Line Mode Programmer's Manual

Manual No. 980353-001 Rev. A

FOREWORD

This manual provides programming information for the Zebra Technologies printers, featuring Line Mode and the EPL2 command language, which are manufactured by Zebra Technologies Corporation, Camarillo, California.

The scope of the manual is Line Mode print operations and commands. For details concerning non line mode printing and programming, see the printer's user's manual and the Page Mode (EPL2) Programmer's manual.

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TRADEMARKS

REVISION HISTORY

Rev.A - This manual version coincides with EPL firmware version 4.06(or higher) and is available from Zebra Technologies in electronic form. Line Mode firmware version tracking number is 0.12 (or higher) and is a subset of the EPL firmware.

See the Zebra Technologies web site at: www.zebra.com for an Adobe Acrobat file or call Zebra Technologies customer service.

Contents

INTRODUCTION

This section contains information about the basic features, command syntax and terminology of the Line Mode programming language.

Line mode printing is ideal for basic retail (point of sale - POS), shipping, inventory, work flow control, and general labeling. EPL printers with Line Mode, are versatile and are capable of printing a wide range media and bar codes.

Line mode printing and programming is designed to support label and bar code printing with little to no programming required.

The Line Mode printer can print:

- ❏ Receipts
- ❏ Labels
- ❏ Tags
- ❏ Support chemical and water proof media
- ❏ UPC (Universal Product Code) bar codes
- ❏ Postal bar codes
- ❏ Support for the common international industry standard bar codes

The Line Mode printing language is designed to be command compatible with EPL1 programming language used in LP2022 and LP2042 printers.

Features Line Mode in flash based printers is similar in operation to the early model LP Series printer which used the EPL1 programming language. Line mode only approximates EPL1 printed data and commands.

Line Mode features include:

- ❑ ASCII based command language.
- ❑ Immediate print and execution of a single line of text or command data.
- ❑ Support for 10 standard bar codes.
- ❑ Two (2) resident fonts:
  Out of Box Font: 14 by 22 dots (CCSET1) and 10 by 18 dots (CCSET3) bit mapped fonts. These fonts are part of EPL1 emulation soft font set (v,w,x,y,z) preloaded into the printer at time of shipment.

  Base Default Font: 14 by 24 dots (Font 4) and 10 by 16 dot (Font 2) bit mapped fonts.
- ❑ Print and command buffering.

Limitations Line Mode has limited support for the EPL1 command language set. See the Command Reference table on page 3-1 for a list of commands.

- ❏ The Line Mode printer has compatiable EPL1 softfonts preloaded into the printer. If the EPL1 softfont sets are removed, then the default ELP2 fonts and character sets will be used. The default font sets have differences that may affect print results of legacy EPL1 programmed data. . See Appendix C for details on font set control.
- ❏ Line Mode printing does not support black line (or mark) sensing.
- ❏ The printer does not support all character code pages supported by Page mode (EPL2) printing.
- ❏ The printer does not support all the bar code formats supported by Page Mode (EPL2) printing. (See the Bar Code Select command (**?**)).

Configuration

Zebra EPL flash based printers are, by default, configured for Page (EPL2) mode operations. The operator must convert the printer to Line Mode prior to the initial use of Line Mode. This is done via a hardware select procedure with the Feed button during printer power-up.

Line Mode configuration settings are retained after reset has been issued or power has been cycled.

Manually Setting Line Mode

The printer utilizes the Feed button during printer power-up to toggle between printer personality modes, Line and Page (EPL2).

1. With printer power off, press and hold the Feed button while turning the printer on, then release the button when the LED starts blinking red.

2. When the indicator LED starts flashing green, immediately press and hold Feed button.

3. Release the Feed button when the LED turns a steady Amber (orange).

4. Verify printer personality with Dump Mode printout:. Line Mode or Page Mode (EPL2).

5. Press the Feed button to exit the Dump Mode.

Printing on continuous media requires programming. Use the **N** command with no parameters to disable Top of Form (label gap) sensing.

Printer Settings The Line Mode printer configuration and settings can be displayed by sending a Print Configuration Label (**EPL?**) command or by preforming an AutoSense routine.

The printout produced by this command includes some of the following information:

- Printer Model Number Code
- Firmware Version
- Serial Port Settings
- Print Head Test Pattern
- Character Set Selection
- Speed and Density
- Label Size
- Bar Code Settings
- Basic Print Control Character Settings
- Current Media Sensor Values
- Status of Printer Specific Features and Options:
  Battery Life (Portable Printers)
  ELP1 compatible fonts are loaded if **oEv,w, x,y,z** is displayed on the Option line.
- EPL2 Programming Parameters Not Used By Line Mode

Sample of Dump Mode Printout

```
4"M03352F     16 V4.01.65
Serial port:96,N,8,1
Line Mode 0.6

Image buffer size:0507K
Fmem:000.0K,061.4K avl
Gmem:000K,0069K avl
Emem:000K,0069K avl
I8,1,001 rY
S2 D10 R000,000 ZT UN
q832 Q615,024
X2 x2,05 M03
ESC 027     CR 013
LF  010     FF 012
Option:
04 08 13
```

Printer Defaults The Line mode printer defaults into the configuration shown below. Some settings are printer specific, such as default print width.

- Font Characters - 14 by 24 dots
  Command Equivalent - **A11** (Text 1h x 1w) (go to)
- Character Set - Code Page 850 (Multilingual code page)
  Command Equivalent - **I0** (go to)
- Speed - 1.5 ips
  Command Equivalent - **S1** (go to)
- Left Margin
  Command Equivalent - **M3** (go to)
- Bar Code - I2 of 5 (Interleave 2 of 5)
  Command Equivalent - **?2** (go to)
- Bar Code -Narrow Bar Width is **2 Dots**
  Command Equivalent - **X2** (go to)
- Bar Code - Narrow to Wide Bar Width Ratio is **2.5**
  Command Equivalent - **x25** (go to)
- Density - Printer Dependent.
  See the **D** command. (go to)

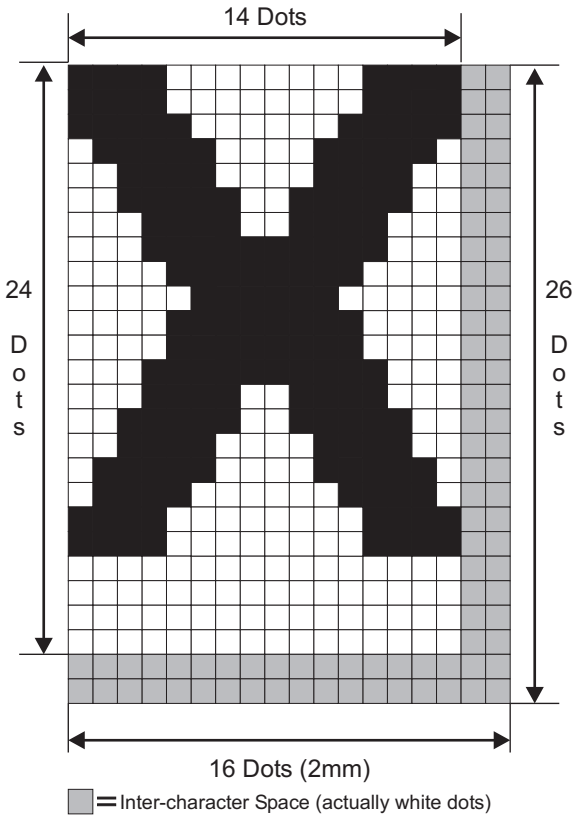
Basic Printing

Line Mode operation allows printing of simple text (data) without using coded or programmed data strings. The text that the user types can be directly output to the printer for immediate printing. This simple text may be sent to the printer as simple text files (generated by most ASCII editors) or from ASCII data sent by a terminal device or software program.

