

ZPL[®] Emulation

Command Reference

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Amendment history

[illegible]

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Command correspondence table

Instruction	Support	Label-View	Symbol	3/1 Release	4/24 Release	6/14 Release
ZPL® II Basic						
the Beginning of the Label	O	O	^XA	O	O	O
the Ending of the Label	O	O	^XZ	O	O	O
Label Home	O	O	^LHx,y	O	O	O
Label Length	O	O	^LLy	O	O	O
Maximum Label Length	O		^MLa	2/E	O	O
Set Label Shift	O		^LSa	4/E	Add	O
Print Width	O		^Pwa	2/E	O	O
Field Orientation	O		^FWr	O	O	O
Print Orientation	O		^POa	O	O	O
Field Origin	O	O	^FOx,y	2/E	O	O
Field Typeset	O		^FTx,y	O	O	O
Field Parameter	O		^FPd,g	4/E	Add	O
Field Data	O	O	^FD<data>	O	O	O
Field Separator	O	O	^FS	O	O	O
Field HEX Instruction	O		^FHa	4/E	Add	O
Printer Configuration						
Print Mode	O	O	^MMa,b	2/E	O	O
Media Tracking	O	O	^MNa	O	O	O
Media Type	O	O	^MTa	2/E	O	O
Set Units of Measurement	O		^MUa,b,c	4/E	Add	O
Media Darkness	O	O	^MDa	2/E	O	O
Set Darkness	O		~SD#	2/E	O	O
Text for Labels						
Change International Font	O	O	^Cla,s1,d1,s2,d2,.....	4/E	Add	O
Font Selection	O		^CFf,h,w	2/E	O	O
Alphanumeric Font Instructions	O	O	^Afo,h,w	O	O	O
Scalable Font Size	O		^A0o,h,w	2/E	O	O
Use Font Name to Call Font	O		^A@o,h,w,n	4/E	Add	O
Download Bitmap Font	O	O	~DBd:o.x,a,h,w,base,space,#char,c,data	O	O	O
Download Unbounded TrueType Font	O		~DUD:f,s,data	4/E	X*	O
Font Identifier	O	O	^CWa,d:o.x	O	O	O
Bar Codes						
Interleaved 2 of 5	O		^B2o,h,f,g,e	2/E	O	O
Codabar	O		^BKo,e,h,f,g,k,l	2/E	O	O
Plessey	O		^BPo,e,h,f,g	2/E	O	O
POSTNET	O		^BZo,h,f,g	4/E	Add	O
EAN-8	O		^B8o,h,f,g	2/E	O	O

UPC-E	O		^B9o,h,f,g,e	2/E	O	O
EAN-13	O		^BEo,h,f,g	2/E	O	O
UPC/EAN Extensions	O		^BSO,h,f,g	2/E	O	O
UPC-A	O		^BUo,h,f,g,e	2/E	O	O
Code 39	O		^B3o,e,h,f,g	2/E	O	O
Code 93	O		^BAo,h,f,g,e	2/E	O	O
Code 128	O		^BCo,h,f,g,e	O	O	O
Two-Dimensional Bar Code						
PDF417	O		^B7o,h,s,c,r,t	2/E	O	O
UPS MaxiCode	O		^BDm,n,t	4/E	Add	O
Data Matrix	O		^BXo,h,s,c,r,f,g	2/E	O	O
Bar Codes others						
Bar Code Field Default Instruction	O	O	^BYw,r,h	O	O	O
Graphic Instruction						
Graphic Box	O	O	^GBw,h,t,c,r	O	O	O
Graphic Circle	O		^GCd,t,c	2/E	O	O
Graphic Diagonal Line	O		^GDw,h,t,c,o	2/E	O	O
Download Direct Bitmap	O		^DDa,b,data	4/E	Not Support ed*	Not Supporte d*
Downloading a Graphic Image	O	O	~DGd:o.x,t,w,data	O	O	O
Graphic Field	O		^GFa,b,c,d,data	4/E	Not Support ed*	Not Supporte d*
Download Graphics	O		~DYf,b,x,t,w,data	4/E	Add	O
Recall Graphic image	O	O	^XGd:o.x,mx,my	O	O	O
Image Move	O		^IMd:o.x	4/E	Add	O
Saving Label Format in Memory as Graphic Images	O		^ISd:o.x,p	4/E	Add	O
Recalling Label Format from Memory	O		^ILd:o.x	4/E	X	O
Deleting Object from Memory	O	O	^IDd:o.x	4/E	Add	O
Deleting all Graphic Images from DRAM	O	O	^EG ~EG	2/E	O	O
Advanced Techniques						
Nonprinting Comments	O		^FX<data>	2/E	O	O
Reverse Printing a Field	O	O	^FR	O	O	O
Label Reverse Print	O		^LRa	O	O	O
Mirror Image	O	O	^PMa	4/E	Add	O
Serialized Data	O	O	^SNv,n,z	2/E	O	O
Tear-off Adjust Position	O		~TA###	4/E	Add	O
Initialize/Erase Stored Formats	O		^EF or ~EF	4/E	Add	O
Download Format	O		^DFd:o.x	4/E	Add	O
Recall Stored Format	O		^XFd:o.x	4/E	Add	O
Set Time/Date	O		^STa.b.c.d.e.f,g	2/E	O	O

Power On Reset	O		~JR	2/E	O	O
Set Media Sensor Calibration	O		~JC	2/E	O	O
Cancel All	O		~JA	4/E	Add	O
Pause and Cancel Format	O		~JP	4/E	Add	O
Cancel Current Partially....	O		~JX	4/E	Add	O
Slew to Home Position	O	~* ^O	~PH ^PH	2/E	O	O
Programable Pause	O		~PP ^PP	2/E	O	O
Print Start	O		~PS	2/E	O	O
Print Quantity	O	O	^PQq,p,r,o	O	O	O
Print Rate	O	O	^PRp,s,b	2/E	O	O
Applicator Reprint	O		~PR	4/E	Add	O
Set Dots/Millimeter	O	O	^JMn	4/E	Add	O
Change Caret	O		^CCx ~CCx	2/E	O	O
Change Delimiter	O		^CDx ~CDx	2/E	O	O
Change Tilde	O		^CTa ~CTa	2/E	O	O
Change Memory Letter Designation	O		^CMa,b,c	4/E	Add	O
Ebable Communucation Diagnostics	O		~JD	2/E	O	O
Print Configuration	O		~WC	2/E	O	O

***Since correspondence is technically impossible, ^DD and ^GF do not support.**

‘O’ means command is available.

ZPL®

Command Reference

ZPL® Basic

^XA

Start Format

Description:

The ^XA command is used at the beginning of ZPL® code, It is the opening bracket and indicates the start of a new label format.

Format: ^XA

Comments:

Label formats should start with the ^XA command and end with the ^XZ command to be in valid ^ZPL® format.

^XZ

End Format

Description:

The ^XZ command is the ending(closing)bracket. It indicates the end of a label format. When this command is received, a label will be printed.

Format: ^XZ

Comments:

Label formats must start with the ^XA command and end with the ^XZ command to be in valid ZPL® format.

^LH

Label Home

Description:

The ^LH command sets the label home position.

The default home position of a label is the upper-left corner (position 0,0 along the x-axis and y-axis).This is the axis reference point for labels. Any area below and to the right of this point is available for printing. The ^LH command changes this reference point. For instance, when working

with preprinted labels, use this command to move the reference point below the preprinted area. This command will only affect fields that come after it. It is suggested that this be one of the first commands in the label format.

Format: ^LHx,y

Parameters:

x = x-axis position(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Initial Value at Power-up:0 or last permanent saved value

y = y-axis position(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Initial Value at Power-up:0 or last permanent saved value

Depending on the printhead used in your printer, use one of the following when figuring the values for x and y:

8 dots=1 mm(millimeter),200 dots=1 inch.

12 dots=1 mm(millimeter),300 dots=1 inch.

To be compatible with existing printers, this command must come before the first ^FS(Field Separator)command. Once you have issued an ^LH command, the setting is retained until you turn off the printer or send a new ^LH command to the printer.

^LL

Label Length

Description:

The ^LL command defines the length of the label. This command is necessary when using continuous media(i.e. media not divided into separate labels by gaps, spaces, notches, slots or holes). To affect the current label and be compatible with existing printers, this command must come before the first ^FS command. Once you have issued an ^LL command, the setting is retained until you turn off the printer or send a new ^LL command to the printer.

This command changes “Contitu.MediaLen”(operation panel).

Format: ^LLy

Parameters:

y = y-axis position(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi),not to exceed the maximum label size.

While the printer will accept any value for this parameter, the amount of memory

installed will determine the maximum length of the label.

Default Values:

A value must be entered or the command is ignored

101.6mm(4.00inch) using 8 dot/mm printhead

Comments:

If multiple ^LL commands are issued in the same label format, the last ^LL command will also affect the next label unless it is prior to the first ^FS.

^ML

Maximum Label Length

Description:

The ^ML command lets you adjust the maximum label length.

Format: ^MLa

Parameters:

a = maximum label length(in dot rows)

Accepted Values: 0 to maximum length of label

Default Value: last permanently saved value

Comments:

In order for calibration to work properly, you must set the maximum label length equal to or greater than your actual label length.

^LS

Label Shift

Description:

The ^LS command is used to shift all field positions to the left.

If the print position is less than 0,set ^LS to 0.

This command must come before the first ^FS command. Once you have issued an ^LS command, the setting is retained until you turn off the printer or send a new ^LS command to the printer.

But if you execute “Save Setting” on operation-panel, the setting isn’t saved.

Format: ^LSa

Parameters:

a = shift left value(in dots)

Accepted Values:-9999 to 9999

Initial Value at Power-up:0

Comments:

When entering positive values, it is not necessary to use the + sign, The value is assumed to be positive unless preceded by a negative sign.

^PW

Print Width

Description:

The ^PW command allows you set the print width.

This command changes “Label Width”(operation panel).

Format: ^PWa

Parameters:

a = label width in dots

Default Values:

A value must be entered or the command is ignored

103.9mm(4.09) inches using 8 dot/mm printhead

Comments:

^FW

Field Orientation

Description:

The ^FW command sets the default orientation for all command fields that have an orientation (rotation) parameter. Fields can be rotated 0,90,180,270 degrees clockwise by using this command.

The ^FW command only affects fields that follow it. Once you have issued a ~FW commands, the setting is retained until you turn off the printer or send a new ^FW command to the printer.

