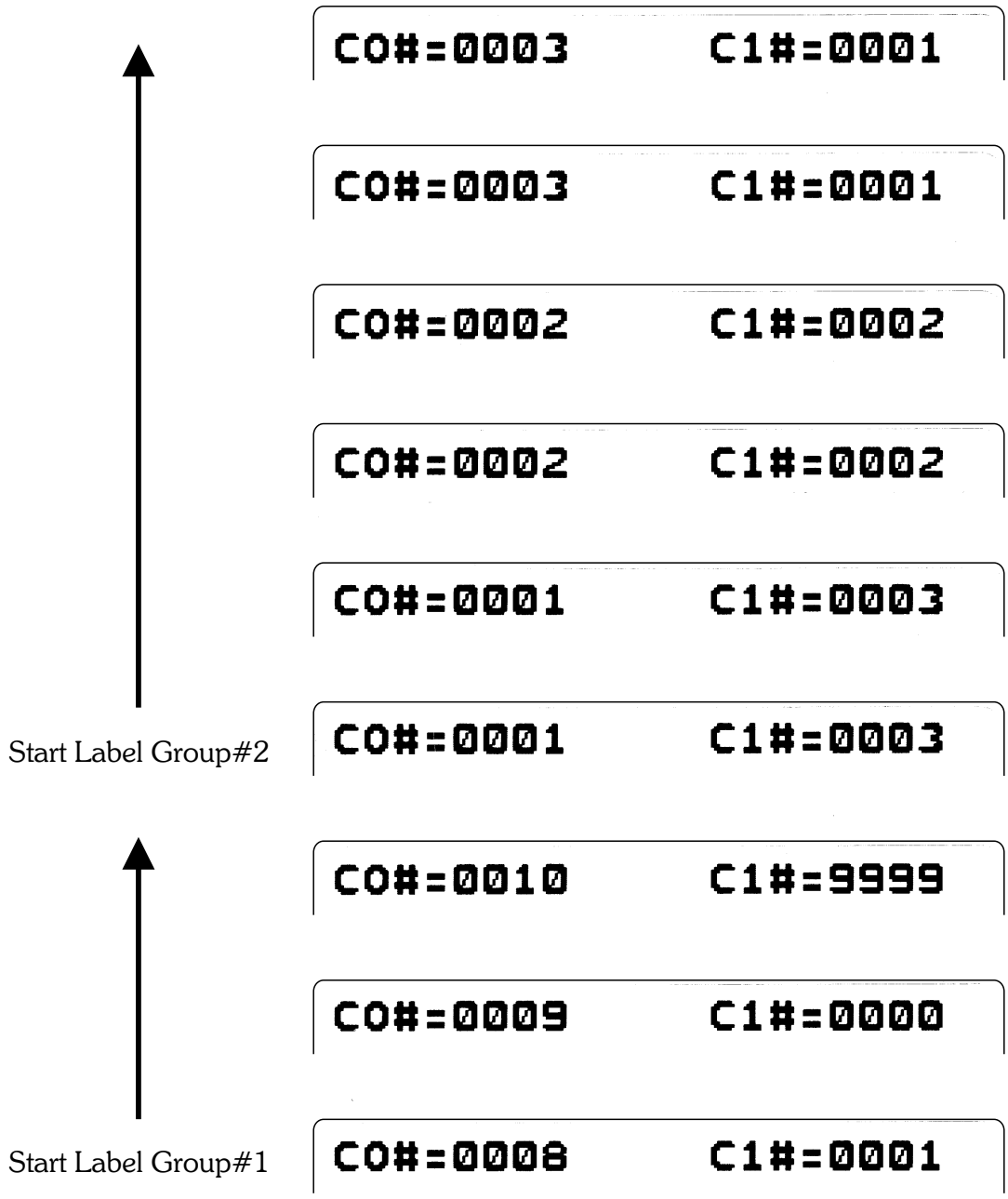
This example demonstrates variation of counting with the printer counter variables. The examples show number roll-over, the effect of non-numeric characters in the counter field and printing multiples of a label.