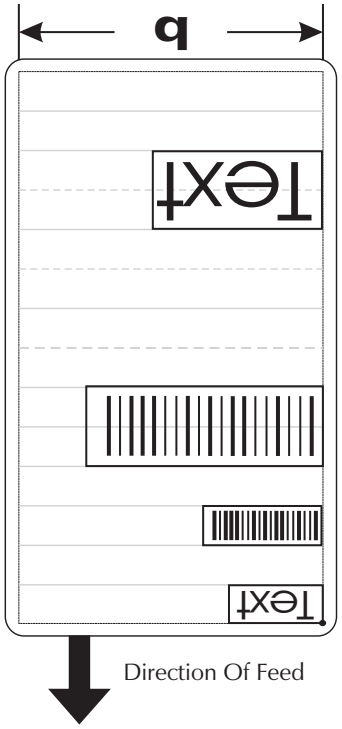
Data is sent to and processed by the printer on a line by line basis. The printer will immediately process a terminated line of data. Line termination is a line feed (**LF**), carriage return (**CR**), or a combination (**CR**/**LF**).

Line and print heights are determined by multiples of the selected text character height. Bar code height is also affected by the line height. See the Bar Code Select (**?**) command for affected bar code.

Example of Default Font Character Dot Map



Printing Example



Text Printed at 2x, Line Terminated with Form Feed (FF)

Line Height Set to 2x, Single Line Feed Only

Line Height Set to 2x, Single Line Feed Only

Change Line Height (2x), Print Bar Code Data
Line Feed Only
Bar Code Data
Line Feed Only
First Line of Text at Top of Form

Printer Commands The printer utilizes "Escape" sequence data to notify the printer that the following data is a command. Printer commands for Line Mode are used to:

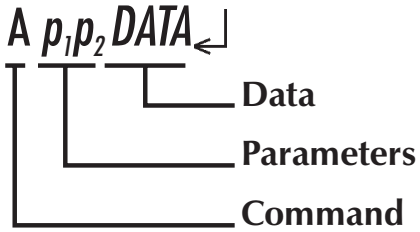
- Change the line (and font) size
- Print bar codes
- Select and configure bar code parameters
- Select Character Set
- Control print margins, speed and density
- Buffer Commands and Batch Print

Command Conventions

The manual uses the following typographic conventions to describe commands.

Command Name

Text/Bar Code Size



Example	Description
← or **Esc**	Escape Character, ASCII value 27d (1Bh)
♀ or **FF**	Form Feed Character, ASCII value 12d (0Ch)
◙ or **LF**	Line Feed Character, ASCII value 10d (0Ah)
♪ or **CR**	Carriage Return Character, ASCII value 13d (0Dh)
↵ or **CR/LF**	Carriage Return & Line Feed
A	Command - Commands are typically a single character. Some commands contain up to four (4) characters.
p1p2p3	Required parameters (No delimiters)
[**p1p2p3**]	Optional parameters (No delimiters)
DATA	Text or bar code data to be printed.
This text should →be on one line	The line-continuation character (→) indicates that code continued from one line to the next in the manual should be typed all on one line. *Note: This is not used to program the printer.*

Character Numbering

Character map positions are referred to by the ASCII decimal numbers **0 - 255** and are designated with a trailing **d**. The programmer will refer to these character locations using hexadecimal numbering and are designated as hexadecimal with a **h**. See the character map in Appendix A for reference.

Basic Command Syntax

Each command consists of an **ESC**ape (denoted as ← or **ESC**) character followed by a single ASCII character to identify the specific command desired. Some commands require one or more additional parameters to complete the command. Refer to Figure 1-1. for the basic command syntax.

Each command line must be terminated with a Line Feed (**LF**) character. As an alternate method both the Carriage Return (**CR**) and Carriage Return Line Feed (**CR/LF**) combination may be used. Most PC based systems send a Carriage Return Line Feed (**CR/LF**) when the Enter (Return) key is pressed.

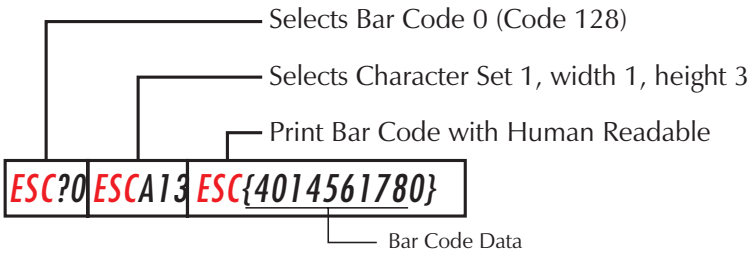
Default ASCII Values for the Basic Printer Control Functions

Command	Function	Processing Order	Decimal	Hexadecimal
CR	Carriage Return	1	13	0D
LF	Line Feed	2	10	0A
FF	Form Feed	3	12	0C
ESC	Escape	4	27	1B

Command Concatenation

Most commands can be concatenated together to print several objects on the same line. Refer to following for an example command concatenation.

Figure 6-1 Concatenated Commands



All objects on a line must be the same size (height). An exception to this is the printer's ability to concatenate a line command that changes line size after issuing one of the following commands: **ESCA** (Text), **ESC{DATA}** (Bar Code) and the **ESC |DATA}** (Bar Code with human readable text). While you can concatenate other commands on the same line as the **A** command which sets line and bar code height, you can not mix objects of different sizes on the same line.

To over come this limitation, the **R** command can be used to backup the label to print additional objects on what seems to be the same line.

Basic Line Mode Guidelines

The following are basic line mode programming and operation guidelines.

- ❑ Printing is from right to left and from top to bottom.
- ❑ Sending a simple unformatted text (ASCII data) to the printer followed by a carriage return (**CR**), line feed (**LF**) or both (**CR/LF**) characters will result with printed text as typed (or stored as a file) on the media.
- ❑ A line consisting of only a carriage return (**CR**), line feed (**LF**) or both (**CR/LF**) characters will produce a blank line.
- ❑ Once set to line mode, the printer will remain in line mode until changed by the Line Mode/Page Mode (EPL2) configuration subroutine (*see* page 1-5) or the **EPL2** command (*see* page 3-15).
- ❑ Printing graphics does not effect text or bar code printing (line height) or parameters.
- ❑ The printer will accept data that exceeds the right hand margin or media edge and will be truncated. Note: Printing off the media and onto the platen may reduce the printer's operational life span.

LINE MODE COMMAND REFERENCE

This section contains a complete listing of all commands in alphabetical order.

A Command - Text/Bar Code Size

Description Use this command to set character and bar code height, as well as, character width. This command controls the default font for the printer.

Out of Box Font: 14 by 22 dots (CCSET1) and 10 by 18 dots (CCSET3) bit mapped fonts. These fonts are part of EPL1 emulation soft font set (v,w,x,y,z) preloaded into the printer at time of shipment.

Base Default Font: 14 by 24 dots (Font 4) and 10 by 16 dot (Font 2) bit mapped fonts.