Format: ^FWr

Parameters:

r = rotate field

Accepted Value:

N = normal

R = rotated 90 degrees

I = inverted 180 degrees

B = bottom-up 270 degrees, read from bottom up

Initial Value at Power-up: N

Comments:

If the ^FW command is entered with the r parameter missing, the command is ignored.

^FW only affects the orientation in commands where the rotation parameter has not been specifically set. If an command has a specific rotation parameter, that is the once that is used.

^PO

Print Orientation

Description:

The ^PO command inverts the label format 180 degrees. In essence, the label is printed upside-down. If the original label contains commands such as ^LL, ^LS the inverted label output will be effected differently.

Format: ^POa

Parameters:

a = invert label 180 degrees

Accepted Values: N(normal) or I(invert)

Default Value: N

Comments:

If multiple ^PO commands are issued in the same label format, only the last command send to the printer is used.

Once you issue a ^PO command, the setting is retained until another ^PO command is received or the printer is powered down.

^FO

Field Origin

Description:

The ^FO command sets a field origin, relative to the label home(^LH) position. ^FO sets the upper-left corner of the field area by defining points along the x-axis and y-axis independent of the rotation.

Format: ^FOx,y

Parameters:

x = x-axis location(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Default Value:0

y = y-axis location(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Default Value:0

Comments:

If the value entered for the x or y parameter is too high, it could position the field origin completely off the label.

^FT

Field Typeset

Description:

The ^FT command also sets the field position, relative to the home position of the label designated by the ^LH command. The typesetting origin of the field is fixed with respect to the contents of the field and does not change with rotation.

Format: ^FTx,y

Parameters:

x = x-axis location(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Default Value: position after last formatted text field

y = y-axis location(in dots)

Accepted Values: 0 to 7999(200dpi) / 0 to 11998(300dpi)

Default Value: position after last formatted text field

Text-Origin is the start of the character string, at the baseline of the font. Normally the baseline is the bottom of most characters except for those with descenders such as 'g', 'y', etc.

Bar Codes-The origin is the base of the bar code, even when an interpretation is present below the bar code, or if the bar code has guard bars.

Graphic Boxes-Origin is at the bottom-left corner of the box.

Images-Origin is at the bottom-left corner of the rectangular image area.

^FP

Field Parameter

Description:

The ^FP command sets the inter-character gap.

Format: ^FPd,g

Parameters:

d = not care

g: = additional inter-character gap(in dots)

Accepted Values:0 to 9999

^FD

^Field Data

Description:

The ^FD command defines the data string for the field. The field data can be any printable character except those used as command prefixes(^ and ~).

Format: ^FDa

Parameters:

a = data to be printed

Accepted Values: any ASCII string up to 3072 characters.

Default Value: none – a string of characters must be entered.

Comments:

The ^ and ~ characters can be printed by changing the prefix characters – refer to the ~CC and ~CT commands. The new prefix characters cannot be printed.

Characters with codes above 127,or the ^ and ~ characters can be printed using the ^FH and ^FD commands.

^FS

Field Separator

Description:

The ^FS command denotes the end of the field definition.

Format: ^FS

Parameters:

^FS = field separator

^FH

Field Hexadecimal Indicator

Description:

The ^FH command allows you to enter the hexadecimal value for any character directly into the ^FD statement. The ^FH command must precede each ^FD command in which it will be used.

Within the ^FD statement, the HEX indicator must precede each hexadecimal value. The default hexadecimal indicator is _(underscore). There must be a minimum of two characters designated to follow the underscore. The a parameter can be added when a different hexadecimal indicator is needed.

This command can be used with any of the commands that have field data (i.e. ^FD, ^SN (Serialized Data)).

Valid hexadecimal characters are;

0123456789ABCDEFabcdef

Format: ^FH a

Parameters:

a = hexadecimal indicator

Accepted Values: any character except current format and control prefix (^ and ~ by default).

Default Value: _(underscore)

Example:

^FO100,100^AD^FH^FD Tilde _7e used for HEX^FS

Tilde ~ used for HEX

Printer Configuration

^MM

Print Mode

Description:

The ^MM command determines the action the printer takes after a label or group of labels has been printed. There are four different modes of operation:

1. Tear-Off - After printing, the label is advanced so that the web is over the tear bar. Label, with backing attached, can then be torn off manually.

2.Tear-On - After printing, the next label is positioned under the printhead (no backfeed motion).

3.Peel-Off - After printing, the label is moved forward and activated a label Available Sensor. Printing stops until the label is manually removed from the printer.

Power peel-backing material is automatically rewound using an optional internal rewind spindle.

4.Cutter - After printing, the media feeds forward and is automatically cut into predetermined lengths.

Format: ^MMa,b

Parameters:

a = desired mode

Accepted Values:

T = tear off

P = peel off

R = tear on

C = cutter

Default Value: T

b = not care

The command will be ignored if parameters are missing or invalid. The current value of the command will remain unchanged.

^MN

Media Tracking

Description:

The ^MN command relays to the printer what type of media is being used(continuous or non-continuous) for purposes of tracking. There are two choices for this command:

1.Continuous Media – This media has no physical characteristic(web, notch, perforation, mark, etc,)to separate labels. Label Length is determined by the ^LL command.

2.Non-continuous Media – This media has some type of physical characteristic(web, notch, perforation, mark, etc,)to separate the labels.

Format: ^MNa

Parameters:

a = media being used

Accepted Values:

N = continuous media

Y = non-continuous media

W = non-continuous media web sensing

M = non-continuous media mark sensing

Comments:

If the parameter is missing or invalid, the command will be ignored.

^MT

Media Type

Description:

The ^MT command selects the type of media being used in the printer. There are two choices for this command;

1. Thermal Transfer Media-This media uses a high carbon black or colored ribbon. The ink on the ribbon is bonded to the media.

2. Direct Thermal Media-The media is heat sensitive and requires no ribbon.

Format: ^MTa

Parameters:

a = media type used

Accepted Values:

T = thermal transfer media

D = direct thermal media

Comments:

If the parameter is missing or invalid, the command will be ignored.

^MU

Set Units of Measurement

Description:

This command sets the printer units of measurement. The ^MU command works on a field-by-field basis. Once the mode units is set, it carries over from field to field until a new mode units is entered.

Format: ^MUa,b,c

Parameters:

a = units

Accepted Values:

D = dots

I = inches

M = millimeters

Default Value: D

b = not care

c = not care

Comments:

This command should appear at the beginning of the label format to be in proper ZPL® format.

^MD

Media Darkness

Description:

This ^MD command adjusts the darkness relative to the current darkness setting. The minimum value is -30 and the maximum value is 30.

Format: ^MDa

Parameters:

a = media darkness level

Accepted Values:-30 to 30,depending on current value.

Initial Value at Power-up:0

If no value is entered, this command is ignored.

Examples:

- If the current value(value on configuration label)is 16,entering the command^MD-9 would decrease the value to 7.
- If the current value(value on configuration label)is 1,entering the command ^MD15 would increase the value to 16.
- If the current value(value on configuration label)is 25,entering the command ^MD10 would only increase the value to 30 since that is the maximum value allowed.

Each ^MD command is treated separately in relation to the current value as printed on the configuration label.

For example, this is what would happen if two ^MD commands were received.

Assume the current value is 15. An ^MD-6 command is received that changes the current value to 9. Another command, ^MD2, is received. The current value is changed to 17. The two ^MD commands were treated individually with respect to the current value of 15.

~SD

Set Darkness

Description:

The ~SD command lets you set the darkness of printing via ZPL®. It is equivalent to the darkness setting parameter on the front panel display.

This command changes “Print Darkness”(operation panel).

Format: ~SD#

Parameters:

#=desired darkness setting(2-digit number)

Accepted Values: 00 to 30

Default Value: last permanently saved value

Comments:

The ^MD command value, if applicable, is added to the ~SD command.

Text for Labels

^CI

Change International Font

Description:

The printers can print TrueType fonts using various international character sets; USA, UK, Denmark/Norway, Sweden/Finland, Germany, France, Italy, and Spain.

ZPL® follows the ISO standards for international characters.

The ^CI command enables you to call up the international character set you want to use for printing. You can mix character sets on a label. The following page shows the international character sets available.

This command allows character remapping. Any character within a font can be remapped to a different numerical position.

It depends on the font at that time for the character printed by the actual code page.

Format: ^CIa,s1,d1,s2,d2,...

Parameters:

a = desired character set

Accepted Values:

0=U.S.A.

1=Reserved (U.S.A.)

2=UK

3= Reserved

4=Denmark/Norway

5=Sweden/Finland

6=Germany

7=France

8= Reserved (France)

9=Italy

10=Spain

11=Reserved (U.S.A.)

12=Reserved (U.S.A.)

13=IBM Code Page 850

Initial Value at Power-up: last permanent value saved.

s1=source 1(character position to be remapped)

Accepted Values: decimals 0 to 255

d1=destination 1(new position for the character referred to in s1)

Accepted Values: decimals 0 to 255

s2=source 2(character position to be remapped)

Accepted Values: decimals 0 to 255

d2=destination 2(new position for the character referred to in s2)

Accepted Values: decimals 0 to 255

... = continuation of pattern

Up to 256 source and destination pairs can be entered in this command.

Example:

This example re-maps the Euro symbol(21) to the Dollar sign value(36).In this way, when the dollar sign character is sent to the printer, the Euro symbol will print. The Euro symbol value,15 Hex, equals 21 decimal, and the Dollar sign value,24 Hex, equals 36 decimal.

^CI0,21,36

Hex	2	3	4	5	5	5	5	6	7	7	7	7
	3	0	0	B	C	D	E	0	B	C	D	E
CI0	#	0	@	[	¢	]	^	'	{	|	}	~
CI1	#	0	@	½	¢	¾	^	'	¼	½	¾	~
CI2	£	0	@	[	¢	]	^	'	{	|	}	~
CI3	f	0	s	[	U	]	^	'	{	i	j	~
CI4	#	0	@	Æ	Ø	Å	^	'	æ	ø	å	~
CI5	Ü	0	E	Ä	Ö	Å	Ü	é	ä	ö	å	ü
CI6	#	0	s	Ä	Ö	Ü	^	'	ä	ö	ü	ß
CI7	£	0	à	[	ç	]	^	'	é	í	ú	è
CI8	#	0	à	â	ç	ê	î	ô	é	ù	è	û
CI9	£	0	s	[	ç	é	^	ù	à	ò	è	ì
CI10	#	0	s	ì	Ñ	¿	^	'	{	ñ	ç	~
CI11	£	0	E	Ä	Ö	Ü	^	ä	ë	ï	ö	ü
CI12	#	0	@	[	¥	]	^	'	{	|	}	~
CI13	#	0	@	[	\	\]	^	'	{	|	}	~

International Character Sets

Comments:

The “space” character cannot be remapped for any font.

