DATAMAX

Programmers Manual

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Navigating the Manual

Welcome to the Programmer's On-line Manual. This manual explains in detail the Datamax Programming Language (DPL), how to write programs that will enable Datamax label printers to create label formats (designs), and allow the user to control the operation of the printer. Label formats that have been created can be printed, stored, and edited. 'Hyperlinks' are available throughout the document. Clicking on these 'Hyperlinks' will link you to different areas of the manual. These 'Hyperlinks' are described below.

Large globes located at the beginning of each section links you to the Contents page.

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Introduction

This manual is designed for users who wish to create their own label production software. Operators without programming experience may prefer to use a label-creation software package.

This manual explains in detail the Datamax Programming Language (DPL), how to write programs that will enable Datamax label printers to create label formats (designs), and allow the user to control the operation of the printer. Label formats that have been created can be printed, stored, and edited.

Notes:	This manual refers to IBM-PC based keyboard command characters for access to the ASCII character set. Systems based on different formats, (i.e., Apple's Macintosh™), should use the appropriate keyboard command to access the desired ASCII character. Appendix A contains the entire ASCII character set. <CR> is used to identify the line termination character. Other strings placed between <> in this document represent the character of the same ASCII name.

There are four main command types used to create labels and control the printer:

1. Immediate Commands
2. System-Level Commands
3. Label-Formatting Commands
4. Font-Loading Commands.

- **Immediate Commands:** Interrupts the printer to perform a particular action, then the printer resumes normal operations.
- **System-Level Commands:** Are performed in the sequence that they are received and generally control the printer's hardware. In addition, system-level commands allow memory configuration, and scalable font and image downloading.
- **Label-Formatting Commands:** Are used to control the position of text and images. The label format termination commands can selectively store and print the label and end the formatting process.
- **Font-Loading Commands:** Are used to download font data in PCL-4 compatible bit-maps.

Control Codes

In order to be ready for a command sequence, the printer must first receive a special character called an "**attention getter**", this informs the printer that it is about to receive a command and the type of command it will be. Immediate commands, system-level commands, and font-loading commands each have their own attention getter. The attention getter character is followed by a command character that tells the printer what action to take. Most system-level command characters are followed by parameter values.

ASCII Char.	Decimal Value	HEX Value	Printer Dump	Attention Getter For
SOH	1	01	^A	Immediate Commands
STX	2	02	^B	System-Level Commands
ESC	27	1B	^[	Font-Loading Commands

Table 1-1 Control Codes

Note: The attention getters (e.g., **"**SOH") are standard ASCII control labels that represent a one character control code,(i.e., ^A or Ctrl A). Appendix A contains the entire ASCII Control Code Chart. An alternate set of attention getters is shown in the table below. Depending on the printer, this set may be selected via a dip switch, menu selection, or the system command <STX>KD.

Control Character	Standard	Main Frame
SOH	0x01	0x5E
STX	0x02	0x7E
CR	0x0D	0x0D
ESC	0x1B	0x1B
"Count By"[1]	0x5E	0x40

[1] See Label-Formatting Commands, ^set count by amount.

Table 1-2 Alternate Control Codes

Immediate Commands <SOH>

When the printer receives an **immediate command** it will stop whatever it is doing and perform that command. Immediate commands may be issued before or after system commands; however, immediate commands may not be issued among label-formatting commands. Immediate commands consist of:

1. Attention Getter
2. Command Character
3. Parameters (if any).

Command Character	Printer Response	Command Function
#	Y	Reset
A	Y	Send ASCII Status String
B	N	Toggle Pause
C	N	Stop/Cancel
D	N	SOH Shutdown
E	Y	Send Batch Quantity
F	Y	Send Status Byte

Table 2-1 Immediate Commands

SOH # Reset

This command resets the printer. Resetting the printer returns all settings to default and clears both the input and print buffers. The command also clears the internal RAM memory. See Appendix L.

Sample: <SOH>#
The printer will now reset.

Printer Response**:** T <XON>;
The T may come after the <XON>

SOH A Send ASCII Status String

This command allows the host computer to check the printer for its current status. The printer returns a string of eight characters to the host computer, followed by a carriage return. Each character is either a Y or N indicating whether the associated condition is true or false (Y=true). Byte 1 is the first character transmitted by the printer.

Sample**:** <SOH>A

Printer Response**:** abcdefgh<CR>

Byte	Character Y/N	Condition
1	a = Y/N	Y = Interpreter busy
2	b = Y/N	Y = Paper out
3	c = Y/N	Y = Ribbon out
4	d = Y/N	Y = Printing batch
5	e = Y/N	Y = Busy printing
6	f = Y/N	Y = Printer paused
7	g = Y/N	Y = Label presented
8	h = N	Always No

Table 2-2 ASCII Status

SOH B Toggle Pause

This command toggles the printer’s paused state between on and off. This is the same function that is achieved when the pause button on the printer's front panel is pressed.