The base default fonts will be used if the soft fonts are deleted or inactivated with EPL2 programming (in EPL2, page mode).

See Appendix C for information on controlling line mode font sets.

Syntax **←Ap_1p_2**

Parameters **p_1** = Horizontal size control and font set selection.
Sets the width of Text character, only.
Values: **1, 2, 3, 4, 5, 6, & 7**
Default: **1**

Model	Font	Characters Per	**p_1** (width multiplier)						
			1 (x1)	**2 (x2)**	**3 (x3)**	**4 (x4)**	**5 (x1)**	**6 (x2)**	**7 (x3)**
2443 2844	**CCSET1 & Font 4 ***	**Inch (cpi)**	7	3.5	2.25	1.75	N/A		
		Line	52	26	17	13			
	CCSET3 & Font 2 *	**Inch (cpi)**	N/A				16.9	8.46	5.64
		Line					69	34	23
2722 2824	**CCSET1 & Font 4***	**Inch (cpi)**	7	3.5	2.25	1.75			
		Line	28	14	9	7			
	CCSET3 & Font 2 *	**Inch (cpi)**					16.9	8.46	5.65
		Line					37	18	12

A Command - Text/Bar Code Size

p_2 = Vertical size (multiplier).
Sets Text and Bar Code height.

Values: **1, 2, 3, 4, 5, 6, 7** & **8**
Default: **1**

Font	Per Character	Line Height as Set by p_2							
		1	2	3	4	5	6	7	8
CCSET1 & Font 4*	**Dots**	26	52	78	104	130	156	182	208
	Millimeters	3.25	6.5	9.75	13	16.25	19.5	22.75	26
CCSET3	**Dots**	24	48	72	96	120	144	168	192
	Millimeters	3	6	9	12	15	18	21	24
	Lines Per Inch	8.4	4.2	2.8	2.1	1.6	1.4	1.2	1
Font 2*	**Dots**	26	52	78	104	130	156	182	208
	Millimeters	3.25	6.5	9.75	13	16.25	19.5	22.75	26
	Lines Per Inch	7.8	3.9	2.6	1.9	1.5	1.3	1.1	0.97

- ❏ All text and bar codes will be printed at the size selected by this command until a new size is selected.
- ❏ The printer only supports a single line height setting per line.

A Command - Text/Bar Code Size

Example:

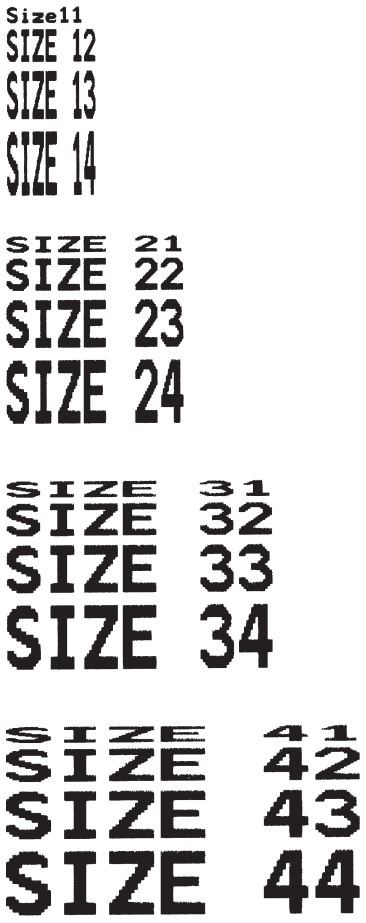
```
←A11SIZE 11↲
←A12SIZE 12↲
←A13SIZE 13↲
←A14SIZE 14↲

←A21SIZE 21↲
←A22SIZE 22↲
←A23SIZE 23↲
←A24SIZE 24↲

←A31SIZE 31↲
←A32SIZE 32↲
←A33SIZE 33↲
←A34SIZE 34↲

←A41SIZE 41↲
←A42SIZE 42↲
←A43SIZE 43↲
←A44SIZE 44↲
```

Will Produce:
(Not to scale)



A0 Command - Small Text

Description Use this command to set the small font character height and width. This command does not affect bar code height.

Out of Box Font: 5 by 7 dots (bit mapped font) (CCSET4). This font is part of EPL1 emulation soft font set (w,x,y,z) preloaded into the printer at time of shipment.

Base Default Font: 8 by 12 dots (bit mapped font) (Font 1).

The base default fonts will be used if the soft fonts are deleted or inactivated with EPL2 programming (in EPL2, page mode).

See Appendix C for information on controlling line mode font sets.

Base Small Font size: 8 by 12 dots (bit mapped font). See Appendix C for alternate font sets.

Syntax ←**A0p_1**

Parameters **p_1** = Sets vertical and horizontal character height multipliers.
Sets Small Text width.

p	Width Multiplier	Height Multiplier
0	1	1
1	1	1*
2	1	2*
3	1	3*
4	2	2
* - EPL1 fonts were bold versions for these settings		

- ❑ All text will be printed at the size selected by this command until a new size is selected. Bar code size will remain unaffected by this command.
- ❑ The printer only supports a single line height setting per line.

B Command - Begin Command Buffer

Description Use this command to batch print labels or minimize the affects of host system delays.

Command buffering allows:

- Assembly of a series of line print commands (text, bar codes, etc.) for print.
- Buffered printing treats the print operation as a single print routine. and will print without starting and stopping between line print operations.

Syntax ←B

Parameters **None**
Default: Command Buffering Off

Use the command with the **E** command, End Command Buffer.

Command Buffering Rules

- ❏ Do not use printer configuration and control commands (speed, mode changes, density, etc.) within command buffer data strings.
- ❏ Line, text and bar code control commands are allowed within the command buffer data strings.
- ❏ Printing with the buffer mode will automatically assert a form feed at the end of buffer. To disable this feature, use the **N** command, Form Feed control, without any parameters.
- ❏ The printer will automatically backup to top of form (label) when buffer printing a label. The **R** command can not be used in buffered print operations.

CR - Carriage Return

Description Use this command to print a line of data (text and bar codes) and move to the next line.

This command may be used in conjunction with the Line Feed (**LF**) and will react as if a single Line Feed (**LF)** or a single Carriage Return (**CR**) has been issued.

Syntax ♪ : ASCII value 13d (0Dh)
: Abbreviation = CR

♪◙ :Abbreviation = CR/LF
:Treated as a single Line Feed (LF)

Parameters **None**

D Command - Density

Description Use this command to set print density. This command controls the amount of heat applied to the media by the print head.

Syntax ←Dp_1

Parameters p_1 = Density setting - Line Mode Printing only!

Model	Values[1]	Default[2]	EPL2[3]	
2443 / 2844	0-7	5	0-15	10
2722 / 2824	0-7	5	0-15	7
LP Models (Reference Only)	0-7	5		

Note 1: 0 is the lightest print and 7 is the darkest.
Note 2: The printer saves and shares density settings between Line Mode and Page (EPL2) mode.
Note 3: Range and default density for EPL2 (Page Mode) operation is listed for reference to the AutoSense Dump Mode printout.

The selected density will remain in effect until changed or power is removed.

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

DATA - Text for Print

Description **Data** is standard ASCII text characters. Text (**DATA**) does not require special commands or identifiers (i.e. **Esc**) to print. A simple Line Feed (**LF**) character, a Carriage Return (**CR**), a Carriage Return and Line Feed combination (**CR/LF**) or **FF** (Form Feed) will cause the printer to print a line of **DATA** (text) and advance to the start of the next line (or form if a Form Feed is used to terminate a line).