Example 15:

```
↵
FK"EXAM-15"↵
FS"EXAM-15"↵
C0,4,L,+1,"Counter 1"↵
C1,4,N,-1,"Counter 2"↵
D8↵
S2↵
Q609,24↵
q784↵
A50,50,0,1,4,4,N,"C0#="C0↵
A600,50,0,1,4,4,N,"C1#="C1↵
FE↵
↵
OD↵
FR"EXAM-15"↵
↵
?↵
08↵
01↵
P3,1↵
↵
?↵
01↵
03↵
P3,2↵
```

Using non-numeric characters in a counter field may result in invalid counter data. Counting is unpredictable if a non-numeric values are used.

Will Produce:



Example 16 - Counter Justification

This example demonstrates the counter justification setting (**p_2=L,R,C and N**) for printing of the counter data field (**p_3** = variable data field size parameter).

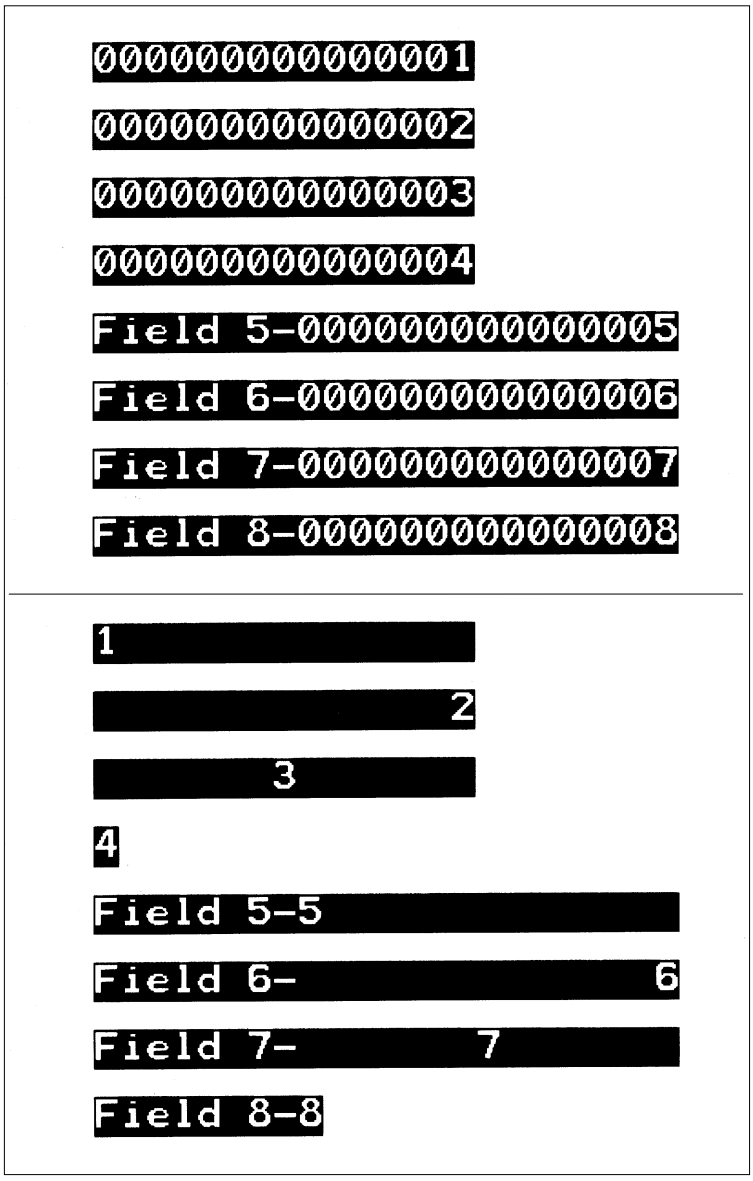
The example uses the **A** (Text) command's reversed text data field to show how the printer treats the different justification options.