Sample: <SOH>B

This command will illuminate the pause/stop light, suspend printing, and wait until one of the following happens.

- The SOH B Command is sent to the printer.
- The STX p Command is sent to the printer.
- The pause button is pressed on the front panel of the printer.

Upon which it will turn the pause/stop light off and resume operation from where it was interrupted. On some printers if the RX Buffer is not full a <XON> character will be transmitted from the printer.

SOH C Stop/Cancel

This command performs the same function as pressing the stop/cancel button on the printer's front panel. The stop/cancel function clears the current label format from the print buffer. It will also pause the printer and turn the pause/stop light on.

Sample: <SOH>C

The pause condition is terminated as described under <SOH>B.

SOH D SOH Shutdown

This command causes the printer to ignore immediate commands (^A). The SOH shutdown command must be sent before loading graphic images or fonts since some graphic images or fonts may contain data sequences that could be interpreted as an immediate command.

Sample: <SOH>D

After the SOH shutdown command is sent, immediate commands can be turned back on by sending the SOH B command three times with a one second delay between each command, or by manually resetting the printer. It is good practice to check batch quantities <SOH>E to verify that the SOH commands are working.

SOH E Send Batch Quantity

This command causes the printer to send back a 4-digit number indicating the quantity of labels left to print in the current batch, followed by a carriage return. Communications latency may cause this value to be higher than actual on some printers.

Sample: <SOH>E

From the Printer: 0000<CR>

SOH F Send Status Byte

This command instructs the printer to send a single status byte where each bit (1 or 0) represents one of the printer's status flags, followed by a carriage return. If an option is not available for a printer the single bit will always be 0.

Sample: <SOH>F

From the Printer: X<CR>

Bit	Value	Condition
8	0	Always zero
7	1 or 0	Label presented
6	1 or 0	Printer paused
5	1 or 0	Busy printing
4	1 or 0	Printing batch
3	1 or 0	Ribbon out
2	1 or 0	Paper out
1	1 or 0	Command interpreter busy

Table 2-3 Status Byte

Note: One is the least significant bit (LSB).

System-Level Commands <STX>

The most commonly used commands are the **system-level commands**, these commands are used to load and store graphic information and to control the printer. System-level commands may be used before or after immediate commands but cannot be issued among label-formatting commands. System-level commands can be used to override default parameter values, (fixed and selectable). Selectable-parameter value defaults may be assigned via switch setting or menu selection. Menu selectable parameters are shown in the printer's operator's manual.

System commands consist of:

1. Attention Getter
2. Command Character
3. Parameters (if any).

Command Character	Command Function
A	Set Time and Date
a	Enable Feedback Characters
B	Get Printer Time and Date Information
b	Set Cutter signal time
C	Copy Module
c	Set Continuous Paper Length
D	Memory Dump (Test Mode Only)
d	Set Printer to double buffer mode
E	Set Quantity for Stored Label
e	Select Edge Sensor
F	Form Feed
f	Set Form Stop Position
G	Print Last Label Format
g	Internal Batch Software Mode
I	Input Graphics Data
i	Download Scalable Font
J	Set Pause for each label

Table 3-1 System-Level Commands (continued)

Command Character	Command Function
K	Extended System Commands
k	Test RS-232 Port, With a Y if ok
L	Enter Label Formatting Mode
M	Set Maximum Label Length
m	Set Printer to Metric
N	Enter Internal Batch
n	Set Printer to Inches
O	Set Start of Print Position
o	Cycle Cutter
P	Enter Character Dump Mode
p	Controlled Pause
Q	Clears all Modules
q	Clear Module
R	Ribbon Saver
r	Select Reflective Sensor
S	Set Feed Rate
s	Set Printer to single buffer mode
T	Printhead Dot Pattern Test Label
t	Test RAM Memory Module
U	Label Format Field Replacement
V	Software Switch Settings
v	Printer's Firmware Version Information
W	Request Memory Module Information
w	Test FLASH Memory Module
X	Set Default Module (Special Dump Mode)
x	Delete Module File
Y	Output Sensor Values
y	Select Font Symbol Set
Z	Print Internal Information and Dot Pattern
z	Pack Module

Table 3-1 System-Level Commands (concluded)

STX A Set Time and Date

This command sets the time and date. The first time the date is set it will be stored in the printer's internal inch counter. This date can be verified by printing a configuration label.

<STX>A*wmmddyyyyhhMMjjj*

where:

w	1 digit for day of week; 1 = Monday
mm	2 digits for month
dd	2 digits for day
yyyy	4 digits for year
hh	2 digits for hour in 24 hour format
MM	2 digits for minutes
jjj	3 digits for Julian date *

Figure 3-2 Time and Date

Sample: <STX>A1020319960855034

Prints: Mon. Feb 3rd., 1996, 8:55AM, the 34th day of the year.