Parameters DATA = ASCII Characters

Range: 32 to 254 decimal (20-FE Hexadecimal) and include 20-21 decimal (14-15 hexadecimal).

See the Line Mode Character Map (Code Page 850) in Appendix A.

Example: **Data Entered:**

ABC 123 EFG : Text terminated with CR - Carriage Return

ABC 123 EFG : Text terminated with LF - Line Feed

ABC 123 EFG : Text terminated with CR/LF combination

Will Print:

ABC 123 EFG
ABC 123 EFG
ABC 123 EFG

{DATA} Command - Print Bar Code (with Human Readable)

Description Use this command to write the bar code data field with human readable code.

Example: ←**{DATA}**

Parameters **DATA** = bar code data to be encoded.

	Description
{	1. Starts bar code data field 2. Identifies bar code to include human readable text
DATA	1. Bar code data 2. Must comply with bar code specifications, i.e. type of character (number only or alpha-numeric), supported characters, data field size, etc.
}	1. Terminates the data to be entered into the bar code.

Example: ←**{**1234567890**}**↵

|DATA} Command - Print Bar Code (w/o Human Readable)

Description Use this command to write the bar code data field as a bar code without human readable text.

Syntax ←|**DATA}**

Parameters **DATA** = Bar code data to be encoded.

	Description
|	1. Starts bar code data field 2. Identifies bar code to be without the human readable text
DATA	1. Bar code data 2. Must comply with bar code specifications, i.e. type of character (number only or alpha-numeric), supported characters, data field size, etc.
}	1. Terminates the data to be entered into the bar code.

Example: ←|1234567890}↵

E Command - End Command Buffer

Description Use this command to finish (terminate) command buffering.

Syntax ←**E**

Parameters **None**
Default: Command Buffering Off

Always use the **E** command in conjunction with the **B** command, Begin Command Buffer.

See the **P** and **p** commands to print buffered commands.

EPL? Command - Print Configuration Label

Description This command is used to print the current printer configuration. This is the same Dump Mode status printout that is printed by the AutoSense alignment and configuration routine.

Syntax ←**EPL?**

EPL2 Command - Switch To Page Mode

Description This command is used to switch the printer from Line Mode to Page Mode (EPL2).

This command can not be concatenated with other commands on a single line.

This command is not intended to be used during normal print operations.

Syntax ←**EPL2**

Example: ←**EPL2** :switch to Page Mode

The EPL2 command **OEPL1** (followed by a **LF**, **CR** or **CR/LF**) can be sent to the printer to return the printer to Line Mode operation.

FF - Form Feed

Description Use this command to feed to the top of the next form (label).

When in continuous media mode, the printer will advance the printer to the next line unless set to a different value by the **N** command.

Syntax ♀ : ASCII value 12d (0Ch)
: Abbreviation = FF

Parameters **None**

Default - Label (Gap Sense) Mode:
Go to Top Of (Next) Form.

By Default, Continuous Media Mode:
Go to next line when a Form Feed (**FF**) is issued. Line height is set as per the **A** command setting.

Continuous Media Mode with N set:
Move the print position from 0 to 99 mm (**N00** to **N99**) for each Form Feed (**FF**) issued to the printer. See the **N** command for details.

G Command - Draw Graphics

Description Use this command to draw single line of a bit mapped graphic. The bit map data pattern can be repeated automatically, in sequence, up to eight times. The line height is set by the **H** command. The bit map image is assembled on a line by line basis.

Syntax **←Gp_1DATA**

Parameters **p_1** = Number of bytes to follow.
Values : **01** to **99**

DATA = Data bytes representing the bit mapped graphic. Each bit represents one dot (**1**=black, **0**=white).

Each additional line of graphics must start with the **G** command and include the complete command parameter and data string (**←Gp_1DATA**).

DO NOT add carriage returns (**CR**) or Line Feeds (**LF**) or **CR/LF** to the end of a Draw Graphics command line.
Sending a **CR** or **LF** or **CR/LF** will advance the print position by full text line as defined by the default or previously issued **A** command.

g Command - Draw Graphics

Description Use this command to draw single line of a bit mapped graphic. The bit map data pattern can be repeated automatically, in sequence, up to eight times. The line height is set by the **H** command. The bit map image is assembled on a line by line basis.

Syntax **←gp$_1$DATA**

Parameters **p$_1$** = Number of bytes to follow.
Values : **001** to **199**

DATA = Data bytes representing the bit mapped graphic. Each bit represents one dot (**1**=black, **0**=white).

Each additional line of graphics must start with the **G** command and include the complete command parameter and data string (**←gp$_1$DATA**).

DO NOT add carriage returns (**CR**) or Line Feeds (**LF**) or **CR/LF** to the end of a Draw Graphics command line.
Sending the **CR** or **LF** or **CR/LF** will advance the print position by full text line as defined by the default or previously issued **A** command.

H Command - Graphic Line Height

Description Use this command to set the number of times (up to eight) that a graphic (line) of bit map data will be repeated when printing. The **G** or **g** commands are used to send the bit map data.

Syntax ←**H**p_1

Parameters p_1 = Line height of graphic (bit map data pattern) measured in dots.

Range: **1 - 8** Default: **1**

(8 dots = 1mm)

I Command - Country Code Character Set

Description Use this command to select the appropriate character set for printing.

Syntax **Ip_1**

Parameters **p_1** = Select **0- 8** Default = **0**

Character Set Selection			
p_1	Data Bits	Country	Dump Mode Status Printout
0	**8**	USA	I8,1
1	**7**	British	I7,1
2		German	I7,2
3		French	I7,3
4		Danish	I7,4
5		Italian	I7,5
6		Spanish	I7,6
7		Swedish	I7,7
8		Swiss	I7,8

LF - Line Feed

Description Use this command to print a line of data (text and bar codes) and move to the next line.

This command may be used in conjunction with the Carriage Return (**CR**) and will react as if a single Line Feed (**LF)** or a single Carriage Return (**CR**) has been issued.

Syntax

: ASCII value 10d (0Ah)
: Abbreviation = LF

: Abbreviation = CR/LF
:Treated as a single Line Feed (LF)

Parameters **None**

M Command - Left Margin

Description Use this command to adjust the Left Margin.

By default, the Line Mode printer's outside margins are set to match the maximum printable area for the largest typical label media supported by that printer.

Syntax ←Mp_1

Parameters p_1 = Additional margin in millimeters.
Range: **00** - **99**
Default: **03** (3mm)

1 millimeter = 0.040" = 8 dots

Do not set 2 inch printers to have margin values of greater than 49mm.

The margin command can not be applied to a line of print after print data (text, bar codes, or graphics) has proceeded it in a line.

The left margin parameter(**M**) is displayed on the Dump Mode Printout and has a range of **M00** to **M99**.

Printable Area = 1-2 mm margin on all sides. *Printing outside of the "printable" area may damage or shorten the print head's life.*

Example: ←**M05**↵:set a 5mm left margin

N Command - Form Feed Control

Description Use this command to disable automatic form feed (**N**) or set the form feed length (**Nxx**) when using continuous media.

Syntax **←N[p_1]**

Parameters **None** = Disables auto form feed in buffer mode.

p_1 = Sets length of the form in millimeters. Feed a specified distance (**p_1**) when a Form Feed (**FF**) is issued.