^CF

Change Alphanumeric Default Font

Description:

You can use the ^CF command to keep your programs simple. The ^CF command sets the default font used in your printer.

Format: ^CFf,h,w

Parameters:

f = specified default font

Accepted Values: A through H, and numerals 0 to 9.

Initial Value at Power-up: A

h = individual character height(in dots)

Accepted Values:0 to 32000

Initial Value at Power-up:9

w = individual character width(in dots)

Accepted Values:0 to 32000

Initial Value at Power-up:5 or last permanent saved value.

Parameter f specifies the default font for every alphanumeric field. Parameter h is default height for every alpha field, parameter w is default width value for every alpha field.

The default alphanumeric font is A. If you do not change the alphanumeric default font(^CF command) and do not use any alphanumeric field command(^Af) or enter an invalid font value, any data you specify will print in font A.

Defining only the height or width forces the magnification to be proportional to the parameter defined. If neither value is defined, the ^CF values given or the default ^CF values for height and width are used.

^A

Scalable/Bitmapped Font

Description:

The ^A command is used with build-in or TrueType® fonts. ^A designates the font for the current ^FD statement or field. The font specified in ^A will be used only once for that ^FD entry. If ^A is not specified again, the default ^CF font will be used for the next ^FD entry.

Format: ^Af,o,h,w

Parameters:

f = font name

Accepted Values: letters A through Z, and numbers 1 to 9.

Default Value: A

Any font in the printer(downloaded, EPROM, stored fonts, font A through Z and 1 to 9)can also be selected with the ^CW command. If the value is incorrect or unspecified, it will revert to the default or the current ^CF value.

o = font orientation

Accepted Values:

N = normal

R = rotated90 degrees(clockwise)

I = inverted180 degrees

B = read from bottom up,270 degrees

Default Value: the last accepted ^FW value or the ^FW default.

h = character height(in dots)

Scalable:

Accepted Values:10 to 1500

Default Value: last accepted value for ^CF.

Bitmapped:

Accepted Values: Multiples of height from 1 to 24 times the standard height, in increments of 1.

Default Value: The standard matrix height for a specified font.

w = width(in dots)

Scalable:

Accepted Values: 10 to 1500

Default Value: last accepted value for ^CF.

Bitmapped:

Accepted Values: Multiples of width from 1 to 24 times the standard width, in increments of 1.

Default Value: The standard matrix width for a specified font.

Comments:

Fonts are built using a matrix that defines standard height-to-width ratios. If you specify only the height or width value, the standard matrix for that font will automatically determine the other value. If the value is blank or a 0(zero) is entered, the height or width will be determined by the standard font matrix.

^A@

Use Font Name to Call Font

Description:

The ^A@ command uses the complete name of a font, rather than the character designation used in ^A. Once ^A@ is defined, it will represent that font until a new font name is specified by ^A@.

Format: ^A@o,h,w,n

Parameters:

o = font orientation

Accepted Values:

N = normal

R = rotated 90 degrees (clockwise)

I = inverted 180 degrees

B = read from bottom up, 270 degrees

Default Value: Last ^FW value or N if an orientation is not specified.

h = character height(in dots)

Default Value: Magnification specified by w(character width) or the last accepted ^CF

value. The base height is used if none is specified.

Scalable:

The value is the height in dots of the entire character block. Magnification factors are unnecessary, since characters are scaled.

Bitmapped:

The value is rounded to nearest integer multiple of the font's base height, then divided by the font's base height to give a magnification nearest limit.

w = character width(in dots)

Default Value: Magnification specified by h(height) or the last accepted ^CF value. The base width is used if none is specified.

Scalable:

The value is the width in dots of the entire character block. Magnification factors are unnecessary, since characters are scaled.

Bitmapped:

The value is rounded to nearest integer multiple of the font's base width, then divided by the font's base width to give a magnification nearest limit.

n = font name(.FNT extension)

Accepted Values: any valid font(with the extension .FNT)

Default Value: If no letter designates the device location, the default device is RAM or R:. The font named will carry over on all subsequent ^A@ commands without a font name.

Example:

```
^XA^A@N,25,25,B:Cyrillic.FNT^FO100,20^FS
```

```
^FDThis is a test^FS
```

```
^A@N,50,50^FO200,40^FS
```

```
^FDThis string uses the B:Cyrillic.FNT^FS^XZ
```

The first line will search the non-volatile memory of the printer(e.g. B:) looking for the "Cyrillic.FNT" font name. When the font is found, the command will set the character size, the field origin, and print the field data "This is a test" on a label(line2).

In the third command line, the character size is increased and a new field origin is set. Line 4 prints the field data "This string uses the B: Cyrillic.FNT" in the same font.

~DB

Download Bitmap Font

Description:

The ~DB command sets the printer to receive a download bitmap font, defines native cell size, baseline, space size, and copyright.

This command consists of two portions, a ZPL® command which defines the font and a structured data segment which defines each character of the font.

Format: ~DBd:o,x,a,h,w,base,space,"char,©,data

Parameters:

d = destination drive to store font

o = name of font

Accepted Values: 1 to 8 alphanumeric characters

Default Value: UNKNOWN.FNT

x = extension

Fixed: .FNT

a = orientation of native font

Fixed: Normal

h = maximum height of cell(in dots)

w = maximum width of cell(in dots)

base = dots from top of cell to character baseline

space = width of space or non-existent characters

#char = number of characters in font

Maximum characters allowed is 256, This must match the number of characters being downloaded.

©=copyright holder

Maximum length of text string is 63 characters.

¥data = structured ASCII data that defines each character in the font

The # symbol signifies character code parameters which are separated with periods. The character code is from 1 to 4 characters to allow for large international character sets to be downloaded to the printer.

The data structure is:

#xxxx,h,w,x,y,i,data

#xxxx = character code

h = bitmap height(in dot rows)
w = bitmap width(in dot rows)
x = x-offset(in dots)
y = y-offset(in dots)
i = typesetting motion displacement(width including inter-character gap
of a particular character in the font)
data = hexadecimal bitmap description

~DU

Download Unbounded TrueType Font

Description:

Some international fonts have more than 256 printable characters. These fonts are supported as “LARGE TrueType Fonts” such as Asian fonts, and are downloaded to the printer with the ~DU command.

A ZPL® downloadable format must be converted from original True Type Fonts file.

Format: ~DUf,s,data

Parameters:

f = font name

Accepted Values: A destination indicator(any non-volatile RAM device; default device is R:) followed by the TrueType name, up to 8 characters.

Default Value: If no name is entered, UNKNOWN is used.

s = font size

Accepted Values: The number of memory bytes required to hold the ZPL® downloadable format of the font.

Default Value: If no data is entered, the command is ignored.

data = data string

Accepted Values: a string of ASCII hexadecimal values(2 hex digits/byte).The total number of 2-digit values must match s.

Default Value: If no data is entered, the command is ignored.

Example:

~DUR:KANJI,896753,60CA017B0CE7...

^CW

Font Identifier

Description:

All built-in fonts have a one-character identifier. The ^CW command assigns a single alphanumeric character(A through Z and 0 to 9)to a font stored in DRAM, memory card, EPROM or Flash.

If the assigned character is the same as that of a built-in font, the downloaded font is used in place of the built-in font. The new font will be printed on the label wherever the format calls for the built-in font. If used in place of a built-in font, the change is only in effect until power is turned off.

If the assigned character is different, the downloaded font is used as an additional font. The assignment will remain in effect until a new command is issued or the printer turned off.

Format:^CWa,d:o,x

Parameters:

a = letter of existing font to be substituted, or new font to be added

Required is a one-character entry.

d = destination of device to store font in(optional)

Accepted Values: E:, B:, R:, Z:

Default :R:

o = name of the downloaded font to be substituted for the built-in, or as an additional font(1 to 8 alphanumeric characters)

Accepted Values: any name up to 8 characters

Default: If no name is entered, UNKNOWN is used.

x = 3-character extension

Fixed: .FNT

Example:

To use MYFONT.FNT stored in DRAM whenever a format calls for Font A:

^XA^CWA,R:MYFONT.FNT^XZ

To use MYFONT.FNT stored in DRAM as additional Font Q:

^XA^XWQ,R:MYFONT.FNT^XZ

To use NEWFONT.FNT stored in DRAM whenever a format calls for font F:

^XA^CWF,R:NEWFONT.FNT^XZ

Bar Codes

^B2

Interleaved 2 of 5 Bar Code

Description:

The ^B2 command is a high density, self-checking, continuous, numeric symbology.

Each data character for the Interleaved 2 of 5 Bar Code is composed of five elements: five bars or five spaces. Of the five elements, two are wide and three are narrow. The bar code is formed by interleaving characters formed with all spaces into characters formed with all bars.

• ^B2 standard ratio(ratio of thick bar to thin bar) is 5 : 2.

• Field data(^FD) is limited to the width(or length, if rotated)of the label.

Format: ^B2o,h,f,g,e

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

e = calculate and print Mod 10 check digit

Accepted Values: Y(yes) or N(no)

Default Value: N

Example:

^XA^FO100,100^BY3

^B2N,150,Y,N,N

^FD1234567890^XZ



Comments:

The total number of digits in an Interleaved Bar Code must be even.

The printer automatically adds a leading 0(zero)if an odd number of digits is received.

The Interleaved 2 of 5 bar code uses the Mod 10 check-digit scheme for error checking.

^BK

ANSI Codabar

Description:

The ^BK command is currently used in a variety of information processing applications such as libraries, the medical industry, and overnight package delivery companies. This bar code is also known as USD-4 code,NW-7 and 2 of 7 code. It was originally developed for retail price-labeling use.

Each character in this code is composed of seven elements: four bars and three spaces. Codabar bar codes use two character sets, numeric and control(start/stop)characters.

- ^BI standard ratio is 3 : 1.

- Field data(^FD) is limited to the width (or length, if rotated) of the label.

Format:^BKo,e,h,f,g,k,l

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

e = not care

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

k = designates start character

Accepted Values: b, c, d

Default Value: a

l = designates stop character

Accepted Values: b, c, d,

Default Value: a

Example :

^XA^FO100,100^BY3

^BKN,N,150,Y,N,A,B

^FD123^XZ



^BP

Plessey Bar code

Description:

The ^BP command is a pulse-width modulated, continuous, non-self-checking symbology.