Notes: * When this value is set to 000, the Julian date is automatically calculated. If a value other than 000 is sent to the printer, the Julian date will print as that number, and will not increment daily.

Printers with operators panels may also set the time via the panel.

Ovation printers without the Time/Date Option lose the time/date when power is removed.

This command is not available on the Prodigy.

STX a Enable Feedback Characters

This command enables the feedback ASCII HEX characters 07, 1E and 1F to be returned from the printer after specific events. The printer returns character 07 after an invalid command, 1E after each label is printed, and 1F after each batch of labels. For printers without an LCD/keypad front panel, the default value is ‘off’

Sample: <STX>a

Event	Printer's Response
Invalid character	(BEL) 0x07
Label printed	(RS) 0x1E
End of batch	(US) 0x1F

STX B Get Printer Time and Date Information

This command instructs the printer to retrieve the s time and date information.

Sample: <STX>B

Printer Response: wmmddyyyyhhMMjjj <CR>

Where:

w	1 digit for day of week; 1 = Monday
mm	2 digits for month
dd	2 digits for day
yyyy	4 digits for year
hh	2 digits for hour in 24 hour format
MM	2 digits for minutes
jjj	3 digits for Julian date

Sample: 1020319960855034 <CR>

Prints: Mon. Feb 3rd., 1996, 8:55AM, the 34th day of the year.

Note: See <STX>A for restrictions.

STX b Set Cutter Signal Time

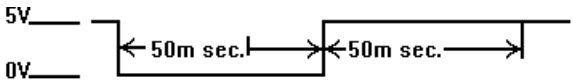
Prodigy/Prodigy Plus

<STX>bnnnn

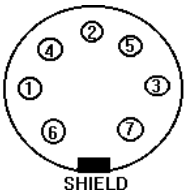
Where:	nnnn	=	4 digits, msec * 24, low/delay time
	Default	=	3125 (75 msec)

This command sets the signal time, (external signal @ port J4) and will determine the low pulse length and delay time setting to the specified value. To set a 50 msec. delay and low pulse, first calculate the four-digit time (0.050/0.000024 = 2083.33.)

For the example above, the following signal will be sent out of J4 Pin 2 located on the back panel of the printer.



↑At this point the printer will continue to print

PIN	Connected To	J4 Pin out
1	Ground	
2	Cutter signal	
3	24V 1.5 Amp Fused	
4	Not Used	
5	Not Used	
6	Not Used	
7	9V 1.0 Amp Fused	
Shield	Chassis	

STX C Copy Module

Prodigy

The copy module command will halt all operation of the printer until the module copy is complete. Be sure that the new module's write protect switch is off and the original module has the write protect switch on. Because there is only one module slot available, the following procedure must be followed for a module to be copied:

1. The pause light should begin blinking after the command is sent to the printer.
2. Insert the module to be copied at this time, (if it is not already installed).
3. Press pause to copy the module or the cancel button to abort.
4. When the pause light blinks again remove the original module and insert the new module that you want the data to be copied to. If the paper/ribbon light is on, note that it indicates the data of the original module is now being held on the main board of the Prodigy.
5. Press the pause button again and the data will be copied to the newly installed module.
6. While the module is being copied, the pause light will stop blinking and stay off, the paper/ribbon light will go out for a few seconds and then re-illuminate. When the paper/ribbon light is back on, the new module will contain the same information that the original one did.

Note: The printer can copy a module without the use of this command. If you wish to copy a group of modules it can be done by directly controlling the printer through the front panel. You can do this by first pressing the stop/cancel button and then pressing the feed button at the same time. Next release both buttons and look for the blinking pause light. Now go to step one listed above.

Prodigy Plus

Copies from module B **(**lower slot) to module A (upper slot). Both modules must be flash modules. When the data is being copied, the pause and the paper/ribbon LED's will toggle back and forth. After the copy is complete the paper/ribbon LED will stay on. This command will abort if there is data in the module A. Be sure that module A is formatted before using this command and that the write protect switch on module A is in the off position.

Sample: <STX>qA
<STX>C

This sample will first clear and format the module, then the data from module B will be copied to module A.

STX c Set Continuous Paper Length

This command is intended for applications that use continuous forms. It disables the label-edge sensor and sets a page length for the printer to feed. The sensor will continue to detect paper-out conditions.

<STX> **c***nnnn*

Where: *nnnn-* Is inches/100 or millimeters/10 (see STX m), the length of the paper to feed for each label format. It must be set to zero for edge or reflective top-of-form operation.

Sample: <STX>c0100

The above sample sets a page length of 100, which equals 1.00”, assuming metric mode has not been enabled; see <STX m>

STX D Memory dump (Test Mode Only)

Prodigy

Dumps selected memory to RS-232 port in hex-dump format, and <ESC> terminates the mode. There are several tables that provide the necessary address, this is for engineering purposes only, (refer to Appendix E). Test mode can be enabled via the DIP switch or menu selection, see the printer's operator manual for additional information.