Range: **00** - **25** (1 = 1 millimeter)

oR Command - Enable Euro Character

Description This command allows the advanced programmer to substitute the Euro currency character for any ASCII character in printer.

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

Syntax ←**oR**[p_1, p_2]

Parameters p_1 = **E**
If the 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 (p_1/p_2) resets to all code pages to original default character mapping.

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

- ❏ 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.). The parameter data is preserved until it is changed by the **oR** command or reprogramming of the printer.

oR Command - Enable Euro Character

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 - Print Buffer 1-99 times

Description Use this command to print 1 to 99 batch forms or labels from commands and data previously stored in the printer's command buffer.

The printer can print one or more forms or labels that have been stored in the printer's command buffer as a single "batch". The "batch" of forms or labels are then printed 1 to 99 times as set per **p_1** parameter of this command.

Syntax **←Pp_1**

Parameters **p_1** = Sets the number of batch forms or labels to print.

Range: **00** - **99**

The **P** command **does not** need to be terminated with a Line Feed (**LF**) character or alternately the Carriage Return (**CR**) or Carriage Return Line Feed (**CR/LF**) combination. If the print (**P**) command string is terminated immediately following the command, the top of form will be move down one line on the next label following the completion of the batch print routine.

p Command - Print Buffer 1-999 times

Description Use this command to print 1 to 999 batch forms or labels from commands and data previously stored in the printer's command buffer.

The printer can print one or more forms or labels that have been stored in the printer's command buffer as a single "batch". The "batch" of forms or labels are then printed 1 to 999 times as set per **p_1** parameter of this command.

Syntax ←**pp_1**↵

Parameters **p_1** = Sets the number of batch forms or labels to print.

Range: **001** - **999**

The **p** command **must be** terminated with a Line Feed (**LF**) character. As an alternate method, both the Carriage Return (**CR**) or Carriage Return Line Feed (**CR/LF**) combination may be used.

Line Mode Operational Command Difference - The equivalent ELP1 **p** command automatically prints a 100 labels when the **p_1** parameter is set to **001** through **099**.

P00 Command - Reprint Buffer

Description Use this command to print and repeat print a batch form or label programmed from commands and data previously stored in the printer's command buffer.

- ❏ Each time the FEED button is pressed, the form (or label) stored in the image buffer will print.
- ❏ The printer will accept no more commands or data once this command has been issued.
- ❏ To cancel the feed to reprint the buffer, reset the printer by cycling the printer power.

Syntax ←**P00**

Q? Command - Auto Detect Label Parameters

Description Use this command to printer automatically detect the label and gap length and set the sensor levels similar to the AutoSense routine.

This command will not enter the printer into the Dump mode or print the printer configuration label.

Syntax ←**Q?**

Parameters **None**

R Command - Backup

escription Use this command to control the print positioning. This command's positioning functions can:

- Reposition the print position back towards the Top of Form after printing a line (or lines).
- Disable the reposition to Top of Form before printing (**R00**).
- Move the print position to the physical Top of form. Issuing the **Rnn** (**nn** = **01 -99**) command in the **first command line** following a form feed (**FF**), a print buffer command (**p** or **P**), a reset condition (power-up, etc.) or as the first command in a group of buffered commands will cause the printer to reposition to the physical Top of Form.

Syntax ←**R**p_1

Parameters p_1 = Distance in millimeters to backup.

Range: **01 - 99** (1 = 1 millimeter)
00 = Disables automatic backup to top of form.

❑ The printer will reset to the default position for Top of Form after a print command (**p** or **P**) has been sent to the printer.

❑ The default Top of Form position (or margin) is approximately 1mm below the top edge of the media (label).

❑ The **R** command cannot be used inside a Buffered Label or to print a buffered label (see the **B**, **E**, **P**, and **p** commands).

Example: ←R05 :moves the first print line 5mm
:toward the top edge of the label

S Command - Speed Select

Description Use this command to select media print speed.

Syntax ←**Sp$_1$**

Parameters **p$_1$** = Speed select value.

Model	Value	Speed
2722	0 1 2	1.0 ips (25 mmps) 1.5 ips (37 mmps) 2.0 ips (50 mmps)
2443 2844 2824	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)

The selected speed will remain in effect until changed or power is removed.

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

Description Use this command to print a MaxiCode bar code symbol. The printer will automatically interpret and encode data into MaxiCode symbols for data modes 2, 3, 4, and 6. Up to eight symbols can be linked.

Syntax **←Up_1,[p_2,],"DATA"**

Parameters **p_1** = Horizontal start position from the left margin in millimeters.

Range = **00 to 99** (millimeters)

Note - The vertical start position is set by line position.

p_2 = 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_2** (**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_2** 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 bar code 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.

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/

Using AIM Specified MaxiCode Data Formatting

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

Control String	Hexadecimal 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"[AIM MaxiCode Data]"

Example

←U20,m2,"001,840,93065,1692,[)>R_S01G_S96XXXZZFDAAFG_SSHIPG_S309$G_S$$G_S$1/1$G_S10G_SNG_S$$G_S$CAMARILLO$G_SCAG_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 MaxiCode symbol for Mode 2. This can be omitted by the programmer and the printer will auto-select the mode per parameter **p_2** rules.

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.

V Command - Enable Reverse Print

Description This command is used to enable reversed (white on black) printing.

Syntax ←**V**

Parameters Default Condition - Disabled

The reversed print condition will be cleared when:

- ❑ The line has been printed, ie a line termination comand (**LF**, **CR** or **CR/LF** or a combination there of).
- ❑ A Disable Reverse Print command (**v**) is sent to the printer.
- ❑ A print command (**P or p**) is sent to the printer.
- ❑ The print has power cycled and returns to the default condition, which is disabled.

v Command - Disable Reverse Print

Description Use this command to disable reversed printing.

Syntax ←v

X Command - Bar Width

Description Use this command to set the "**X**" dimension (or narrow bar width) of a bar code.

Syntax ←Xp_1

Parameters p_1 = Width in dots.
Each dot is 0.125mm or 0.005" wide.
Values: **2, 3 or 4**
Default: **2** (.25mm or .010")

The selected value will remain in effect until:

- ❑ The setting is changed,
- ❑ An error condition occurs or
- ❑ The print has power cycled and returns to the default setting.

Example: ←X2↵ :sets the bar width to 10 mils.

x Command - Bar Width Ratio

Description Use this command to set ratio of the narrow bar width to the wide bar width for applicable bar code types.

Supported bar codes that have adjustable bar with ratios are:

- Code 39
- Interleaved 2 of 5
- CodaBar

Syntax ←x$p_1$$p_2$

Parameters p_1 = Narrow bar width in dots.
Values: **2, 3 or 4**
Default: **2** (.250 mm or .010 inch)

p_2 = Wide bar width in dots.
Values: **04 to 12**
Default: **05** (.625 mm or .025 inch)

The selected value will remain in effect until changed, an error condition occurs, or power is removed.

Example: ←x205↵ :sets the narrow bar to 2, and the :wide bar to 5.

? Command - Bar Code Select

Description Use this command to select the bar code type.

Syntax ←?p_1

Parameters p_1 = Bar Code type.
Default = **2** (I 2 of 5).

