

**LDS II**  
**PROGRAMMING**  
**GUIDE**

PART NUMBER 880019-0123

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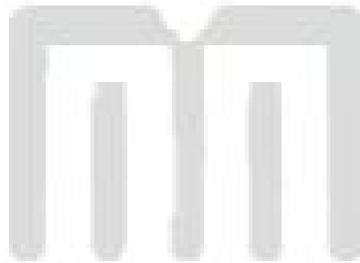
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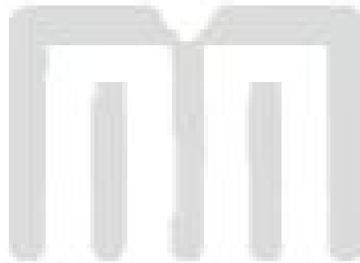
# Introduction

This programming guide provides the user with an overview of the LDSII command structure and label formatting requirements.

The Label Design Software (LDSII) is the resident printer control language that is used to create, store and print label scripts, while also controlling the other various printer features.

LDSII can be used in conjunction with mini-computers, mainframes, personal computers, and most other special purpose computers. The examples provided within this guide use an IBM® compatible personal computer with an available serial port, and a terminal emulation software program (i.e., Procomm Plus, HyperTerminal, HyperAccess or Tera Term Pro). Microcom Corporation printers are shipped with serial parameters set to 9600-baud, no parity, 8 data bits, and 1 stop bit unless setup with a custom configuration. The emulator program will have to be set to these parameters for proper serial communication. LDSII printers require the use of hardware flow control (CTS/RTS) for proper data management to occur.

During the power-up, the indicator light will flash amber and green, the printer copies the current application (source code or firmware) to the RAM memory. This allows for faster transfer and operation after the printer has been powered-up. The second phase of the power up is the printer's initialization process and flash file system restore. This process restores all of the files saved in the flash memory. The power-up process will vary in time depending on the files that have been saved into the printer's flash memory



# Chapter 1: Designing Using LDSII

Label formats or scripts are very easy to design using LDSII by following these basic steps below. LDSII printers require the use of hardware flow control (CTS/RTS) for proper data management to occur. Software flow control should not be used to manage data being sent to an LDSII printer.

1. Determine the media type, media size, and print speed desired for your application; enter this data into the script header.
2. Determine the type of handling operation desired and use the appropriate LDSII printer control commands.
3. Define the formatting instructions for the type and placement of data.
4. Enter the text data that corresponds to the formatting instructions.
5. Send the script to the printer.

## 1.1 Special Control Codes

The printer can accept either the one-character control code (“Ctrl + E”) or the two-character caret (^) plus alpha character (“^E”). Control codes are processed immediately while the ^Dxx commands are processed in the order they are issued. It is recognized that some mainframe and mini-computers cannot use the ASCII carat “^” character. The ASCII pipe symbol “|” can be used as a substitute for these instances. Below is a list of special control codes used by LDSII. A one (1) second delay should follow all control codes before executing the next command to assure that the code and/or command executed correctly.

- ^A Begin Script:** Marks the beginning of an LDSII script file entry.
- ^C Clear Halting Error:** When issued five consecutive times with a one second delay between each ^C the printer will clear blocking or halting error conditions returning ^Dxx command responsiveness. If the printer has remaining jobs in the queue, the printer will return to a >PAUSED< state instead of the >READY< state. Please note that if the condition that caused the error still exists, pressing the print button and/or sending further scripts will cause this error to be reported again. Halting error messages are conditions that must be corrected before printing may resume. Refer to section 6.3 for additional information regarding error conditions.
- ^D Standard Command Preface:** Combined with three-digit number issues a command. See Chapter 2 for more information regarding ^D commands.
- ^E Printer Enquiry:** Causes the printer to list its current status to an active communications port.
- ^H Back Space:** Causes the printer to issue a back space.

- ^J Line Feed:** Represents a Line Feed (LF) character or 0x0A.
- ^K Print Test Label:** Causes the printer to print a test pattern consisting of diagonal lines used to test the condition of the dots on the print head.
- ^L Form Feed:** Scrolls one label out of the printer using the previous formats layout.
- ^M Carriage Return:** Represents a Carriage Return (CR) character or 0x0D.
- ^O Top-of-Form (TOF):** Instructs the printer to perform a TOF operation which uses the Label Present Detector (LPD) in order to retract the media to the proper alignment in regards to the print head.
- ^P Print:** Causes the printer to print. *Note: If no label scripts are loaded or stored in the printer's memory, the printer will not print a label until a script is processed.*
- ^Q Send Data:** Instructs the printer to send data or resume sending data (XON).
- ^R Reset Printer:** Instructs the printer to perform a reset through software that duplicates a hard reset. Issuing the ^R causes the reset to occur immediately, bypassing commands sent but not yet processed. The ^D39)0 command is a queued or serialized version of the ^R and should be used if a reset condition is desired programmatically.
- ^S Stop Sending Data:** Instructs the printer to stop sending data (XOFF).
- ^U List Selections:** Causes the printer to list the current configured selections of the printer through an active communications port.
- ^V List Settings:** Causes the printer to list the current configured settings of the printer through an active communications port.
- ^W List Statistics:** Causes the printer to list the current statistics of the printer through an active communications port.
- ^X Toggle Pause:** Pauses the printer if printing, resumes if the printer is currently paused.
- ^Y List Enablements:** Causes the printer to list the current configured enablements of the printer through an active communications port.
- ^Z End Script:** Marks the end of a script file.
- ^] Cancel All Jobs:** Causes all jobs currently queued to be deleted returning the printer to its idle state. Refer to the ^D330 command.

## 1.2 Script Creation: An Overview

This section is intended to show a sample script file that will be used to explain the individual components of the script.

A script consists of printer commands, a script header, field formats, and text data. The script is initiated by sending an “^A)” (Begin Script) and continues until a “^Z)” (End Script) has been received. All commands, unless otherwise noted, are terminated with either another command or carriage return (ASCII 0x0D) character. The printer ignores the LF (0x0A) character so it may be helpful to terminate each line with a CR+LF to assist in the creation and troubleshooting of script files. Script files may contain up to a maximum total of 20,000 characters and up to 1000 different commands. Each command may contain up to a total of 20 characters for the argument. This provides the flexibility in script creation to handle even the most demanding applications.

The sample label script is listed below and will be referred to as the individual components are discussed in the subsequent sections of Chapter 1. The actual programming instructions that have been typed into a text file, using Windows Notepad, are in **bold** typeface. These instructions are followed by a brief explanation shown within the parentheses “()”.

### **^A)Sample Script**

(^A indicates the beginning of the script file followed by an optional script title)

### **^D200)3.3, 1.9, 0.125, 1.063, 5 , 1 , 0, 0**

(Script header used to define the label format or script file. Units have been entered using inches as the unit of measure in this example.)

### **^F1)0.15, 1.50, @normal\_14**

(Field #1 formatting instructions containing text using a normal 14 point font)

### **^F2)0.30, 0.50, @code128auto, 3, 0.70**

(Field #2 formatting instructions containing a Code128 bar code using automatic compression)

### **^F3)0.60, 0.13, @normal\_10**

(Field #3 formatting instructions containing text using a normal 10 point font)

### **^T1)MICROCOM CORPORATION**

(Text data for field #1)

### **^T2)12345678901234567**

(Text data for field #2)

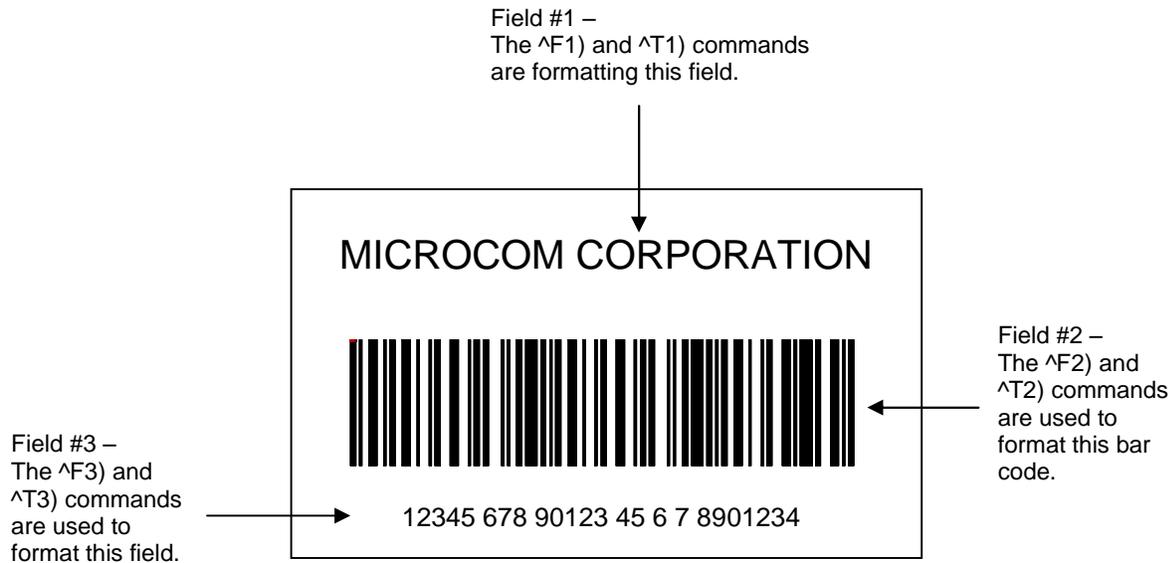
### **^T3)12345 678 90123 45 6 7 8901234**

(Text data for field #3)

### **^D300)1**

(Instructs the printer to print one copy once the ^Z instruction is received)

### **^Z)** (Marks the end of the script file)



**Figure 1 Sample Script Format**

### 1.3 Begin Script - ^A)filename

This command is used to mark the beginning of a script file. The script may be saved into the printer's non-volatile flash memory if a title or filename is placed after the command. The filename may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [ ] \_ ' and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero ("0") or 0x30 characters. A script that contains a "filename" will only save the script and will not process and print. The "^D350)filename" would be issued to recall and process the saved script. If the script does not contain a "filename", the script is processed normally and will be volatile in nature.

*For Example:* The previous example script's first line is "**^A)Sample Script**" which would save this script into the printer's flash memory (non-volatile) as "Sample Script".

### 1.4 Script Header

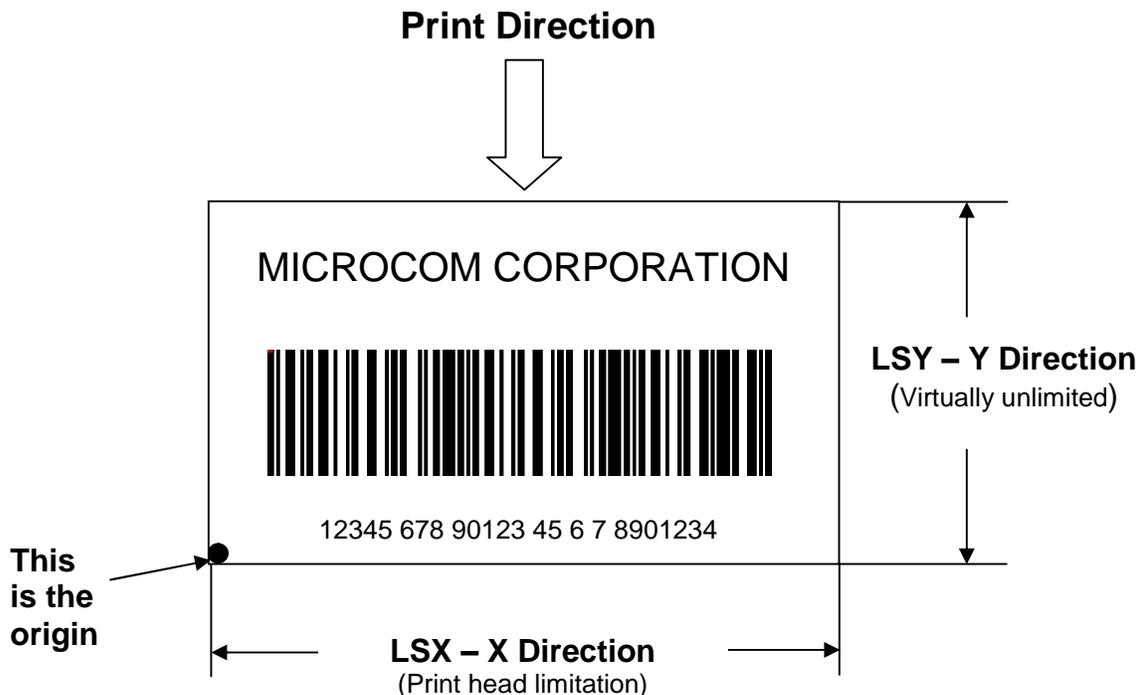
The script header consists of the "**^D200)**" command followed by eight parameters that control the media layout as well as printer operation. The parameters must be separated by a delimiter, comma by default, and are entered using the current unit of measure selected by the "**^D564)**" command. The origin or the starting coordinate is always the lower left corner as the media exits the printer. This command may be issued from outside a script but is typically created within a script file.

The script header is used to temporarily override the individual header parameters when issued from within a script file. The parameters may be defaulted to the current persistent value by not entering a value between the delimiters. Each of the header parameters has an "**^D6xx)**" command equivalent that when set outside a script file remains persistent.

*For Example:* "**^D200)LSX,LSY,,DRM**", would cause the "GAP" parameter to be defaulted to the current "**^D633)**" value that was set outside a script file.

The persistent commands are helpful in setting the printer up for a basic configuration and then override them within the script. It is recommended that a script header contain values for each and every parameter if access to the persistent command listings is not available.

## **^D200)LSX, LSY, GAP, DRM, SPD, DET, OFX, OFY**



**Figure 2 Script Parameters**

### **1.4.1 LSX (Label Width)**

LSX, LSY, GAP, DRM, SPD, DET, OFX, OFY

Specifies the width or “X” direction of the label in the unit of measure selected by the “^D564)” command. The maximum LSX is the width of the print head installed in the printer. This parameter is always required for proper script operation. See also ^D631)n command.

### **1.4.2 LSY (Label Height)**

LSX, LSY, GAP, DRM, SPD, DET, OFX, OFY

Specifies the height or “Y” direction of the label in the unit of measure selected by the “^D564)” command. The maximum LSY height is 24”. This parameter is always required for proper script operation. See also ^D632)n command.

### **1.4.3 GAP (Gap Size)**

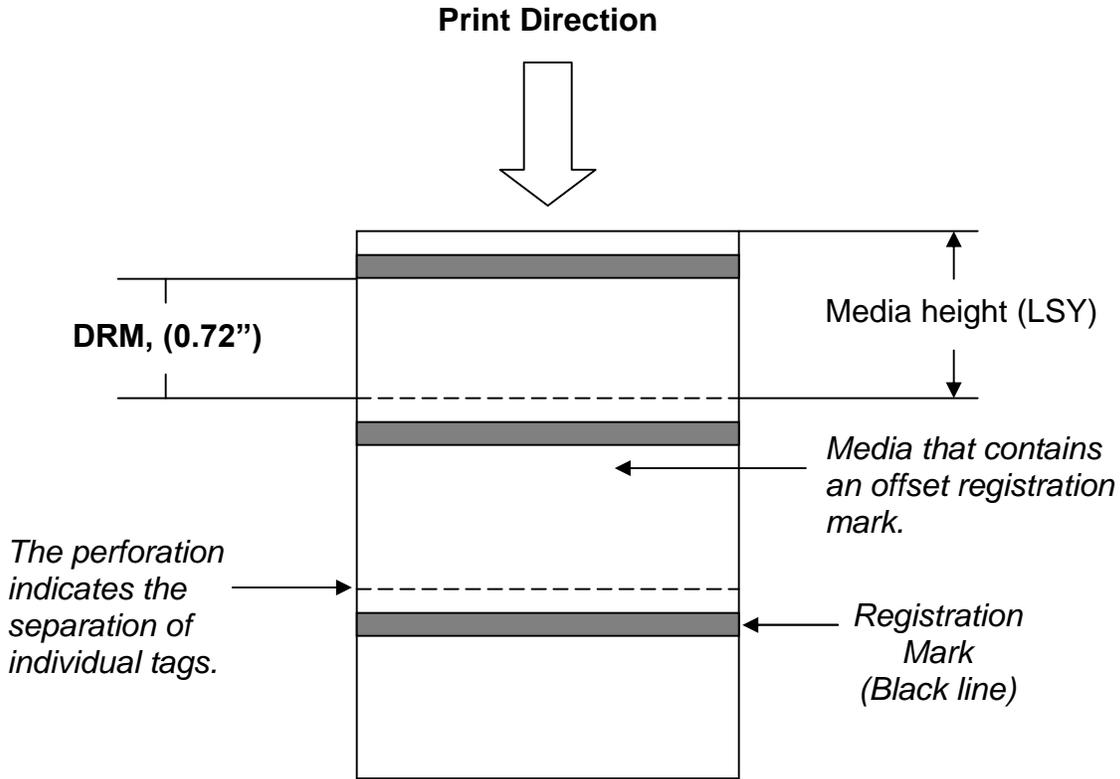
LSX, LSY, GAP, DRM, SPD, DET, OFX, OFY

The GAP is the height of the registration mark on each label and/or tag. This would be the backing material found between die-cut labels, blowhole sense mark, and/or the blackline height. The value is entered using the current unit of measure selected by the “^D564)” command. See also ^D633)n command.

**1.4.4 DRM (Distance to Registration Mark)**

LSX, LSY, GAP, **DRM**, SPD, DET, OFX, OFY

This parameter is typically only used when the registration mark is not located at the edge of the media. The “DRM” is the distance from the leading edge of the media to the beginning of the registration mark. The DRM is entered using the current selected unit of measure selected by the “^D564)” command. See also ^D634)n command.



**Figure 3 Distance-to-Registration Mark (DRM)**

**1.4.5 SPD (Print Speed)**

LSX, LSY, GAP, DRM, **SPD**, DET, OFX, OFY

This is the speed of the printer while printing, which is defined in either “inches/second (ips)” or “centimeters/second (cms) as selected by the “^D564)” command. The print speed can be adjusted anywhere from 1 ips (2.54 cms) to 6 ips (15.24 cms). See also ^D635)n command.

**1.4.6 DET (Detection Method)**

LSX, LSY, GAP, DRM, SPD, **DET**, OFX, OFY

This parameter selects the type of method the printer uses for detecting registration marks on different media types. A selection of a “0” disables registration detection and is used in conjunction with media that does not contain a registration mark like continuous media. The detectors are only used to detect Stock Out conditions when a selection of “0” is selected. A selection of a “1” uses the reflective detection method and is used when detecting registration marks located on the bottom side of the media. A selection of a “2” uses the transmissive detection method which requires both the upper and the lower gap detectors to be installed on the printer. This method can be used with any type of media but is not recommended when only detecting registration marks located on the bottom side of the media. A selection of a “3” also uses the transmissive detection method and is used in

conjunction with media containing a blowhole. The blowhole and die-cut selections differ on how they detect an out of stock condition. See also ^D636)n command.

0	None	(gap sensors are disabled)
1	Blackline	(lower gap sensor is enabled)
2	Die-cut	(upper and lower gap sensors are enabled)
3	Blowhole	(upper and lower gap sensors are enabled)

#### 1.4.7 OFX (Offset X Direction)

LSX, LSY, GAP, DRM, SPD, DET, **OFX**, OFY

This parameter moves or offsets all fields in the “X” direction without altering the field’s insertion points. The value is entered using the current unit of measure selected by the “^D564)” command. See also ^D637)n command.

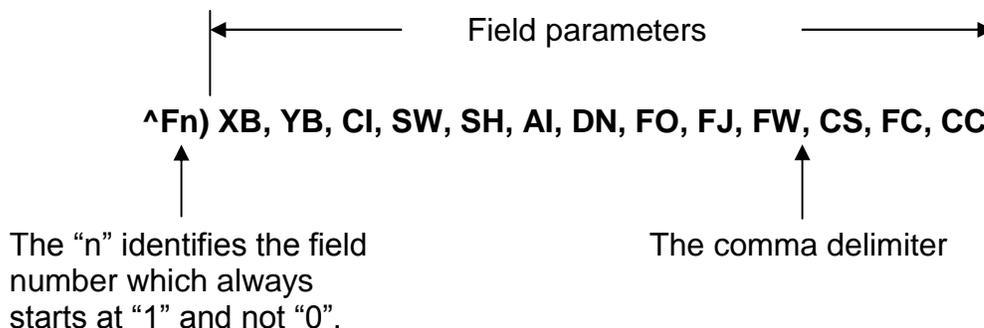
#### 1.4.8 OFY (Offset Y Direction)

LSX, LSY, GAP, DRM, SPD, DET, OFX, **OFY**

This parameter moves or offsets all fields in the “Y” direction without altering the field’s insertion points. The value is entered using the current unit of measure selected by the “^D564)” command. See also ^D638)n command.

### 1.5 Format Entry Command - ^Fn)

The *Format Entry* command is used to define the characteristics, placement and representation of the corresponding text data of the individual fields. This command starts with the “^Fn)” structure which is then followed by thirteen different parameters that define and control the desired field. The “n” is an identifier that represents the field number being formatted and corresponds to the equivalent “^Tn)” line. As with the ^Dxxx commands, multiple parameters must be separated by the comma (“,”) delimiter. The format entry command can be issued from outside a script but is typically created within a script file. Unlike the “^Dxx)” commands and the script header, the Format Entry Command typically does contain default values as there are no equivalent commands for the individual parameters. The default values are discussed under the individual parameter descriptions.



**Figure 4 Format Entry Command**

**1.5.1 XB (X Coordinate)**

**XB**, YB, CI, SW, SH, AI, DN, FO, FJ, FW, CS, FC, CC

This parameter is used to set the X coordinate of the field. The X coordinate is measured from the left edge of the media, as viewed from the front of the printer. The value is entered using the current unit of measure selected by the “^D564”) command and may contain any number of digits desired. A leading zero before the decimal point is not required but should be used to make trouble shooting scripts easier (i.e., .75 should be entered as 0.75). This parameter does not contain a default value and is required.

**1.5.2 YB (Y Coordinate)**

XB, **YB**, CI, SW, SH, AI, DN, FO, FJ, FW, CS, FC, CC

This parameter is used to set the Y coordinate of the field. The Y coordinate is measured from the bottom edge of the media, as viewed from the front of the printer. The value is entered using the current unit of measure selected by the “^D564”) command and may contain any number of digits desired. A leading zero before the decimal point is not required but should be used to make trouble shooting scripts easier (i.e., .75 should be entered as 0.75). This parameter does not contain a default value and is required.

**1.5.3 CI (Conversion Identifier)**

XB, YB, **CI**, SW, SH, AI, DN, FO, FJ, FW, CS, FC, CC

The Conversion Identifier (CI) determines how the associated text field will be rendered. This parameter can be used to select from the available fonts, graphics, line draw feature, and/or bar codes that will be used to render the associated Text Entry command line (“^Tn”). Objects that are stored in the printer’s flash memory are selected using the system character (“@”) and the appropriate text identifier. This parameter can also be used to select other user stored files by entering the name of the saved file into the CI parameter. The entered values for the CI parameter are not case sensitive because the printer will internally translate as lower case.

**Resident Bitmapped Fonts**

The resident fonts stored in the printer are listed in the table below. To access the resident fonts, enter the appropriate Font Name into the CI parameter. The printer may store up to nineteen bitmapped fonts and custom font sets are available upon request.