Each character in the Plessey bar code is composed of eight elements: four bars and four adjacent spaces.

• Field data(^FD)is limited to the width (or length, if rotated) of the label.

Format: ^BPo,e,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

e = not care

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

Example:

^XA^FO100,100^BY3
^BPN,N,100,Y,N
^FD12344^XZ



^BZ

POSTNET Bar Code

Description:

The POSTNET bar code is used to automate the handling of mail. POSTNET uses a series of five bars, two tall and three short, to represent the digits 0 to 9.

• Field data(^FD) is limited to the width (or length, if rotated) of the label.

Format: ^BZo,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = not care

f = not care

g = not care

Example:

^XA^FO100,100^BY3
^BZN,40,N,N
^FD32569^XZ



Comments:

This bar code size can be change by using parameter w & r in the ^BY command.

If additional information about the POSTNET Bar Code is required, contact the United States Postal Service and ask for Publication 25-Designing Letter Mail, which includes a full specification for POSTNET. You can also download Publication 25 from the URL below:

^B8

EAN-8 Bar Code

Description:

The ^B8 command is then shortened version of the EAN-13 bar code. EAN is an acronym for European Article Numbering. Each character in the EAN-8 bar code is composed of four elements: two bars and two spaces.

- ^B8 element size is 1 : 1, 2 : 2, 3 : 3, 4 : 4, 6 : 6, and 8 : 8.

- Field data(^FD)is limited to exactly seven characters. When the eight characters is sent from the computer, the printer compares the characters with the calculated checksum. If they do not agree, the printer prints all bar codes 0 (zero). And it is not printed when the input characters is smaller than seven characters.

Format: ^B8o,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

Example:

^XA^FO100,100^BY3

^B8N,100,Y,N

^FD0987234



^B9

UPC-E Bar Code

Description:

The ^B9 command is a variation of the UPC symbology used for number system 0. It is a shortened version of the UPC-A bar code in which zeros are suppressed, resulting in codes that require less printing space.

Each character in a UPC-E bar code is composed of four elements: two bars and two spaces. The ^BY command must be used to specify the width of the narrow bar.

- ^B9 element size is 1 : 1, 2 : 2, 3 : 3, 4 : 4, 6 : 6, and 8 : 8.
- Field data(^FD)is limited to exactly 6 characters.
- The first digit numbering system character is "0" fixed so it is not transmitted.
- When the six characters is sent from computer, the printer automatically calculates the checksum at the end of digit
- When the seven characters is sent from the computer, the printer compares the characters with the calculated checksum. If they do not agree, the printer prints all bar codes 0 (zero). And it is not printed when the input characters is smaller than 6 characters.
- If supplementary code is to be added, refer to item of bar code ^BS.

Format:^B9o,h,f,g,e

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) N(no)

Default Value: Y

g = not care

e = not care

Example:

^XA^FO150,100^BY3
^BSN,100,Y,N,Y
^FD098723^XZ



^BE

EAN-13 Bar Code

Description:

The ^BE command is similar to the UPC-A bar code. It is widely used throughout Europe and Japan in the retail marketplace.

The EAN-13 bar code has 12 data characters, one more data character than the UPC-A code. An EAN-13 symbol contains the same number of bars as the UPC-A, but encodes a 13th digit into a parity pattern of the left-hand six digits. This 13th digit, in combination with the 12th digit, represents a country code.

- ^BE Element size is 1 : 1, 2 : 2, 3 : 3, 4 : 4, 6 : 6, and 8 : 8.
- Field data(^FD) is limited to exactly 12 characters.
- When the 12 characters is sent from computer, the printer automatically calculates the checksum at the end of digit
- When the 13 characters is sent from the computer, the printer compares the characters with the calculated checksum. If they do not agree, the printer prints all bar codes 0 (zero). And it is not printed when the input characters is smaller than 12 characters.

Format: ^BEo,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

e = not care

Example:

^XA^FO150,100^BY3

^BEN,100,Y,N

^FD098723497823^XZ



^BS

UPC/EAN Extensions

Description:

The ^BS(UPC/EAN extensions)command is the 2-and 5-digit add-on used primarily by publishers to create bar codes for ISBN's(International Standard Book Numbers).These extensions are handled as separate bar codes.

The ^BS command is designed to be used with ^BU(UPC-A Bar Code)and ^B9(UPC-E Bar Code)

- Field data(^FD) is limited to exactly 2 or 5 characters.
- When the 3 or 6 characters is sent from the computer, the printer compares the characters with the calculated checksum. If they do not agree, the printer prints all bar codes 0 (zero). And it is not printed when the input characters is smaller than 2 or 5 characters.

Format:^BS_o,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values:1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

Example:

^XA^FO150,100^BY3

^BSN,100,Y,N

^FD12^XZ

^XA^FO150,100^BY3

^BSN,100,Y,N

^FD12345^XZ



^BU

UPC-A Bar Code

Description:

The ^BU command is a fixed length, numeric symbology. It is Primarily used in the retail industry for labeling packages. The UPC-A bar code has 11 data characters.

- ^BI Element size is 1 : 1, 2 : 2, 3 : 3, 4 : 4, 6 : 6, and 8 : 8.
- Field data(^FD) is limited to exactly 11 characters.
- When the 11 characters is sent from computer, the printer automatically calculates the checksum at the end of digit
- When the 12 characters is sent from the computer, the printer compares the characters with the calculated checksum. If they do not agree, the printer prints all bar codes 0 (zero). And it is not

printed when the input characters is smaller than 11 characters.

Format: ^BUo,h,f,g,e

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height (in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

e = not care

Example:

^XA^FO150,100^BY3

^BUN,100,Y,N,N

^FD09872349782^XZ



^B3

Code 39 Bar Code

Description:

The Code 39 bar code is the standard for many industries, including the U.S.Department of Defense(DOD).It is one of three symbologies identified in the American National Standards Institute(ANSI)standard MH 10.8M-1983.Code 39 is also known as “USD-3 Code”and “3 of 9 Code.”

Each character in a Code 39 bar code is composed of nine elements: five bars, four spaces, and an inter-character gap. Three of the nine elements are wide; the six remaining elements are narrow.

- ^B3 standard ratio is 3 : 1.
- Field data(^fd) is limited to the width(or length, if rotated)of the label.
- Code 39 automatically generates the Start and Stop Character(*)
- Valid ASCII codes are as follows: 32, 36-37, 43, 45-47, 48-57, 65-90.

Format: ^B3o,e,h,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

e=Mod-43 check digit

Accepted Values: Y(yes) or N(no)

Default Value: N

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

Example:

^XA^FO100,75^BY3

^BAN,100,Y,N,N

^FDABC123^XZ



^BA

Code 93 Bar Code

Description:

The ^BA command is a variable length, continuous symbology. It is used in many of the same applications as Code 39. Valid ASCII codes are “: , & # @ \$ % □ + - . /

ABCDEFGHIJKLMNOPQRSTUVWXYZ

0123456789abcdefghijklmnopqrstuvwxyz."

Each character in Code 93 Bar Code is composed of six elements: three bars and three spaces. Although invoked differently.

• ^BA element size is 1 : 1, 2 : 2, 3 : 3, 4 : 4, 6 : 6, and 8 : 8.

• Field data(^FD) is limited to the width(or length,if rotated)of the label.

Format: ^BAo,h,f,g,e

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height (in dots)

Accepted Value: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

g = not care

e = not care

Example:

^ XA^FO100,75^BY3

^ BAN,100,Y,N,N

^ FD123ABC^XZ



^BC

Code 128 Bar Code(Subsets A, B, and C)

Description:

The ^BC command is a high-density, variable length, continuous, alphanumeric symbology. It was designed for complexly encoded product identification.

Code 128 has three subsets of characters. There are 106 encoded printing characters in each set, and each character can have up to three different meanings, depending on the character subset being used.

Each Code 128 character consists of six elements: three bars and three spaces.

• Field data(^FD) is limited to the width(or length, if rotated)of the label.

Format: ^BCo,h,f,g,e,m

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: Value set by ^BY

f = print interpretation line

Accepted Values: Y(yes) or N(no)

Default Value: Y

The interpretation line can be printed in any font by placing the font command before the bar code command.

g = not care

e = not care

m = mode

Accepted Values:

N-no selected mode

U-UCC Case Mode

Default Value: N



The following tables represent the **Code 128 Character Sets**.

Value	Code A	Code B	Code C	Value	Code A	Code B	Code C
0	SP	SP	00	53	U	U	53
1	!	!	01	54	V	V	54
2	"	"	02	55	W	W	55
3	#	#	03	56	X	X	56
4	\$	\$	04	57	Y	Y	57
5	%	%	05	58	Z	Z	58
6	&	&	06	59	[	[	59
7	'	'	07	60	\	\	60
8	(	(	08	61	]	]	61
9	)	)	09	62	^	^	62
10	*	*	10	63			63
11	++	++	11	64	NUL	-	64
12	,	,	12	65	SOH	a	65
13	-	-	13	66	STX	b	66
14	.	.	14	67	ETX	c	67
15	/	/	15	68	EOT	d	68
16	0	0	16	69	ENQ	e	69
17	1	1	17	70	ACK	f	70
18	2	2	18	71	BEL	g	71
19	3	3	19	72	BS	h	72
20	4	4	20	73	HT	i	73
21	5	5	21	74	LF	j	74
22	6	6	22	75	VT	k	75
23	7	7	23	76	FF	l	76
24	8	8	24	77	CR	m	77
25	9	9	25	78	SO	n	78
26	:	:	26	79	SI	o	79
27	<	<	27	80	DLE	p	80
28	<	<	28	81	DC1	q	81
29	=	=	29	82	DC2	r	82
30	>	>	30	83	DC3	s	83
31	?	?	31	84	DC4	t	84
32	@	@	32	85	NAK	u	85
33	A	A	33	86	SYN	v	86
34	B	B	34	87	ETB	w	87
35	C	C	35	88	CAN	x	88
36	D	D	36	89	EM	y	89
37	E	E	37	90	SUB	z	90
38	F	F	38	91	ESC	{	91
39	G	G	39	92	FS	|	92
40	H	H	40	93	GS	}	93
41	I	I	41	94	RS	~	94
42	J	J	42	95	US	DEL	95
43	K	K	43	96	FNC3	FNC3	96
44	L	L	44	97	FNC2	FNC2	97
45	M	M	45	98	SHIFT	SHIFT	98
46	N	N	46	99	Code C	Code C	99
47	O	O	47	100	Code B	FNC4	Code B
48	P	P	48	101	FNC4	Code A	Code A
49	Q	Q	49	102	FNC1	FNC1	FNC1
50	R	R	50	103		START(Code A)	
51	S	S	51	104		START(Code B)	
52	T	T	52	105		START(Code C)	

Special Conditions if UCC Case Mode is Selected

- Field data(^FD) is limited to exactly 19 characters.
- It is not printed when the input characters is not 19 characters.