<STX>Dbbaaaa

Where: bb = System bank address
aaaa = Memory address, from 4000 to 7999

Sample: CR>
<STX>D074000

Printer Response:

```
A07 4000
0 4000 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .....
0 4010 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .....
0 4020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .....
0 4030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ..... .....
```

Prodigy Plus / Allegro / Allegro 2

<STX>D bb(mm)aaaa

Where: bb = System bank address
mm = Module bank address if selected by system bank address. This is optional and not used with EPROM or internal RAM.
aaaa = Memory address
This must be between 4000 to 7FFF

> ☑**Note:** The difference between the Prodigy Plus and the Allegro is in selecting the module bank and the configuration of the EPROM.

Sample: <CR>
<STX>D074000

The sample above will let you view data in RAM #1 Bank 7 and the data will be displayed in a debug format. When you hit Enter more data will be transmitted out the RS-232 port. You should use a program like PC Batch version 5.0 or greater, which has a dumb terminal mode, or uses a dumb terminal to view the data. You must enter Esc to leave this mode and regain control of the printer.

STX d Set Printer to Double Buffer Mode

This command instructs the printer to enter the double buffer mode. In this mode, when printing labels with incrementing fields (see label-formatting commands) the printer will only erase and format those incremental fields, leaving the rest of the label format untouched. This in turn increases the printer's through-put. This feature is only active when the labels being printed are less than half the maximum size of the printer's print buffer, (see <STX>S).

Sample: <STX>d

✓**Note:**	This command is not available on the Prodigy.

DMX 600, DMX 800, Prodigy Max, PE42, PE43, Titan 6200, Ovation and Ovation 2

The <STX>d command is not generally used on these printers since fast formatting is the normal mode of operation when the number of variable print fields, (see label-formatting commands +, -, <,>,u) is less than, or equal to 1/3 of the total print field count. The <STX>d command forces fast formatting even when the proportion of variable print fields is greater than 1/3 the total. The maximum label size is not effected by this command, <STX>s restores normal fast formatting.

STX E Set Quantity For Stored Label

This command sets the number of labels to print for the label format currently stored in the print buffer. The most recent label sent to the printer will automatically remain stored in the buffer until the printer is reset or turned off, (this command is also used in conjunction with the STX G command, which will print the labels).

<STX>E*nnnn*

Where: *nnnn* - A four-digit quantity, including leading zeros.

Sample: <STX>E0025
<STX>G

The above sample will print 25 labels of the current label format in memory. This command may be issued prior to a label format not containing a specified quantity (Qnnn).

STX e Select Edge Sensor

This command is used for "see-through" media sensing such as die cut labels or tags with sensor holes. This command sets the printer to sense a minimum gap of 0.1 inches (2.54mm) between labels. Labels must be at least .5 inches (12.7mm) between each top-of-form, which is the point where printing of the new label will begin. To line up the top-of-form with the printhead, use the label offset command STX O.

For printers without LCD/keypad front panels, this is the default setting when the printer is powered up or reset.

Sample: <STX>e

✍**Notes:**	This command will override the LCD display or switch settings. This command is ignored when STX cnnnn has been issued with a non-zero value for nnnn. Use the STX r command to change the printer from edge sensing to reflective sensing. This command is not available on the Prodigy.

STX F *Form Feed*

This command feeds one label. After a reset condition for the first label out, if the physical label length is less than the label offset value (see <STX>O), the printer will feed more than one label until a top-of-form is sensed, or when the label edge offset is reached.

Sample: <STX>F

STX f *Set Form Stop Position (Backfeed Command)*

This command is used to adjust the stop position. This command causes the label stock to stop at a position past the start of print. When the next label format is sent to the printer, it will automatically backfeed to the start-of-print position. If a quantity of more than one label is to be printed, the printer will operate without backfeeding. Label backfeed will then only occur when the printer has stopped printing for a few seconds.

<STX>f*nnn*

Where: *nnn-* Is a three-digit distance from the sensor in inches 100 or mm/10. Distance is independent of the start-of-print position, yet must be greater than the start of print position to have any effect.

Sample*: <STX>f230

* The above sample sets a stop position distance of 230, which equals 2.3" from the label sensor unless the printer is in metric mode (see <STX>m).

Note: This command is not available on the Prodigy.

STX G Print Last Label Format

This command prints a previously formatted label and restarts a canceled batch job after the last processed label. This command is used when there is a label format in the buffer. The STX E command is used to enter the quantity. (If the STX E command is not used only one label will print.)

Sample: <STX>G

STX g Internal Batch Software Mode

This command instructs the printer to enter the Internal Batch Software Mode. There are two ways of entering the printer's Internal Batch Software Mode; first, enabling Internal Batch Mode via the operator's panel (printers with LCD/keypad front panels), or enabling the appropriate DIP switch, (some printers without LCD/keypad front panels). The second method is to send an 'Enter Internal Batch Command'. This has the same effect as the first, except that a printer reset will return the printer to the default mode of operation.