CI - Font Name	Font Sample
@normal_06	6 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZabcdefghijklmnopqrstu <strong>vw</strong> xy
@bold_06	6 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZabcdefghijklmnopqrstu <strong>vw</strong> xy
@normal_08	8 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZabcdefghijklmnopqrstu <strong>vw</strong> xy
@bold_08	8 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZabcdefghijklmnopqrstu <strong>vw</strong> xy
@normal_10	10 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZab
@bold_10	10 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZa
@normal_12	12 Point – 01234567890ABCDEFGHIJKLMN <strong>OP</strong> QRSTUVWXYZab

CI - Font Name	Font Sample
@bold_12	<b>12 Point – 01234567890ABCDEFGHIJKLMN OPQRSTUVWXYZa</b>
@normal_14	14 Point – 01234567890ABCDEFGHIJKLMN OPQRSTU
@bold_14	<b>14 Point – 01234567890ABCDEFGHIJKLMN OPQRST</b>
@normal_16	16 Point – 01234567890ABCDEFGHIJKL
@bold_16	<b>16 Point – 01234567890ABCDEFGHIJKL</b>
@normal_20	20 Point – 01234567890ABCDEFGHIJ
@bold_20	<b>20 Point – 01234567890ABCDEFGHI</b>
@normal_24	24 Point – 0123456ABCDEGabc
@bold_24	<b>24 Point – 012345ABCabcdefgh</b>
@ocra_12	12 Point - 0123456789ABCDEFGHIJKLMN OPQRUSTUWXYZabc
@ocrb_08	8 Point - 1234567890ABCDEFGHIJKLMN OPQRSTUVWXYZabcdefghijklmnopqr
@ocrb_12	12 Point - 1234567890ABCDEFGHIJKLMN OPQRSTU

**Table 1 Resident Bitmapped Fonts**

**Font File Type Example:**

If a normal 8 point font is desired then “@normal\_08” should be entered for the CI parameter in order for the proper font to be printed. Fonts are accessed by entering the system character “@”, font name followed by the underscore character and then the point size into the CI parameter.

**Line Draw**

The line draw feature is selected by entering “@line” into the CI parameter. The line draw feature easily creates lines by using the XB and YB coordinates as an insertion point for the line to start and then adjusting the SW and SH parameters to define the width and the height of the line.

**Line Draw Example:**

```

^A)
^D200)3.3, 1.9, 0.125, 1.063, 5, 1
^F1)1.0, 1.0,@line, 1.11, 0.01
^F1)1.0, 1.0,@normal_14
^T1)Line Draw Feature
^D300)1
^Z)

```

This script would cause a line to be inserted an inch from the left side and an inch from the bottom. The line would be 1.11" in width or length (X direction) and would be 0.01" in height (Y direction). The “^Fn” field must reference a “^Tn” field for proper operation. The line draw does not have to reference its own specific Text Entry command (“^Tn”) and may reference an existing Text Entry field in the script file as demonstrated in the above example. Refer to *Chapter 4* for additional information regarding the line draw feature.

### Bar Codes

The bar codes or symbologies are stored in the printer and can be selected by entering the system character “@” followed by the text equivalent code of the desired symbology in the CI parameter, refer to Table 2 for the available bar codes.

The bar codes that provide optional check digits can be accessed and printed by entering “cs” immediately following the bar code text equivalent code. This is helpful to meet the individual bar code specifications.

For example: If the user wanted to generate a human readable MSI1 that included the check digits, “msi1cs\_hr” would then be entered while “msi1\_hr” would not include the check digits in human readable form.

See *Chapter 5* for more detailed information pertaining to bar codes and their individual formatting requirements.

CI - Barcode Name	Bar code Type
@codabar	Codabar
@code128	Code 128 using manual compression
@code128auto	Code 128 using automatic compression
@code39	Code 3 of 9
@code93	Code 93
@codei2of5	Code I2 of 5
@msi0	Modified Plessey, User provides both check digits
@msi1	Modified Plessey, User provides one check digit
@msi2	Modified Plessey, User provides no check digits
@postnet	POSTNET
@uccean128	UCC/EAN 128
@data	Data Matrix 2D Bar code
@pdf417	PDF417 2D Bar code

**Table 2 Bar Code Index**

## Graphics

The printer is capable of processing monochrome 1-bit bitmaps. If color 1-bit bitmaps are used, it is recommended that the user use Burkes dithering method at the print resolution of the printer. The bitmap graphic does not need a separate converter to convert to the printer's recognized graphic structure as the printer will do this internally. The actual ".bmp" may be saved to the printer's non-volatile flash memory using the "^D340)" command or into volatile RAM using the "^D345)" command. User definable graphic images are accessed and printed by entering the file name of the appropriate stored graphic, that was used to save the graphic using the "^D340)" command, into the CI parameter.

Graphics may also be sent to the printer in "zipped" (.zip file extensions) form without specifying the file size. The file size would be provided by the zipped files header and should not be included in the command line. This also reduces the transfer time of sending the graphic to the printer improving throughput.

### **Graphic File Type Example:**

If a BMP graphic is saved as "my graphic" then "my graphic" should be entered for the CI parameter in order for the graphic to be printed.

### **1.5.4 SW (Size Width)**

XB, YB, CI, **SW**, SH, AI, DN, FO, FJ, FW, CS, FC, CC

This parameter is used to adjust the width multiple of fonts, bar codes and/or lines.

### **Bitmapped Fonts**

For bitmapped fonts, the SW can be used to adjust the width multiple of the font chosen using the CI parameter. The parameter is entered in as an integer and has a valid range of 1 to 256. The SW default for bitmapped fonts is set a 1.

### **Bar Codes**

The SW has a different effect when used in conjunction with bar codes. When a 0 or 180 degree bar code is selected using the CI parameter, the SW is used to modify the bar code width by a multiple of the narrowest rendition. This means that a value of "1" will produce the narrowest rendition related to the bar elements while a value of "3" would produce a Bar code that is three times this width. The default value of "1" will be used if a bar code is selected and this field is left blank. For 90 or 270 degree bar codes, the SW field would specify the actual width or height using the current selected unit of measure. The default SW height, 90 and 270 degree rotations, is set a value of 0.5 inches or 12.7mm depending on the current unit of measure ("^D564)" command) setting with the default for 0 and 180 degree rotation being set to a 1.

### **Line Draw**

The SW determines the width of a line when the CI field has selected the line draw feature. This is a required field when used in conjunction with the line draw feature.

### **1.5.5 SH (Size Height)**

XB, YB, CI, SW, **SH**, AI, DN, FO, FJ, FW, CS, FC, CC

This parameter is used to adjust the height multiple of fonts, bar codes and/or lines.

## Bitmapped Fonts

For bitmapped fonts, the SH can be used to adjust the height of the font chosen using the CI parameter. The parameter is entered in as an integer and has a valid range of 1 to 256. The SH default for bitmapped fonts is set a 1.

## Bar Codes

The SH has a different effect when used in conjunction with bar codes. When a 90 or 270 degree bar code is selected using the CI parameter, the SH is used to modify the bar code width by a multiple of the narrowest rendition. This means that a value of "1" will produce the narrowest rendition related to the bar elements while a value of "3" would produce a bar code that is three times this width. The default value of "1" will be used if a bar code is selected and this field is left blank. For 0 or 180 degree bar codes, the SH field would specify the actual height of the bar code using the current selected unit of measure. The default SH height, 0 and 180 degree rotations, is set a value of 0.5 inches or 12.7mm depending on the current unit of measure ("^D564" command) setting with the default for 90 and 270 degree rotation being set to a 1.

## Line Draw

The SH determines the height of a line when the CI field has selected the line draw feature. This is a required field when used in conjunction with the line draw feature.

### 1.5.6 AI (Attribute Index)

XB, YB, CI, SW, SH, AI, DN, FO, FJ, FW, CS, FC, CC

The attribute index controls the type of effect that is placed on text and/or bar codes. The default is a setting of "0", which is normal text or a method called OR. This causes new black dots to be placed regardless of existing dots that may be black or white. Also, a white area added to an existing black area does not become white, but the original black dots stay black. The default value may be entered in as "1" or may be omitted by just entering the comma delimiter (",," would use the default value). The valid values for the AI parameter are listed in Table 3 below.

Attribute Index Value	Conversion / Effect
0	OR (Default)
2	Reverse Video
2:1	Wide to Narrow Bar Ratio
3:1	Wide to Narrow Bar Ratio
4:2	Wide to Narrow Bar Ratio (3:1 bar; 4:2 space)
5:2	Wide to Narrow Bar Ratio
8:3	Wide to Narrow Bar Ratio

**Table 3 Attribute Index**

## Reverse Video

The reverse video function inserts a black rectangle that is one dot larger than the contents of the text string field that will be printed. The result would be that the text would be placed as white on a black background area. This effect is the same as if the image was XOR'ed onto a black box or line. In fact, if the automatic black box is too small, the line draw feature may be used to increase the size of the background black box. Refer to section 4.1 for additional information regarding the reverse video function.

## Ratios

The ratios are used in conjunction with the Codabar, Code 39, and I2 of 5 bar codes. This value determines the size of the wide to narrow bar ratio. The narrow bar module is always one dot by default. The actual size of the dot is based on the type of print head installed on the printer. By using the SW and/or SH parameters, it is possible to multiply the narrow bar module and then apply the various ratios to create the desired bar code size.

For example: An 8 dot per mm or 203 dots per inch print head has a dot every 0.0049". This would mean that the narrow bar module by default is 0.0049" and that a 2:1 ratio would result in the wide bars equaling 0.0098". Using the SW and/or SH parameters, depending on the orientation of the bar code, it is possible to multiply and adjust the narrow bar module. This would mean that for a 0 degree bar code, a SW value of 2 (2 x 0.0049) would adjust the narrow bar module to 0.0098" and then applying a 2:1 ratio would produce wide bars of 0.0196"(0.0098 x 2).

### 1.5.7 DN (Direction)

XB, YB, CI, SW, SH, AI, **DN**, FO, FJ, FW, CS, FC, CC

This parameter is used to select the direction of the text. The only valid parameter for direction is rightwards text. A selection of rightwards text would cause the characters to be printed left to right.

1	Rightwards Direction	(default)
---	----------------------	-----------

### 1.5.8 FO (Field Orientation)

XB, YB, CI, SW, SH, AI, DN, **FO**, FJ, FW, CS, FC, CC

The values entered in this parameter are expressed in degrees. The normal orientation (0°) is right side up as viewed from the front of the printer. The valid arguments are 0, 90, 180 and 270. The rotation is measured counter-clockwise.

0	0 degree	(default)
90	90 degree	
180	180 degree	
270	270 degree	

### 1.5.9 FJ (Field Justification)

XB, YB, CI, SW, SH, AI, DN, FO, **FJ**, FW, CS, FC, CC

The field justification or FJ controls the alignment, kerning, and the proportionality of text and/or bar codes with respect to the type of composition used. Alignment is done side-to-side (left, right, centered, or full justified to span the entire LSY distance) and vertically (on or below baseline, which is an imaginary line extending from the starting coordinates along the direction of the text), relative to the default (0 degree) orientation of text and/or bar codes and the insertion point of the field. This means that whatever the direction and

orientation may be; left will always be the left edge of the characters when the media exits the printer.

Kerning is when one character in a proportional font can be slid under another character to achieve a more appealing result. Kerning is enabled and used by default unless a value for the FJ parameter is entered. If a value is entered then kerning would have to be selected by adding "100" to the justification value.

Proportionality refers to whether the characters are all different widths or all the same. A proportional font has characters that are mostly different widths. A mono-spaced font has characters that are all the same width, except generally for punctuation.

When selecting the alignment value, text and/or bar codes will be aligned from the XB and YB insertion point. The justified function, to be aligned, can be specified by using a combination of the insertion point and the FW (Field Width) parameter so that the text is spaced to run this entire distance.

The desired alignment value can be determined from the table below:

	Composition		Horizontal Alignment			
	Horizontal	Vertical	Left	Center	Right	Justified
Vertical Alignment	Above Baseline	Top	11	12	13	14
	Below Baseline	Bottom	31	32	33	34

*Add 100 for kerning and add 200 for mono-spacing to the FJ value to produce effects.*

**Table 4 Field Justifications**

For Example: A typical European language would be left horizontal and normal vertical alignment, which would be a value of "11" for the "FJ" parameter. If kerning was also desired, the proper value would then be "111" and for mono spacing it would be "211".

**1.5.10 FW (Field Width)**

XB, YB, CI, SW, SH, AI, DN, FO, FJ, **FW**, CS, FC, CC

The field width parameter sets the width of a text field, using the current unit of measure, along the direction of composition. This is used to limit the physical width of the cell where the appropriate data is to be placed. If the desired data is longer than the field width setting, then characters outside the cell width setting will not be printed.

**1.5.11 CS (Character Spacing)**

XB, YB, CI, SW, SH, AI, DN, FO, FJ, FW, **CS**, FC, CC

This parameter adjusts the spacing between each character or the inter-character spacing. The change is made relative to a default, where omitting this parameter or entering a "0" causes the default to be used. The specified spacing value is in units of typesetting points, where 1 point = 1/72". Positive point values increase the default spacing while negative

values reduce the default spacing. The point values are accurate to a single digit following the decimal place (1.4 for example).

### 1.5.12 FC (First Character)

XB, YB, CI, SW, SH, AI, DN, FO, FJ, FW, CS, **FC**, CC

The FC parameter is used to select the first character to be used as data within the text string data. This parameter is helpful in allowing several fields to use sections of the same text string minimizing the amount of data transmitted. If the value specified for the FC parameter is equal to or greater than the included data, the entire data string will be printed. For Example, for the text string **0123456789**, a FC value of 5 would start the data on the fifth character and the resulting data would be **456789**. This parameter is typically used in conjunction with the CC (Character Count) parameter listed below.

### 1.5.13 CC (Character Count)

XB, YB, CI, SW, SH, AI, DN, FO, FJ, FW, CS, FC, **CC**

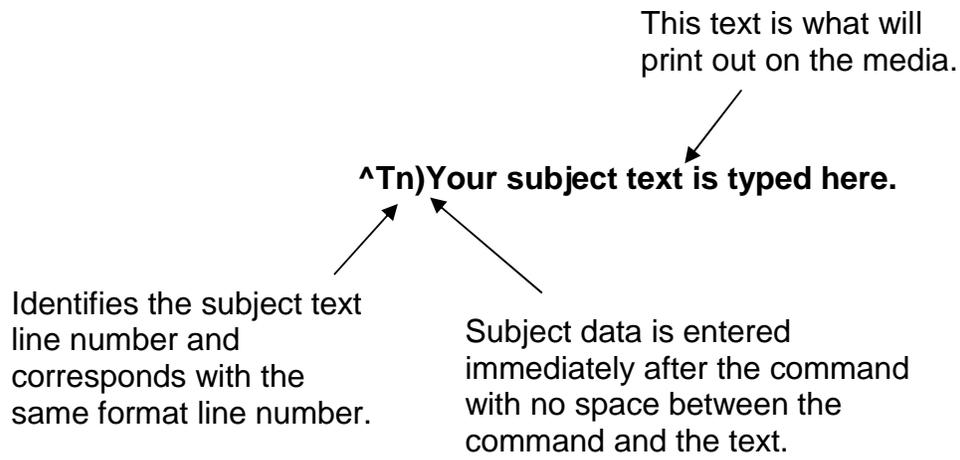
This parameter is used to determine the number of characters that will be used as data within a text string. If the number of characters in the selected text string is more than the quantity specified by the CC, then the remainder of the text string is ignored. If this parameter is left blank then the entire text string will be used as the data. Using the same example described in section 1.4.12, a CC value of 2 in conjunction with a FC value of 5, would result in a value of **45** to be used as the data.

## 1.6 Text Entry Command - ^Tn)

The *Text Entry* command is used to define the actual data to be rendered using the output identified by the CI parameter. This command starts with the “^Tn)” structure and then is followed by the subject text or data. The “n” is an identifier that represents the subject text lines and will use the formatting that has been placed in the corresponding “n” of the format entry command (“Fn”).

For features like graphics and/or line draw, this command is simply a placeholder for the equivalent “^Fn)” command, so any text may be entered. When printing graphics, text containing the graphic name or simply the word graphic should be entered and can be helpful for debugging purposes. The same would be true when using the line draw feature by entering the word “line” in the “^Tn)”, this also assists in debugging easier.

*Note: To print either the caret (“^”) or the pipe (“|”) characters simply enter them twice (example - “^^”).*



**Figure 5    Text Entry Command**

## Chapter 2: Printer Commands

The script management commands may be issued inside a script file while the ^Dxx printer control commands may be issued from inside or outside a script file. Commands will be persistent and non-volatile if issued from outside a script file and temporary if issued from inside a script. Commands that are issued from inside a script file will override the persistent setting during the processing of the script file and then return to the value of the previous persistent command. The commands require a “)” between the command and the first parameter or argument. Commands that contain multiple parameters must be separated with the comma delimiter. The printer control commands follow the standard command preface (“^Dxxx”) structure and are divided into eight sub-categories. These categories are identified by the “hundreds” digit as listed below. The commands are also executed in the order that they are issued with the only exceptions being the ^D391, ^D566, ^D565, and ^D564 commands. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

^Dxxx Series Number	Series Number Command Definition
2xx	Formatting Commands
3xx	Operation Commands
4xx	Volatile Selection and Setting Commands
5xx	Configurable Selection Commands
6xx	Configurable Setting Commands
7xx	Configurable Enablement Commands
8xx	<i>Reserved for future use.</i>
9xx	Self Test and Factory Commands

**Table 5      ^Dxxx Series Commands**

### 2.1      Script Management Commands

The script management commands deal specifically with scripts and control how scripts are processed and executed. These commands are only valid when sent inside a script file. Refer to the previous chapter for detailed description on working with script files and their formatting requirements. Certain commands are always processed before other commands with disregard to their placement. These commands include the ^D391, ^D566, ^D565, ^D564, and then the ^D200 command. The commands are processed in this order, if present, and after processed the remaining commands are executed in the order they are issued.

### 2.1.1 Begin Script - ^A)filename

This command is used to mark the beginning of a script file. The script may be saved into the printer's non-volatile flash memory if a title or filename is placed after the command. The filename may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [\\_]' and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero ("0") or 0x30 characters. A script that contains a "filename" will only save the script and will not process and print. The "^D350)filename" would be issued to recall and process the saved script. If the script does not contain a "filename", the script is processed normally and will be volatile in nature.

### 2.1.2 Begin Temporary Script - ^AT)filename

This command is used to mark the beginning of a temporary or transient script file. The script may be saved into the printer's volatile RAM if a title or filename is placed after the ^AT) command. The filename may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [\\_]' and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero ("0") or 0x30 characters. Scripts saved in RAM report "\*volatile\*" in the comments column to distinguish between volatile and non-volatile scripts. A script that contains a "filename" will only save the script and will not process and print. The "^D350)filename" would be issued to recall and process the saved script. If the script does not contain a "filename", the script is processed normally and will be volatile in nature. Temporary scripts are not saved and are lost once a reset or power cycle occurs.

### 2.1.3 Format Entry Command - ^Fn)XB,YB,CI,SW,SH,AI,DN,FO,FJ,FW,CS,FC,CC

The *Format Entry* command is used to define the characteristics, placement and representation of the corresponding text data of the individual fields. This command starts with the "^Fn)" structure which is then followed by thirteen different parameters that define and control the desired field. The "n" is an identifier that represents the field number being formatted and corresponds to the equivalent "^Tn)" line. As with the ^Dxxx commands, multiple parameters must be separated by the comma (",") delimiter. The format entry command may be issued from outside a script but is typically created within a script file. Unlike the "^Dxx)" commands and the script header, the Format Entry Command typically does contain default values as there are no equivalent commands for the individual parameters. The default values are discussed under the individual parameter descriptions. Refer to section 1.5 for the individual parameters detailed descriptions.

### 2.1.4 Text Entry Command - ^Tn)text data

The *Text Entry* command is used to define the actual data to be rendered using the output identified by the CI parameter. This command starts with the "^Tn)" structure and then is followed by the subject text or data. The "n" is an identifier that represents the subject text lines and will use the formatting that has been placed in the corresponding "n" of the format entry command ("Fn)").

For features like graphics and/or line draw, this command is simply a placeholder for the equivalent "^Fn)" command, so any text may be entered. When printing graphics, text containing the graphic name or simply the word graphic should be entered and can be

helpful for debugging purposes. The same would be true when using the line draw feature by entering the word “line” in the “^Tn”, this also assists in debugging easier.

*Note: To print either the caret (“^”) or the pipe (“|”) characters simply enter them twice (example - “^^”).*

## 2.2 2xx Series Commands

The 2xx series commands control the formatting commands. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

### 2.2.1 ^D200)LSX,LSY,GAP,DRM,SPD,DET,OFX,OFY (Script Header)

This command is followed by eight parameters that control the media layout as well as printer operation. The beginning parameter (LSX) must be separated from the ^D command with a “)” character and each following parameter must be separated by the delimiter, which is the comma (“,”) by default. It is recommended that since the header is used to identify a certain media configuration that all header parameters are included in a script file. Refer to section 1.4 for additional information.

### 2.2.2 ^D202)n (Text Replacement Header)

This command may be used in place of the script header (“^D200)”) after a script containing ^Fn) formatting instructions has been processed. Parameter “n” is used to specify a script that has been saved into the printer memory that will be used as the current script. The “^D202)” command causes new text data to replace the corresponding text from the previously processed script sent to the printer or by entering value for “n” a script saved in memory. This provides a streamlined method for entering new data into an existing script without having to send the header and formatting instructions again, thus improving throughput. The data that needs to be replaced is sent after the “^D202)” command using the corresponding ^Tn) command in the current script. To erase or clear a format line, you would send the desired ^Tn) line and omit new data. To conserve text data from the previous script, do not reference the line after the “^D202)” command.

*For Example:*

^AT)test	<-- saves a volatile file called "test"
^D200)3,1,0.125,0,3,2,0,0	<-- label header
^F1)1.50,0.75,@normal_10,1,1,0,1,0,12	<-- field #1 definition
^F2)1.50,0.50,@normal_10,1,1,0,1,0,12	<-- field #2 definition
^F3)1.50,0.25,@normal_10,1,1,0,1,0,12	<-- field #3 definition
^T1)Text	<-- field #1 data
^T2)Replacement	<-- field #2 data
^T3)Example	<-- field #3 data
^D300)1	<-- print “1” copy command when recalled
^Z)	<-- end script

**^D202 Print Example #1**

**Text  
Replacement  
Example**

The “^D202 Print Example #1” illustrates what the sample script listed above would generate if recalled using the “^D350) command (“^D350)test”).

**^D202 Print Example #2**

```

^A)          <-- start script
^D202)test   <-- recalls file “test”
^T3)Print Sample <-- replace ^T3 data
^D300)1      <-- print 1 copy
^Z)          <-- end script

```

**Text  
Replacement  
Print Sample**

The “^D202 Print Example #2” illustrates recalling the script from Example #1 (“test”) and then replacing the data in text field #3 (“^T3”) from “Example” to “Print Sample”.

**^D202 Print Example #3**

```

^A)          <-- start script
^D597)1      <-- advance after print
^D202)test   <-- recalls file “test”
^T1)         <-- replace/delete ^T1 data
^T3)Print Sample <-- replace ^T3 data
^D300)2      <-- print 2 copies
^Z)          <-- end script

```

**Replacement  
Print Sample**

The “^D202 Print Example #3” illustrates adding a ^D command, recalling the script from Example #1 (“test”), replacing text field #1 with blank space, replacing the data in text field #3 (“^T3”) from “Example” to “Print Sample”, and increasing how many copies are printed (“^D300)2”).

**2.3 3xx Series Commands**

The 3xx series commands control basic operation and list commands. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. The ^D3xx series commands are also required to be sent each and every time because persistent or values set outside a script file are not retained. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

**2.3.1 ^D300)n (Print Command)**

This command will print a label or a batch of labels where “n” controls how many labels of the identical script are printed. When this command is used within a script file, it should be placed at the end of the ^D commands. The “^D300)” command is equivalent to the ^P (ASCII 0x10) control code.

**2.3.2 ^D305)1 (Infinity Print Command)**

Issuing this command will initiate infinity printing. The printer will continue to print until the machine is turned off. This command may be sent from outside or from inside a script file.

**2.3.3 ^D311)1 (Top-OF-Form)**

This command uses the Label Present Sensor to detect the edge of the media and retracts the leading edge of the media to the print head dot row or start position. The “^D311)” command is equivalent to the ^O (ASCII 0x0F) control code.

**2.3.4 ^D312)n (Form Feed)**

This command causes the printer to feed or scroll a form size that is based upon the previous script’s configuration where “n” controls how many copies are issued. The form is determined by the last label size that was processed. This command can be used inside and/or outside a script file. The “^D312)” command is equivalent to the ^L (ASCII 0x0C) control code.