Code 128 Subsets

The three Code 128 character subsets are referred to as Subset A, Subset B, and Subset C. A subset may be selected in one of two ways.

1. A special Invocation Code can be included in the field data (^**FD**) string associated with that bar code.
2. Place the desired Start Code at the beginning of the field data. If no Start Code is entered, Subset B will be used.

To change subsets within a bar code, place the appropriate Invocation Code at the

appropriate points within the field data string. The new subset will stay in effect until changed with appropriate Invocation Code. For example, in Subset C, “>7 “ in the field data changes the Subset to A.

The table below shows the Code 128 Invocation Codes and Start Characters for the three subsets.

Invocation Code	Decimal Value	Subset A Character	Subset B Character	Subset C Character
><	62			
>0	30	>	>	
>=	94		—	
>1	95	USO	DEL	
>2	96	FNC 3	FNC 3	
>3	97	FNC 2	FNC 2	
>4	98	SHIFT	SHIFT	
>5	99	CODE C	CODE C	
>6	100	CODE B	FNC 4	CODE B
>7	101	FNC 4	CODE A	CODE A
>8	102	FNC 1	FNC 1	FNC 1
Start Characters				
>9	103	Start Code A	(Numeric Pairs give Alpha/Numerics)	
>:	104	Start Code B	(Normal Alpha/Numeric)	
>;	105	Start Code C	(All Numeric 00 - 99)	

Code 128 Invocation Characters

Example of Code 128 - Subset B

Since Code 128 subset B is the most commonly used subset, ZPL® defaults to subset B if no start character is specified in the data string. This is demonstrated in following two



Figure A: Subset B with no start character



Figure B: Subset B with start character

samples.

The bar codes in the following two samples are identical.

The first two instructions (^XA^FO100,75) start the label format and sets the field origin (from the upper-left corner) at which the bar code field begins to 100 dots across the x axis and 75 dots down the y axis. The third instruction (^BCN,100,Y,N,N) calls for a Code 128

style bar code to be printed with no rotation and a height of 100 dots.

Instruction four (^FDCODE128 in Fig. A) and (^FD>:CODE128 in Fig. B) specify the content of the bar code. Command five (^XZ) indicates the end of the print field and the end of the label format.

The interpretation line will print below the code with the UCC check digit turned off.

The ^FD command for Fig. A does not specify any subset so the B subset is used. In Fig. B, the ^FD instruction specifically calls subset B Although ZPL® defaults to Code B, it is very good practice to include the invocation codes in the command.

Code 128 - subset B is programmed directly as ASCII text, except for values greater than 94 decimal and a few special characters:

^ > ~

These characters must be programmed by using the invocation codes.

Example of Code 128 - Subsets A and C

Code 128 subsets A and C are programmed as pairs of digits, 00-99, in the field data string. (Refer to the Code 128 characters chart.)

In subset A, each pair of digits results in a single character being encoded in the barcode; in subset C, they are printed as entered. Fig E below is an example of Subset A. (The ">9" is the Start Code for Subset A.)

Non-integers programmed as the first character of a digit pair (D2) are ignored. However, non-integers programmed as the second character of a digit pair (2D) invalidate the entire digit pair, and the pair is ignored. An extra, unpaired digit in the field data string just before a code shift is also ignored.

Fig. C and Fig. D below are examples of subset C. Notice that the bar codes in the figures are identical. In the program code for Fig. D, the "D" is ignored and the 2 is paired with the 4.



**Figure C: Subset C,
Normal Data**

**Figure D: Subset C,
ignoring the Alpha
character**

Figure E: Subset A

^B7

PDF417 Bar Code

Description:

The ^B7 command is a two-dimensional, multi-row, continuous stacked symbology. PDF417 is capable of encoding over 1,000 characters per bar code. It is ideally suited for applications where large amounts of information are required at the time the bar code is read.

The code consists of 3 to 90 stacked rows. Each row consists of start and stop patterns and symbol characters called “code-words.” A “code-word” consists of four bars and four spaces. A three code-word minimum is required per row.

Format: ^B7o,h,s,c,r,t

Parameters:

o= orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = bar code height for individual rows

Accepted Values: 1 to height of label

Default Value: Value set by ^BY

This number multiplied by the module equals the height of the individual rows in dots.1 is not a recommended value.

s = security level

Accepted Values: 1 to 8(error detection and correction)

Default value: 0(error detection only)

This determines the number of error detection and correction code-words to be generated for the symbol. The default level provides only error detection without correction. Increasing the security level adds increasing levels of error correction and increases the symbol size.

c = number of data columns to encode

Accepted Values: 1 to 30

Default Value:1:2 (row-to-column aspect ratio)

The user can specify number of code-word columns given control over the width of the symbol.

r = number of rows to encode

Accepted Values: 3 to 90

Default value:1:2 row-to-column aspect ratio.

The user can specify the number of symbol rows giving control over the height of the symbol.

For example, with no row or column values entered,72 code-word would be encoded into a symbol of 6 columns and 12 rows. Depending on code-words, the aspect ratio will not always be exact.

t = truncate right row indicators and stop pattern

Accepted Values: Y(perform truncation)and N(no truncation).

Default Value: N

Example1:

^XA^BY2,3

^FO10,10^B7N,5,0,,,N

^FDPDF417^FS

^XZ



Example2:



PDF417 without Truncation being selected



PDF417 with Truncation being selected

Comments:

- If both columns and rows are specified, their product must be less than 928.
- No symbol is printed if the product of columns and rows is greater than 928.

- No symbol is printed if total code-words is greater than the product of columns and rows.
- Serialization is not allowed with this bar code.
- The truncation feature can be used in situations where label damage is not likely. The right row indicators and stop pattern will be reduced to a single module bar width. The difference between a non-truncated and a truncated bar code is shown in Example2.

^BD

UPS MaxiCode Bar Code

Description:

The ^BD command creates a two-dimensional, optically read(not scanned) code. This symbology was developed by UPS(United Parcel Service).

The code is generated from the information in the ^FD statement which is described generate an interpretation line. The ^BY command has no affect on the UPS MaxiCode Bar Code.

Format: ^BDm,n,t

Parameters:

m = mode

Accepted Values:

- 2 – Structured carrier message: numeric postal code(U.S.)
- 3 – Structured carrier message: alphanumeric postal code(Non-U.S.)
- 4 – Standard symbol, secretary
- 5 – Full EEC
- 6 – Reader program, secretary

Default Value:2

n = symbol number

Accepted Values: 1 to 8 may be added in a structured document.

Default Value:1

t = total number of symbols

Accepted Values: 1 to 8,representing the total number of symbols in this sequence.

Default Value: 1

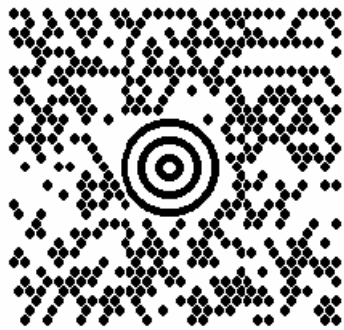
Example:

^XA

^FO50,50

^BD^FH^FD001840152382802[>_1E01_1D961Z00004951_1DUPSN_1D_06X610_1D
159_1D1234567_1D1/1_1D_1DY_1D
634 ALPHA DR_1DPITTSBURCH_1DPA_1E_04^FS

^XZ



Special Consideration for ^FD when Using ^BD

The ^FD statement is divided into two parts: a High Priority Message(hpm) and a Low Priority Message(lpm). There are two types of High Priority Messages. One is for a U.S.Style Postal Code; the other is for a Non-U.S.Style Postal Code. The syntax for either or these High Priority Messages must be exactly as shown or an error message will be generated.

Format: ^FD<hpm><lpm>

Parameters:

<hpm> = high priority message(only applicable in Modes 2 and 3)

Accepted Values: 0 through 9,excepte where noted.

U.S.Style Postal Code(Mode2)

<hpm> = aaabbbccccddd

aaa = three-digit class of service

bbb = three-digit zip code

cccc = five-digit zip code extension. If none exists,four zeros must be entered(0000).

Non-U.S.Style Postal Code(Mode 3)

<hpm> = aaabbbcccccc

aaa = three-digit class of service

bbb = three-digit country zip code

cccccc = six-digit zip code(0-9 or A-Z)

<lpm> = low priority message (only applicable in Modes 2 and 3)

Gs is used to separate fields in a message(0x1D). Rs is used to separate format types(0x1E).Eot is the end of transmission character.

MessageHeader

[>Rs

Transportation Data	
FormatHeader	01Gs96
Tracking Number*	<tracking number>
SCAC*	Gs<SCAC>
UPS Shipper Number	Gs<shipper number>
Julian Day of Pickup	Gs<day of pickup>
Shipment ID Number	Gs<shipment ID number>
Package n/x	Gs<n/x>
Package Weight	Gs<weight>
Address Validation	Gs<validation>
Ship to Street Address	Gs<street address>
Ship to City	Gs<city>
Ship to State	Gs<state>
Rs	Rs
End of Message	Eot
(*Mandatory Data for UPS)	

Comments:

- The formatting of <hpm> and <lpm> only apply when using Modes 2 and 3. Mode 4, for example, will take whatever data is defined in the ^FD command and place it in the symbol.
- UPS requires that certain data be present in a defined manner. When formatting MaxiCode data for UPS, always use uppercase characters. When filling in the “fields” in the <lpm> for UPS, follow the data size and types as specified in Guid to Bar Coding with UPS.
- If you do not choose a mode, the default mode will be Mode 2. If you use non-U.S. postal codes, you will probably get an error message (invalid character or message too short). When using non-U.S. codes, use mode 3.
- ZPL® doesn’t automatically change your mode based on the zip code format.
- When using special characters, such as Gs, Rs, or Eot, use the ^FH command to tell ZPL® to use the hexadecimal value following the underscore character(_).