Sample: <STX>g

✓**Notes:**	This command is available for printers that support the Internal Batch Software, see the Internal Batch Operator's Manual for additional information.

STX H Set Cutter Signal Time

Prodigy / Prodigy Plus

<STX>Hnnnn

Where: nnnn = 4 digits. usec. * 24 delay time
Default = 3125 (75 msec)

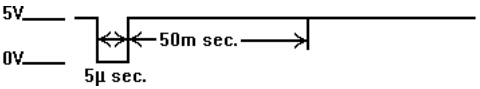
Set cutter signal time (external signal @ port J4). This command will result in a 5 usec. low pulse and setting the cutter signal on delay time.

Example:

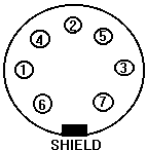
To set a 50 msec. delay and low pulse you must first calculate the 4 digit time.
0.050/0.000024 = 2083.33

<STX>H2083

The following signal will be sent out of J4 Pin 2 located on the back panel of the printer.



-At this point the printer will continue to print

PIN	Connected To	J4 Pin out
1	Ground	
2	Cutter signal	
3	24V 1.5 Amp Fused	
4	Not Used	
5	Not Used	
6	Not Used	
7	9V 1.0 Amp Fused	
Shield	Chassis	

STX I Input Image Data

This command precedes the download of image data from the host to the printer. The data that immediately follows the command string will be image data. If any of the 8-bit input formats are to be used, it is necessary to disable the immediate level command interpreter by executing a SOH D command before issuing this command. To print an image, select font type Y, (see 'Generating Label Formats'). Horizontal and vertical magnification may be used with human-readable fonts. Data sent to this field is also used as the name of the defined graphic image.

<STX>l*abfnnnnnnnn*<CR>data

Where:

a- Memory Module Bank Select, A-E (see Appendix L)

b- Data Type (optional), A or omit

b Value	Image Data Value Range
A	ASCII Characters 0-9, A-F, (7bit)
omitted	00-FF, (8 bit)

f- Format Designation, F,B,B, I, I, P, p

Designator	Format
F	7-bit Datamax image load file
B	.BMP 8-bit format (image will be flipped), 256 color[1] or B&W
b	.BMP 8-bit format (save image as received), 256 color[1] or B&W
I	.IMG 8-bit format (image will be flipped), B&W
i	.IMG 8-bit format (save image as received), B&W
P	.PCX 8-bit format (image will be flipped), B&W
p	.PCX 8-bit format (save image as received), B&W

[1] - Available on DMX600, DMX800, Prodigy Max, PE42, PE43, Ovation! and Titan 6200.

nnnnnnnn- Up to 8 characters used as an image name, must be terminated by <CR>.

data- Image data

Sample:

```
<SOH>D
<STX> I Ap Test <CR>
data...data <CR>
```

The above sample instructs the printer to receive an 8-bit .PCX image sent by 8-bit data, named ‘Test’, and to store it in memory module A.

STX i Downloading Scalable Fonts

The command structures for downloading both IntelliFont (.CDI) and True Type (.TTF) scalable fonts are as follows. Font files may be single byte or double byte character systems.

Syntax: <STX>**i***mtnnName<CR>xxxxxxxxdata...*

Where:

m Module ID to save this font to ('A', 'B', ‘C’, 'E')

t Type of scalable font being downloaded:
'I' - IntelliFont
'T' - True Type

nn Two digit font reference id. Valid range is 50-99, 9A-9Z, 9a-9z, base 62 numbers)

Name The for this font. Up to 16 characters.

<CR> 0x0d Terminates the name.

xxxxxxxx	Digit size of the font data, number of bytes, hexidecimal, padded with leading zeros.
data	The scalable font data.

Example:

<STX>iET52Tree Frog<CR>000087C2data...
This command downloads a true type font to module 'E' and assigns it the font ID of 52 and the name "Tree Frog". The size of the font data is 0x87C2 bytes long.

✓**Notes:**	Available on printers supporting the scalable font technology. Double byte font files are only compatible with printer systems that are appropriately equipped.

STX J Sets Pause For Each Label

This command is intended for use with the Peel and Present Mechanism Option or with a tear bar when the present sensor is not installed. This command causes the printer to pause between each label. After removing the printed label, the pause button must be pushed in order to print the next label. (The printer must be reset to clear the <STX > J command.)

Sample: <STX>J

✓**Note:**	This command is not available on the Prodigy or Prodigy Plus.

Prodigy – Request Memory Module Status

This command requests the memory module status response from the printer. This command will send back the memory module configured in the Prodigy.

Printer Response Format: x-btn<CR>

Where:	x	=	Y or N for bank checksum
	b	=	Bank partition being reported
	t	=	G graphics bank
			L label format bank
			X not formatted bank
	n	=	Name of bank followed by a carriage return

Sample: <STX>J

Printer Response: Y-AGPRODIGY
Y-BGSERVICE

STX K Extended System Commands

This command allows for expansion of the DPL-system commands. See page 51 for the Extended-System Commands.