**2.3.5 ^D313)n1,n2 (Advance Media)**

This command is used to advance the media by a programmable distance (n1) at a programmable speed (n2). The distance and speed parameters are specified in the current selectable units (“^D564)” and “^D565)”) commands. A negative distance for the n1 parameter causes the printer to retract the specified amount at the speed entered with the n2 parameter.

**2.3.6 ^D315)n (Calibrate Sensor Thresholds)**

This command is used to recalibrate the registration mark sensor thresholds for proper detection of registration marks used on the current media. This command is an interactive command requiring the printer’s response set to VERBOSE mode or the “^D550)9)” command. The “n” parameter is the registration mark width and is entered using the current unit of measure selected by the “^D564)” command. The calibration is done at the factory and recalibration should only be issued when the installation of new sensors has occurred or the original threshold does not function properly for the media being used. The registration detection mode command “^D636)” must also be correctly set to the type of media that is being used for successful calibration to occur. If this command is used improperly, the printer may not be able to detect registration marks causing the print to be out of registration.

### 2.3.7 **^D323)n (List Enablements)**

The “^D323)” command will list the printers current configurable enablements along with each of the individual enablement specific ^D7xx command. This command should only be issued from outside a script file and not issued in a script file. The valid parameters for “n” are listed below. If the ^D command is issued without a parameter, the default will be used. The “^D323)” command is equivalent to the ^Y (ASCII 0x19) immediate control code.

- 1 through active port (default)
- 2 print out

### 2.3.8 **^D324)n (List Statistics)**

This command is used to report the printer’s current status such as the firmware version, communication parameters, memory information, and basic usage statistics. The “^D324)” command is equivalent to the ^W (ASCII 0x17) control code.

- 1 through active port (default)
- 2 print out

### 2.3.9 **^D325)n (List Selections)**

The “^D325)” command will list the printers current configured selections along with each of the individual selection specific ^D5xx command. This command should only be issued outside a script file. The valid parameters for “n” are listed below. If the ^D command is issued without a parameter, the default will be used. The “^D325)” command is equivalent to the ^U (ASCII 0x15) control code.

- 1 through active port (default)
- 2 print out

### 2.3.10 **^D326)n (List Settings)**

The “^D326)” command lists the printers current settings along with each of the individual setting specific ^D6xx) commands. This command should only be issued outside a script file. The valid parameters for “n” are listed below. If the ^D command is issued without a parameter, the default will be used. The “^D326)” command is equivalent to the ^V (ASCII 0x16) control code.

- 1 through active port (default)
- 2 print out

### 2.3.11 **^D327)1 (List Status)**

The “^D327)1” command will report the printers current status through the active port. When the indicator light on the front panel changes from green to amber or red, this command will provide information of the current status (i.e., >STOCK OUT<, >READY<, >PAUSED<...). The actual response the printer sends depends on the printer response set configuration, refer to the “^D550)” command for additional information. This command may be issued inside or outside a script file. The “^D327)1” command is the queued or serialized equivalent to the ^E (ASCII 0x05) immediate control code. Refer to Chapter 6 for the available status messages.

### 2.3.12 ^D340)filename (Load/Save File)

The “^D340)” command causes the printer to take the ensuing data transfer as a binary file upload from the host. The file will then be permanently stored in the printer’s flash memory until it is explicitly erased. The printer will currently accept the following file types: 1-bit (monochrome) BMP graphics, and MCF’s (Microcom Corporation Converted Font). The file transfer can be sent in uncompressed or PKZIP compatible compressed formats. A ^E (0x05) character may be sent to the printer during the download without any negative effects towards the file size. The ^D340) command has three parts, which are name, file size, and comment. Both the name and file size are required while the comment is optional.

The filename and/or comment may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [ ] \_ ’ and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero (“0”) or 0x30 characters.

When saving MCF files, the chosen name should include the “\_” (underscore character) followed by the point size; see the examples below.

#### Command Syntax: ^D340)filename, file size, comment (optional)

Example 1: “^D340)swiss721\_10,3092”

Example 2: “^D340) graphic, 2862, my graphic”

Example 2 would save a BMP file titled “graphic” and a comment “my graphic” into the printer’s flash memory. The printer will automatically detect the file type of the ensuing data and save it as such.

### 2.3.13 ^D341)type (List Catalog)

This command is used to list the files stored in the printer’s flash memory. The list reports the files name (user file CI), any associated comments, file type, and the file size of all file types. This command should only be issued from outside a script file and not entered from a script file. Issuing this command with the “?” as the argument also causes the listing to be generated. The ^D341) command may contain a search string type to limit a search for specific file types. The valid parameters for “type” are listed below.

- 1 List all file types
- 2 List only graphic file types
- 4 List only bitmapped font file types
- 5 List only script file types

### 2.3.14 ^D342)filename (Delete File)

This command is used to delete a stored font, graphic, or script. The filename must match a saved file name and/or contain the wild card character (\*) for the stored file to be properly deleted. This would include any space characters that were entered when saving the file.

The “^D341)” command is useful in determining the exact filename and the valid wild card structure is listed below.

- \*x - deletes filenames that end with character string x.
- x\* - deletes filenames that begin with character string x.
- x\*y - deletes filenames that begin with character string x and end with string y.
- \*x\* - deletes filenames where character string x is found anywhere in the filename.

### 2.3.15 ^D343)filename (List Script)

This command lists the contents of the specified script that has been saved in the printer's flash memory to the active port.

### 2.3.16 ^D345)filename (Load Volatile File)

The “^D345)” command causes the printer to take the ensuing data transfer as a binary file upload from the host without saving to the printer's flash memory. The file is volatile in nature and will be lost when power is cycled. The printer will currently accept the following file types: 1-bit (monochrome) BMP graphics, MCF (Microcom Corporation Converted Font), and user created script files. The file transfer can be sent in uncompressed or PKZIP compatible compressed formats. A ^E (0x05) character may be sent to the printer during the download without any negative effects towards the file size. The “^D345)” command has two parts, which are the file name and file size.

The filename may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [ ] \_ ' and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero (“0”) or 0x30 characters.

When saving MCF files, the chosen name should include the “\_” (underscore character) followed by the point size; see the examples below.

#### Command Syntax: ^D345)filename, file size

Example 1: “^D340)swiss721\_10,3092”

Example 2: “^D340) graphic, 2862”

Example 2 would save a BMP file titled “graphic” into the printer's volatile RAM memory. The printer will automatically detect the file type of the ensuing data and save it as such.

### 2.3.17 ^D346)1 (Defragment Flash Files)

The “^D346)” command is used to Defragment or free up used flash memory file area. Issuing this command causes the printer to delete the user area of flash memory and rewrite the contents copied to RAM back into the flash memory. During the Defragment process, the printer's power should not be interrupted as the printer's file area is stored in volatile RAM until defragmenting is completed. If power is lost while using the “^D346)” command the printer's flash memory contents will become corrupted and the printer will not function. The “>FLASH DEFRAGMENTING<” message is reported in response to an enquiry

command until the defragmenting operation has completed. The “^D360)”, “^D324)”, and ^W commands are helpful in determining when the printer requires defragmenting by listing the amount of available flash memory. If the printer responds with the “>INADEQUATE FLASH SPACE<” message, the printer’s flash memory is either full or requires defragmentation to free up additional flash memory. The printer typically only requires the defragment process when files are being saved and deleted into flash memory and not when using the ^AT) command which only saves script into RAM. The “^D346)” may be set to run automatically on a power-up when the available flash memory falls below 10% of the total flash file area with enabling the “^D760)” command.

### 2.3.18 ^D350)filename (Execute Script)

This command recalls and processes a script that has been saved in the printer’s flash memory or volatile scripts that are currently in RAM.

### 2.3.19 ^D360)1 (List Memory Available)

This command lists the current RAM and Flash memory available. The available RAM is listed and then the available Flash memory is reported. The memory types are separated by the comma (“,”) delimiter.

### 2.3.20 ^D365)? (List Status Response List)

This command generates a list of the status responses and sends it to the active port. The list contains the byte, text, and verbose equivalent responses. Refer to the “^D550)” command regarding the byte, text, and verbose response sets. This command should only be issued outside a script file. The available status responses are listed in the Table 6.

Byte Mode Responses (ASCII)	Text / Verbose Mode Response Equivalent
0x01	>STOCK OUT<
0x02	>STOCK OVERADVANCED<
0x03	>STOCK JAMMED<
0x04	>INCORRECT STOCK<
0x06	>OK<
0x10	>CUTTER JAMMED<
0x11	>CUTTER INOPERATIVE<
0x12	>CUTTER WATCHDOG STOPPED CUTTER<
0x13	>CUTTER WATCHDOG WON'T RESET<
0x1C	>MISSING LABELS<
0x1D	>INCOMPLETE FORM<
0x20	>CATCH TRAY FULL<
0x21	>INPUT 1<

Byte Mode Responses (ASCII)	Text / Verbose Mode Response Equivalent
0x22	>INPUT 2<
0x30	>SCRIPT ERROR<
0x31	>INVALID PARAMETER<
0x32	>PARSER ERROR<
0x40	>COMM ERROR<
0x51	>FLASH ERROR<
0x80	>RESTARTED<
0x81	>READY<
0x82	>BUSY<
0x83	>PAUSED<
0x84	>PRINTING<
0x85	>FEEDING<
0x86	>LABEL/TAG PRESENT<
0x87	>STOCK ADVANCED<
0x8A	>FLASH DEFRAGMENTING<
0x8D	>LABEL/TAG NOT PRESENT<
0x8F	>STOCK NOT LOADED<
0x90	>RETRACTION DELAY<
0x91	>PRINT DELAY<
0xB0	>FLASH MEMORY LOW<
0xC0	>BUTTON 1 TAPPED<
0xC1	>BUTTON 1 HELD<
0xD0	>TEMPERATURE OUT OF RANGE<
0xD1	>NONEXISTENT COMMAND<
0xD2	>INCOMPLETE COMMAND<
0xD3	>ZIP FILE ERROR<
0xD4	>FILE CONVERSION ERROR<
0xD5	>UNSUPPORTED FILE TYPE<
0xD6	>FILE NOT FOUND<
0xD7	>INADEQUATE ACCESS MODE<
0xD9	>FILE IS READ ONLY<
0xDA	>INADEQUATE FLASH SPACE<



“^D392)1” command after a Flash code update may cause the printer to become unstable. A reset (^D390) and/or power cycle is required for this command to complete.

### 2.3.24 ^D394)1 (Draw Platen Roller Compensation Line)

The “^D394)1” command prints 10” lines in the “Y” direction that are used to correct any tolerance issues with the printer’s drive roller. This command is intended to be used in conjunction with the “^D646)” command. Continuous media should be used when using the “^D394)1” command.

## 2.4 5xx Series Commands

The 5xx series commands control the printer’s configurable selections and may be issued from outside and/or inside a script file. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

### 2.4.1 ^D501)n (Select Emulation Mode)

This command is used to select the various products and their command structure that can be emulated by entering the “n” parameter. Once the printer has been set to a specific emulation mode, the commands will then follow the rules of that particular product. This command should only be issued from outside a script and not from within a script. The printer will force commands to their default LDSII settings when returning to the LDSII mode. The “n” parameter is used to select the desired Model of the printer that will be used. Selecting this parameter automatically adjusts the necessary changes within the printer. The printer returns the current mode separated by <CR> characters when issued.

- |   |                |
|---|----------------|
| 1 | LDSII Language |
| 2 | Limited 410ECA |

### 2.4.2 ^D506)n (Select Cutter Type)

This command is used to select the type of cutter that is installed on the printer. The valid parameters for “n” are listed below. The printer has to be reset and/or a power cycle must occur after setting this command. To adjust the dispense distance for the available cutters, refer to the “^D642)” command.

The recommended “^D642)” value for the guillotine cutter dispense distance for the Model 426 printer is 0.84” (21mm) but may vary due to mechanical tolerances and/or printer model numbers.

The recommended “^D642)” value for the rotary cutter dispense distance for the Model 426 printer is 0.98” (25mm) but may vary due to mechanical tolerances and/or printer model numbers.

- |   |                   |
|---|-------------------|
| 0 | None              |
| 1 | Guillotine Cutter |
| 2 | Rotary Cutter     |

### 2.4.3 ^D507)n (Select Printed Media Handler)

This command is used to select the type of Printed Media Handler (PMH) that is installed on the printer. The valid parameters for “n” are listed below. Once this command is changed, printer power needs to be cycled before changes take effect.

- 0 None
- 1 Catch Tray type 1
- 2 PMP (Printed Media Presenter) type 1
- 3 Stacker 160P

### 2.4.4 ^D508)n (Select Label Present Detector Type)

The “^D508” command selects from among the available label present detector (LPD) types. The LPD is set to reflective if using with a Model 426 printer and transmissive type 1 if the printer is used in conjunction with the catch tray. If selections 1 through 3 are used the printer will report either the >LABEL\TAG PRESENT< or 0x86 when media blocks the sensor depending on the configured response set or “^D550” command. When selections 1 through 3 are used and media does not block the LPD either the >LABEL\TAG NOT PRESENT< or 0x8D when media blocks the sensor depending on the configured response set or “^D550” command. A selection, 1 through 3, is also required when using the Dispense mode or “^D597” or the dispense mode command with automatically retract ignoring the LPD signal. This command is also used to control the optional INPUT 2 sensor using selections 4 through 7. These settings configure how and when the >INPUT 2< or 0x22 message is reported. The valid parameters for “n” are listed below.

- 0 None
- 1 Reflective
- 2 Transmissive type 1
- 3 Transmissive type 2
- 4 Send only a message when INPUT2 signal is active (LOW)
- 5 Send only a message when INPUT2 signal is inactive (HIGH)
- 6 Assert an error when INPUT2 signal is active (LOW)
- 7 Assert an error when INPUT2 signal is inactive (HIGH)

### 2.4.5 ^D509)n (Select INPUT1 Response Polarity and Action)

The “^D509” command selects whether the printer issues an >INPUT 1< or 0x21 message, depending on the “^D550” command setting, when the optional INPUT 1 sensor’s signal is active (LOW), or when it is inactive (HIGH), and whether it sets an error or just sends a message through the printer’s active port. The “^D509” command is set to “3” when using the optional Catch Tray assembly with the printer.

- 0 No response when INPUT 1 signal changes
- 1 Send only a message when INPUT 1 signal is active (LOW)
- 2 Send only a message when INPUT 1 signal is inactive (HIGH)
- 3 Assert an error when INPUT 1 signal is active (LOW)
- 4 Assert an error when INPUT 1 signal is inactive (HIGH)

### 2.4.6 ^D541)n (Select Button 1 Response)

This command is used to select the operation and response of Button 1 which is typically referred to as the print button. When set to a value of “1”, the printer will reprint the previously printed script with a short button press and if the button is held, the printer will continuously feed media until the button is released. When set to a value of “2”, the printer will form feed with a short or brief button press and continuous feed if held. A setting of “3” causes the short button press to send the “>BUTTON 1 TAPPED<” response to the active port while holding the button in continuously feeds media until the button is released. A setting of “4” causes the short button press to send the “>BUTTON 1 TAPPED<” response to the active port while holding the button in sends the “>BUTTON 1 HELD<” response through the active port. A setting of “5” causes the short button press to initiate a TOF (Top-Of-Form) or ^D311 command while holding the button in continuously feeds media until the button is released.

- 1 Short press = reprint; button held = continuous feed (default)
- 2 Short press = form feed; button held = continuous feed
- 3 Short press = “>BUTTON 1 TAPPED<” response;  
button held = continuous feed
- 4 Short press = “>BUTTON 1 TAPPED<”;  
button held = “>BUTTON 1 HELD<”
- 5 Short press = Initiates a TOF (^D311); button held = continuous feed

### 2.4.7 ^D550)n (Select Printer Response Set)

This command is used to select among the available response sets the printer offers. The response sets determine how the printer will react to commands, functions, and enquiry responses. Issuing a ^Dxx command without a parameter will report the commands current setting regardless of the selected response set. Descriptive text is reported by issuing the question mark character (“?”) after a ^Dxx command and is available in all response sets.

For Example: Issuing the “^D550)? <CR>” command sequence would cause the printer to report text that describes the commands current setting as well as the commands operation and valid settings.

Refer to the following sample dialog:

```

^D550 n -- Selects response mode
  1 - TEXT -- Text responses (default)
  2 - BYTE -- Byte-encoded responses
  9 - VERBOSE -- Text responses with command help text
    and confirmations of settings
Current setting is: 1.
Use a selection index to change the setting.

```

**Text:** If text responses are selected, the printer responds with simple text responses to enquiries and error conditions. Commands that are issued without an argument will return that commands current setting without descriptive text while in the text mode response set. The printer is capable of multiple line responses so the final response is terminated with a “CR LF” or “0x0D 0x0A” sequence to assist in programming. The only response that is

automatically generated is the >POWERED DOWN< response and occurs when power is removed from the printer.

**Byte:** When the byte response set is selected, the printer returns all responses in binary form. Commands that are issued without an argument will return that commands current setting without descriptive text while in the byte mode response set. The printer is capable of multiple line responses so the final response is terminated with the ^Z or 0x1A character to assist in programming. The only response that is automatically generated is the >POWERED DOWN< or 0xFF response and occurs when power is removed from the printer.

**Verbose:** If verbose responses are selected, the printer will include elaborate text help about commands when that command is issued without an argument, a summary of any action that has just resulted from a command, and listings of printer parameters, where the listed values are each identified by descriptive text. This mode is very helpful when learning how to use the printer for the first time and is not intended to be used for actual programming.

- 1 Text (Default)
- 2 Byte
- 9 Verbose

#### 2.4.8 ^D564)n (Select Measurement Units)

This command is used to select the prevailing unit of measure the printer will use. Some commands and/or calculations use a constant unit of measure and will not change with the issuance of this command. These commands and/or calculations that use a constant unit of measure are noted in their respective descriptions. This command is always the first command to be processed by the printer regardless of the placement within a script. This is helpful in forcing a unit of measure for troubleshooting and support capabilities.

- 1 Inches
- 2 Millimeters

#### 2.4.9 ^D565)n (Select Speed Units)

This command is used to select the desired unit of measure used for the speed parameter. This command is independent from the “^D564)” command. The valid selections for the “n” parameter are listed below with the default being a “1” (Inches). This command is always processed first in a script or just after the “^D564)” command by the printer regardless of the placement within a script. This is helpful in forcing a unit of measure for troubleshooting and support capabilities.

- 1 Inches per Second (ips)
- 2 Centimeters per Second (cm/sec)

#### 2.4.10 **^D566)n (Select Temperature Units)**

The “^D566)” command is used to select the temperature unit of measure the printer will use for displaying the print head temperatures in degrees. This command is always processed first in a script or just after the “^D564)” and “^D565)” commands by the printer regardless of the placement within a script. This is helpful in forcing a unit of measure for troubleshooting and support capabilities.

- 1 Fahrenheit
- 2 Centigrade

#### 2.4.11 **^D567)filename (Select Power-up Script)**

The “^D567)” command is used to select the script that is processed on a printer power-up. It is used in conjunction with the “^D720)” command to automatically process the selected script on a power-up. Issuing the “^D567)” without a parameter builds and lists the scripts that have been saved into the printers flash memory. The filename may contain to a maximum of 20 characters in length and include any character from ASCII 0x20 and 0x41 to 0x7A (alphabetical characters plus [ ] \_ ' and SP (space character)) with the exception of the caret (^) character. Script filenames can not use a leading zero (“0”) or 0x30 characters.

#### 2.4.12 **^D570)n (Select Active Port)**

The “^D570)” command is used to select the printer’s active port. When the Autodetect is selected the printer will automatically determine and set the port based on which port is connected at powerup. If both serial and USB ports are connected, the autodetect will select the USB as the active port. If autodetect is selected and neither the Serial nor the USB is connected at power up, the Serial port will be selected as the active port. The Autodetect feature will only determine the active port at power up and will continue to use the selected port for the duration of the power up time. The valid parameters for “n” are listed below.

- 0 Autodetect (Serial/USB)
- 1 RS-232 Serial Port
- 2 USB Type 1 (serial port disabled)
- 5 Wired Ethernet (serial port disabled)

#### 2.4.13 **^D581)n (Select Stock Out Handling Method)**

This command is used to select the procedure the printer will use when handling >STOCK OUT< conditions. The valid arguments for “n” are listed below. A selection of “1” instructs the printer to immediately halt on a >STOCK OUT< condition. A button press clears the error condition and reprints the last label format. A selection of “2” instructs the printer to finish printing the current format before halting when a >STOCK OUT< condition occurs. A button press clears the error condition and printing is resumed, if a print job is in process, without reprinting the last script. If the printer could not finish the last script, the >INCOMPLETE FORM< or 0x1D error response is generated along with the >STOCK OUT< message. Once this occurs a button press is used to clear the error and the last script that was incomplete is reprinted.

- 1 Immediate halt upon detection of stock-out.

- 2 Finish current label before halting.

#### 2.4.14 ^D597)n (Select Dispense Mode)

This command may be used for either Peel-N-Dispense and/or Tag/Tear dispense methods. The Tag/Tear dispense method is when the perforation of a tag that has printed is advanced out to the peel edge to make removal easier. The Peel-N-Dispense method is when die-cut media is used and advanced so that the “peeled” media stays on the peel edge after printing. The “n” is used to adjust the dispense methods, according to the list below, and may be issued from outside a script or from within a script file. Depending on the desired dispense method, the value for advancing to the peel or tear edge varies. To adjust the dispense distance, refer to the “^D642)” command. A LPD (Label Present Detector) and a “^D508)” selection are both required for this command to properly function. If a “^D508)” selection is omitted or if a LPD does not exist on the printer, the media will immediately retract after printing has stopped.

The >STOCK ADVANCED< or 0x87 response is generated when the printer has advanced the media to the desired dispense point. This response will be reported until the media is removed or the “^D641)” delay time has expired causing the media to be retracted. When the media is in the advanced position, the indicator light is solid amber in color.

The recommended “^D642)” value for the Tag/Tear dispense method for the Model 426 printer is 0.512” (13mm) but may vary due to mechanical tolerances and/or printer model numbers.

The recommended “^D642)” value for the Peel-N-Dispense dispense method for the Model 426 printer is 0.472” (12mm) but may vary due to mechanical tolerances and/or printer model numbers.

Valid selections for the “n” parameter –

- 0 **No Advance/Retract** – This will disable the Dispense mode.
- 1 **Advance after every label (LTS Enabled)** – Causes the label or tag perforation to be advanced to the peel edge after every label is printed. Before the printer retracts, it will wait for both the label to be taken and any advance delay time setting.
- 2 **Advance after copies count (LTS Enabled)** – Causes the label or tag perforation to be advanced to the peel edge after the set copies count has been reached. Before the printer retracts, it will wait for both the label to be taken and any advance delay time setting.
- 3 **Advance when idle (LTS Disabled)** – This will cause the label or tag perforation to be advanced to the peel edge when the printer has no pending data on the communications port. When new data is sent through the port the printer will retract and then begin the printing process. This command should be issued outside a script file and not within a script file for proper operation.

- 4 **Advance after every label (LTS Disabled)** - Causes the label or tag perforation to be advanced to the peel edge after every label is printed. Before the printer retracts, it will wait only for any advance delay time setting.
- 5 **Advance after copies count (LTS Disabled)** - Causes the label or tag perforation to be advanced to the peel edge after the set copies count has been reached. Before the printer retracts, it will only wait for any advance delay time setting.

## 2.5 6xx Series Commands

The 6xx series commands control the configurable settings and may be issued outside and/or inside a script file. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

### 2.5.1 ^D631)n (Set Media Width)

This command specifies the width of the media using the current selected prevailing unit of measure selected by the “^D564)” command. The maximum width is the width of the print head installed on the printer. This command is also a parameter in the “^D200)” script header command. See also, LSX.

### 2.5.2 ^D632)n (Set Media Height)

This command specifies the height of the media using the current selected prevailing unit of measure selected by the “^D564)” command. The maximum LSY height is 24”. This command is also a parameter in the “^D200)” script header command. See also, LSY.