Example 16:

```
↵
FK"EXAM-16"↵
FS"EXAM-16"↵
C0,15,L,+1,"Counter 1"↵
C1,15,R,+1,"Counter 2"↵
C2,15,C,+1,"Counter 3"↵
C3,15,N,+1,"Counter 4"↵
C4,15,L,+1,"Counter 5"↵
C5,15,R,+1,"Counter 6"↵
C6,15,C,+1,"Counter 7"↵
C7,15,N,+1,"Counter 8"↵
D8↵
Q609,24↵
q784↵
A50,25,0,1,2,2,R,C0↵
A50,100,0,1,2,2,R,C1↵
A50,175,0,1,2,2,R,C2↵
A50,250,0,1,2,2,R,C3↵
A50,325,0,1,2,2,R,"Field 5-"C4↵
A50,400,0,1,2,2,R,"Field 6-"C5↵
A50,475,0,1,2,2,R,"Field 7-"C6↵
A50,550,0,1,2,2,R,"Field 8-"C7↵
FE↵
↵
↵
FR"EXAM-16"↵
?↵
1↵
2↵
3↵
4↵
5↵
6↵
7↵
8↵
P1,1↵
↵
?↵
01↵
```

```
02↵
03↵
04↵
05↵
06↵
07↵
08↵
P1,1↵
```

Will Produce:



Example 17 - Printing with Forms: Putting It All Together

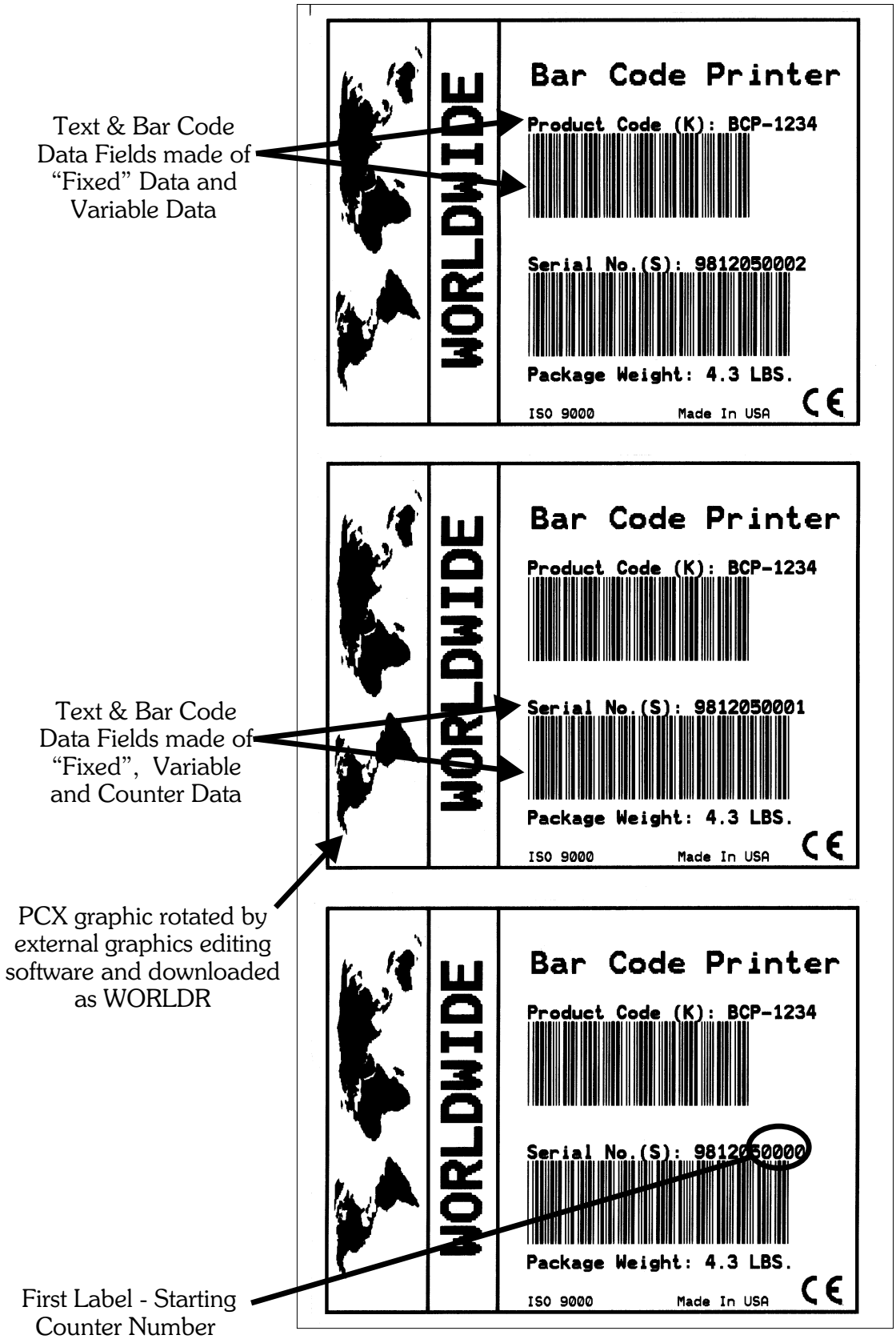
This example demonstrates creating and recalling for use, a form and printing a complete label set with variables, counter, text, bar code, and graphic elements. The form uses preloaded PCX graphics from printer memory. This provides the fastest label download process for EPL2 printers.