STX k Test RS-232 Port

This command instructs the printer to transmit the character Y from the printer's RS-232 port. Failure to receive a Y could indicate an interfacing problem.

Sample: <STX>k

Printer Response: Y

Note: This command is not available on the Prodigy.

STX L Enter Label-Formatting Command

This command switches the printer to the label-formatting command input mode. Once in this mode, the printer expects to receive field record definition and label-formatting commands until command E, s or X is received. Immediate, system-level commands, and font-loading commands will be ignored until the label formatting is terminated with E, s, or x. See label-formatting commands for additional information.

Sample: <STX>L

STX M Set Maximum Label Length

This command will instruct the printer of the maximum distance to search for a label's edge (registration hole/mark) before declaring a paper fault. This condition can occur when this command is set to a value close to the physical length of the label (within 0.1in., 2.54mm). It is good practice to set this command to 2.5 to 3 times the actual length of the label used. The minimum position value should be at least 5" (127mm).

<STX>M*nnnn*

Where: *nnnn*- 4-digit length, 0000-9999, in/100 or mm/10
Maximum setting is 9999 (99.99in. or 2540mm).

Printer	Default (Length)
Prodigy Plus, Prodigy, 400, 430, Allegro, Allegro 2, Ovation, and Ovation 2	12in./304.8mm.
Prodigy Max, PE42, PE43, 600, 800 and 6200	16in./406.4mm.

Sample: <STX>M0500

The above sample sets a maximum label length of 5 inches unless printer is in metric mode (see <STX>m).

STX m Set Printer To Metric

This command sets the printer to measure in metric. When this command is sent, all measurements will be interpreted as metric values, (e.g., <STX>c0100 will be interpreted as 10.0mm.). See STX n.

Sample: <STX>m

Default setting: Inches

STX N Enter Internal Batch Mode (Prodigy)

With this command you can enter directly into the Internal Batch Software without using any of the dip switches at the rear of the printer. To return to the standard operating mode, go to the ALT-S screen and enter 8 to return to the RS-232 mode. See <STX> g for other printers.

Sample: <STX>N

STX n Set Printer To Inches

This command sets the printer to interpret measurements in inches, (e.g., <STX>c0100 will be interpreted as 1.00in.). See STX m.

Sample: <STX>n

Default setting: Inches

STX O Set Start Of Print Position

This command sets the point where printing starts, relative to the top-of-form position. Top-of-form is the point where a label edge is detected by the label edge sensor. The printer will feed from the top-of-form to the offset point specified in this command, and begin printing there. To set the top-of-form exactly at the label's leading edge of the printhead, use a value of 220 +/- 5. (This value may vary from printer to printer due to the distance between the edge sensor and the printhead). This offset value is independent of the STX f, set form stop position command.

<STX>O*nnnn*

Where: *nnnn*- Is a 4-digit offset value. The "zero" setting is default. Settings below 50 are adjusted back to default.

Printer	Default Start of Print	
	Inches	**Metric**
Prodigy	0250	0635
Prodigy Plus, 6200[2]	0110	0279
Prodigy Max[1]	110/250	0279/0635
All others[2]	0220	0559

[1] DIP switch selectable
[2] Menu selectable, if equipped

Sample: <STX>O0300

The above sample sets a start of print position of 3 inches unless printer is in metric mode. (See <STX>m).

STX o Cycle Cutter

When this command is sent, the (optional) cutter mechanism will immediately make a cut. The Cutter Option must be enabled and the cutter motor cover must be in place for the cutter to operate.

Sample: <STX>o

✍**Notes:**	This command is not available on the Prodigy. The Prodigy Plus requires firmware version 1.18 or greater.

STX P Character (HEX) Dump Mode

This command instructs the printer to begin the Character Hex Dump Mode, also known as the ASCII Dump or "monitor" mode. Any data sent afterwards to the printer will be printed on the labels. Labels must be at least 4 in./101.6 mm) long and as wide as the printer’s width. This command has the same effect as turning the printer on while holding the feed button; however, two test labels will be printed. To return to normal operations the printer must be manually reset.

Sample: <STX>P

STX p Controlled Pause

This command causes the printer to pause and has the same effect as the immediate command, Pause (SOH B); however, the controlled pause command will cause the printer to pause only after all previously received commands are executed. This pause is often useful between batches of labels.

Sample: <STX>p

✍**Note:**	This command is not available on the Prodigy.

STX Q Clears All Modules

This command instructs the printer to clear all of the Flash, RAM, and Internal Modules, (see your operator's manual for Flash, RAM and Internal Module options).