### 2.5.3 ^D633)n (Set GAP Size)

This command sets the height distance, as viewed inside the printer, of the registration mark that identifies the label and/or tag size and is entered using the current selected prevailing unit of measure selected by the “^D564)” command. This would be the backing material found between die-cut labels, blowhole sense mark, and/or the blackline height. This command is also a parameter in the “^D200)” script header command. See also, GAP.

### 2.5.4 ^D634)n (Distance To Registration Mark)

This command is only used when the registration mark is not located at the edge of the media. The “DRM” is the distance from the leading edge of the media to the beginning of the registration mark and is entered using the current selected unit of measure. This command is also a parameter in the “^D200)” script header command. See also, DRM.

### 2.5.5 ^D635)n (Set Print Speed)

The “^D635)” command sets the print speed of the printer using the current selected unit of measure. Parameter “n” has a range of 1-6 inches per second or 2.54 - 15.24 cm/second. This command is also a parameter in the “^D200)” script header command. See also, SPD.

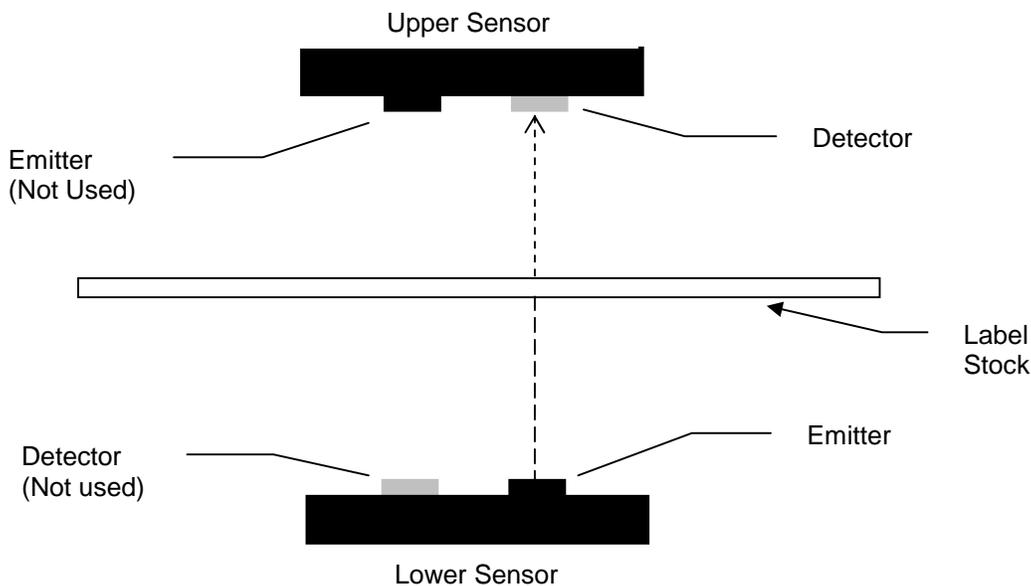
### 2.5.6 ^D636)n (Set Detection Mode)

This command selects the type of method the printer uses for detecting registration marks on the different media types. A selection of a “0” disables the detection of registration marks and is used in conjunction with media that does not contain a registration mark like continuous media. A selection of a “1” uses the reflective detection method and is used when detecting registration marks located on the bottom side of the media. A selection of a “2” uses the transmissive detection method which can be used with any type of media but is not recommended when only detecting registration marks located on the bottom side of the media. A selection of a “3” also uses the transmissive detection method and is used in conjunction with media containing a blowhole. Both upper and lower gap detectors are required for stock out detection regardless of the type of registration mark detection. This command is also a parameter in the “^D200)” script header command. See also, DET.

0	None	(gap sensors are disabled)
1	Blackline	(lower gap sensor is enabled)
2	Die-cut	(upper and lower gap sensors are enabled)
3	Blowhole	(upper and lower gap sensors are enabled)

#### 2.5.6.1 Detection Mode - None (0)

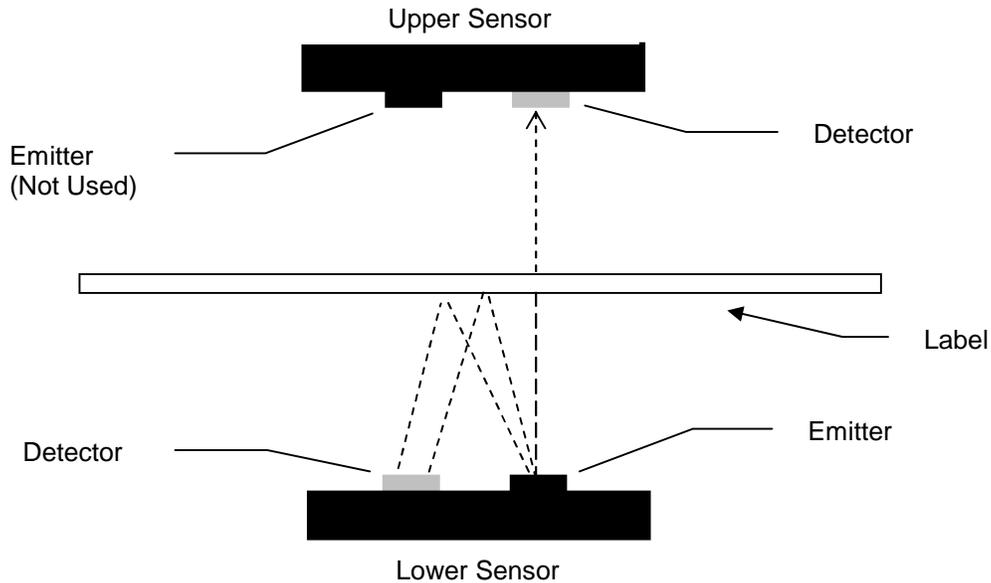
This mode is usually used with continuous media. Even though it is not necessary to sense a registration mark, it is still important that the Upper and Lower Sensors are vertically aligned to sense out-of-stock or stock out conditions.



**Figure 6 Detection Mode - None**

### 2.5.6.2 Detection Mode - Blackline (1)

This detection mode is used when a black line on the underside of the media is used to register the labels. The Lower Sensor detector “senses” the amount of light reflected off of the label from the Lower Sensor emitter. While registration is determined by the Lower Sensor only in this mode, the upper gap sensor is used for out-of-stock or stock out conditions.



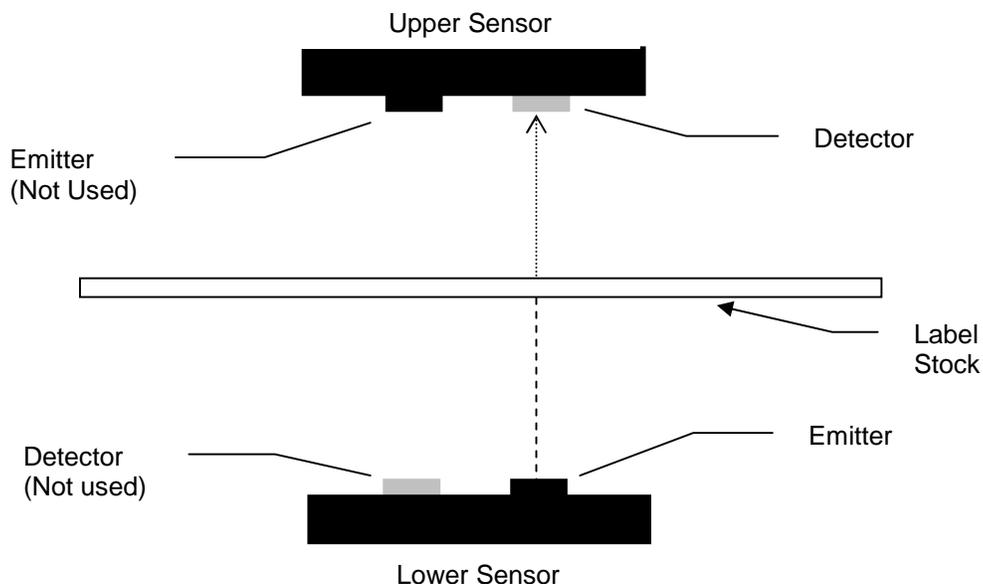
**Figure 7 Detection Mode - Blackline**

### 2.5.6.3 Detection Mode - Die-cut (2) and Blow-hole (3)

Die-cut sensing refers to die-cut label registration where the difference in the transparency of [label] and [label + backing] is detected (gap between labels is registration point).

Blow-hole sensing refers to label stock with holes punched out as registration marks. In this case, the Upper and Lower Sensors must be aligned so that the hole in the stock passes over the sensors.

Die-cut and blow-hole use the same basic method of detection. However, because of the difference in light intensity and stock out detection, they each require their own Detection Mode setting (^D636).



**Figure 8 Detection Mode - Die-cut and Blowhole**

### 2.5.7 **^D637)n (Offset X Direction)**

This command moves or offsets all fields in the “X” direction without altering the field’s insertion points. The value is entered using the current selected unit of measure. This command is also a parameter in the “^D200”) script header command. See also, OFX.

### 2.5.8 **^D638)n (Offset Y Direction)**

This command moves or offsets all fields in the “Y” direction without altering the field’s insertion points. The value is entered using the current selected unit of measure. This command is also a parameter in the “^D200”) script header command. See also, OFY.

### 2.5.9 **^D639)n (Set Centering Offset)**

The “^D639”) command is used to set the image position offset in the X direction independently of OFX or “^D637”) command. This command is used to compensate for mechanical misalignments that can not be adjusted mechanically. The value is entered using the current selected unit of measure or “^D564”) command. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1”) command.

### 2.5.10 **^D640)n (Set Delay Time Between Labels)**

This command delays the printing between labels in a batch. The value for “n” is entered in decimal seconds and has a maximum of 15 seconds.

### 2.5.11 **^D641)n (Set Retraction Delay Time)**

This command is used in conjunction with the dispense modes (“^D597”) command) and/or when a cutter is used. The delay controls how long the media is presented before being retracted. The value for “n” is entered in decimal seconds with a 15 second maximum.

**2.5.12 ^D642)n (Set Advance/Retract Distance)**

This command is used to set the distance the media advances and retracts after printing while in dispense modes (“^D597”) command) or when a cutter is installed. The distance “n” is entered in based on the unit of measure selected by the “^D564”) command.

The recommended “^D642”) value for the guillotine cutter dispense distance for the Model 426 printer is 0.91” (23.1mm) but may vary due to mechanical tolerances and/or printer model numbers.

The recommended “^D642”) value for the rotary cutter dispense distance for the Model 426 printer is 0.91” (26.67mm) but may vary due to mechanical tolerances and/or printer model numbers.

The recommended “^D642”) value for the Tag/Tear dispense method for the Model 426 printer is 0.512” (13mm) but may vary due to mechanical tolerances and/or printer model numbers.

The recommended “^D642”) value for the Peel-N-Dispense dispense method for the Model 426 printer is 0.472” (12mm) but may vary due to mechanical tolerances and/or printer model numbers.

**2.5.13 ^D643)n (Set Print Head to LPD Distance)**

This command sets the distance from the print head to the LPD (Label Present Detector) using the unit of measure selected by the “^D564”) command. This distance is the distance media is retracted after reaching the LPD so that the media is properly positioned at the print head. The distance is entered using the current unit of measure selected by the “^D564”) command. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1” command.

**2.5.14 ^D644)n (Set Idle Recognition Delay)**

The “^D644”) command is used to set the time after a printer goes idle before idleness is recognized and is used in conjunction with the “^D597)3” command. The value for “n” is entered in decimal seconds, with tenths of a second resolution.

**2.5.15 ^D645)n1 (Set Advance/Retract Speed)**

This command is used to set the speed that the printer advances and retracts while in a “^D597”) dispense mode. The value entered is based on the current unit of measure or “^D565”) command setting. If media slippage occurs, the speed should be lowered to reduce this from reoccurring.

**2.5.16 ^D646)n (Set Platen Roller Compensation)**

This command is used to set the drive roller compensation factor to accommodate the tolerance of the drive roller. This command is set at the factory and should only be changed if a new drive roller is installed. The value for “n” is entered using the current unit of measure that is set by the “^D564”) command and is the distance of the lines generated by

the “^D394)1” command. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1” command.

### 2.5.17 ^D647)dc,dp (Set Print Head Parameters)

The “^D647)” command is used to identify and specify the values for the print head installed on the printer. The “dc” parameter specifies the “dot count” or total number of dots on the print head while the “dp” or “dot pitch” identifies the dots per millimeter value. This command is available in all access modes with the exception being LOCKOUT mode only. This command is typically set at the factory and never changed. Refer to the following table for the available print heads and their appropriate values. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1” command.

Print Head Part Number	Printer Model Number	dc Parameter	dp Parameter
630015-0000	226 – 203 DPI	406	8
630018-0000	326M – 203 DPI	640	8
630021-0000	326M – 300 DPI	960	11.808
630020-0000	426M – 203 DPI	832	8
630019-0000	426M – 300 DPI	1280	11.808
630014-0000	426 – 203 DPI	832	8
630017-0000	426 – 300 DPI	1280	11.808

**Table 7 Print Head Parameters**

### 2.5.18 ^D648)n (Set Blackline Sensor to Print Head Distance)

The “^D648)” command is used to set the blackline sensor to print head distance at the factory. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1” command.

Printer Model Number	Recommended ^D648 Value
226	2.32"
326M	1.36"
426M	1.36"
426	2.32"

**Table 8 Blackline Sensor to Print Head Distance**

### 2.5.19 ^D649)n (Set Gap Sensor to Print Head Distance)

The “^D649)” command is used to set the gap sensor to print head distance at the factory. This command is a “property” which means that it controls a specific distance that is set at the factory. The property commands may be set back to their default values using the “^D392)1” command.

Printer Model Number	Recommended ^D649 Value
226	2.34"
326M	1.38"
426M	1.38"
426	2.34"

**Table 9 Gap Sensor to Print Head Distance**

### 2.5.20 ^D655)n (Set Labels Printed)

This command gives the user the ability to set and/or reset the “Labels Printed” counter of the printer that is reported either by issuing the “^D655)” without a parameter or “^D324)” (List Statistics) command.

### 2.5.21 ^D670) (Set Serial Port)

The “^D670)” command is used to configure the serial port. The command starts with the “^D670)” and is then followed by four parameters or arguments. The first parameter must be separated from the ^D command by a space and the following parameters must be separated from each other using the comma delimiter. The command is entered using



**2.5.26 ^D678)n (Set Broadcast Mask Address)**

This command is used to set the Broadcast Mask address. This command is provided in all access modes. The default Broadcast Mask address is set to “255.255.255.255” at the factory. The printer uses the new settings only after a power cycle and/or reset command.

**2.5.27 ^D679)n (Set Net Mask Address)**

This command is used to set the Net Mask address. This command is provided in all access modes. The default Net Mask address is set to “255.255.255.255” at the factory. The printer uses the new settings only after a power cycle and/or reset command. This is typically set to 255.255.255.0.

**2.5.28 ^D680)n (Set Gap Threshold)**

The “^D680)” command is used to set the Gap threshold. The printer’s default threshold is set to “30” and typically does not require any adjustment. The command is provided in all access modes in the event that this threshold requires adjustment to correct registration issues using different types of die-cut or blow-hole media. The values reported by the “^D900)” Tick-Tick command will increase when sensing the registration mark and decrease when the sensor is looking at label and backing of the media. The threshold should be set to a mid-point between these two points.

**2.5.29 ^D681)n (Set Blackline Threshold)**

The “^D681)” command is used to set the blackline threshold. The printer’s default threshold is set to “128” and typically does not require any adjustment. The command is provided in all access modes in the event that this threshold requires adjustment to correct registration issues with media using a blackline registration mark. The values reported by the “^D900)” Tick -Tick command will decrease when sensing the black registration mark and increase when the sensor is looking at more reflective portions of the media. The threshold should be set to a mid-point between the black mark and more reflective portion. If the media contains preprint, the threshold should be lowered until proper registration occurs.

**2.5.30 ^D682)n (Set Stock Sensor Threshold)**

The “^D682)” command is used to set the stock sensor or out of stock detection. The printer’s default threshold is set to “110” and typically does not require any adjustment. The command is provided in all access modes in the event that this threshold requires adjustment to correct the proper detection of stock out conditions. The values reported by the “^D900)” Tick -Tick command will increase when sensing out of stock conditions. The default threshold is set to a point that should detect most stock out conditions. If the media contains preprint, the threshold should be increased until proper registration occurs.

**2.5.31 ^D683)n (Set LPD PWM)**

This command is used to adjust the sensitivity of the Label Present Detector or LPD. The default is set to 64 and should work for most applications. If the sensor always detects media, reducing the PWM will make the LPD less sensitive.

**2.5.32 ^D690)n (Set Darkness Range)**

The “^D690”) command is used to set the contrast of the printers output and does not correlate to actual print head temperature. The value for “n” is a range from 1 to 100 with a setting of 80 being the printers default. The lowest setting that produces the desired result should be used to extend print head life and performance.

**2.6 7xx Series Commands**

The 7xx series commands are used to control configurable enablements. These commands may be issued either outside or inside a script file. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

**2.6.1 ^D701)n (Enable Force LDS1 on Power-up)**

The “^D701”) command is used to force the printer to power-up in the limited LDSI emulation mode selected by the “^D501”) command. When this command is enabled, the printer will always revert back to the limited 410 emulation mode even if the printer was in the native LDSII language.

0	Disable
1	Enable

**2.6.2 ^D720)n (Enable Auto Power-Up Script)**

This command allows scripts stored in the printer’s flash memory to be processed on power-up or a reset condition. The printer has a default power-up script, @default, that will be used if a script has not been selected using the “^D567”) command. Once a script has been selected, the “^D720”) command processes the script on power-up as if it was normally received by the printer.

0	Disable
1	Enable

**2.6.3 ^D721)n (Enable Auto Enquiry After Print)**

The “^D721”) command sends an enquiry or “^D327)1” after each script in the queue has completed printing, or if printing has halted due to an error condition automatically when enabled. Refer to section 6.2 for additional information regarding the possible enquiry responses.

0	Disable
1	Enable

**2.6.4 ^D723)n (Enable Auto TOF on Power up)**

This command will issue the “^D311”) command on power-up and/or a reset condition automatically. This command is very helpful when using continuous media so that the

starting edge of the media is aligned to the print head reducing media waste. This command requires that the printer is equipped with an LPD and that it has been selected using the “^D508)” command.

0	Disable
1	Enable

### 2.6.5 ^D726)n (Enable Auto ACK/NAK)

This command enables the automatic acknowledgement after each command. With this command enabled, the printer automatically issues the command ACK (Human readable descriptive text if in verbose mode, the >OK< response if in text mode, or 0x06 if in byte mode) after a successful command. If a command was not successful, the appropriate error response or NAK would be generated automatically. The responses are sent automatically and do not require sending either the serialized “^D327)1” command or the immediate ^E enquiry command. Refer to section 6.2 for additional information regarding the possible enquiry responses.

0	Disable
1	Enable

### 2.6.6 ^D727)n (Enable Auto Error Reporting)

The “^D727)” command automatically reports halting errors immediately upon recognition of the error condition when enabled. The “^D550)” commands configuration determines if the error is reported as text or as a byte code. This command automatically reports the error and does not require sending either the serialized “^D327)1” command or the immediate ^E enquiry command.

0	Disable
1	Enable

### 2.6.7 ^D735)n (Enable Immediate Graphic Printing)

This command enables the immediate printing of any 1-bit (monochrome) BMP file that is received by the printer. The printer places the graphic at dot one or the lower left corner of the media as viewed from the front of the printer. The media size is based either on the last received script or the persistent media layout ^D63x commands if a script has not yet been executed.

0	Disable
1	Enable

### 2.6.8 ^D736)n (Enable Immediate Graphic Centering)

The “^D736)” command is used to laterally center immediate graphics based on the configured print head size.

0	Disable
1	Enable

**2.6.9 ^D740)n (Enable Cutter)**

This command is used to control the enablement of a cutter that has been selected using the “^D506)” command. If a cutter is not installed, selected, and this command is enabled, the printer issues the >CUTTER INOPERATIVE< or 0x11 depending on the “^D550)” command configuration.

0	Disable
1	Enable

**2.6.10 ^D741)n (Enable PMH)**

The “^D741)” command is used to control the enablement of a PMH (Printed Media Handler) that has been selected using the “^D507)” command.

0	Disable
1	Enable

**2.6.11 ^D760)n (Enable Auto Defrag on Power-up)**

If this command is enabled, the printer automatically performs a flash memory defrag on a power-up and/or reset when the flash memory falls below 10% of the total file area or if an attempt to save a file larger than available flash occurs. The printer transfers or copies the contents of flash memory to RAM and then performs the flash memory defrag on the next power-cycle or reset condition. The RAM contents are then resaved into flash memory once the memory defrag is completed. If power is cycled during a flash defrag, the contents of flash will be lost and of corrupted. The printer responds with either >FLASH DEFRAAGMENTING< or 0x8A depending on the “^D550)” command configuration while performing the flash memory defragmenting.

0	Disable
1	Enable

**2.6.12 ^D770)n (Enable Software Flow Control)**

This command determines if software flow control (XON / XOFF) will be used to throttle the printer’s response between the host and the printer.

0	Disable
1	Enable

**2.6.13 ^D771)n (Enable Hardware Flow Control)**

This command determines if hardware flow control (CTS / RTS) will be used to throttle the printer’s responses between the host and the printer.

0	Disable
1	Enable

## 2.7 9xx Series Commands

The 9xx series commands are reserved for printer self tests, factory configuration, and setup commands. Most of the ^D9xx series commands are not available in access modes lower than SERVICE level. Commands will return the current status and/or setting if the ^Dxx command is entered without an argument. Entering a question mark (“?”) after the ^Dxx command causes the printer to report the commands current setting as well as the verbose description and help text associated with that particular command.

### 2.7.1 ^D900)d, s (Diagnostic Tic-Tic Mode)

This command is used to enable the tic-tic mode which steps the motor while reporting the current readings from the registration mark sensors. This command is available in all access levels. The Tic-Tic mode reports the sensor data based on the current selected detection method or outside script sensor configuration. The sensor type must be selected for the desired operation using the “^D636)” command before entering Tic-tic mode. Pressing the print button cancels this diagnostic mode.

Parameter	Parameter Description	Valid Arguments
d	Direction	f = forward, r = reverse
s	Speed	“^D565)” command configurable

**Table 11 ^D900) and ^D902) Parameters**

The printer is set up from the factory to sense proper registration with a wide range of different stocks. However, it may be necessary to adjust the threshold in order to properly register some media. The ^D680 and ^D681 commands are used to adjust the registration mark sensor thresholds.

It is highly recommended that the threshold setting only be adjusted as a last resort. Registration problems may occur with other types of label stock when the threshold setting has been changed. The ^D900 command is used to determine a threshold value that will work for a specific media type.

#### 2.7.1.1 Blackline Threshold Calculation Example

Follow the process outlined below for an example to determine the blackline or reflective sensor threshold calculation. The values reported will vary depending on the different types of media used.

1. Verify that the sensors are clean and are unobstructed.
2. Load black line media into printer.
3. Establish communication with a terminal emulation program (HyperTerminal, Tera Term Pro, etc.).