^BX

Data Matrix Bar Code

Description:

The ^BX command is a two-dimensional matrix symbology which is made up of square modules arranged within a perimeter finder pattern.

Format: ^BXo,h,s,c,r,f,g

Parameters:

o = orientation

Accepted Values:

N = normal

R = rotated 90 degrees(clockwise)

I = inverted 180 degrees

B = read from bottom up,270 degrees

Default Value: Current ^FW value

h = dimensional height of individual symbol elements

(one to width of label)

The individual elements are square – this parameter specifies both module and row height. If this parameter is zero(or not given),the h parameter(bar height) in ^BY will be used as the approximate symbol height.

s = quality level

Accepted Values:0,50,80,100,140,200

Default Value:0

“Quality” refers to the amount of data that is added to the symbol for error correction. The AIM specification refers to it as the ECC value. ECC 50,ECC 80,ECC 100,and ECC 140 use convolution encoding; ECC 200 uses Reed-Solomon encoding. For new applications, ECC 200 is recommended. ECC 000-140 should only be used in closed applications where a single party controls both the production and reading of the symbols and is responsible for overall system performance.

c = columns to encode

When ECC 0-140 is specified, the number of these values must be odd(9 - 49). And, when ECC 200 is specified, the number of these values must be even(10, 12..., 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, 144).

Moreover, when this value is set as 0, columns is calculated automatically.

The symbol will be sized to a square if the rows and columns do not match.

r = rows to encode(9 to 49)

When ECC 0-140 is specified, the number of these values must be odd(9 - 49). And, when ECC 200 is specified, the number of these values must be even(10, 12..., 26, 32,

36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, 144).

Moreover, when this value is set as 0, columns is calculated automatically.

The symbol will be sized to a square if the rows and columns do not match.

If the rows and columns value less than 9 but not 0, or if the data is too large for the forced size, no symbol will print.

f = format ID(0 to 6) – not used with quality set at 200

Accepted Values:

0 = Automatically choose the encodation scheme based on the characters to be encoded.

1 = Field data is numeric + space(0..9,' ')

2 = Field data is upper-case alphanumeric + space(A..Z,' ')

3 = Field data is uppercase alphanumeric + space, period, comma, dash, and slash(0..9,A..Z,",".-/)

4 = Field data is upper-case alphanumeric + space(0..9,A..Z,' ')

5 = Field data is full 128 ASCII 7-bit set

6 = Field data is full 256 ISO 8-bit set

Default Values: 6

g = not care

ECC Level	ID=1	ID=2	ID=3	ID=4	ID=5	ID=6
0	620	452	394	413	310	271
50	457	333	291	305	228	200
80	401	292	255	267	200	175
100	299	218	190	199	149	131
140	144	105	91	96	72	63

Maximum Field Sizes

Field Data(^FD) for ^BX

Quality 000 to 140

- Other characters in the control character range can only be inserted by using ^FH. Excess field data will cause no symbol to be printed. The field data must correspond to a user-specified format ID or no symbol will be printed.
- The maximum field sizes for quality “0” to “140” symbols are shown in the following table:

Quality 200

- The maximum size of numeric characters is 3116. And the maximum alphanumeric capability is 2335. Excess field data will cause no symbol to be printed.

^BY

Bar Code Field Default

Description:

The ^BY command is used to change the default values for the Narrow Element Module(Narrow Bar or Space)Width, the Wide Bar to Narrow Bar Width Ratio and the Bar Height. It can be used as often as necessary within a label format.

Format: ^BYw,r,h

Parameters:

w = module(narrow bar) width (in dots)

Accepted Values: 1 to 10

Initial Value at Power-up:2

r = wide bar to narrow bar width ratio

Accepted Values:1.0 to 24.0 (not to exceed $w*r=24$)

h = height of bars (in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Initial Value at Power-up: 10

Module width and height (w and h) may be changed at anytime with the ^BY command regardless of the symbology selected.

Comments:

Once a ^BY command is entered into a label format, it stays in effect until another ^BY command is encountered.

Graphic Instruction

^GB

Graphic Box

Description:

The ^GB command is used to draw boxes and/or lines as part of a label format. Boxes and lines are used to highlight important information, divide labels into distinct areas, or just dress up the way the label looks. The same format command is used for drawing either boxes or lines.

Format: ^GBw,h,t,c,r

Parameters:

w = box width(in dots)

Accepted Values: value of t to 7999(200dpi) / t to 11998(300dpi)

Default Value: value used for thickness(t) or 1

h = box height (in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: value used for thickness(t) or 1

t = border thickness(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: value used for thickness (t) or 1

c = not care

r = not care

For the w and h parameters, keep in mind that printers will have a default of 8,12 dots/millimeter. This comes out to 200,300 dots per inch. To determine the values for w and h, calculate the dimensions in millimeters and multiply by 8,12.

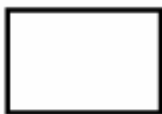
If the width and height are not specified, you will get a solid box with its width and height as specified by value t.

Examples:

Width:1.5 inch; Height:1 inch; Thickness:10

^XA^FO150,100

^GB305,203,10^XZ



Width: 0 inch; Height: 1 inch; Thickness:20

```
^XA^FO150,100
^GB0,203,20^XZ
```



Width: 1 inch; Height: 0 inch; Thickness:30

```
^XA^FO150,100
^GB203,0,30^XZ
```



^GC

Graphic Circle

Description:

The ^GC command produces a circle on the printed label. The command parameters specify the diameters specify the diameter(width) of the circle, outline thickness. Thickness extends inward from the outline.

Format: ^GCd,t,c

Parameters:

d = circle diameter(in dots)

Accepted Values:3 to 636(200dpi) / 3 to 955(300dpi)

Default Value:3

f = border thickness(in dots)

Accepted Values:1 to 636(200dpi) / 1 to 955(300dpi)

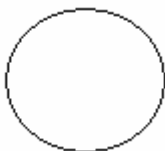
Default Value: value used for thickness(t) or 1

When the parameter d is exceeded than parameter f*2, border thickness value is set to 1 and a circle is smeared away except it.

c = not care

Example:

```
^XA
^FO100,100
^GC250,10^FS
^XZ
```



^GD

Graphic Diagonal Line

Description:

The ^GD command produces a straight diagonal line connecting one corner with the opposite corner of a box closing this line.

Format: ^GBw,h,t,c,r

Parameters:

w = box width(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: value of t(thickness) or 1

h = box height(in dots)

Accepted Values: 1 to 7999(200dpi) / 1 to 11998(300dpi)

Default Value: value of t(thickness) or 1

t = not care

c = not care

o = orientation – direction of the diagonal

Accepted Values:

R(or /)=right-leaning diagonal

L(or ¥)=left-leaning diagonal

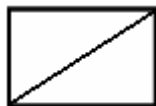
Default Value: R

Example:

^XA

^FO150,100^GB350,203,10^FS

^FO155,110^GD330,183,10,,,^FS



~DG

Download Graphics

Description:

The ~DG(Download Graphic)command performs the following functions:

- 1.Puts the printer into graphics mode.

2.Names the graphic(this name is used to recall it into a label).

3.Defines the size of the graphic.

4.Downloads the hexadecimal string to the printer.

Format: ~DGd:o,x,t,w,data

Parameters:

d = destination device to store image

Accepted Values: a non-volatile RAM device

Default Value: R: (DRAM)

o = image name

Accepted Values: 1 to 8 alphanumeric characters

Default Value: If no name is entered, UNKNOWN is used.

x = filename extension

Fixed: .GRF

f = total number of bytes in graphic

Refer to the formula on the following page.

w = number of bytes per row

Refer to the formula on the following page.

data = ASCII hexadecimal string defining image

The data string defines the image and is an ASCII hexadecimal representation of the image. Each character represents a horizontal nibble of four dots.

The t parameter can be determined by using the following formula:

$$\frac{x \times (\text{dots/mm})}{8 (\text{bits/byte})} \times (y \times (\text{dots/mm})) = \text{total bytes}$$

where x is the width of the graphic in millimeters, y is the height of the graphic in millimeters and dots/mm is the print density of the printer being programmed.

For example, to determine the correct t parameter for a graphic 8mm wide, 16mm high and a print density of 8 dots/mm, the formula works this way:

$$\left(\frac{8 \times 8}{8}\right) \times (16 \times 8) = \text{total bytes}$$
$$8 \times 128 = 1024 \text{ bytes}$$
$$t = 1024$$

Raise any portion of a byte to the next whole byte.

The w parameter (the width in terms of bytes per row) can be determined by using the following

formula:

$$\frac{x \times (\text{dots/mm})}{8} = \text{total bytes per row}$$

where x is the width of the graphic in millimeters and dots/mm is the print density of the printer being programmed.

For example, to determine the correct w parameter for a graphic 8mm wide and a print density of 8 dots/mm, the formula works this way:

$$\frac{8 \times 8}{8} = 8 \text{ bytes}$$

Raise any portion of a byte to the next whole byte.

Parameter w is the first value in the t calculation.

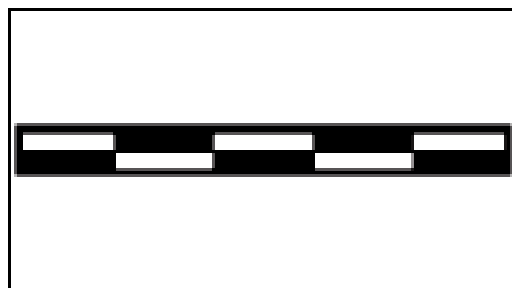
Parameter data is a string of Hexadecimal numbers sent as a representation of the graphic image. Each Hexadecimal character represents a horizontal nibble of four dots. For example, if the first four dots of the graphic image to be created should be white and the next four black, the dot by dot Binary code would be 00001111. The Hexadecimal representation of this Binary value would be 0F. The entire graphic image is coded in this way. The complete graphic image is sent as one long continuous string of Hexadecimal values.

Example:

The following is an example of using the ~DG command to load a checkerboard pattern into DRAM. The name used to store the graphic is SAMPLE.GRF.

```
~DGR: SAMPLE.GRF, 00080, 010,
```

```
FFFFFFFFFFFFFFFFFFFF
8000FFFF0000FFFF0001
8000FFFF0000FFFF0001
8000FFFF0000FFFF0001
FFFF0000FFFF0000FFFF
FFFF0000FFFF0000FFFF
FFFF0000FFFF0000FFFF
FFFFFFFFFFFFFFFFFFFF
```



~DY

Download Graphics

Description:

~DY downloads to the printer graphic objects in any supported format. This command can be used in place of ~DG for more saving and loading options.