Sample: <STX>Q

Prodigy – Clear 32K SRAM module

<STX>QaCLEAR

Where: a = Memory bank
A = A bank 16K
B = B bank 16K
C = Both banks 32K

This command will clear out the desired memory bank of the Prodigy printer. After the module has been cleared it will need to be formatted for graphics or label formats; see the STX Xatnn. command.

Sample: <STX>QACLEAR
<STX>XAGTEST

The above command will clear and format bank A of the 32K SRAM module on a Prodigy.

Notes: This command is not available on the Prodigy Plus, Allegro, or Allegro 2.

STX q Clear Module

This command clears the selected memory module (Flash or RAM). Turn off the write protect switch on flash memory modules before using this command. If a module becomes corrupt during normal operations it must be cleared. A corrupt module is identified when the printer responds with a ‘No Modules Available’ message to a <STX>W, request memory module information command. If a flash module is corrupt it cannot be cleared with this command; to clear and reformat a corrupted module, place it in the slot and cycle the printer's power off and then on. If an image file is loaded improperly, or it is bad, the entire module may appear corrupt. The flash module is at the end of its life cycle after it has been cleared approximately 100,000 times. If a module directory intermittently returns the message ‘No Modules Available’, or data continuously becomes corrupt with the write protect switch on, the module is at the end of its life and must be replaced. Before concluding that a module is defective, cycle the printer's power and test the module.

<STX>q*a*

Where: *a* = Memory module bank select, A-E

Sample: <STX>qA

The above sample clears memory module A.

Notes: This command is not available on the Prodigy.
See Appendix L for additional information.

STX R Ribbon Saver on/off

<STX>Rx

Where: x = Y= Enabled (default*)
N = Disabled

This is the only command that is used for the ribbon saver. This command is not used to tell the ribbon saver when to lift or go down, rather it turns the option completely on or off. The ribbon saver will operate automatically and lift when the minimum amount of white space is exceeded. Ribbon saver operation will work continuously when it is on.

Sample: <STX>RN

The sample above will turn the ribbon saver off.

Default: DIP switch or operator panel selection.

☑**Note:**	This command is ignored on printer's not equipped with the ribbon saver option.

Prodigy – Remove Graphic Image

<STX>Rnn...n

Where: nn...n = Image name, 8 characters maximum.

With this command an individual graphic image can be removed from the memory module. This function is only available on the standard Prodigy printer.

Sample: <STX>RLOGO<CR>

STX r Select Reflective Sensor

This command selects the reflective sensor for label detection. Used for "black-stripe" media sensing such as continuous tags or butt-cut labels. A black stripe must be printed on the back side of the media. The sensor will sense the end of the black mark determining the top-of-form, (the point where printing will begin). Labels must be at least 0.5" (13mm) between each top-of-form. To line up the top-of-form with the printhead, use the label offset command STX O. The reflective sensor on the printer can be moved left/right to line up with a mark on the underside of the labels, (the STXe command changes the printer from reflective sensing back to edge sensing).

Sample: <STX>r

Default setting: Edge sensing

Note: This command is not available on the Prodigy.

STX S Set Feed Rate

This command sets the speed that the printer will feed media when the feed button is pressed.

<STX>S*n*

Where: *n* - Is a letter value from A to S, (see Appendix M).

STX STEST Test Module Memory (Prodigy only)

<STX> STEST

This command will cause a test of the 32K RAM module for the Prodigy printer and overwrite any information stored on the module.

Sample: <STX>STEST

Printer Response: Good: MODULE OK!!<CR><BEL>
Bad: MODULE BAD!! <CR><BEL>

STX s Set Printer To Single Buffer Mode

This command instructs the printer to use single buffer mode. In this mode, the printer will erase and format all fields. This in turn decreases the printer's through-put when incremental or replacement fields (see label-formatting commands) are used. (See <STX>d double buffer mode).

Sample: <STX>s

Note: This command is not available on the Prodigy.

STX T *Printhead Dot Pattern Test Label*

This command instructs the printer to print a dot pattern test label. This command prints the same dot pattern test label as powering up the printer with the ‘Feed’ button held down (self-test mode), except that the printer will not print a configuration label and will not enter Character Hex Dump Mode. To view the full test pattern use the media as wide as the print width and at least 2 in. (50.8 mm) long.

Sample: <STX>T

STX t *Test RAM Memory Module*

This command tests all RAM modules; however, the printer must be in test mode for the command to function. The printer returns a one-line message stating whether the module is good or bad, (no message is returned if a module is not available). Test Mode can be enabled via the DIP switch or menu selection, see the printer’s operator manual for additional information.

Sample: <STX>t

DMX 400 / 430 / Allegro / Allegro 2 / Prodigy Plus

From the Printer: a xxxK MODULE GOOD<CR>

Where: a - 1 or 2 to specify the slot (memory module).
1= Slot (Top) 2 = Slot B (Bottom)
Allegro = 2 (B slot - left side)
xxx - States size of module in Kbytes (256 or 512)

All other Printers

From the Printer:	Module A:	xxxxK	Ram Tested	results<CR>
	Module B:	xxxxK	Ram Tested	results<CR>
	Module D:	xxxxK	Ram Tested	results<CR>
	Module e:	xxxxK	Ram Tested	results<CR>

Where: xxxx States size of module in Kbytes
Results: Module test results, ‘good’ or ‘bad’

Note: This command is not available on the Prodigy.