4. Be sure that the printer is in the reflective detection mode selected is a “1” by issuing the “^D636)?” command.
5. Enter Tic-Tic mode by issuing the “^D900)f,3” command.
6. The printer will return a numerical value for the sensor output selected by the ^D636 command.
7. A high value should be returned for the area outside of the black line. A low value should be returned when the black line passes over the black line.
8. Enter a new threshold value (between the high value and the low value) using the Black Line Sensor Threshold command ^D681)n

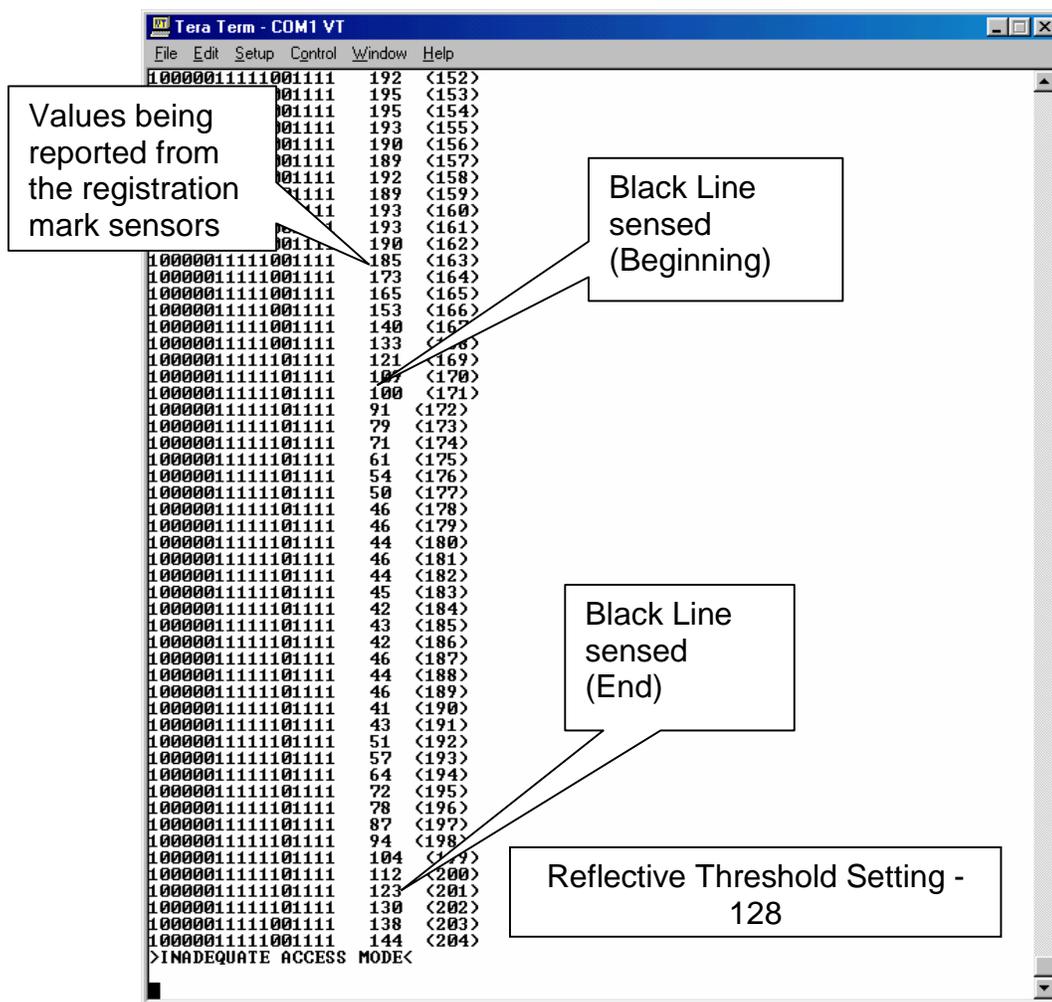
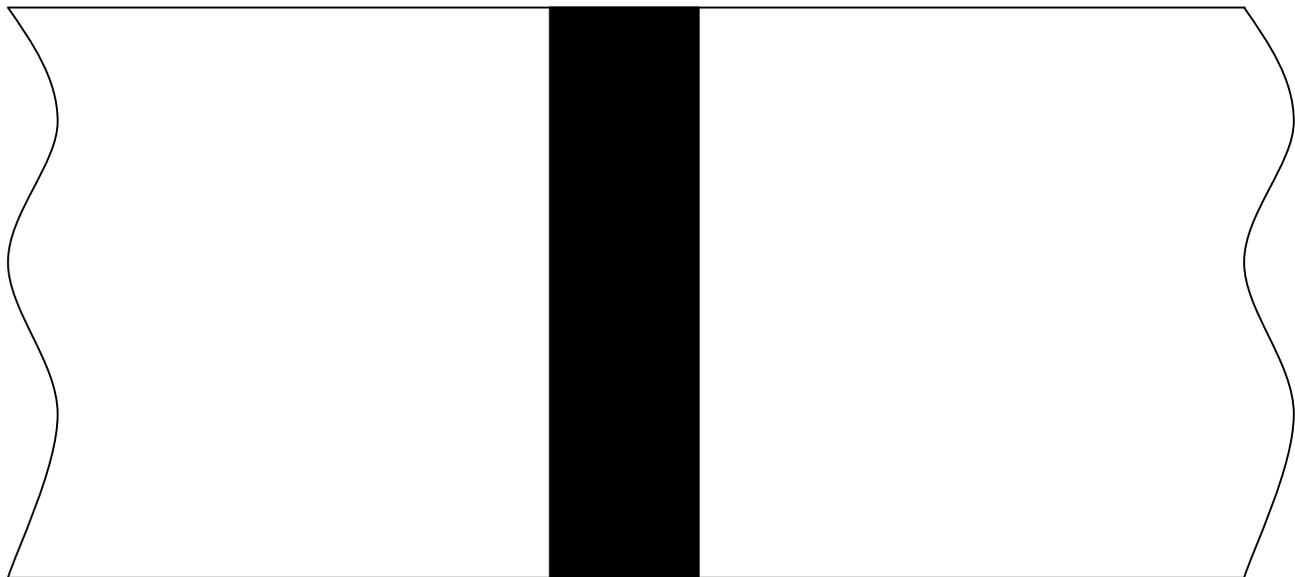
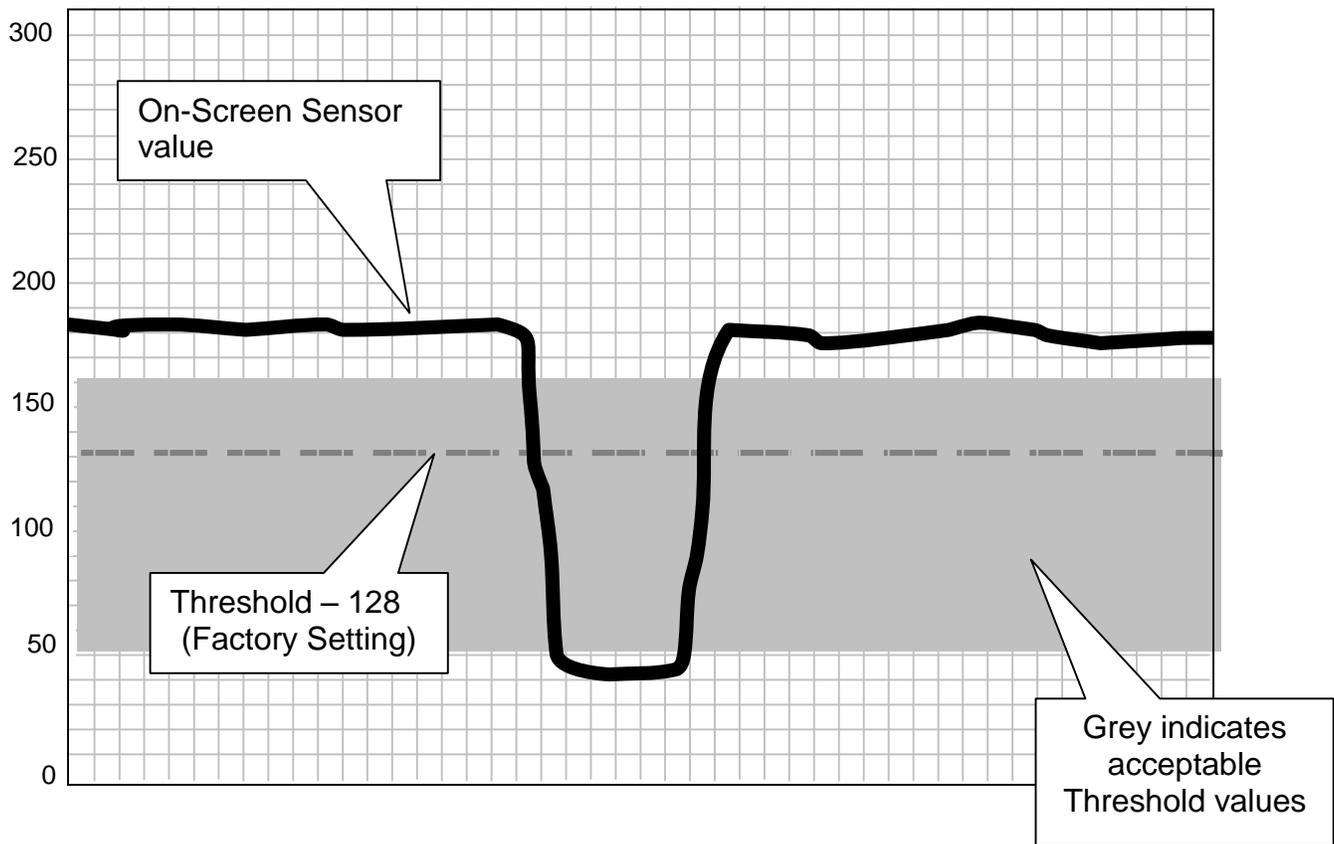


Figure 9 ^D900 Blackline Listing



**Figure 10** ^D900 Blackline Threshold Example

**2.7.1.2 Die-Cut/Blowhole Threshold Calculation Example**

Follow the process outlined below for an example to determine the die-cut/blowhole or transmissive sensor threshold calculation. The values reported will vary depending on the different types of media used.

1. Verify that the sensors are clean and are unobstructed.

2. Load media into the printer.
3. Establish communication with a terminal emulation program (HyperTerminal, Tera Term Pro, etc.).
4. Be sure that the printer is in a transmissive detection mode (“2” or “3”) by issuing the “^D636)?” command.
5. Enter Tic mode [^D900)f,3].
6. The printer will return a numerical value for the Gap Sensor output.
7. A high value should be returned for the area outside of the black line. A low value should be returned when the black line passes over the black line.
8. Enter a new threshold value (between the high value and the low value) using the Gap Sensor Threshold command [^D680)n]

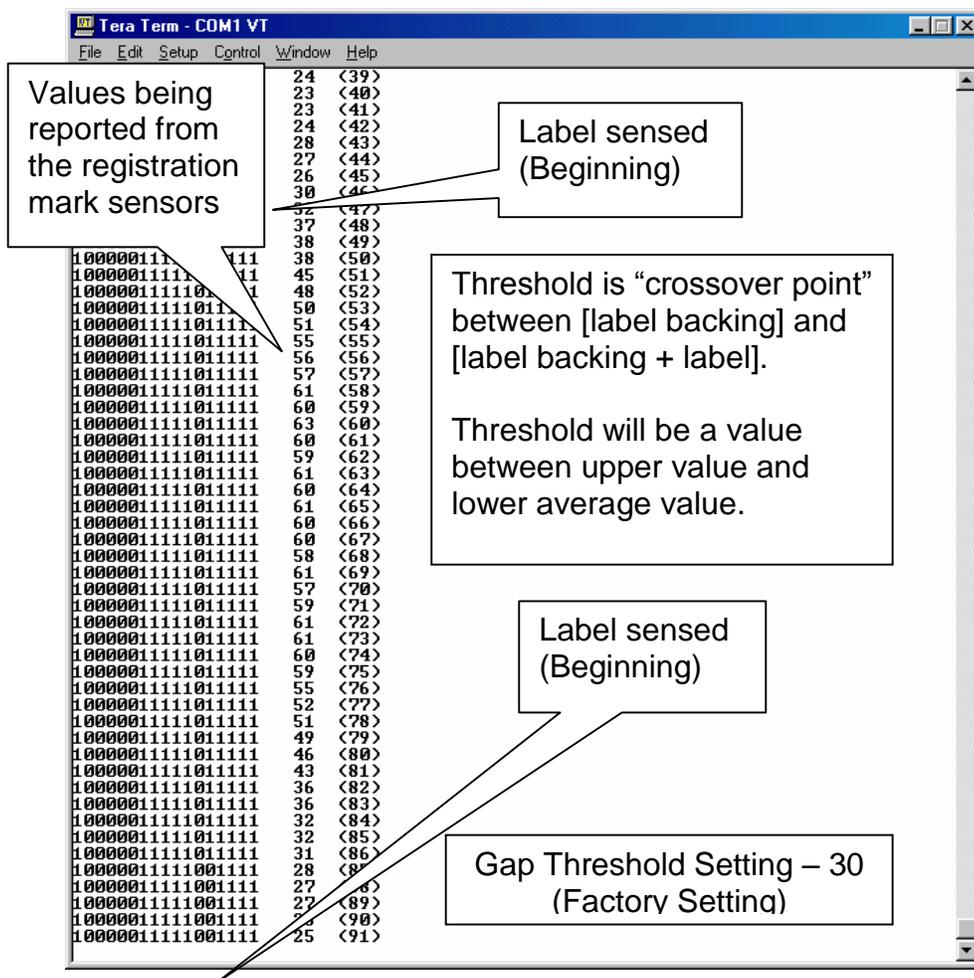


Figure 11 ^D900 Die-cut Listing

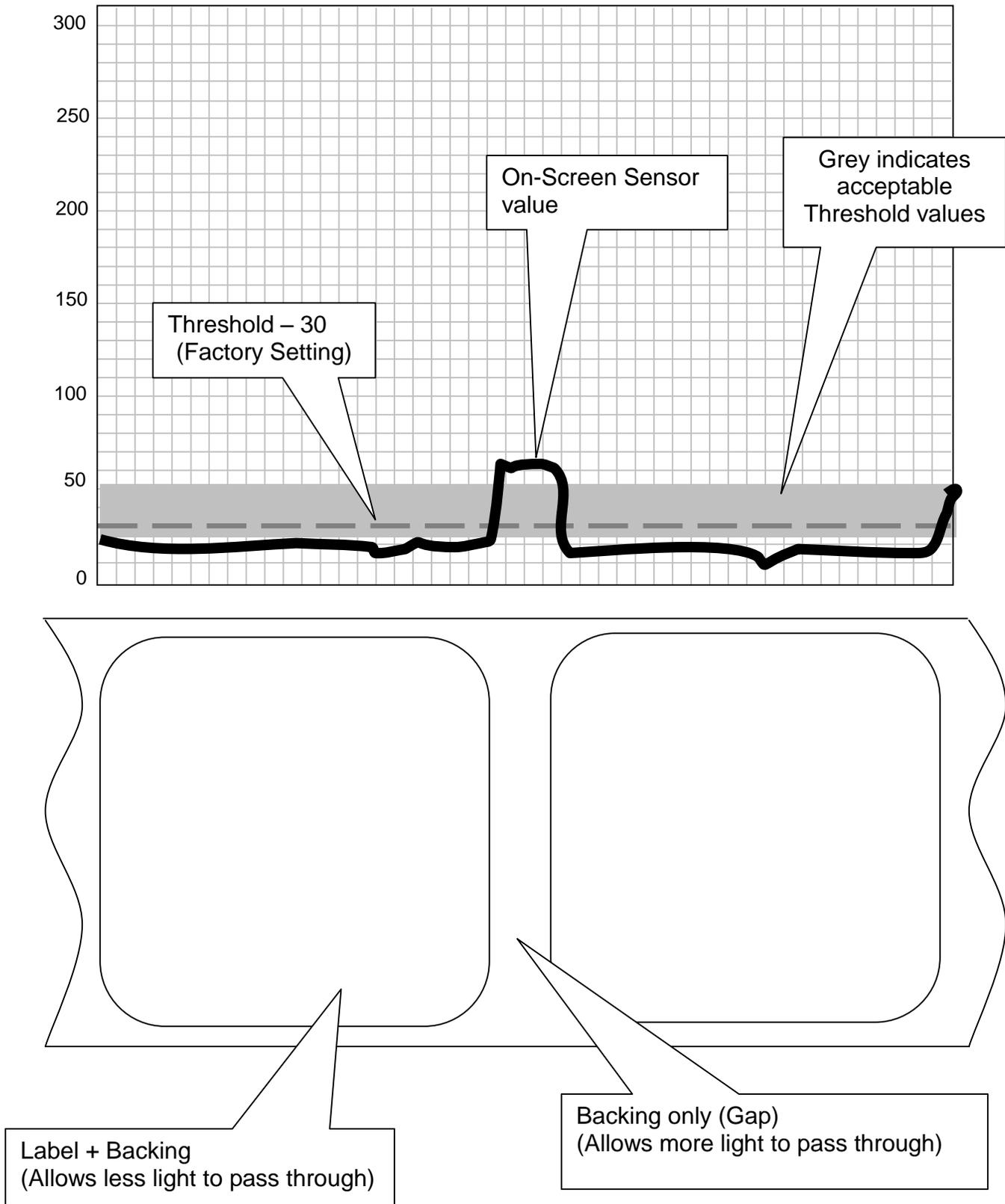


Figure 12 ^D900 Die-cut Threshold Example

**2.7.3 ^D930)level (Get Access Code Key)**

This command returns an access code that is used to change the printer's current access level. Once issued, the access code is the same until the “^D930)” command is issued again. Once an access code has been acquired, Microcom Corporation support is contacted and a password will then be issued. This is only required when higher than “BASIC” access level is desired. The “level” parameter is the desired access level (BASIC, FACT, DEV and SERVICE) and will only work for that access level. Refer to the “^D931)” command for additional information regarding the access levels and their meanings.

**2.7.4 ^D931)level, password (Change Access Level)**

The “^D931)” command is used to change the access level of the printer. A password is required to access a higher privilege level. The access levels may be changed to a lower level without a password but would still require a password to set back to the original higher level. The level parameter is the desired access level while the password parameter is the actual password for that access level. The password is received by Microcom Corporation support departments with the appropriate “^D930)” access code. The access levels and their meaning are listed in the table below.

Access Level	Access Level Description
DEV	Access level intended for internal Microcom Corporation development personnel.
FACT	Access level intended for internal Microcom Corporation factory personnel used to setup and configure the printer.
SERVICE	Access level intended for approved third party service groups used to perform diagnostics, troubleshooting, and maintenance capabilities.
BASIC	Access level used by most users that provides access to most commands with the exception of some diagnostics, troubleshooting and maintenance capabilities.

**Table 12 Access Levels**

**2.7.5 ^D932) (List Access Passwords)**

This command causes the printer to list the current access password along with the other lower level passwords.

Example: If the current access level was SERVICE and the “^D932)” command was issued, the SERVICE and BASIC access level passwords would both be reported.

**2.7.6 ^D945)n (List Diagnostic Dump)**

This command causes the printer to list all of the printer's current setup through the active port and is used for setup and diagnostic purposes. Each line of the listing is terminated with a CR LF (0x0D 0x0A) that may be used to assist in programming delineation while the

entire listing is terminated with either an additional CR+LF or 0x1A character depending on the “^D550”) command configuration. The list is generated by issuing the command without the “n” parameter. Issuing the “^D945”) command with the “?” character will always report the “^D550”) commands configuration as “9” for VERBOSE mode because the “?” cause the printer to report the VERBOSE descriptive text. The “n” parameter may be used to select one item from the numbered listing to report only its current value followed by a CR+LF (0x0D+0x0A) used for termination. The “^D945”) command listing is continually updated to provide additional information but all new information is added to the end of the listing for backwards compatibility.

### **2.7.7 ^D960)n (Print Test Pattern)**

This command causes the printer to print diagonal lines used to verify the condition of the dots on the print head. The diagnostic pattern prints using the previous scripts configuration or the media layout ^D63x persistent command settings if a script has not yet been processed. The “^D960)1” is the serialized version of the “^K” immediate control code.

- 1 Diagonal Lines
- 2 2-On 30-Off Vertical Lines
- 3 5x5 Checkers
- 4 50% Grey (1x1 checkers)

### **2.7.8 ^D971)n (Edit Inches Printed Statistic)**

The “^D971”) command is used to enter, reset, and/or change the Inches Printed statistics field. This statistic is only incremented while the printer is actually printing. The Inches Printed statistic is used to record the print use of the printer between service periods and is reset to “0” when service and/or repair is completed. The “^D971”) command is available in access modes SERVICE and higher.

### **2.7.9 ^D972)n (Edit Total Inches Run Statistic)**

This command is used to enter the total inches run or motor movement statistic of the printer. The “^D972”) command is only set at the factory and is only reset if the printer’s CPU is replaced. The total inches run is used for warranty replacement of the print head and its value should be recorded when a new print head is installed in the unit. This command is only available in FACT and/or a DEV modes, as it is the printer’s odometer.

### **2.7.10 ^D973)n (Edit Power on Time Statistic)**

The “^D973”) command is used to enter, reset, and/or change the Power on Time statistics field. This statistic is only incremented while the printer is actually on. The Power on Time statistic is used to record time the printer is powered and in only set at the factory. The “^D973”) command is only available in FACT and/or DEV modes.

### **2.7.11 ^D974)n (Edit Head Up Cycles Statistic)**

This command is used to enter the Head Up cycle’s statistic of the printer. The “^D974”) command is only set at the factory and is never reset. This command is only available in

FACT and/or DEV modes. This statistic field is only available on models that contain head up detection.

### **2.7.12 ^D975)n (Clear All Statistics)**

The “^D975)” command is used at the factory for the initial setup. This command resets all of the statistical parameters to “0”. This command is only available in modes FACT and/or DEV access modes.

### **2.7.13 ^D976)n (Edit Unit Serial Number)**

This command is used to enter serial number of the printer manually at the factory. This command is only available in modes FACT and/or DEV access modes.

### **2.7.14 ^D977)n (Edit Cutter Cycles Statistic)**

The “^D977)n” command is used to enter the total cutter cycles that have been performed on a cutter installed on the printer. The cutter is an optional component and does not exist on all printers. This cutter count is used to verify the use of a cutter for reliability and warranty purposes. The “^D977)” command is available in access modes SERVICE and higher.

### **2.7.15 ^D978)0xn (Edit Ethernet MAC Address)**

This command is used to set the printer’s unique Ethernet MAC address. A unique Ethernet MAC address is assigned and set at the factory and is never edited and/or reissued. Microcom Corporation MAC addresses begin with “000257”. The MAC address is entered by issuing the “^D978)” command followed by the “0x” characters (indicating that the value for “n” will be in HEX) and then the “n” value would be the last six digits. This command is only available in access modes FACT and/or DEV.

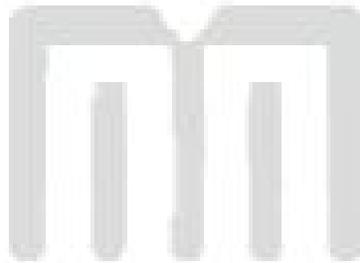
### **2.7.16 ^D979)n (Edit CPU Serial Number)**

This command is used to enter serial number of the printer manually at the factory. This command is only available in modes SERVICE, FACT and/or DEV access modes.

### **2.7.17 ^D980)n (Calibrate Sensors)**

The “^D980)” command is used to calibrate the printer’s sensors. The factory calibration should work for most applications and typically does not require recalibration. The calibration should only be executed if the printer is a new printer and/or new registration sensors have been installed on the printer. If the printer does not register properly, the thresholds may require adjusting. Refer to the “^D680)”, “^D681)”, “^D682)”, and “^D683)” commands to adjust the threshold in order to correct registration issues. The values for “n” are listed below.

- |   |                            |
|---|----------------------------|
| 0 | Calibrate All Sensors      |
| 1 | Calibrate Blackline Sensor |
| 2 | Calibrate GAP Sensor       |
| 3 | Calibrate LPD Sensor       |



## Chapter 3: Updating Flash Memory

The printer's firmware (Microcom Corporation Application; MCA) or Bootloader (Microcom Corporation Bootloader; MCB), which is stored in the flash memory, may be updated using the different methods. The procedures are slightly different depending on the type of update required. This section provides the information necessary to properly update the firmware stored in flash memory.

Both the MCA and MCB code files should always be sent to the printer in the compressed zipped format. The MCB or Bootloader should be updated after the MCA has been updated to avoid any compatibility conflicts.

### 3.1 Compressed File Update

This method is used to update the firmware stored in flash memory. To update the printer's firmware the following are required: a compressed MCA or MCB (ZIP file), a host computer equipped with a RS-232 serial port, and a Terminal Emulation Program (i.e., HyperAccess, HyperTerminal, Procomm Plus, Tera Term Pro...). The printer is configured at the factory with serial parameters of 9600,n, 8,1 and the terminal emulation program will need to be set accordingly.