Value	Description
0	Code 128B/C Serial Shipping Container Code
1	Code 128 (Auto-selects mode A, B or C)
2	Interleaved 2 of 5 (default)
3	Code 39 (w/extended)
9	Code 93
U	UPC-A and UPC-E
E	EAN8 and EAN13
P	Postnet 5, 9,11 & 13 digit
K	CodaBar
M	Plessey (MSI-1) with mod. 10 check digit
L	MSI-3 with mod. 10 check digit

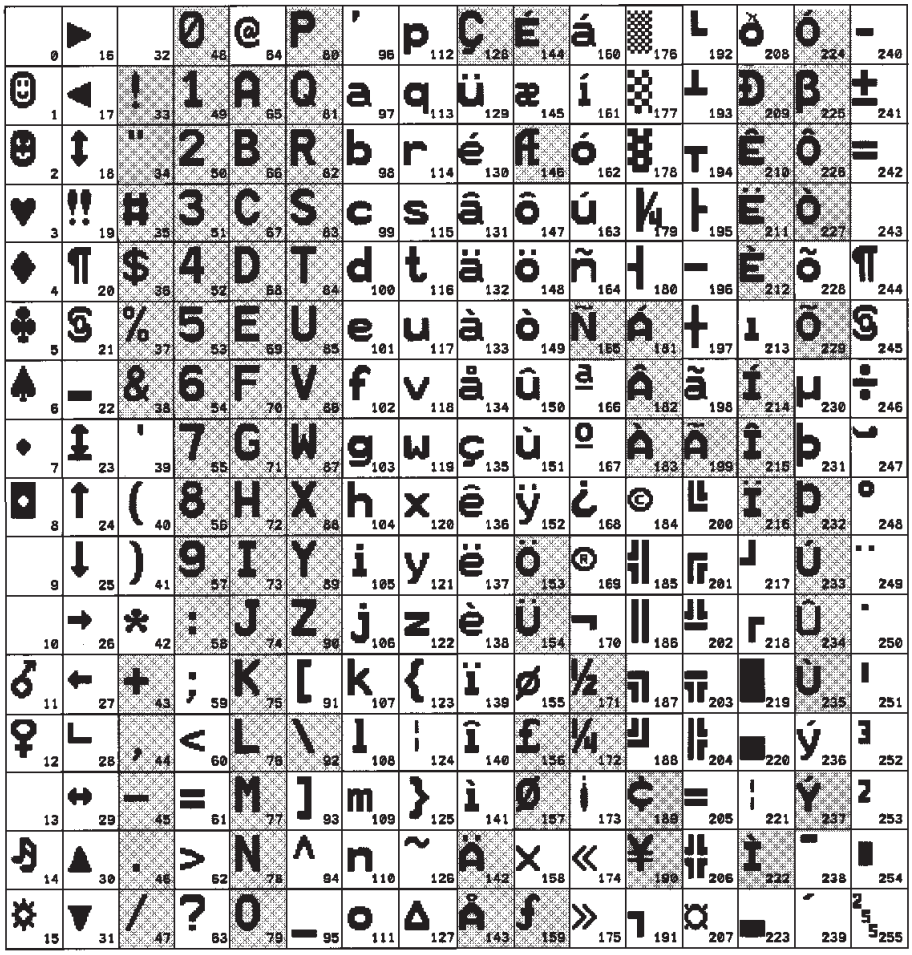
The selected Bar code will remain in effect until changed or power is removed.

Example: ←?2↵ :selects Interleaved 2 of 5 bar codes

Appendix A - Character References

This section has character reference.