The form can be accessed via a KDU or other remote terminal device.

Example 17:

```
↵
FK"EXAM17"↵
FS"EXAM17"↵
V00,18,N,"Enter Product Name"↵
V01,10,N,"Enter Product Code"↵
V02,6,N,"Enter Date Code (YYMMDD)"↵
V03,10,N,"Enter Carton Weight"↵
C0,4,N,+1,"Enter starting Serial No. (1=0001; 4digits)"↵
D6↵
S1↵
Q609,24↵
q784↵
X5,5,5,770,594↵
LO150,10,5,584↵
LO250,10,5,584↵
A170,510,3,4,3,3,N,"WORLDWIDE"↵
A300,70,0,3,2,2,N,V00↵
A295,148,0,4,1,1,N,"Product Code (K): "V01↵
B295,172,0,3,2,5,120,N,"K"V01↵
A295,350,0,4,1,1,N,"Serial No.(S): "V02C0↵
B295,373,0,3,2,5,120,N,"S"V02C0↵
A295,510,0,4,1,1,N,"Package Weight: "V03↵
A295,570,0,2,1,1,N,"ISO 9000    Made In USA"↵
GG685,540,"CE_5M"↵
GG15,45,"WORLDR"↵
FE↵
↵
FR"EXAM17"↵
?↵
Bar Code Printer↵
BCP-1234↵
981205↵
4.3 LBS.↵
0000↵
P3,1↵
```

Will Produce:



Example 18 - Using a KDU Terminal

The Keyboard Display Unit (KDU) is a terminal unit that interfaces with a printer in a stand-alone capacity.

The KDU has sixty-two (62) keys and a 2-line, 20 character LCD display. The KDU is powered by and communicates with the printer through an RS232 serial port with a DB-9 (standard printers) or RJ-11 (portable printers). The power is enabled by jumper on the printers main PCBA.

The KDU has an auxiliary RS232C serial port for input only (e.g., from a scanning device, magnetic stripe reader, scale, ...). The KDU provides +5 volts to the auxiliary port.

The KDU is strictly a terminal and does not have the capability to store data or set up parameters. The KDU is used for the following functions:

- List label forms stored in printer
- Retrieve label forms stored in printer
- Input variable data
- Printing labels

KDU Use Example Use the following steps to retrieve label form and produce labels with the printer and KDU.

① Start Up At power ON, the Main Menu reads:

```
FORM - retrieve form
F2 - list forms vx.x
```

② List of Saved Forms Press the F2 key to print a list of saved forms.

③ Retrieve a Form Press the FORM key. The top line in the display will prompt:

```
Enter Form Name:
_
```

Enter the form name using the keys on the keyboard. Upper and lower case letters must match exactly as the form name was saved. If a scanner is connected to the KDU, you may enter the form name by scanning.

When the form name is entered, press ENTER to continue. The form is now retrieved and active in the printer.

Printing Forms without Variables

If the form does not contain variables, the display line will prompt:

```
Number of Label Sets
1_
```

The default number of labels is always one (1).

Single Label - If one (1) label is desired, press ENTER to print that label.

Multiple Labels - If multiple labels are desired, enter the new quantity and press ENTER to print labels.

Exit a Form - Press EXIT at any time to return to the Main Menu, or press FORM to select another form.

Printing Forms with Variables

If the form contains variables, the display line will display the 1st variable prompt, i.e.:

```
Store No.
_
```

Enter data at each variable prompt and press ENTER. The final prompt is:

```
Number of Label Sets
```

The default number of labels is always one (1).

Single Label - If one (1) label is desired, press ENTER to print that label.

Multiple Labels - If multiple labels are desired, enter the new quantity and press ENTER to print labels.