It is a good idea to completely read through the procedure before an update attempt is made. Do not send any unnecessary characters or remove the printer's power during the update or the printer may become inoperable. Refer to section 3.2 in the event the printer does not function properly after an update and the printer has become inoperable.

1. Make sure the RS-232 serial connection is made between the host and the printer including the proper Baud rate.
2. It is recommended to use the fastest Baud rate up to 115200 to reduce transfer time. Refer to the “^D670)” command regarding the printer's serial port parameters. If the printer does not update properly, use a slower Baud rate to transfer the update.
3. Contact the Microcom Corporation support department and/or visit the following web address [www.microcomcorp.com](http://www.microcomcorp.com) to acquire the desired MCA file.
4. Issue the “^D945)?” command and retain the resulting listing for comparison after flash update.
5. Send the MCA or MCB file to the printer in compressed form (ZIP). The MCA must be updated before the MCB if both are being updated. Failure to do this may cause the printer to become unstable.
6. Send the MCA file to the printer in compressed form (ZIP).
7. After the printer has identified the MCA file, the following dialog will be reported to the host: “File received. Unzipping. Please Wait...” This dialog is only reported if the printer is set to use the VERBOSE response set. Refer to the “^D550)” command for additional information regarding the printer response sets.

8. After the file has been unzipped and the checksum verified, the following dialog is reported to the host: “Unzipped. CRC Okay: 0x36410D55” (The checksum shown is for demonstration purposes only. The checksum will reflect the MCA files internal checksum and report any differences automatically.) This dialog is only reported if the printer is set to use the VERBOSE response set. Refer to the “^D550)” command for additional information regarding the printer response sets.
9. Sample MCA update dialog is reported to the host and is listed below. If the MCB code is being updated, the same dialog format would be reported with the word “application” being changed to “bootloader” as the only difference.

```

Application file recognized.
Erasing old application.....

Saving new application..... (The periods are status indicators)

Booting application now . . . (The periods are status indicators)

```

10. If problems are experienced during the update and the printer has lost the previous application, refer to the following section regarding the recovery file update.
11. After the code has been successfully updated, the “^D391)1”, “^D392)1”, and “^D390)1” commands must be sent to complete the update process. The “^D391)1” and “^D392)1” commands force setting to factory defaults while the “^D390)1” resets the printer and automatically issues an enquiry command on reboot.
12. Once the printer reboots, any custom configuration file and/or commands must be sent to the printer to verify that all commands are set to the desired values before using with the intended application.
13. The “^D945)?” command may now be issued to compare against the previous listing to assist in determining what commands were changed in the update process.



**CAUTION:** *Do not send any unnecessary characters or turn the printer off during the flash memory update. Failure to observe this precaution may result in the printer becoming inoperable.*

### 3.2 MCA Compressed File Recovery

The printer’s firmware can typically be recovered using this method in the event that during the MCA update the printer has become unstable. Using this method is only intended to provide a recovery method and is not intended to be a normal way to update the MCA firmware stored in the printer’s flash memory. This method requires the use of a compressed MCA code file, a host computer equipped with a RS-232 serial port, and a Terminal Emulation Program (i.e., HyperAccess, HyperTerminal, Procomm Plus, Tera Term Pro...).

It is a good idea to completely read through the procedure before an update attempt is made. Do not send any unnecessary characters or remove the printer’s power during the update or the printer may become inoperable.

1. Make sure the RS-232 serial connection is made between the host and the printer including the proper Baud rate.
2. Contact Microcom Corporation support department and/or visit [www.microcomcorp.com](http://www.microcomcorp.com) to acquire the desired MCA code file.
3. Start the terminal emulation program and set the serial parameters to 115200,n,8,1.
4. While pressing the Auxiliary button (see Figure 6) turn the printer power switch on.  
*Note: To press the Auxiliary button, use a ballpoint pen and gently press and hold the switch in.*
5. Immediately after applying printer power, observe the terminal window and follow the sample dialog below. The bold italics text denotes informational comments or instructions and is not part of the printer's update dialog.

Found rear button pressed. Load an application, now? (y/n) [n]:

***Enter "y" to load new code ↵***

Request received

Okay. You may send a zipped application file now (e.g., MCA\_version.zip).

Start of transfer recognized.....

File received

Unzipping. Please stand by (approx. 54 seconds) . . .

Unzipped. CRC32 okay: 0x3fd1bf94

Application file recognized.

Erasing old application.....

Saving new application.....

Now booting to the new firmware

***The printer takes approximately 5 minutes to read the read and copy the new code. If a power loss occurs during this time the printer will revert back to the previous code and the update process will have to be restarted.***

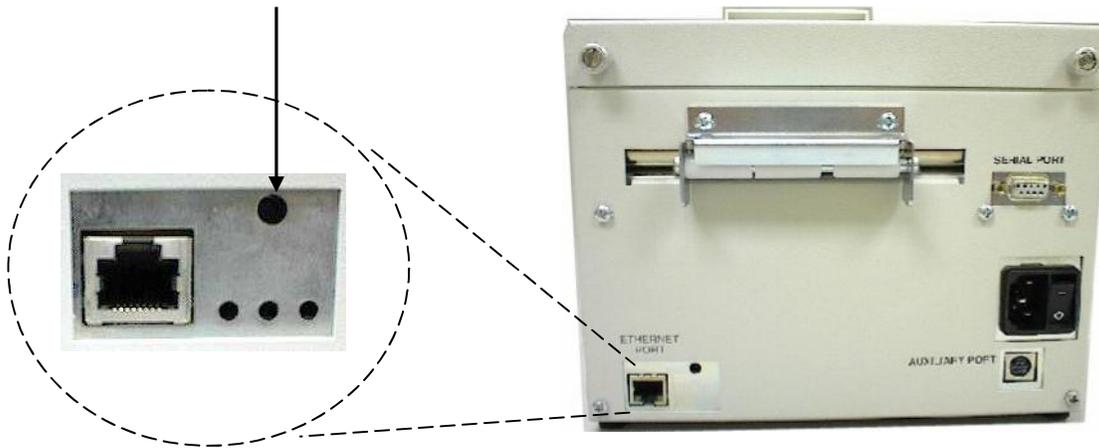
6. The flash memory has been recovered and the MCB firmware may be upgraded using the procedure outlined in section 3.1.

**Note:** The emulation program used to transfer the MCA file via the serial port must be capable of sending Binary data, (i.e., Tera Term Pro) for proper transfer to occur. If the transfer was not successful the emulation program used, may not have the ability to transfer Binary data.



**CAUTION:** Do not send any unnecessary characters or turn the printer off during the flash memory update. Failure to observe this precaution may result in the printer becoming inoperable.

Press and hold the  
Auxiliary Button in while  
powering up the printer.



**Figure 13** Auxiliary Button

# Chapter 4: Special Features

## 4.1 Reverse Video

The Reverse Video feature is used to automatically generate a box, using the current foreground color, on top of text. This creates text that is the background color, and is done by setting the "AI" (Attribute Index) field to a "2" in the Format Entry command ("^Fn"). The box can be increased in size by simply overlaying the desired area with a line using the Line Draw feature. The Line Draw format line should be placed before the Reverse Video field to increase the size of the overlaying box.

### Auto Reverse Video Example:

```
^A)  
^D200) 3.3, 1.9, 0.125, 1.063, 5, 1  
^F1) 1.0, 1.0, @normal_14, , , 2  
^T1)Reverse Video  
^D300)1  
^Z)
```

← Set to a "2" in the "AI" field to produce Reverse Video.

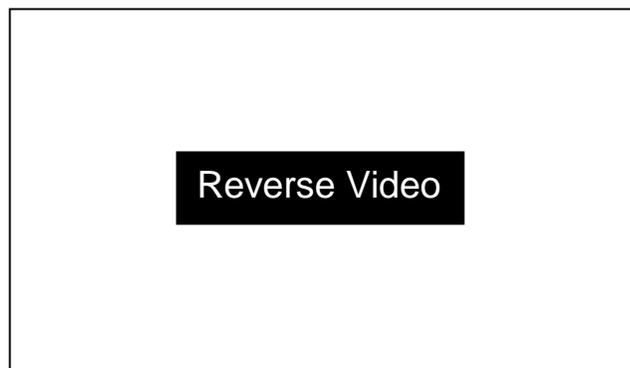


Figure 14 Reverse Video

**Line Draw Reverse Video Example:**

```

^A)
^D200) 3.3, 1.9, 0.125, 1.063, 5, 1
^F1) 0.25, 0.50, @line, 2.75, 1.00 ← Line Draw feature
^F1) 1.0, 1.0, @normal_14, , , 2      to produce a larger
^T1)Reverse Video                    box for Reverse
^D300)1                               Video.
^Z)

```

**Figure 15 Line Draw Reverse Video****4.2 Line Draw**

The line draw feature is selected by entering “@line” into the CI parameter of the “^Fn)” Format Entry command. The line draw feature easily creates lines by using the XB and YB coordinates as an insertion point for the line to start. Adjusting the SW and SH parameters determines the width and the height of the line with respect to the rotation or orientation of the FO field.

**Line Draw Example:**

```

^A)
^D200) 3.3, 1.9, 0.125, 1.063, 5, 1
^F1) 1.0, 1.0, @line, 1.11, 0.01
^F1) 1.0, 1.0, @normal_14
^T1)Line Draw Feature
^D300)1
^Z)

```

This would cause a line to be inserted an inch from the left side and an inch from the bottom. The line would be 0.01” in height and would be 1.11” in width or length. The “^Fn)” field must reference a “^Tn)” field for proper operation. The line draw does not have to reference its own specific Text Entry command (^T) so it could reference an existing Text Entry field in the script file as demonstrated in the above example.



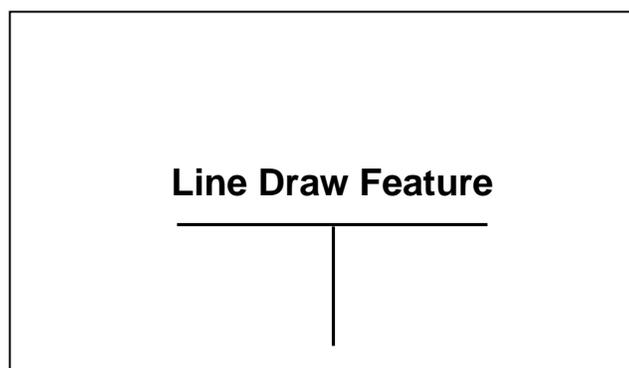
**Figure 16 Line Draw Feature**

**Two Lines Example:**

```

^A)
^D200) 3.3, 1.9, 0.125, 1.063, 5, 1
^F1) 1.0, 1.0, @line, 1.11, 0.01
^F1) 1.55,0.25,@line, 0.01, 0.75
^F1) 1.0, 1.0, @normal_14
^T1)Line Draw Feature
^D300)1
^Z)

```



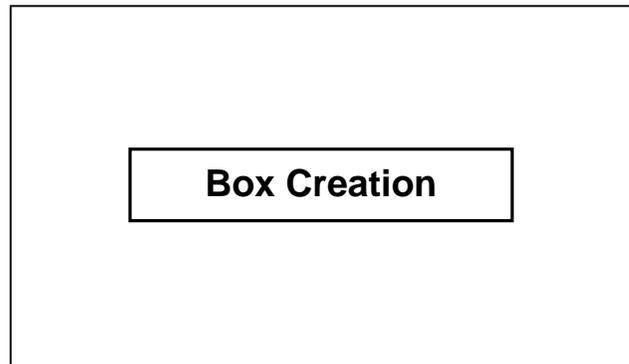
**Figure 17 Two Lines**

This example shows a line inserted an inch from the left side and an inch from the bottom. This line would be 0.01” in height and would be 1.11” in width or length. A second line is being inserted 1.55” from the left edge and a .25” from the bottom. This line would be 0.75” in height and would be 0.01” in width or length. This demonstrates that the Line Draw feature can be used to draw any amount of lines desired without creating a new “^Tn)” pointer as seen in the example above.

The Line Draw feature can also be used to create boxes. To accomplish this you simply create four lines that connect together to form a box.

**Box Creation Example:**

```
^A)
^D200) 3.3, 1.9, 0.125, 1.063, 5, 1
^F1) 0.90, 1.00, @line, 1.35, 0.01
^F1) 0.90, 1.25, @line, 1.35, 0.01
^F1) 0.90, 1.00, @line, 0.01, 0.25
^F1) 2.24, 1.00, @line, 0.01, 0.25
^F1) 1.00, 1.00, @normal_14
^T1)Box Creation
^D300)1
^Z)
```



**Figure 18**    **Box Creation**

# Chapter 5: Bar Codes

The purpose of this chapter is to provide information and the formatting requirements of the different bar codes that are stored in the printer's memory.

## 5.1 Generating Bar Codes

Bar codes that are stored in the printer are generated by using the CI, SW, SH and the AI (when applicable) parameters of the Format Entry Command (“^Fn”). The CI parameter is used to select the text equivalent code of the desired bar code while the SW, SH and AI parameters control the size of the printed bar code.

### 5.1.1 CI Parameter

The CI or Conversion Identifier selects the bar codes that are stored in the printer by entering the text equivalent code of the desired bar code. Refer to Table 1 or the descriptions below, under the “Bar Code Types” section, for the available bar codes and their equivalent codes. The text equivalent codes may be entered in either uppercase, lowercase, or a combination of the two.

### 5.1.2 SW Parameter

When used in conjunction with bar codes the SW parameter is used to modify the Bar code width by a multiple of the narrowest rendition. This means that a value of “1” will produce the narrowest rendition related to the bar elements while a value of “3” would produce a Bar code that is three times this width. The default value of “1” will be used if a Bar code is selected and this field is left blank.

### 5.1.3 SH Parameter

When used in conjunction with bar codes the SH parameter selects the actual height, measured in inches, of the desired bar code. This is a required field when used in conjunction with bar codes.

### 5.1.4 AI Parameter

Some bar code types combine the use of ratios along with the SW and SH parameters to create the different sizes of printed output. The bar codes that use the different ratios are entered in a ratio format and are listed in the descriptions under the “Bar Code Types” section. The ratio is required for the bar codes that utilize the different ratios and if omitted, the bar code will not be printed.

*For example:* “3:1” would be entered for the AI parameter for a bar code that allows a three to one ratio with respect to the wide and narrow bars.

## 5.2 Linear Bar Codes

This section provides information regarding the different requirements of the linear bar codes. Unless stated otherwise in the descriptions below, the printer will automatically generate the necessary check digits when required.

### 5.2.1 Codabar (Rationalized)

Codabar is a variable length linear symbology that is commonly used in libraries, blood banks, and in the air parcel business. Codabar is capable of encoding the 16 following characters: 0123456789-\$/+. and the four start/stop characters ABCD. This symbol uses 2:1, 3:1, 4:2, 5:2, and 8:3 ratios, which may be entered in the AI parameter.

*CI text equivalent codes:* @codabar

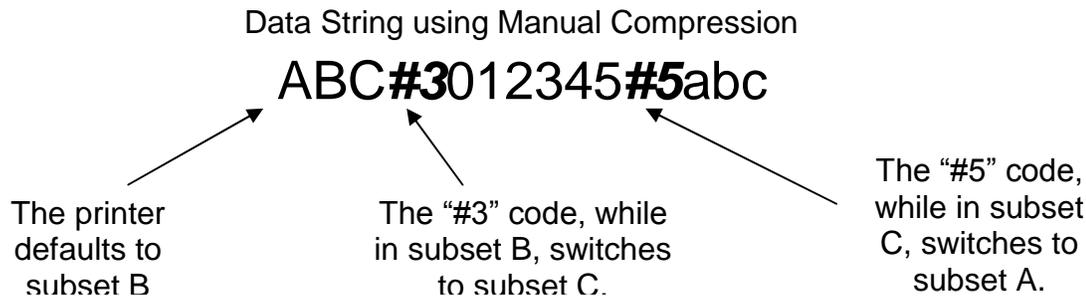
### 5.2.2 Code 128 (Manual Compression)

The Code 128 bar code is a variable length, high density, alphanumeric symbology that is extensively used worldwide. This bar code uses three subsets (A, B, and C) which allows for the encoding of the full 128 ASCII character set along with special control codes. This bar code uses manual compression, which provides full control by manually shifting between the available subsets using the special function access codes. The codes (#n) are placed within the data string to access the desired functions listed in the table below.

Code	SUBSET A	SUBSET B	SUBSET C
#0	FNC3	FNC3	N/A
#1	FNC2	FNC2	N/A
#2	SHIFT	SHIFT	N/A
#3	CODE C	CODE C	N/A
#4	CODE B	FNC4	CODE B
#5	FNC4	CODE A	CODE A
#6	FNC1	FNC1	FNC1
#7	START	N/A	N/A
#8	N/A	START	N/A
#9	N/A	N/A	START
##	#	#	N/A

**Table 13 Code 128 Special Function Access**

When using manual compression the printer defaults to subset B if no start code is defined. The printer will also not attempt to compress the data unless subset C is used. Once in subset C the user must send the appropriate code (#n) to return to either subset A or B.



**Figure 19 Code 128 Subset Switching**

### Subset A

This subset contains 106 unique characters, which includes numbers 0 through 9, the English alphabet (uppercase only), punctuation marks, ASCII control codes, and the special function codes listed in table 6.

### Subset B

This subset contains 106 unique characters, which includes numbers 0 through 9, the English alphabet (both uppercase and lower case), punctuation marks, and the special function codes listed in table 6. This is the default if a subset is not defined when using manual compression.

### Subset C

This subset contains 106 unique characters, which includes matched pair numbers 00 through 99 and the special function codes listed in table 6. Subset C requires that an even amount of digits to be sent because the matched pairs are encoded as a single character. This allows for a greater amount of compression than subsets A and B. If an odd amount of digits and/or non-numeric characters were sent while using subset C, the resulting bar code produced would be invalid.

*CI text equivalent codes: @code128, @c128*

### 5.2.3 Code 128 (Automatic Compression)

The Code 128 bar code is a variable length, high density, alphanumeric symbology that is extensively used worldwide. This bar code uses three subsets (A, B, and C) which allows for the encoding of the full 128 ASCII character set along with special control codes. This bar code uses automatic compression, which means that the printer will automatically choose the most efficient subset and insert the appropriate special function code listed in table 6. It is possible to force a subset change by inserting the appropriate code while in automatic compression but is not recommended. Please note that if a subset is forced while using automatic compression the printer will automatically switch to subset C if 6 or more numeric characters are contained in the data string. Once the even number of characters has been processed, the printer will then switch to subset B. This could create problems if a user sent 6 numeric characters while forcing subset A (“#7123456”), the printer would actually automatically switch to subset C and then back to subset B resulting in an undesired bar code. If specific control of the subsets is a requirement, then the manual compression bar code should be used.

*CI text equivalent codes: @code128auto*

### 5.2.4 Code 39

Code 39 is a variable length, alphanumeric symbology that is very popular and is extensively used in the non-retail, military, manufacturing and medical industries. Code 39 is capable of encoding numerical characters 0 through 9, the English Alphabet (uppercase only), characters - \*\$/% along with the “space” character. The Code 39 is framed with a start/stop character represented by the asterisk (“\*”) character, which is reserved for this purpose. This symbol uses 2:1, 3:1, 4:2, 5:2, and 8:3 ratios, which may be entered in the AI parameter.

*CI text equivalent codes:* @code3of9, @code39, @3of9, @c39

### 5.2.5 Code 93

Code 93 is a variable length; alphanumeric symbology that is capable of encoding 48 different characters and through the use of control characters can encode the full 128 ASCII character set. The 48 characters include the “space”, numerical characters 0 through 9, the English alphabet (uppercase only), characters \$%+-. / and five special characters including the start/stop character.

*CI text equivalent codes:* @code93, @c93

### 5.2.6 Code I2of5 (Interleaved 2 of 5)

The I2of5 is a variable length, paired, numerical symbology that is typically used in the industrial and distribution industries. The I2of5 is a paired symbology, which means that the data string being sent must always be an even number amount. If the desired data to be sent is an odd amount, simply pad the beginning with “0” to achieve an even amount of digits. This symbol uses 2:1, 3:1, 4:2, 5:2, and 8:3 ratios, which may be entered in the AI parameter.

*CI text equivalent codes:* @codei2of5, @i2of5, @i25, @2of5, @c25

### 5.2.7 MSI0 (Modified Plessey)

The MSI Plessey is a variable length, numeric only symbology used for retail shelf labeling. When using the MSI0 bar code, the user provides both check digits.

*CI text equivalent codes:* @msi0

### 5.2.8 MSI1 (Modified Plessey)

The MSI Plessey is a variable length, numeric only symbology used for retail shelf labeling. When using the MSI1 bar code, the user provides one check digit and the printer will calculate the second check digit.

*CI text equivalent codes:* @msi1

### 5.2.9 MSI2 (Modified Plessey)

The MSI Plessey is a variable length, numeric only symbology used for retail shelf labeling. When using the MSI2 bar code, the printer will calculate both check digits.

*CI text equivalent codes:* @msi2

### 5.2.10 Postnet

The Postnet symbol is used to encode digits for postal applications to sort mail. A Postnet symbol is made up of binary digits, represented as full and half bars. Each character is made up of five bars, which together represent a single numeric digit. The 5-digit ZIP code, 9-digit ZIP+4, and 11-digit Delivery Point Code are all supported.

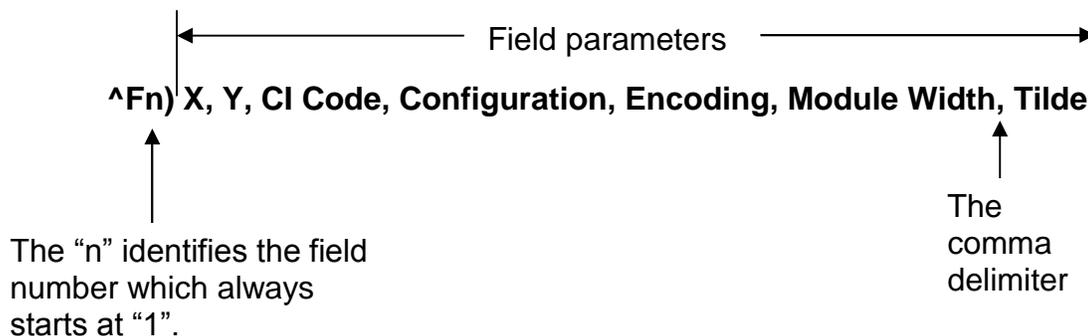
*CI text equivalent codes:* @postnet

## 5.3 2D Bar Codes

This section provides information regarding the different requirements of the two-dimensional bar codes. The 2D symbols generally follow their own unique format structure and not the standard Format Entry Command structure. Unless stated otherwise in the descriptions below, the printer will automatically generate the necessary check digits when required.

### 5.3.1 Data Matrix

Data Matrix is a two-dimensional matrix symbology that is capable of encoding up to 2335 alphanumeric characters, 1556 8-bit byte data characters, or 3116 numeric digits. The ECC 200 version is supported and uses the Reed-Solomon error correction. The requirements for generating a data matrix symbol are the subject data, placement information, CI code, configuration, encoding, module width, and tilde representation. These parameters are set using a Data Matrix unique Format Entry Command that is used in place of the standard Format Entry Command, which is listed below.



**Figure 20 Data Matrix Format Structure**

### X Parameter

This parameter is used to set the X coordinate start position of the Data Matrix symbol.

**Y Parameter**

This parameter is used to set the Y coordinate start position of the Data Matrix symbol.

**CI Code**

This is the Text Equivalent Code that is used to generate the Data Matrix symbol associated with the Text Entry command line (“^Tn”). The valid codes are datamatrix, data, or dm.

**Configuration**

The configuration parameter is used to identify the size and capacity of the Data Matrix symbol. The ECC 200 symbols have an even number of rows and an even number of columns. The symbols can be square, with sizes ranging from 10 x 10 to 144 x 144, or rectangular, with sizes 8 x 18 to 16 x 48. The default is set to “auto”, which means that the printer will automatically generate the smallest Data Matrix symbol possible for the given data. Refer to Table 7 for additional information regarding the valid choices for the configuration parameter.