Format:~DYf,b,x,t,w,data

Parameters:

f = font name

b = format downloaded in data field(f)

a = uncompressed bitmap(.GRF,ASCII)

x = extension of stored graphic

G = raw bitmap(.GRF)

t = total number of bytes in graphic

.GRF images: the size after decompression into memory.

w = total number of bytes per row

.GRF images: number of bytes per row.

data = data

ASCII hexadecimal encoding,ZB64,or binary data, depending on b.

a = ASCII HEXADECIMAL

^XG

Recall Graphic

Description:

The ^XG command is used to recall one or more graphic images for printing. This command is used in a label format to merge pictures such as company logos and piece parts, with text data to form a complete label.

An image may be recalled and resized as many times per format as needed. Other images and data may be added to the format.

Format: ^XGd:o,x,mx,my

Parameters:

d = source device of stored image

Accepted Values: up to 8 alphanumeric characters

Default Value: search priority(R:,B:,E:,Z:)

o = name of stored image

Accepted Values: up to 8 alphanumeric characters

Default Value: UNKNOWN

x = image extension

Fixed Value: .GRF

mx = magnification factory on the x-axis

Accepted Values: 1 to 10

Default Value:1

my = magnification factor on the y-axis

Accepted Values:1 to 10

Default Value:1

Example:

The following is an example of using the ^XG command to recall the image SAMPLE.GRF from DRAM and print it in 5 different locations and 5 different sizes on the same label:

```
^XA
^FO100,100^XGR:SAMPLE.GRF,1,1^FS
^FO100,200^XGR:SAMPLE.GRF,2,2^FS
^FO100,300^XGR:SAMPLE.GRF,3,3^FS
^FO100,400^XGR:SAMPLE.GRF,4,4^FS
^FO100,500^XGR:SAMPLE.GRF,5,5^FS
^XZ
```

^IM

Image Move

Description:

The ^IM command performs a direct move of an image from storage area into the bitmap. The command is identical to the Recall Graphic command except there are no sizing parameters.

Format: ^IMd:o,x

Parameters:

d = device location of stored object

Accepted Values: E:, B:, R:

Default Value: Search priority

o = object name

Accepted Values: any 1 to 8 character name

Default Value: if no name is entered, UNKNOWN is used

x = extension

Fixed: .GRF

Example:

The following example moves the image SAMPLE.GRF from DRAM and prints it in 5 locations in its original size.

```
^XA
^FO100,100^IMR:SAMPLE.GRF^FS
^FO100,200^IMR:SAMPLE.GRF^FS
^FO100,300^IMR:SAMPLE.GRF^FS
^FO100,400^IMR:SAMPLE.GRF^FS
^FO100,500^IMR:SAMPLE.GRF^FS
^XZ
```

Comments:

By using the ^FO command, the graphic image can be positioned anywhere on the label.

The difference between ^IM and ^XG: ^IM does not have magnification, and therefor may require less formatting time.

^IS

Image Save

Description:

The ^IS command is used to save a ZPL® label format. This command is used within a label format, typically at the end. It instructs the printer to save that label format rather than a ZPL® script file. The format can later be recalled with the ^IL command. If the object name is omitted, the default name “UNKNOWN.GRF” is used.

Format: ^ISd:o,x,p

Parameters:

d = device location of stored object

Accepted Values: E:, B:, R:

Default Value: R

o = object name

Accepted Values: any 1 to 8 character name

Default Value: if no name is entered, UNKNOWN is used

x = extension

Accepted Values: .GRF

Default Value: .GRF

p = print image after storing

Accepted Values: Y(yes) or N(no)

Default Value: Y

Example:

The following is an example of using the ^IS command to save a label format to DRAM. The name used to store the graphic is SAMPLE2.GRF

```
^XA
^LH10,15^FWN^BY3,3,85^CFD,36
^GB430,750,4^FS
^FO10,170^GB200,144,2^FS
^FO10,318^GB410,174,2^FS
^FO212,170^GB206,144,2^FS
^FO10,498^GB200,120,2^FSR^FO212,498^GB209,120,2^FS
^FO135,20^A0,70,60^FDZEBRA^FS
^FO80,100^A0,40,30^FDTECHNOLOGIES CORP^FS
^CFD,18,10^FS^FO15,180^FDARTICLE#^FS
^FO218,180^FDLOCATION^FS^FO15,328^FDDescription^FS
^FO15,508^FDREQ.NO.^FS
^FO220,508^FDWORK NUMBER^FS
^FO15,630^AD,36,20^FDCOMMENTS:^FS
^ISR:SAMPLE2.GRF,Y
^XZ
```

^IL

Image Load

Description:

The ^IL command is used at the beginning of a label format to load a stored a format and merge it with additional data. The image is always positioned at ^FO0,0.

Format: ^ILd:o,x

Parameters:

d = device location of stored object

Accepted Values: E:,B:,R:

Default Value:R:

o = object name

Accepted Values:any 1 to 8 character name

Default Value:If no name is entered,UNKNOWN is used.

x = extension

Fixed:.GRF

Example:

The following example recalls the stored image SAMPLE2.GRF from DRAM and overlays it with the additional data. The graphic was stored using the ^IS command. Refer to the ^IS command for the stored label format.

```
^XA
^ILR:SAMPLE2.GRF^FS
^CFD,36,20
^FO15,210^FD900123^FS
^FO218,210^FDLINE 12^FS
^FO15,360^AD^FDTHERMAL^FS
^FO15,400^AD^FDTRANSFER PRINTER^FS
^FO15,540^FD54321^FS
^FO220,530^FD58643^FS
^FO15,670^AD,27,18^FDTesting Stored Graphic^FS
^FO15,700^AD,27,18^FDLabel Formats!!
^XZ
```

^ID

Object Delete

Description:

The ^ID command deletes objects, graphics, fonts, and stored formats from storage areas selectively or in groups. This command can be used within a printing format to delete objects prior to saving new ones, or it can be used in a stand-alone format to delete objects.

The image name and extension support the use of the asterisk(*) as a wildcard. This allows for easy deletion of selected groups of objects.

Format: ^IDd:o.x

Parameters:

d = device location of stored object

Accepted Values: E, B, R:

Default Value: R:

o = object name

Accepted Values: any 1 to 8 character name

Default Value: If no name is entered, UNKNOWN is used.

x = extension

Accepted Values: any valid 3-letter extension

Default Value: .GRF

Example:

To delete the image SAMPLE1.GRF from DRAM:

`^XA^IDR:SAMPLE1.GRF^XZ`

~EG

Erase Download Graphics

Description:

The ~EG command is used to delete all graphic images(hexadecimal images)from DRAM. This command will erase everything in R:, E:, and B: memory

Format: ~EG

Comments:

The ~EG command is no longer recommended for use! It is recommended that the ~ID(Object Delete)command is used to selectively delete stored graphics.

Advanced Techniques

^FX

Comment

Description:

The ^FX command is useful when you want to add a “non-printing” informational comment or statement within a label format. Any data after the ^FX the label format. Therefore, you should avoid using the caret(^)or tilde(~) commands within the ^FX statement.

Format: ^FXc

Parameters:

c = non-printing comment

^FR

Field Reverse Print

Description:

The ^FR command allows a field to appear as white over black or black over white. When printing a field and the ^FR command has been used, the color of the output is the reverse of its background.

Format: ^FR

Parameters:

^FR = field reverse print

Comments:

The ^FR command applies to only one field and has to be specified each time. When multiple ^FR commands are going to be used, it may be more convenient to use the ^LR command.

^LR

Label Reverse Print

Description:

The ^LR command reverses the printing of all fields in the label format. It allows a field to appear as white over black or black over white.

Using the ^LR is identical to placing a ^FR in all current and subsequent fields.

Format: ^LRa

Parameters:

a = reverse print all fields

Accepted Values: Y(yes) or N(no)

Initial Value Power-up: N or last permanently saved value

Comments:

The ^LR setting will remain active unless turned off by ^LRN command or the printer is powered down.

Only fields that come after this command will be affected.

^PM

Printing Mirror Image of Label

Description:

The ^PM command prints the entire printable area of the label as a mirror image. This command flips the image from left to right.

Format: ^PMa

Parameters:

a = print mirror image of entire label

Accepted Values: Y(yes) or N(no)

Default Value: N

Comments:

If the parameter is missing or invalid, the command will be ignored. Once entered, the ^PM command will remain active until ^PMN is received or the printer is powered down.

^SN

Serialization Data

Description:

The ^SN command allows the printer to index data fields by a selected increment or decrement value(i.e., make the data fields increase or decrease by a specified value)each time a label is printed. This can be performed on up to 100 to 150 fields in a given format and can be performed on both alphanumeric and bar code fields. A maximum of 12 of the rightmost integers are subject to indexing. The first integer found when scanning from right to left starts the indexing portion of the data field. If the alphanumeric field to be indexed ends with an alpha character, the data will be scanned, character-by character, from right to left until a numeric character is encountered. Serialization will take place using the value of the first number found.

Format: ^SNv,n,z

Parameters:

v = starting value

Accepted Values: up to 12 digits for the portion to be indexed.

Default Value:1

n = increment/decrement value

Accepted Values:12-digit maximum

Default Value:1

To indicate a decrement value, precede the value with a minus sign(-).

z = add leading zeros(if needed)

Accepted Values: Y(yes) or N(no)

Default Value: N

Comments:

Incrementing and decrementing takes place for each serial-numbered field when all replicates for each serial number have been printed, as specified in parameter r of the ^PQ(print quality)command. If, during the course of printing serialized labels the printer runs out of either paper or ribbon, the first label printed(after the media or ribbon has been replaced and calibration completed)will have the same serial number as the “partial” label printed before the “out” condition occurred. This is done in case the last label before the “out” condition did not fully print.

~TA

Tear-off Adjust Position

Description:

The ~TA command lets you adjust the rest position of the media after a label is printed, which changes the position at which the label is torn or cut.

Format: ~TA###

Parameters:

= change in media rest position(3-digit value in dot rows)

Accepted Values:-120 to 120

Default Value: last permanent value saved

Comments:

If the parameter is missing or invalid, the command is ignored.

~EF

Erase Stored Formats

Description:

The ~EF command erases all stored formats.

Format:~EF

Comments:

The ~EF command is no longer recommended for use! It is recommended that the ^ID(Object Delete)command is used to selectively delete stored formats.