Exit a Form - Press EXIT at any time to return to the Main Menu, or press FORM to select another form.

Printing Forms with Consecutive Number Fields

If the form contains a consecutive number field, the system will automatically keep track of the next number sequence. If you do not need to interfere with this predetermined sequence, press ENTER at this prompt. The final prompt is:

```
Copies of Each Label
1_
```

The default number of copies is always one (1). If one (1) copy is desired, press ENTER to print that label.
Note: *Change the quantity if you desire multiple labels with the same consecutive number.*

Edit a Form

Once a form has been activated, it will automatically indicate the last information keyed in. If you want to retain that information, press ENTER.

To Enter Data:

1) Enter the new data, thereby overriding the old data, **or**

2) Press ENTER if the old data is correct, **or**

3) Use the orange backspace key or the CLEAR key to modify data.

When you have finished editing and have printed the label, you will automatically return to the first variable prompt.

Exit a Form - Press EXIT at any time to return to the Main Menu, or press FORM to select another form.

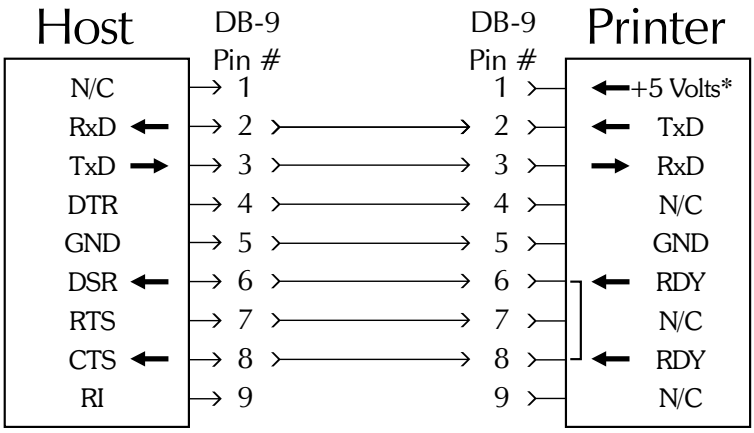
Protecting Data If the label form has been designed to "hide" a variable prompt, i.e., Store No., that data will be protected and this prompt will appear only when the form is initially retrieved.

Another label design command will prevent a prompt from ever showing and may be desirable for applications where data should not be changed, i.e., Serial Numbers. This method is not supported by the portable printer. For information on designing, accessing and modifying protected prompts, see the programming manual.

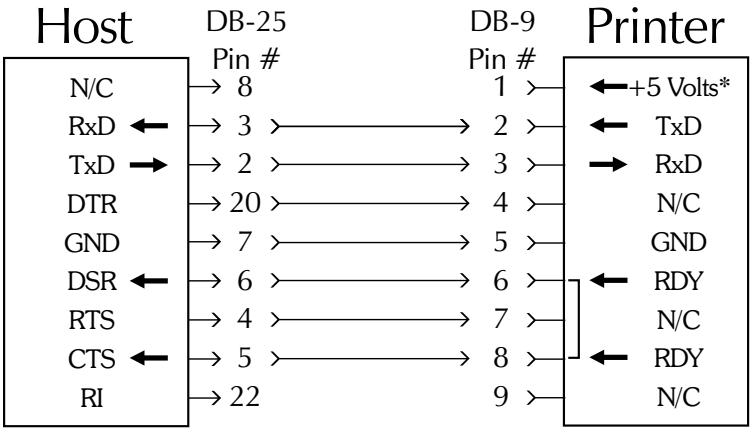
Appendix J - Interface Connection

This section has the interface connection diagrams for Serial and Parallel ports for EPL2 printers.