Symbol Size	Numeric Capacity	Alphanumeric Capacity	Binary Byte Capacity
Auto	---	---	---
10 x 10	6	3	1
12 x 12	10	6	3
14 x 14	16	10	6
16 x 16	24	16	10
18 x 18	36	25	16
20 x 20	44	31	20
22 x 22	60	43	28
24 x 24	72	52	34
26 x 26	88	64	42
32 x 32	124	91	60
36 x 36	172	127	84
40 x 40	228	169	112
44 x 44	288	214	142
48 x 48	348	259	172
52 x 52	408	304	202
64 x 64	560	418	278
72 x 72	736	550	366
80 x 80	912	682	454
88 x 88	1152	862	574
96 x 96	1392	1042	694
104 x 104	1632	1222	814

Symbol Size	Numeric Capacity	Alphanumeric Capacity	Binary Byte Capacity
120 x 120	2100	1573	1048
132 x 132	2608	1954	1302
144 x 144	3116	2335	1556
8 x 18	10	6	3
8 x 32	20	13	8
12 x 26	32	22	14
12 x 36	44	31	20
16 x 36	64	46	30
16 x 48	98	72	47

**Table 14 Data Matrix Configuration Parameters**

### Encoding

The Encoding parameter is used to set the encoding scheme that will be used for the supplied data. The printer default is set to “Auto”, which will automatically switch to the most efficient encoding scheme for the data provided. Refer to Table 8 for the valid choices for the encoding parameter. Consult the Data Matrix Specification (11/96) ANSI/AIM BC11 for additional information.

Encoding Scheme	Characters	Bits per Character
ASCII	Double digit numeric	4
	ACSII values 0 – 127	8
	Extended ASCII values 128 - 255	16
C40	Primarily Uppercase Alphanumeric	5.33
Text	Primarily Lowercase Alphanumeric	5.33
Base256	All byte values 0 – 255	8
Auto	Automatically switches to the most efficient scheme.	NA

**Table 15 Data Matrix Encoding Schemes**

### ASCII Encoding Scheme

ASCII encoding is the basic scheme that encodes ASCII data, double density numeric data and symbology control characters. Which means it encodes one alphabetic or two numeric characters per byte. All other encoding schemes are invoked from ASCII and will then return to this scheme through the use of code words, refer to Table 9.

### C40 Encoding Scheme

C40 encoding scheme is used to encode uppercase alphabetic, numerical and space characters. C40 encodes three alphanumeric data characters into two bytes.

### Text Encoding Scheme

Text encoding is primarily used to encode lowercase alphabetic and numerical characters. Text encodes three alphanumeric data characters into two bytes.

### Base 256 Encoding Scheme

The Base 256 encoding scheme is used to encode any 8-bit byte data, including extended channel interpretations (ECI's) and binary data.

Codeword	Data and/or Function
1 - 128	ASCII data (ASCII value +1)
129	Pad Character
130 - 229	2 digit data 00 – 99 (Numeric Value + 130)
230	Latch to C40 Encoding Scheme
231	Latch to Base256 Encoding Scheme
232	FNC1
233	Structured Append
234	Reader Programming
235	Upper Shift (shift to Extended ASCII)
236	05 Macro
237	06 Macro
239	Latch to Text Encoding Scheme
241	ECI Character

**Table 16    ASCII Codeword Values**

### Module Width

This parameter is used to adjust the size of the individual square modules that are used to create the Data Matrix symbol. This parameter uses dots as its unit of measure with 4 being the default value.

### Tilde

The Tilde parameter is used to determine whether the tilde character (~) will be used as a special control character or as a normal “~” character. The valid arguments for this parameter would be either “1” or “0”, with “1” enabling the use of the special control character. The default for the Tilde parameter is “0”. Refer to Table 10 for a list of the special character representations and their descriptions.

Special Character	Description
~X	Used to represent decimal characters 0 to 26 where “X” is the equivalent control code. Example: ~@ = character 0, ~A = character 1, ~B = character 2, etc...
~1	Represents FNC1 character. When FNC1 appears in the first position or fifth position when using Structured Append, it would indicate that the data conforms to the UCC/EAN Application Identifier Standard.
~2	Represents Structured Append, which is used to link information from several symbols in a sequence. The “~2” must be followed by three additional bytes. Consult the Data Matrix Specification (11/96) ANSI/AIM BC11 for additional information.
~3	This character is only allowed in the first position of the symbol and indicates the data contains commands for the bar code reader.
~5	This character is only allowed in the first position of the symbol. If ~5 is used, the header “[>ascii30 ascii05 ascii29” will be transmitted by the bar code reader, then the symbol data followed by trailer data “ascii30 ascii04”.
~6	This character is only allowed in the first position of the symbol. If ~6 is used, the header “[>ascii30 ascii05 ascii29” will be transmitted by the bar code reader, then the symbol data followed by trailer data “ascii30 ascii04”.
~7NNNNNN	Specifies the Extended Channel Interpretation to be used, where “NNNNNN” is a value between 000000 and 999999. The ECI is used for selecting different character sets. For example: “~7000003” would select ECI number 3, which is the default character set. Consult the Data Matrix Specification (11/96) ANSI/AIM BC11 for additional information.

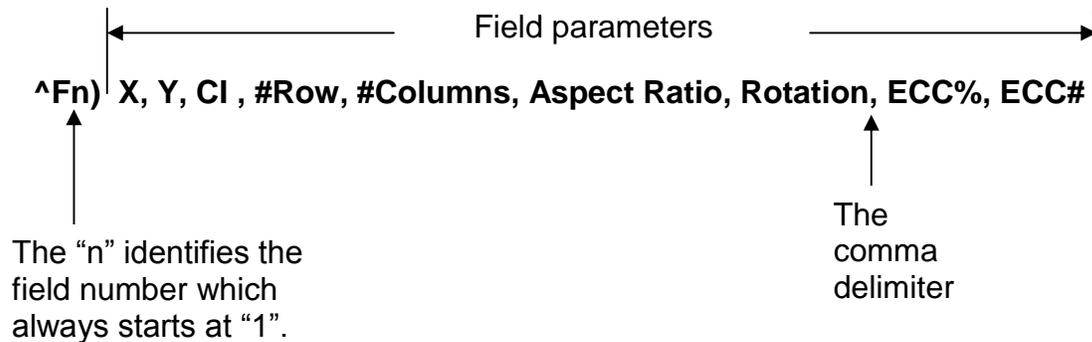
Special Character	Description
~dNNN	Represents the ASCII encoded by the “NNN” value. For example: “~d065” would represent the ASCII character “A”.

**Table 17 Data Matrix Special Characters**

CI text equivalent codes: @datamatrix, @data

**5.3.2 PDF-417**

The Portable Data File 417 or PDF-417 is a two-dimensional stacked symbology that is capable of encoding the entire ASCII character set, 2710 digits, and up to 1108 bytes in a single bar code. The requirements for generating a PDF-417 symbol are the subject data, placement information, size configuration, rotation, and Error Correcting Code or ECC. These parameters are set using a PDF-417 unique Format Entry Command that is used in place of the standard Format Entry Command, which is listed below.



**Figure 21 PDF-417 Format Structure**

**X Parameter**

This parameter is used to set the X coordinate start position of the PDF-417 symbol and has a default value of 0.

**Y Parameter**

This parameter is used to set the Y coordinate start position of the PDF-417 symbol and has a default value of 0.

**CI Code**

This is the Text Equivalent Code that is used to generate the PDF-417 symbol associated with the Text Entry command line (“^Tn”). The valid codes are pdf417, pdf, or 417.

**#Rows**

This parameter is used to specify the number of rows used for rendering the PDF-417 symbol. The PDF-417 symbol may have as few as 3 or as many as 90 rows with a default setting of 90.

**#Columns**

This parameter is used to specify the number of columns used for rendering the PDF-417 symbol. The PDF-417 symbol may have 1 to 30 columns with a default setting of 30.

**Aspect Ratio**

This parameter is used to adjust the aspect ratio of the PDF-417 symbol. The value is entered in ratio format (height: width) and has a default value of 2:1.

**Rotation**

This parameter controls the rotation of the rendered PDF-417 symbol in 90-degree increments. The valid arguments for this parameter would be 0, 90, 180 or 270 with the default being set to 0.

**ECC%**

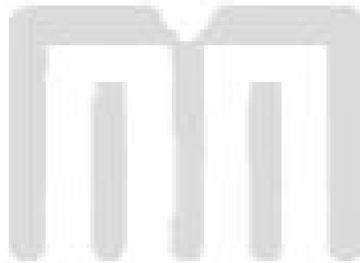
The ECC% parameter is used to set the percentage of overall data dedicated to the Error Correction Control (ECC) of the PDF-417 symbol. This parameter has to be set to 0 if the ECC# method is desired. The default ECC% is set to 0.

**ECC#**

The ECC# parameter is used to set the level of error correction of the PDF-417 symbol with a default value set to 0. This parameter can only be used if the ECC% parameter is set to 0. Refer to Table 11 for the valid ECC# and their equivalent correction codewords.

ECC#	Number of Error Correction Codewords
0	2
1	4
2	8
3	16
4	32
5	64
6	128
7	256
8	512

**Table 18 PDF-417 Error Correction Level**



# Chapter 6: Diagnostics and Troubleshooting

The purpose of this chapter is to provide some information about the diagnostic reporting of the printer that can be used to help identify, diagnose and troubleshoot problems.

## 6.1 Diagnostic Mode

*Diagnostic Mode* temporarily powers the printer using factory default parameters while printing out the printer's current configuration on what is called the *Status Label*. This information can be used to help diagnose and troubleshoot printer configuration issues. The default baud rate is set to 9600 and will be used when entering the diagnostic mode. The printer will continue using the factory default parameters until printer power has been cycled. The printer will then return to the previous configuration that was in use before entering the diagnostic mode.

### 6.1.1 Entering Diagnostic Mode

To enter the diagnostic mode, press and hold the print button in while turning on the printer. Release the button after the status light indicator starts to blink and the printer will power up into diagnostic mode. The printer prints configuration and statistical information followed by the ^D960)1 print head test pattern once it is powered up in the diagnostics mode.

### 6.1.2 Status Label

The printer will print the Status label after the printer has performed powered up and enters the diagnostic mode. The status label prints out the reports that are generated by the “^D323)”, “^D326)”, “^D325)”, and “^D324)” commands.

Enablements (D323 or <Ctrl> Y)		
User Interface		
Software flow control:	(D770)	enabled
Hardware flow control:	(D771)	disabled
Operational		
Auto power-up script:	(D720)	disabled
Auto enquiry after print:	(D721)	disabled
Auto media sizing:	(D722)	disabled
Auto top-of-form alignment:	(D723)	disabled
Auto alignment after error:	(D724)	disabled
Auto acknowledge after cmd:	(D726)	disabled
Auto respond after error:	(D727)	disabled
Cutter:	(D740)	disabled
Printed Media Handler PMH:	(D741)	disabled

Figure 22 ^D323) - List Enablements Example

Settings (D326 or <Ctrl> V)		
Operational		
Print Speed:	(D635)	6.0 ips
Detector mode:	(D636)	0 (none)
Slew Speed:	(D645)	6.0 ips
Darkness:	(D690)	75 (Dark)
Retraction delay:	(D641)	0.5 sec.
Print delay:	(D640)	0.0 sec.
Labels printed:	(D655)	42
Distances		
Label width (LSX):	(D631)	3.34 inches
Label height (LSY):	(D632)	1.5.12 inches
Reg. mark height (GAP):	(D633)	0.148 inches
To reg'n mark (DRM):	(D634)	0.0 inches
X offset (OFX):	(D637)	0.0 inches
Y offset (OFY):	(D638)	0.0 inches
Dist. Past Gap (DPG):	(Auto)	1.225 inches
Activate Gap Det (AGD)	(Auto)	0.0 inches
Advance/retract:	(D642)	0.512 inches
Roll diam. ref. length:	(D646)	10.0 inches
Black line det to head:	(D648)	2.32 inches
Gap det to head:	(D649)	2.34 inches
Printhead		
Width:	(D647)	4.094 inches
Resolution:	(D647)	203 dpi
Serial port settings	(D670)	9600,N,8,1
Ethernet		Active at 10/100
MAC:		0x000257795634
Internet Protocol		
Printer port number:	(D674)	23
Printer addr:	(D675)	192.168.200.3
Server/Host addr:	(D676)	192.168.200.1
Gateway addr:	(D677)	192.168.200.1
Broadcast addr mask:	(D678)	192.168.200.255
Net addr mask:	(D679)	255.255.255.0
Parallel port settings:		Not installed
USB port settings		Not installed
Thresholds		
Gap:	(D680)	30
Black line:	(D681)	120
Stock:	(D682)	110
High head temperature:		147
Low head temperature:		24
PWM periods		
Gap:		12
Black line:		41
Label Present:		64
Stacker:		64
NOTE: Some items may not be correct until after a scripted label has been printed or Auto-size (D310) has been run.		

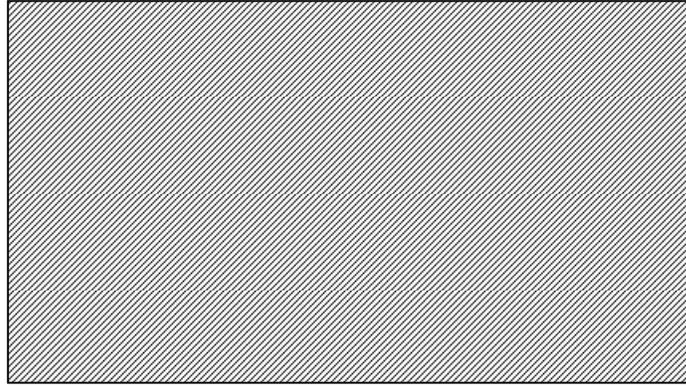
**Figure 23    ^D326) - List Settings Example**

Selections (D325 or <Ctrl> U)		
Operational		
Dispense mode:	(D597)	3
Emulation:	(D501)	Microcom 426
Cutter Type:	(D506)	NONE
PMH Type:	(D507)	NONE
Button Mode:	(D541)	1
Stock-out handling	(D581)	Halt
Response Mode:	(D550)	Text
RS-232 connection:	(D570)	Serial port
Power-up label:	(D586)	@default
Detector mode:	(D636)	0 (none)
Input 1	(D509)	0
LPD type or Input 2	(D508)	0
General		
Measurement units:	(D564)	1 (inches)
Speed units:	(D565)	1 (ips)
Temperature units:	(D566)	1 (Fahrenheit)

**Figure 24 ^D325) - List Selections Example**

Statistics (D324 or <Ctrl> W)		
Identity		
Model number:	(D501)	Microcom 426
Language:	(Auto)	LDS2
Serial number:		01234567890
CPU Serial number:		01234567890
Accumulated operation		
Labels printed:	(D655)	44
Inches printed:		97 inches (246 cm)
Total inches run:		109 inches (276 cm)
Power on time:		2 hours
Printhead		
Width:	(D647)	4.094 inches
Resolution:	(D647)	203 dpi
Temperature:		80 Fahrenheit
Cutter		
Detected at power-up:		false
Type installed:	(D506)	NONE
Operation enabled:	(D740)	false
Total cycle count:		0
Printed Media Handler (PMH)		
Type installed:	(D507)	NONE
Operation enabled:	(D741)	false
Flash		
Installed:		4 MB
Available in file area:		964 KB
RAM:		
Installed:		16.0 MB
Heap:		12.5 MB
Available:		6.53 MB
Code:		
Revision:		1.10
Part number:		950000-0110
Size:		1851552
CRC32:		0x70c6cc74
Bootloader revision:		1.08
Analog PIC revision:		4.5

**Figure 25 ^D324) - List Statistics Example**



**Figure 26** ^D960)1 or ^K Test Pattern

## 6.2 Enquiry Responses

Enquiry responses provide a method of determining the current status of the printer as well as identifying different error conditions. This is possible by sending either the “Ctrl+E” combination, issuing the “^D327)” command, or by enabling any of the auto-reporting commands; Refer to the ^D72x series commands. Fatal error responses are triggered from the printer to the host when they occur and halt the printers operation until resolved. Status responses do not halt the printers operation but are simply a status of the printer’s current state.

Refer to the table below and the following sections for more information about the various types of responses.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
	0x01	>STOCK OUT<
0x02	>STOCK OVERADVANCED<	Excess media past LPD preventing a TOF operation.
0x03	>STOCK JAMMED<	Media is jammed.
0x04	>INCORRECT STOCK<	Problem encountered trying to realign media.
0x06	>OK<	ACK message used with the ^D726)1 command.
0x10	>CUTTER JAMMED<	The cutter has jammed.
0x11	>CUTTER INOPERATIVE<	The cutter is not detected
0x12	>CUTTER WATCHDOG STOPPED CUTTER<	The software shut the cutter off for safety issues.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
0x13	>CUTTER WATCHDOG WON'T RESET<	The software cannot reset the cutter after a stopped condition.
0x1C	>MISSING LABEL<	Generated if more than one die-cut label has been detected.
0x1D	>INCOMPLETE FORM<	A complete script did not print on a >STOCK OUT< condition.
0x20	>CATCH TRAY FULL<	The PMH has reached its capacity.
0x21	>INPUT 1<	The Input 1 sensor has been actuated.
0x22	>INPUT 2<	The Input 2 sensor has been actuated.
0x30	>SCRIPT ERROR<	An error with the script has been detected.
0x31	>INVALID PARAMETER<	The printer has detected an invalid parameter.
0x32	>PARSER ERROR<	An error with the printer's parser has occurred.
0x40	>COMM ERROR<	A Communication error has been detected.
0x51	>FLASH ERROR<	The flash memory has encountered an error.
0x80	>RESTARTED<	The printer has been powered on or the power has been reset.
0x81	>READY<	The printer is in ready to receive data.
0x82	>BUSY<	The printer is currently busy.
0x83	>PAUSED<	The printer has been paused.
0x84	>PRINTING<	The printer is currently printing.
0x85	>FEEDING<	The printer is currently feeding media.
0x86	>LABEL/TAG PRESENT<	Media has been presented in a dispense mode.
0x87	>STOCK ADVANCED<	The media has been advanced.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
0x8A	>FLASH DEFRAGMENTING<	Flash file system is optimizing memory.
0x8F	>STOCK NOT LOADED<	The printer was powered up with out media installed.
0x90	>RETRACTION DELAY<	The retraction has been delayed.
0x91	>PRINT DELAY<	The printing has been delayed.
0xB0	>FLASH MEMORY LOW<	The Flash memory file space is 95% full.
0xC0	>BUTTON 1 TAPPED<	The print button has been pressed.
0xC1	>BUTTON 1 HELD<	The print button has been held.
0xD0	>TEMPERATURE OUT OF RANGE<	The print head temperature is out of operating range.
0xD1	>NONEXISTENT COMMAND<	The received command does not exist.
0xD2	>INCOMPLETE COMMAND<	The received command is not complete.
0xD3	>ZIP FILE ERROR<	The received Zipped file has an error.
0xD4	>FILE CONVERSION ERROR<	The file was not converted properly.
0xD5	>UNSUPPORTED FILE TYPE<	The received file is not recognized.
0xD6	>FILE NOT FOUND<	The requested file does not exist or cannot be found.
0xD7	>INADEQUATE ACCESS MODE<	Incorrect password to a higher access level.
0xD9	>FILE IS READ ONLY<	File is read only and cannot be deleted.
0xDA	>INADEQUATE FLASH SPACE<	Cannot save an item to the flash memory due to lack of space.
0xDB	>I/O FAILURE<	The Input/Output circuitry has failed.
0xDC	>FONT/GRAPHIC NOT FOUND<	The requested file does not exist or cannot be found.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
0xE1	>SWITCH 0 ACTUATED<	Switch 0 has been actuated.
0xE2	>SWITCH 1 ACTUATED<	Switch 1 has been actuated.
0xE3	>SWITCH 2 ACTUATED>	Switch 2 has been actuated.
0xE4	>TOF SWITCH ACTUATED<	The TOF switch has been actuated.
0xF0	>FIELD OFF IMAGE<	An image placement coordinates exceed the print head or form size.
0xF2	>GRAPHIC TOO LARGE<	The sent graphic exceeds the available memory.
0xFF	>POWERED DOWN<	The printer's power has been removed.

**Table 19 Enquiry Responses**

### 6.3 Fatal Error Responses

Fatal error responses are enquiry responses that halt the printer's current operation and cause the indicator light or LED to flash RED in color. A fatal error condition persists until the condition causing the error is removed and the error is cleared. These enquiry responses are sent from the printer to the host, when the appropriate condition occurs, by issuing the "Ctrl+E" (^E) combination or by issuing the queued "^D327)1" command. The printer may be configured to automatically reports errors and status messages by using the ^D72x series commands. The following sections provide further explanations of the various fatal error responses. Refer to the ^D550) command regarding the types of enquiry response sets.

*NOTE: The following section titles are the responses that the printer will generate once the associating condition occurs and the printer processes an enquiry command. The first response (between and including the ">" and "<" characters) is generated if text and verbose responses have been enabled using the ^D550) command. The ASCII hex value listed between the parenthesis characters, indicate the enquiry response if byte mode has been enabled.*

#### 6.3.1 >STOCK OUT< (01)

The ">STOCK OUT<" error response is generated when the printer runs out of stock or media while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0x01 will be issued from the printer in response to an enquiry command.

### 6.3.2 >STOCK OVERADVANCED< (02)

This error response is typically generated when the printer has an excess amount of media feed out of the printer and a Top-of-Form operation is executed. If the printer is configured for byte responses, the code ASCII 0x02 will be issued from the printer in response to an enquiry command.

### 6.3.3 >STOCK JAMMED< (03)

The ">STOCK JAMMED<" error response indicates that media is jammed and requires correction before the printer can continue printing while in text and verbose modes. A stock jam condition may be detected by two separate methods depending on how the printer is configured with a Label Present Detector or LPD. If the printer is configured for byte responses, the code ASCII 0x03 will be issued from the printer in response to an enquiry command.

When the printer is configured with an LPD and selected by the "^D509" command, a stock jam is detected by the LPD when the leading edge of the media did not arrive after the motor stepped through the Print head to LPD distance ("^D643" command) plus 0.2 inches. This detection method does not work if media is not detected at the LPD once printing starts and is used in conjunction with the "^D311" TOF command.

When the printer is configured without an LPD, not selected by the "^D509" command, or if media is blocking a configured LPD once printing commences, a stock jam condition is detected using the registration mark detectors. The stock jam condition is reported when a registration mark does not arrive after the entire script repeat distance plus 0.2 inches.

### 6.3.4 >INCORRECT STOCK< (04)

This error response is generated when the printer detects a registration mark that is too high or too short or if the registration mark is detected too soon or too late. The >INCORRECT STOCK< message is generated once this condition exists when the printer is configured for text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x04 will be issued from the printer in response to an enquiry command.

### 6.3.5 >CUTTER JAMMED< (10)

The ">CUTTER JAMMED<" error response is generated when the cutter is in a jammed condition and cannot complete a full cycle while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0x10 will be issued from the printer in response to an enquiry command.

### 6.3.6 >CUTTER INOPERATIVE< (11)

This error response is typically generated if the cutter is not detected by the printer while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0x11 will be issued from the printer in response to an enquiry command.

**6.3.7 >CUTTER WATCHDOG STOPPED CUTTER< (12)**

This error response is generated when the cutter cannot complete a full rotation and is jammed while in text and verbose modes. The cutter watchdog timer will disable the power to the cutter to prevent damage from occurring. The printer power should be cycled to properly clear this error after the jam has been cleared from the cutter blades. If the printer is configured for byte responses, the code ASCII 0x12 will be issued from the printer in response to an enquiry command.

**6.3.8 >CUTTER WATCHDOG WON'T RESET< (13)**

This error response is generated when the cutter watchdog timer cannot be reset and the printer power is required to be cycled to clear this error while in text and verbose modes. The cutter watchdog timer disables the power to the cutter to prevent damage from occurring. The printer power should be cycled to properly clear this error after the jam has been cleared from the cutter blades. If the printer is configured for byte responses, the code ASCII 0x13 will be issued from the printer in response to an enquiry command.