Default Character Map
Code Page - 850



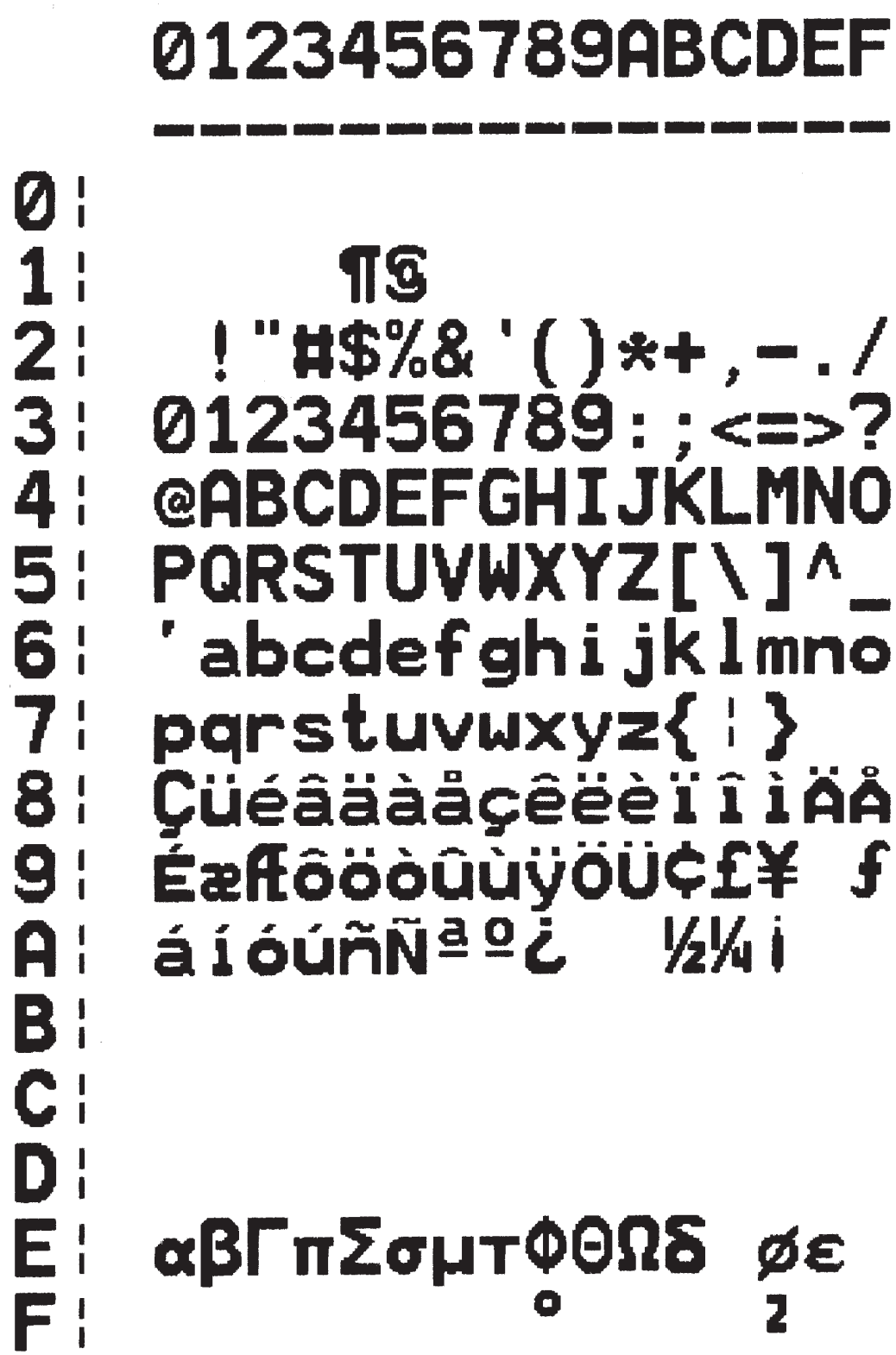
Dump Mode Character Map

Hexidecimal - Most Significant Digit

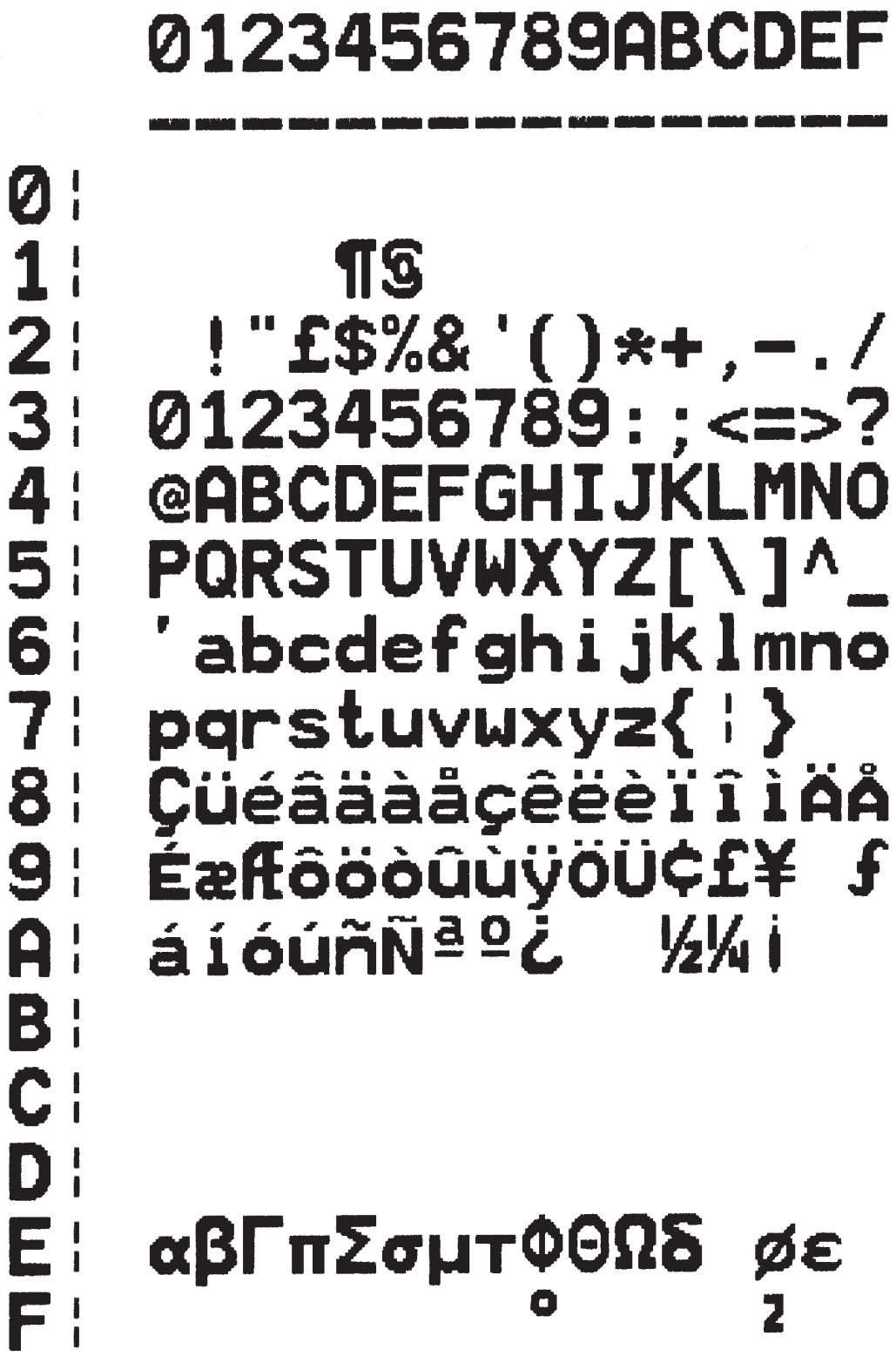
Hexidecimal - Least Significant Digit

	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

Country Code Character Set 0
US ASCII



Country Code Character Set 1
British



Country Code Character Set 2
German

```
    0123456789ABCDEF
    ----------------
0ö
1ö      ¶§
2ö   !"#$%&'()*+,-./
3ö  0123456789:;<=>?
4ö  §ABCDEFGHIJKLMNO
5ö  PQRSTUVWXYZÄÖÜ^_
6ö  'abcdefghijklmno
7ö  pqrstuvwxyzäöüß
8ö
9ö      ¶§
Aö   !"£$%&'()*+,-./
Bö  0123456789:;<=>?
Cö  àABCDEFGHIJKLMNO
Dö  PQRSTUVWXYZ°ç§^_
Eö  'abcdefghijklmno
Fö  pqrstuvwxyzéùè"
```

Country Code Character Set 3
French

```
    0123456789ABCDEF
    ----------------
0ù
1ù      ¶§
2ù   !"£$%&'()*+,-./
3ù 0123456789:;<=>?
4ù àABCDEFGHIJKLMNO
5ù PQRSTUVWXYZ°ç§^_
6ù 'abcdefghijklmno
7ù pqrstuvwxyzéùè¨
8ù
9ù      ¶§
Aù   !"#$%&'()*+,-./
Bù 0123456789:;<=>?
Cù @ABCDEFGHIJKLMNO
Dù PQRSTUVWXYZÆØÅÜ_
Eù 'abcdefghijklmno
Fù pqrstuvwxyzæøåü
```

Country Code Character Set 4
Italian

```
    0123456789ABCDEF
    ----------------
0ø
1ø      ¶§
2ø   !"#$%&'()*+,-./
3ø  0123456789:;<=>?
4ø  @ABCDEFGHIJKLMNO
5ø  PQRSTUVWXYZÆØÅÜ_
6ø  'abcdefghijklmno
7ø  pqrstuvwxyzæøåü
8ø
9ø      ¶§
Aø   !"£$%&'()*+,-./
Bø  0123456789:;<=>?
Cø  §ABCDEFGHIJKLMNO
Dø  PQRSTUVWXYZ°çé^_
Eø  ùabcdefghijklmno
Fø  pqrstuvwxyzàòèì
```

Country Code Character Set 5
Danish

```
    0123456789ABCDEF
    ----------------
0ò
1ò      ¶§
2ò   !"£$%&'()*+,-./
3ò  0123456789:;<=>?
4ò  §ABCDEFGHIJKLMNO
5ò  PQRSTUVWXYZ°çé^_
6ò  ùabcdefghijklmno
7ò  pqrstuvwxyzàòèì
8ò
9ò      ¶§
Aò   !"¡$%&'()*+,-./
Bò  0123456789:;<=>?
Cò  ¡ABCDEFGHIJKLMNO
Dò  PQRSTUVWXYZÑñ¿ü_
Eò  áabcdefghijklmno
Fò  pqrstuvwxyzéíóú
```

Country Code Character Set 6
Spanish

```
    0123456789ABCDEF
    ----------------
0í
1í      ¶§
2í   !"!$%&'()*+,-./
3í  0123456789:;<=>?
4í  ¡ABCDEFGHIJKLMNO
5í  PQRSTUVWXYZÑñ¿ü_
6í  áabcdefghijklmno
7í  pqrstuvwxyzéíóú
8í
9í      ¶§
Aí   !"#$%&'()*+,-./
Bí  0123456789:;<=>?
Cí  ÉABCDEFGHIJKLMNO
Dí  PQRSTUVWXYZÄÖÅÜ_
Eí  éabcdefghijklmno
Fí  pqrstuvwxyzäöåü
```