^DF

Download Format

Description:

The ^DF command saves ZPL® format commands as text strings to be later merged using ^XF with variable data.

While use of stored formats will reduce transmission time, no formatting time is saved – this command saves ZPL® as text strings formatted at print time.

If the image name is omitted, the name and extension UNKNOWN.ZPL® will be used. Enter the ^DF stored format command immediately after the ^XA command, then enter the format commands to be saved.

Format: ^DFd:o,x

Parameters:

d = destination device to store image

Fixed: always a non-volatile RAM device

o = image name

Accepted Values: 1 to 8 alphanumeric characters

Default Value: If a name is not entered, UNKNOWN is used.

x = filename extension

Fixed: .ZPL®

Comments:

A format containing a ^DF will not print. Results are undefined for any commands that appear prior to the ^DF in a format.

^XF

Recall Format

Description:

The ^XF command recalls a stored format to be merged with variable data. One ^XF command

can be used within one label format. It can be set as the arbitrary positions of a label format.

While use of stored formats will reduce transmission time, no formatting time is saved since the ZPL® format being recalled was saved as text strings which need to be formatted at print time.

Format: ^XFd;o,x

Parameters:

d = source device of stored image

Accepted Values: up to 8 alphanumeric characters

Default Value: search priority(R:,B:,E:,Z:)

o = name of stored image

Accepted Values: up to 8 alphanumeric characters

Default Value: UNKNOWN

x = image extension

Fixed Value:.ZPL®

^ST

Set Time/Date(for Real Time Clock)

Description:

The ^ST command sets the time and date of the Real Time Clock.

Format: ^STa,b,c,d,e,f,g

Parameters:

a = month

Accepted Values:01 to 12

Default Value:current month

b = day

Accepted Values:01 to 31

Default Value:current day

c = year

Accepted Values:1998 to 2097

Default Value:current year

d = hour

Accepted Values:00 to 23

Default Value:current hour

e = minute

Accepted Values:00 to 59

Default Value:current minute

f = second

Accepted Values:00 to 59

Default Value:current second

g = format

Accepted Values:

A = a.m.

P = p.m.

M = 24-hour military

Default Value:M

~JR

Power On Reset

Description:

The ~JR command resets all of the printer's internal software,performs a power-on self-test(POST),clears the buffer and DRAM,and resets communication parameters and default values.~JR performs the same function as a manual power-on reset.

Format: ~JR

~JC

Label length measurement

Description:

The ~JC command is used to force a label length measurement.

Format: ~JC

Comments:

In continuous mode, this command does not operate..

~JL

Set Label Length

Description:

The ~JL command is used to set the label length. Depending on size of label, the printer will feed one or more blank labels.

Format: ~JL

~JA , ~JP , ~JX

Pause and Cancel format

Description:

The ~JA , ~JP and ~JX command clears the format currently being processed and places the printer in the Pause mode.

Format: ~JP

^PH ~PH

Slew to Home Position

Description:

The ~PH or ^PH(Slew to Home Position)command causes the printer to feed one blank label.

- The ~PH command feeds one label after the format currently being printing is donw or when the printer is placed in pause.
- The ^PH command feeds one blank label after the format it is in prints.

Format: ^PH or ~PH

^PP ~PP

Programmable Pause

Description:

The ~PP command stops printing after the current label is printed(if one is printing) and places the printer in the Pause mode.

The ^PP command is not immediate. Therefore,severallables may be printed before a pause is performed. This command will pause the printer after the current format prints.

The operation is identical to pressing the PAUSE button on the front panel of the printer. The printer will remain paused until the PAUSE button is pressed or a ~PS command is sent to the printer.

Format: ^PP or ~PP

~PS

Print Start

Description:

The ~PS command causes a printer in the Pause mode to resume printing. The operation is identical to pressing the PAUSE button on the front panel of the printer when the printer is already in the Pause mode.

Format: ~PS

^PQ

Print Quantity

Description:

The ^PQ command gives control over several printing operations. It controls the number of labels to print, the number of labels printed before printer cuts, and the number of replications of each serial number.

Format: ^PQq,p,r,o

Parameters:

q = total quantity of labels to print

Accepted Value:1 to 9,999

Default Value:1

p = Cut value

Accepted Value:1 to 9,999 labels between cuts

Default Value:0-no cut

r = replicates of each serial number

Accepted Value: 0 to 9,999

Default Value: 0 – no replicates

o = not care

^PR

Print Rate

Description:

The ^PR command determines the media speed during printing and the slow speed(feeding a blank label).

The printer will operate with the selected speeds until the setting is reissued or the printer is turned off.

The print speed is application-specific. Since print quality is affected by media and ribbon, printing speeds and printer operating modes, it is very important to run tests for your applications.

Format: ^PRp,s,b

Parameters:

p = print speed

Accepted Values:

A or 2	50.8 mm/sec. (2 inches/sec.)
B or 3	76.2 mm/sec. (3 inches/sec.)
C or 4	101.6 mm/sec. (4 inches/sec.)
5	127 mm/sec. (5 inches/sec.)
D or 6	152.4 mm/sec. (6 inches/sec.)
E or 8	203.2 mm/sec. (8 inches/sec.)
9	220.5 mm/sec.(9 inches/sec.)
10	245 mm/sec. (10 inches/sec.)
11	269.5 mm/sec. (11 inches/sec.)
12	304.8 mm/sec. (12 inches/sec.)

Default Value: A

s = slow speed

Accepted Values:

A or 2	50.8 mm/sec. (2 inches/sec.)
B or 3	76.2 mm/sec. (3 inches/sec.)
C or 4	101.6 mm/sec. (4 inches/sec.)
5	127 mm/sec. (5 inches/sec.)
D or 6	152.4 mm/sec. (6 inches/sec.)
E or 8	203.2 mm/sec. (8 inches/sec.)
9	220.5 mm/sec.(9 inches/sec.)
10	245 mm/sec. (10 inches/sec.)
11	269.5 mm/sec. (11 inches/sec.)
12	304.8 mm/sec. (12 inches/sec.)

Default Value:D

b = backfeed speed

Accepted Values:

A or 2	50.8 mm/sec. (2 inches/sec.)
B or 3	76.2 mm/sec. (3 inches/sec.)
C or 4	101.6 mm/sec. (4 inches/sec.)
5	127 mm/sec. (5 inches/sec.)
D or 6	152.4 mm/sec. (6 inches/sec.)
E or 8	203.2 mm/sec. (8 inches/sec.)
9	220.5 mm/sec.(9 inches/sec.)
10	245 mm/sec. (10 inches/sec.)
11	269.5 mm/sec. (11 inches/sec.)
12	304.8 mm/sec. (12 inches/sec.)

Default Value: A

Comments:

The speed setting for p,s,and b is dependent on the limitations of the printer. If a particular printer is limited to 6 inches per second,a value of 12 can be entered, but it will only perform at a 6 ips rate. Refer to your printer's user's guide for specifics on performance.

~PR

Applicator Reprint

Description:

The ~PR command will be reprinted the last label printed.

Format: ~PR

Comments:

Pressing the REPEAT button on the front panel will also cause the last label to be reprinted.

^JM

Set Dots per Millimeter

Description:

Use the ^JM(Set Dots/Millimeter) command to double the format size of the label. Depending on the print head, normal dots per millimeter on a Printer are 12-dots/mm(300-dots/inch),8-dots/mm(200-dots/inch) .

This command lowers the density of the print – ,12 dots/mm would become 6 dots/mm,8 dots/mm would become 4.

This command must be entered before the first ^FS command. The effects of ^JM are persistent.

Format: ^JMn

Parameters:

n = set dots per millimeter

Accepted Values:

A = 12 dots/mm,8 dots/mm

B = 6 dots/mm, 4 dots/mm

Default Value: A

Comments:

If ^JMB is used, the UPS Maxicode bar code becomes out of specification.

^CC ~CC

Change Caret

Description:

The ^CC and ~CC commands are used to change the format command prefix. The default prefix is the caret(^)

Format: ^CCx or ~CCx

Parameters:

x = caret character change

Accepted Values: any ASCII character

Default Value: a parameter is required. If no parameter is entered, the next character received will be the new prefix character.

Example:

^XA

^CC/

/XZ

Comments:

In the above example, the forward slash(/) is set at the new prefix. Note the /XZ ending tag uses the new designated prefix character(/).

^CD ~CD

Change Delimiter

Description:

The ^CD and ~CD commands are used to change the ZPL® delimiter character. This character is used to separate parameter values associated with several ZPL® commands. The default delimiter is a comma(.).

Format: ^CDa or ~CDa

Parameters:

a = delimiter character change

Accepted Values: any ASCII character

Default Value: a parameter is required. If no parameter is entered, the next character received will be the new prefix character.

Example:

^XA

^CD.

^XZ

Comments:

In the above example, the delimiter character is changed to a period(.).

^CT ~CT

Change Tilde

Description:

The ^CT and ~CT commands are used to change the control command prefix. The default prefix is the tilde(~).

Format: ^CTa or ~CTa

Parameters:

a = change control command character

Accepted Values: any ASCII character

Default Value: Parameter is required. If no value is entered, the next character received will be the new prefix character.

Example:

^XA
^CT+
+DGR:GRAPHIC.GRF,04412,010
^XZ

^CM

Change Memory Letter Designation

Description:

The ^CM command allows the user to reassign a letter designation to the printer's memory devices. If a format already exists, you can reassign the memory device to the corresponding letter without being forced to alter or recreate the format itself.

Using this command will impact every subsequent command that refers to specific memory locations.

Format: ^CMa,b,c

Parameters:

- a= memory alias letter designation
Accepted Values: B:,E:,R:,none
Default Value: B:
- b = memory alias letter designation
Accepted Values: B:, E:, R:, none
Default Value: E:
- c = memory alias letter designation
Accepted Values: B:, E:, R:, none
Default Value: R:

Comments:

If two or more parameters specify the same letter designator, all letter designators will be set to their default values.

If any of the parameters are out of specification, the command will be ignored.

~JD

Enable Communications Diagnostics

Description:

The ~JD command initiates a diagnostic mode that produces an ASCII printout(using current label

length and full width of printer) of all characters received by the printer. This printout includes the ASCII Characters, the hexadecimal value and any communication errors.

Format: ~JD

~WC

Print Configuration Label

Description:

The ~WC command is used to generate a printer configuration label. The printer configuration label contains information about the printer set up, such as sensor type, network ID, mode, firmware version.

Format: ~WC

Comments:

This command only works when the printer is idle.