**6.3.9 >MISSING LABEL< (1C)**

The ">MISSING LABEL<" response indicates that the printer has detected only the backing material when using die-cut media indicating a missing label while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x1C is issued from the printer in response to an enquiry command.

**6.3.10 >INCOMPLETE FORM< (1D)**

The ">INCOMPLETE FORM<" response indicates that the printer did not complete the current script while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x1D is issued from the printer in response to an enquiry command. This response appears in conjunction with the >STOCK OUT< error and a printer configured with the "^D581)2" Finish Label command.

**6.3.11 >CATCH TRAY FULL< (20)**

The ">CATCH TRAY FULL<" response is generated when the optional Catch Tray has reached its capacity while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x20 is issued from the printer in response to an enquiry command.

**6.3.12 >SCRIPT ERROR< (30)**

The ">SCRIPT ERROR<" response is generated when a script contains an error and cannot be processed while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x30 will be issued from the printer in response to an enquiry command.

**6.3.13 >INVALID PARAMETER< (31)**

This error response indicates that a received command contains an invalid parameter or illegal structure while in text and verbose response sets. If the printer is configured for byte

responses, the code ASCII 0x31 will be issued from the printer in response to an enquiry command.

#### **6.3.14 >PARSER ERROR< (32)**

The “>PARSER ERROR<” indicates that the printer has detected an internal error with the parser while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x32 will be issued from the printer in response to an enquiry command.

#### **6.3.15 >COMM ERROR< (40)**

The “>COMM ERROR<” indicates that the printer has detected a communication error while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x40 is issued from the printer in response to an enquiry command. This error response is generated if the serial communication timeout period of 10 seconds plus 100 times the transfer has occurred.

#### **6.3.16 >FLASH ERROR< (51)**

The “>FLASH ERROR<” indicates that an error has occurred with the flash memory while in text and verbose response sets. The printer power should be cycled in the event that this error message has been received. If the printer is configured for byte responses, the code ASCII 0x51 will be issued from the printer in response to an enquiry command.

### **6.4 Basic Status Responses**

Basic status responses are enquiry responses that are not immediate. These enquiry responses are sent from the printer to the host, when the appropriate condition occurs, by issuing the “Ctrl+E” (^E) combination or by issuing the “^D327)” command. The following sections provide further explanations of the non-immediate basic status responses. Refer to the ^D550) command regarding the types of enquiry response sets.

*NOTE: The following section titles are the responses that the printer will generate once the associating condition occurs. The first response (between and including the “>” and “<” characters) is generated if text and verbose responses have been enabled using the ^D550) command. The ASCII hex value listed between the parenthesis characters, indicate the enquiry response if byte mode has been enabled.*

#### **6.4.1 >OK< (06)**

The “>OK<” response is generated in conjunction with the “^D726)1” command and indicates that a command completed successfully while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x06 is issued from the printer in response to an enquiry command.

**6.4.2 >INPUT 1< (21)**

The “>INPUT 1<” response indicates that the INPUT 1 sensor option is tripped while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x21 is issued from the printer in response to an enquiry command. This sensor and response is intended to provide the user with the flexibility for custom configurations.

**6.4.3 >INPUT 2< (22)**

The “>INPUT 2<” response indicates that the INPUT 2 sensor option is tripped while in text or verbose response modes. If the printer is configured for byte responses, the code ASCII 0x22 is issued from the printer in response to an enquiry command. This sensor and response is intended to provide the user with the flexibility for custom configurations.

**6.4.4 >RESTARTED< (80)**

The “>RESTARTED<” response is issued the first time the printer’s status is queried after a power up or reset condition while in verbose and/or semi byte responses. If the printer is configured for byte responses, the code ASCII 0x80 will be issued from the printer in response to an enquiry command.

**6.4.5 >READY< (81)**

The “>READY<” response indicates that the printer is in the normal operating state and that it is ready to accept data while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x81 will be issued from the printer in response to an enquiry command.

**6.4.6 >BUSY< (82)**

The “>BUSY<” response indicates that the printer is performing an operation that prevents the printer from accepting data while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x82 will be issued from the printer in response to an enquiry command.

**6.4.7 >PAUSED< (83)**

The “>PAUSED<” response indicates that the printer’s printing capabilities have been paused while in text and verbose response sets. The printer will continue to receive data while in the >PAUSED< state. The printer may be put into the paused condition by either issuing the “Ctrl+X” combination or by pressing the print button while the printer is printing. Issuing the “Ctrl+X” combination or pressing the print button a second time will cause the printer to resume. If the printer is configured for byte responses, the ASCII code 0x83 will be issued from the printer in response to an enquiry command.

**6.4.8 >PRINTING< (84)**

The “>PRINTING<” response indicates that the printer is currently printing while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x84 will be issued from the printer in response to an enquiry command.

**6.4.9 >FEEDING< (85)**

The “>FEEDING<” response indicates that the printer is currently feeding media while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x85 will be issued from the printer in response to an enquiry command.

**6.4.10 >LABEL/TAG PRESENT< (86)**

This response indicates that media is blocking the Label Present Sensor (LPS) and protruding out the front of the printer. If the printer is configured for byte responses, the code ASCII 0x86 will be issued from the printer in response to an enquiry command.

**6.4.11 >STOCK ADVANCED< (87)**

The “>STOCK ADVANCED<” response indicates that the media has been advanced after printing when a Dispense Mode (^D597) command) is being used while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x87 will be issued from the printer in response to an enquiry command.

**6.4.12 >FLASH DEFRAGMENTING< (8A)**

The “>FLASH DEFRAGMENTING<” response indicates that the printer is optimizing the flash memory and is currently not available while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x8A will be issued from the printer in response to an enquiry command.

**6.3.13 >STOCK NOT LOADED< (8F)**

The “>STOCK NOT LOADED<” response indicates that media is not being detected in the printer on power up while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x8F is issued from the printer in response to an enquiry command. This message persists until media is detected at the registration mark sensors but does not prevent commands from being processed.

**6.4.14 >RETRACTION DELAY< (90)**

The “>RETRACTION DELAY<” response indicates that the printer has been configured with a delay before retracting, refer to the ^D641) command, while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x90 will be issued from the printer in response to an enquiry command.

**6.4.15 >PRINT DELAY< (91)**

The “>PRINT DELAY<” response indicates that the printer has been configured with a delay between labels, refer to the ^D640) command, while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x91 will be issued from the printer in response to an enquiry command.

**6.4.16 >FLASH MEMORY LOW< (B0)**

The “>FLASH MEMORY LOW<” response indicates that the user storage area of the flash memory is 95% full while in text and verbose response sets. This message will continue to be received until files are removed from flash memory or until the printer performs garbage collecting and defragmenting. If the printer is configured for byte responses, the code ASCII 0xB0 will be issued from the printer in response to an enquiry command.

**6.4.17 >BUTTON 1 TAPPED< (C0)**

The “>BUTTON 1 TAPPED<” response occurs when the ^D541) command is configured for the “tapped” response while in text and verbose response sets. This may be used for custom configuration and definition of the print button press or tapped condition. If the printer is configured for byte responses, the code ASCII 0xC0 will be issued from the printer in response to an enquiry command.

**6.4.18 >BUTTON 1 HELD< (C1)**

The “>BUTTON 1 HELD<” response occurs when the ^D541) command is configured for the “held” response while in text and verbose response sets. This may be used for custom configuration and definition of the print button held condition. If the printer is configured for byte responses, the code ASCII 0xC1 will be issued from the printer in response to an enquiry command.

**6.4.19 >TEMPERATURE OUT OF RANGE< (D0)**

The “>TEMPERATURE OUT OF RANGE<” response indicates that the printer’s print head is not within the proper operating range while in text and verbose response sets. This response will not allow the printer to print until the print head returns to the proper operating range. If the printer is configured for byte responses, the code ASCII 0xD0 will be issued from the printer in response to an enquiry command.

**6.4.20 >NONEXISTENT COMMAND< (D1)**

The “>NONEXISTENT COMMAND<” response indicates that the printer has received data in the LDSII command structure that does not exist or is yet to be implemented while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD1 will be issued from the printer in response to an enquiry command.

**6.4.21 >INCOMPLETE COMMAND< (D2)**

The “>INCOMPLETE COMMAND<” response indicates that the printer has received a command that does not contain all of the required parameters for proper operation while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD2 will be issued from the printer in response to an enquiry command.

**6.4.22 >ZIP FILE ERROR< (D3)**

The “>ZIP FILE ERROR<” response indicates that the printer has received a zip file that is either not complete or that the file contains errors while in text and verbose response sets.

If the printer is configured for byte responses, the code ASCII 0xD3 will be issued from the printer in response to an enquiry command.

#### **6.4.23 >FILE CONVERSION ERROR< (D4)**

This enquiry response indicates that the printer encountered an error while performing an internal conversion of the received file while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0xD4 will be issued from the printer in response to an enquiry command.

#### **6.4.24 >UNSUPPORTED FILE TYPE< (D5)**

This enquiry response indicates that the printer does not recognize the type of the received file while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0xD5 will be issued from the printer in response to an enquiry command.

#### **6.4.25 >FILE NOT FOUND< (D6)**

The “>FILE NOT FOUND<” response typically indicates that the printer is being instructed to recall and process a file that does not exist in the printer’s memory while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD6 will be issued from the printer in response to an enquiry command.

#### **6.4.26 >INADEQUATE ACCESS MODE< (D7)**

This enquiry response is typically issued when the user is attempting to issue a persistent command that is not allowed by the current access mode level or is attempting to enter an access mode that has a higher security level. If the printer is configured for byte responses, the code ASCII 0xD7 will be issued from the printer in response to an enquiry command.

#### **6.4.27 >FILE IS READ ONLY< (D9)**

This enquiry response typically indicates that a save or delete command is being issued to the printer and that the file is a protected file stored in the printer. If the printer is configured for byte responses, the code ASCII 0xD9 will be issued from the printer in response to an enquiry command.

#### **6.4.28 >INADEQUATE FLASH SPACE< (DA)**

This enquiry response indicates that the available flash memory is less than the total size of a file being saved to flash memory. If the printer is configured for byte responses, the code ASCII 0xDA will be issued from the printer in response to an enquiry command.

#### **6.4.29 >I/O FAILURE< (DB)**

This enquiry response indicates that the printer has a failure with either the I/O hardware or with the I/O firmware. If the printer is configured for byte responses, the code ASCII 0xDB will be issued from the printer in response to an enquiry command.

**6.4.30 >FONT/GRAPHIC NOT FOUND< (DC)**

This enquiry response typically indicates that a font being specified a script file does not exist in flash memory. If the printer is configured for byte responses, the code ASCII 0xDC will be issued from the printer in response to an enquiry command.

**6.3.31 >SWITCH 0 ACTUATED< (E1)**

This enquiry response typically indicates that switch 0 is actuated while in text or verbose response sets. If the printer is configured for byte responses, the code ASCII 0xE1 is issued from the printer in response to an enquiry command.

**6.3.32 >SWITCH 1 ACTUATED< (E2)**

This enquiry response typically indicates that switch 1 is actuated while in text or verbose response sets. If the printer is configured for byte responses, the code ASCII 0xE2 is issued from the printer in response to an enquiry command.

**6.3.33 >SWITCH 2 ACTUATED< (E3)**

This enquiry response typically indicates that switch 2 is actuated while in text or verbose response sets. If the printer is configured for byte responses, the code ASCII 0xE3 is issued from the printer in response to an enquiry command.

**6.3.34 >TOF SWITCH ACTUATED< (E4)**

This enquiry response typically indicates that the Top-Of-Form (TOF) switch is actuated while in text or verbose response sets. If the printer is configured for byte responses, the code ASCII 0xE4 is issued from the printer in response to an enquiry command.

**6.4.35 >FIELD OFF IMAGE< (F0)**

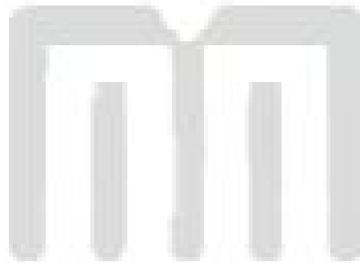
The ">FIELD OFF IMAGE<" response indicates that a fields size and placement coordinates will not allow the field to fit on the print image or script layout while in text and verbose modes. The given field that is being placed off the image will not be printed on to the media. If the printer is configured for byte responses, the code ASCII 0xF0 will be issued from the printer in response to an enquiry command.

**6.3.36 >GRAPHIC TOO LARGE< (F2)**

This enquiry response indicates that the graphic sent to the printer is larger than the available memory while in text or verbose response sets. If the printer is configured for byte responses, the code ASCII 0xF2 is issued from the printer in response to an enquiry command.

**6.4.37 >POWERED DOWN< (FF)**

The ">POWERED DOWN<" response indicates that the printer's power has been interrupted while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0xFF will be issued from the printer in response to an enquiry command. This message also indicates that the printer was successful writing pending updates to flash on a power loss situation.



# Chapter 7: Communications

## 7.1 RS-232 Serial

The printer provides a 9 pin female D-Sub connector, on the rear panel, for RS-232 serial communication. The printer is configured as DCE (Data Circuit-terminating Equipment) so a NULL modem cable is not necessary. A serial data cable is required to use serial communications, refer to the table below for correct cable configurations.

The factory settings, unless otherwise requested, are set at 9600 baud, 8 data bits, 1 stop bit, and no parity with both hardware and software handshaking. The baud rate is user selectable from 1200 to 230,400 and uses software XON/XOFF flow control and/or hardware CTS handshaking.

9 to 9 Pin Cable				9 to 25 Pin Cable			
State	426 DE-9 Pin #	Signals / Direction	PC DE-9 Pin #	State	426 DE-9 Pin #	Signals / Directions	PC DB-25 Pin #
XX	1	DCD → DCD	1	HI	1	DCD → DCD	8
XX	2	TXD → RXD	2	XX	2	TXD → RXD	3
XX	3	RXD ← TXD	3	XX	3	RXD ← TXD	2
HI	4	DTR → DSR	4	HI	4	DTR → DSR	20
LO	5	GND ↔ GND	5	LO	5	GND ↔ GND	7
HI	6	DSR → DTR	6	HI	6	DSR → DTR	6
DC	7	RTS ← CTS	7	DC	7	RTS ← CTS	4
XX	8	CTS → RTS	8	XX	8	CTS → RTS	5
HI	9	+5V ↔ +5V	9	HI	9	+5V	-
DC = DO NOT CARE				XX = INDETERMINATE			

**Table 20 RS-232 Cable Configurations**

If XON/XOFF handshaking is used, only signals RXD, TXD, and GND are required for proper operation. If the hardware handshaking is used the CTS and RTS signals are required. The other signals are offered in the event that the host computer requires them.

### 7.1.1 RS-232 Printer Cables

The printer uses standard cables that may be purchased through Microcom Corporation or a local computer supply company. A NULL-modem cable is not required because the printer is configured as DCE.

*For a 25-pin serial communication port – Use a 25-pin female to 9-pin male cable.*

*For a 9-pin serial communication port – Use a 9-pin female to 9-pin male cable.*



**CAUTION:** Connection of a serial port to a parallel port may result in damage to the printer and / or computer.

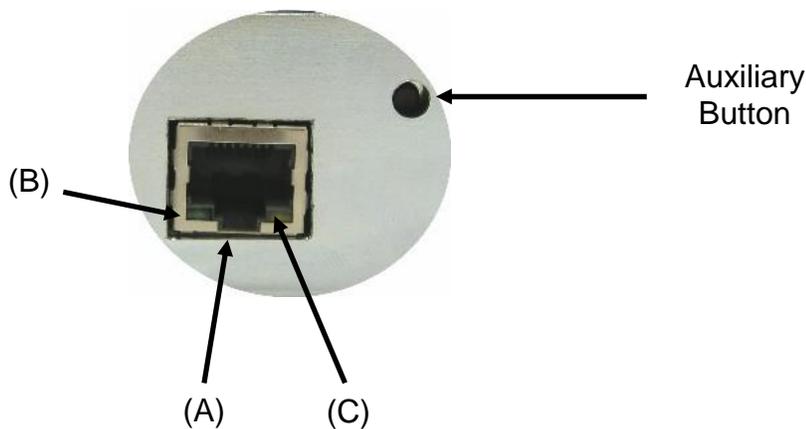
## 7.2 Ethernet - 10/100 BASE-T

The printer provides an auto-sensing, 10/100 Mbps Fast Ethernet port with full duplex operation capability. The Ethernet port supports a proprietary IP Discovery protocol and TCP/IP stream printing. Refer to the “^D570” command for additional information regarding the available communication ports the printer offers. The printer requires that the Printer IP (^D675), Port Number (^D674), Net Mask (^D679), and Ethernet port (“^D570)5”) be properly configured for the Ethernet port to function. The ^D326 or ^V command is useful in reporting the addresses and command values.

(A) = RJ45 connector for Ethernet port connection.

(B) = Solid green light indicates that a connection is present.

(C) = Flashing yellow light indicates that the port has activity.



**Figure 27 10/100 BASE-T Ethernet Port**

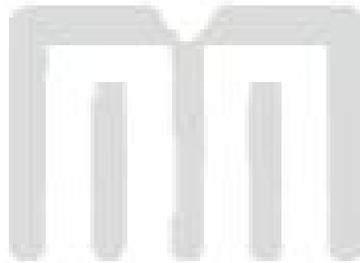
## 7.3 USB Port

The printer provides the capability of a Universal Serial Bus (USB) port that supports version 1.1. The USB Type 1 port is a virtual serial communications port and requires the installation of the Microcom Corporation supplied virtual serial communication USB driver to be installed to properly function. Refer to the “^D570”) command for additional information regarding the available communication ports the printer offers.

# Appendix A – ASCII Chart

DEC	HEX	ASCII	KEY	DEC	HEX	ASCII	DEC	HEX	ASCII	DEC	HEX	ASCII
0	00	NUL	Ctrl @	32	20	Space	64	40	@	96	60	`
1	01	SOH	Ctrl A	33	21	!	65	41	A	97	61	a
2	02	STX	Ctrl B	34	22	"	66	42	B	98	62	b
3	03	ETX	Ctrl C	35	23	#	67	43	C	99	63	c
4	04	EOT	Ctrl D	36	24	\$	68	44	D	100	64	d
5	05	ENQ	Ctrl E	37	25	%	69	45	E	101	65	e
6	06	ACK	Ctrl F	38	26	&	70	46	F	102	66	f
7	07	BEL	Ctrl G	39	27	'	71	47	G	103	67	g
8	08	BS	Ctrl H	40	28	(	72	48	H	104	68	h
9	09	HT	Ctrl I	41	29	)	73	49	I	105	69	i
10	0A	LF	Ctrl J	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	Ctrl K	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	Ctrl L	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	Ctrl M	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	Ctrl N	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	Ctrl O	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	Ctrl P	48	30	0	80	50	P	112	70	p
17	11	DC1	Ctrl Q	49	31	1	81	51	Q	113	71	q
18	12	DC2	Ctrl R	50	32	2	82	52	R	114	72	r
19	13	DC3	Ctrl S	51	33	3	83	53	S	115	73	s
20	14	DC4	Ctrl T	52	34	4	84	54	T	116	74	t
21	15	NAK	Ctrl U	53	35	5	85	55	U	117	75	u
22	16	SYN	Ctrl V	54	36	6	86	56	V	118	76	v
23	17	ETB	Ctrl W	55	37	7	87	57	W	119	77	w
24	18	CAN	Ctrl X	56	38	8	88	58	X	120	78	y
25	19	EM	Ctrl Y	57	39	9	89	59	Y	121	79	x
26	1A	SUB	Ctrl Z	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	Ctrl [	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	Ctrl \	60	3C	<	92	5C	\	124	7C	
29	1D	GS	Ctrl ]	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	Ctrl ^	62	3E	>	94	5E	^	126	7E	~
31	1F	US	Ctrl _	63	3F	?	95	5F	_	127	7F	DEL

ASCII = American Standard Code for Information Interchange



# Glossary

**Alphanumeric** - A term used to identify characters consisting of letters, numbers, and other symbols such as punctuation marks and mathematical symbols.

**Bar code** - Alphanumeric characters that are represented using a system of printed lines, which can be read by a computer.

**Blackline** - A registration mark, typically a black line on the underside of certain media that is used to identify the starting position of a label.

**Blowhole** - A registration mark, typically a notched or cutout in certain media's that is used to identify the starting position of a label.

**Continuous media** - Media that contains no gap and continues as one piece of media.

**CTS (Clear to Send)** - A handshaking signal used to provide information when a DCE or modem is ready to receive data in an RS-232 communication link. Used in conjunction with RTS.

**Cutter** - An optional device, mounted on the printer, which is used to cut media into custom sized labels after printing

**DCE (Data-Circuit-terminating Equipment)** - The modem or printer end of an RS-232 serial communication link. Modem serial ports and other peripherals are typically configured as DCE.

**Die-cut media** - Media that is cut using a die to form individual labels that have a start and stop point. Typically the excess material surrounding the label is removed from the backing material.

**Direct thermal** - Method of printing with a special heat-sensitive media that directly contacts heat elements of a thermal print head. (See *Thermal print head*)

**DPI (Dots Per Inch)** - A unit of measure term used to identify the print resolution capability.

**Drive roller** - Platen roller that is located below the print head that is used to drive media through the printer.

**DSR (Data Set Ready)** - A handshaking signal used to provide information about the status of an RS-232 communication link. Used in conjunction with DTR.

**DTE (Data Terminal Equipment)** - The terminal or computer end of an RS-232 serial communication link. Serial ports on computers are typically configured as DTE.

**DTR (Data Terminal Ready)** - A handshaking signal used to provide information about the status of the communication line connected to the DCE end of an RS-232 link. Used in conjunction with DSR.

**Ethernet** - A fast and capable serial interface used by many networks for connecting host computers to various peripherals.

**Fanfold media** - Die-cut or tag media that is folded into stacks.

**Flash memory** - Memory that is used to store font, graphics and label formats for faster access. This is a non-volatile type of memory, which means that the information stored is saved even when the printer power is turned off.

**GND (Signal Ground)** - The ground terminal of a power supply's output, and all points that connect to it. This is an essential signal in an RS-232 communication link that is used to reduce noise spikes, which can cause a receiver to misread logic levels. Also known as SG and SGND.

**Guillotine Cutter** – A cutter that has a blade that cuts perpendicular to the media path.

**LDSII (Label Design Software II)** - This is the resident control software language that is used to develop label formats and controls the full function of the printer.

**LPS (Label Present Sensor)** - This sensor, when enabled, detects when media is present. Also referred to as LTS (Label Taken Sensor).

**Platen** - Roller that is located below the print head, which the media rests upon. (See *Drive roller*)

**Rolled media** - Media that has been rolled onto a core, which is typically cardboard in nature.

**Rotary Cutter** – A cutter that has multiple angled blades mounted to a shaft that cut media by rotating the shaft.

**RS-232** - A popular and inexpensive asynchronous serial interface used for connecting host computers to various peripherals.

**RTS (Request To Send)** - A handshaking signal used to provide information when a DTE or terminal has data to send in an RS-232 communication link. Used in conjunction with CTS.

**RXD (Receive Data)** - An essential signal that carries data from the DCE to the DTE for 2-way RS-232 serial communication. Also known as RX and RD.

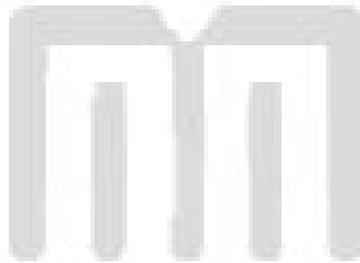
**SDRAM (Synchronous Dynamic Random Access Memory)** - Memory that is used to store formats while printing. This is volatile memory, which means that the information stored in this memory is not saved when the printer power is turned off.

**Tag stock** - Media that typically has no adhesive backing, thicker in nature and generally is a fanfold type media.

**Thermal print head** - A print head that uses thermal technology, to heat individual elements or dots to produce images. Also referred to as print head in this manual.

***TXD (Transmit Data)*** - An essential signal that carries data from the DTE to the DCE for 2-way RS-232 serial communication. Also known as TX and TD.

***USB (Universal Serial Bus)*** - A high-speed asynchronous serial interface typically transfers up to 12M bits/second, used for connecting host computers to various peripherals.



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