Serial Interface Cable Connections



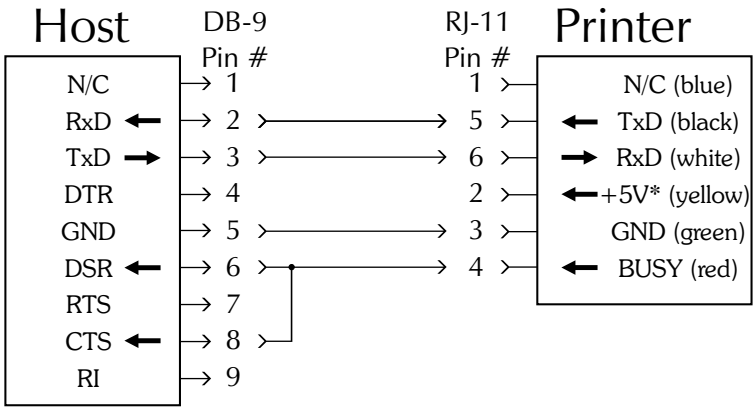
Female DB-9 to Male DB-9
Cable P/N 300017-006 (6') or 300017-010 (10')



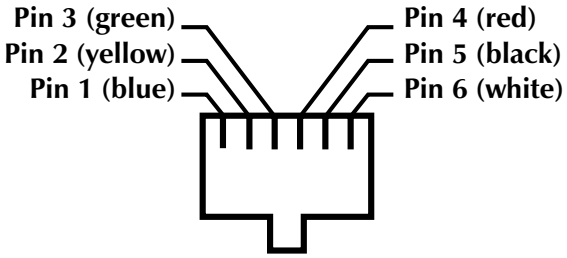
Female DB-25 to Male DB-9
Cable P/N 300018-006 (6')

*+5 volts at 150 mA for external device (e.g. KDU or scanner)

P2242 Serial Interface Cable Connections

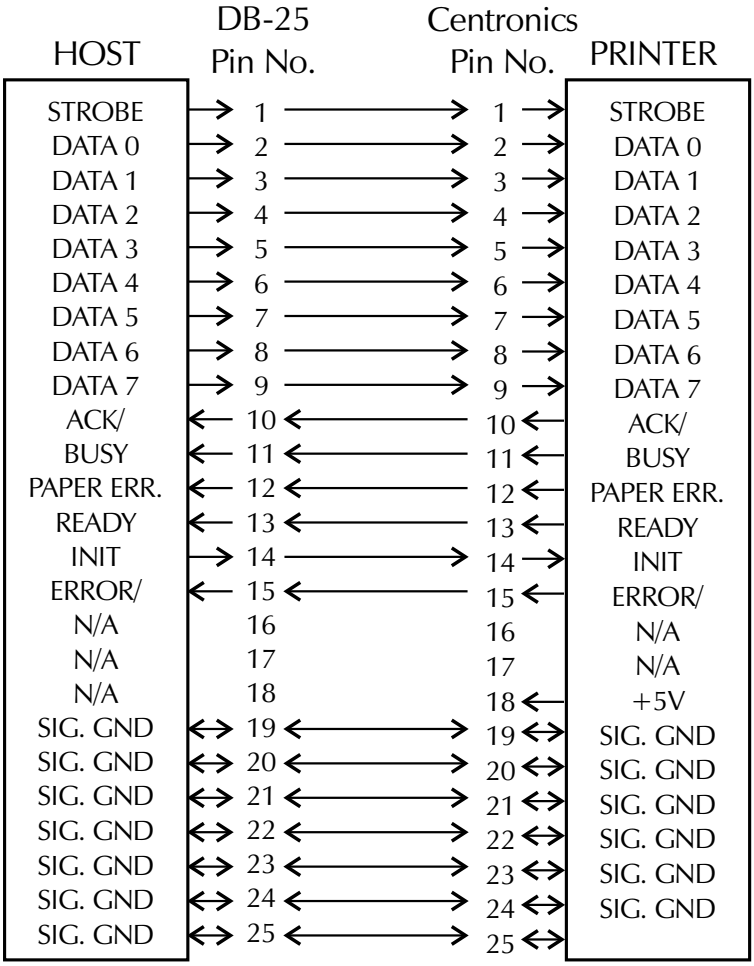


Female DB-9 to RJ-11
Cable P/N 300065-001 (6')
***+5 volts @ 200 mA max.**



Front View of RJ-11
Modular Connector

Parallel Interface Cable Connections



Female DB-25 to Male Centronics (Cable)

The +5 volt at pin 18 of the printer's parallel port provides power to Eltron PrintServers; a 10base-T Ethernet network adapter. The maximum current for this adapter power feed is limited to 600ma.

Flash printer models, except the Eclipse, support the Eltron PrintServer, as of September 1999. Contact your Eltron product representive for more details.