Country Code Character Set 7
Swedish

```
    0123456789ABCDEF
    ----------------
0ö
1ö      ¶§
2ö   !"#$%&'()*+,-./
3ö  0123456789:;<=>?
4ö  ÉABCDEFGHIJKLMNO
5ö  PQRSTUVWXYZÄÖÅÜ_
6ö  éabcdefghijklmno
7ö  pqrstuvwxyzäöåü
8ö
9ö      ¶§
Aö   !"£$%&'()*+,-./
Bö  0123456789:;<=>?
Cö  §ABCDEFGHIJKLMNO
Dö  PQRSTUVWXYZàçè^_
Eö  'abcdefghijklmno
Fö  pqrstuvwxyzäöüé
```

Country Code Character Set 8
Swiss

```
    0123456789ABCDEF
    ----------------
0ö
1ö      ¶§
2ö   !"£$%&'()*+,-./
3ö  0123456789:;<=>?
4ö  §ABCDEFGHIJKLMNO
5ö  PQRSTUVWXYZàçè^_
6ö  'abcdefghijklmno
7ö  pqrstuvwxyzäöüé
8ö
9ö      ¶§
Aö   !"#$%&'()*+,-./
Bö  0123456789:;<=>?
Cö  @ABCDEFGHIJKLMNO
Dö  PQRSTUVWXYZ[\]^_
Eö  'abcdefghijklmno
Fö  pqrstuvwxyz{¦}
```

Appendix B

System Compatibility Features Many computer operating systems have unique character values assigned to the basic printer control functions of escape, line feed, carriage return and form feed. The line mode printer programming allows for any one or all of these functions to be reassigned as a new one or two character (hexadecimal) data string.

Default ASCII Values for the Basic Printer Control Functions

Command	Function	Processing Order	Decimal	Hexadecimal
CR	Carriage Return	1	13	0D
LF	Line Feed	2	10	0A
FF	Form Feed	3	12	0C
ESC	Escape	4	27	1B

The table below describes the unique, non-printing data characters that are used by the line mode printer to reprogram these basic printer control functions.

Command	Standard Character Name	Decimal	Hexadecimal
<STX>	Start Transmission	02	02
<ETX>	End Transmission	03	03
<EOT>	End of Text	04	04
<CAN>	Cancel	24	18

Changing Control Function Characters Use this command string to change the basic command code functions.

Syntax: **<STX>p_1<EOT>p_2<ETX>**

Parameters **p_1** = Character to be substituted for: Escape (**ESC**), line feed (**LF**), carriage return (**CR**) or a form feed (**FF**).

p_2 = One to two character string to be substituted. Each individual control character can be substituted with a one or two ASCII characters.

Example: **<STX>LF<EOT>?-<ETX>**:The printer will treat a **?-** as a line feed (**LF**).

If control function code substitution is such that a higher priority code is a subset of a lower priority code, the lower priority code will not be executed. For instance, if the carriage return is replaced with **?** and the line feed is replaced with **?-** and the user sends the line feed sequence to the printer the **?** will be interpreted as a carriage return and the **–** will be printed as data.

Resetting the Control Function Characters

Use this command string to reset (or return) the basic printer control function character codes to their default values.

Syntax: **<STX><CAN><ETX>**

Checking Control Function Code Settings

The AutoSense routine's Dump Mode Printout has the decimal values for the basic printer control function displayed near the bottom of the printout.

```
4"M03352F      16 V4.01.65
Serial port:96,N,8,1
Line Mode 0.6
Image buffer size:0507K
Fmem:000.0K,061.4K avl
Gmem:000K,0069K avl
Emem:000K,0069K avl
I8,1,001 rY
S2 D10 R000,000 ZT UN
q832 Q615,024
X2 x2,05 M03
ESC 027      CR 013
LF  010      FF 012
Option:
04 08 13
```

Control Character Values

Appendix C

Modifying Your Printer For EPL1 Compatibility

The Line Mode printing language is designed to be command compatible with EPL1 programming language. The printer character sets used for printing are the basic differences between the ELP flash based Line Mode printer and the EPL1 LP series printer (i.e. LP2022, LP2042, etc.).

ELP1 printers had a character sets for font 1 (CCSET 1) of 14 by 22 dots and font 2 (CCSET 4) that was 5 by 7 dots. See the **A** command (page 3-3) for the default Line Mode fonts. The EPL1 character sets can be installed in the printer prior to switching to Line Mode and using the printer Font Downloader utility.

The printer automatically performs the functions of the Top-of-form (**Qnnn**) command for labels less than 2 inches long and the Extra Feed (**On**) command for label taken sensing.

The printer does not support the Print Line Command (**L**). Lines can be printed with the **G**, **g** and **H** graphic print commands.

Loading ELP1 Font Sets

1. Set the reconfigure the printer for Page (EPL2) Mode. Send a **EPL2** command to the printer.

2. Send the EPL2 **U** command to the printer. The printer will print a Dump Mode status report. If it prints a U, then the print is still in Line Mode and steps 1 and 2 need to be repeated.

3. Download the EPL1 Font file (**LMFONT.BIN**) with the Firmware Downloader program. Change the file type pull down menu to *.BIN files and load the font (and the embedded command that activate the EPL1 fonts).

4. Send the EPL2 **OEPL1** (Set Line Mode) command to the printer. Send a Line Mode **EPL?** command to the printer to print a Dump Mode printout. Verify that the printer is in Line Mode and that the status line immediately below the "**Option:**" line has, at minimum, the following: **oEw, x, y, z**

Cycle the printer power and repeat steps 3 & 4 if the printer is not in Line Mode or the fonts (as represented by **oEw, x, y, z**) are not active and loaded.

Deactivating the EPL1 Fonts

1. 1. Set the reconfigure the printer for Page (EPL2) Mode. Send a **EPL2** command to the printer.

2. Send the EPL2 **U** command to the printer. The printer will print a Dump Mode status report. If it prints a U, then the print is still in Line Mode and steps 1 and 2 need to be repeated.

3. Send the EPL2 **o** (Clear Special Mode Options) command to the printer.

4. Send the EPL2 **OEPL1** (Set Line Mode) command to the printer. Send a Line Mode **EPL?** command to the printer to print a Dump Mode printout. Verify that the printer is in Line Mode and that the status line immediately below the "**Option:"** line has been cleared of the following: **oEw, x, y, z**

Typically the last two lines will read:

```
Options:
04 07 10      << label sensor readings
```

Cycle the printer power and repeat steps 3 & 4 if the printer is not in Line Mode or the fonts have not been cleared.

EPL1 LP20XX Conversion to LN20XX Printer Models

The LN20XX EPL1 printer had unique Control Function Characters (see Appendix B) preprogrammed into the printer.

1. 3. Download the EPL1 LN printer conversion file (**EPL1 Chr Substitution LN.bin**) with the Firmware Downloader program. Change the file type pull down menu to *.BIN files and load the conversion file.

The printer will print a Dump Mode Printout automatically if the conversion is correct. The control function character should be as follows:

```
ESC 063       CR 063,044
LF  063,044  FF 063,046
```

Resetting the LN20XX to LP20XX Printer Mode

See the "Resetting the Control Function Characters" in Appendix B, page B-3.