STX U Label Format Field Replacement

This command places new label data into format fields. Format fields are used to build a label. The new data string must equal the original string length and contain valid data. To easily keep track of fields put all of the fields to be updated with the command at the beginning of the label format. A maximum of 99 format fields can be updated. Fields are numbered consecutively 01 to 99 in the order in which they are received.

<STX>U*nnss..s*<*CR*>

Where: *nn* - Is the format field number, 2 digits.

ss..- Is the new string data followed by a <CR>

Sample: <STX>L
161100001000100data field1<CR>
161100001100110data field2<CR>
161100001200120data field 3<CR>
00001
E
<STX>U01New data F1<CR>
<STX>U02New data F2<CR>
<STX>E0002
<STX>G

The sample above results in three printed labels, the first is formatted with the commands between <STX>L and E. The next two labels print with the replacement data contained in the STX U commands, (see STX E and STX G).

STX V Software Switch Settings

Printer options are set by entering selections through the front panel menu or DIP switch settings, (depending on the model of printer). The software switch setting command allows three of these option settings to be modified without having to enter the front panel menu routine or change DIP switch settings. Choosing the appropriate values allow any or all of the options to be turned on or off. Each option has a corresponding bit whose value is 1 when the option is enabled. The bit value tables indicate the appropriate command value for the desired bit.

<STX>V*n*

Where: *n* - Is a single digit ASCII numeric value from 0-F. The value of n is used to override the power up option settings. Reset or power-up cancels the override and returns the printer to the original settings.

DIP Switch: Bit Assignment By Printer

Bit Assignment	400, 600, 800, and 6200	Prodigy Plus	Prodigy	Allegro, Allegro 2	Prodigy Max, Ovation, Ovation2, PE42 and PE43	DIP Switch
0	Cutter	Cutter	Cutter	Cutter	Cutter	8
1	Internal Batch	Insert Ribbon Sense	Invert Ribbon Saver	Internal Batch		7
2	Label Present	Label Present	Label Present		Label Present	6
3			Internal Batch			5

Use the bit assignment table listed above to determine the command value n in the binary table below.

Bit Value: Command Value

	Bit						Bit			
n	3	2	1	0		n	3	2	1	0
0	0	0	0	0		8	1	0	0	0
1	0	0	0	1		9	1	0	0	1
2	0	0	1	0		A	1	0	1	0
3	0	0	1	1		B	1	0	1	1
4	0	1	0	0		C	1	1	0	0
5	0	1	0	1		D	1	1	0	1
6	0	1	1	0		E	1	1	1	0
7	0	1	1	1		F	1	1	1	1

Sample: <STX>V5

The sample above corresponds to setting Bits 0 and 2, which for a DMX400, set the printer to the following:

“Label present ‘on’; Internal Batch ‘off’; and cutter enabled.”

The DIP switch, mounted on the rear of the printer, is read on power-up or with the SOH # command. The position of switches 6 through 8 can be modified by this command.

STX v Printer's Firmware Version Information

This command causes the printer to respond by sending a version string. The version may be different from printer to printer, (this data is the same as that on the test label).

Sample: <STX>v

From the Printer: VER DA - 01.01 12/21/93<CR>

Note: This command is not available on the Prodigy.

STX W Request Memory Module information

This command requests a directory listing for memory module(s). Although a module can store font, graphics and format data together, it can display only one type of information at a time. If the module contains all three types of data, it will be necessary to check the directory three times, using each of the control parameters, F, G, and L, to determine its contents.

<STX>W*a*

Where: a-F = Font data
G = Graphic data
L = Format data

Sample: <STX>WG

Printer response*: MODULE: A<CR>
AVAILABLE BYTES IN MODULE:
00049083<CR>
MODULE: B<CR>
LOGO<CR>
CAM<CR>
AVAILABLE BYTES IN MODULE:
00257919<CR>

*The response shows Module A contains no graphic data and has 49083 bytes of free space. Module B contains two graphic image files, LOGO and CAM, and has 257919 bytes free.

STX w Test Flash Memory Module

This command performs a test sequence on flash memory modules; however, the time for each test will vary (20 seconds to two minutes), depending on the size of the module. The module must have the write protect switch ‘off’ for testing; all data in the flash module will be destroyed.

DMX 400/430 / Allegro / Allegro 2 / Prodigy Plus

The printer responds with a list of 32 characters representing the programming and verification of 16 banks of 16K of data. If only p's and v's are returned all programmed data has been verified and the Flash Module is good; **e** indicates a definite memory error; and **?** indicates that a hardware problem exists. The problem could be a module or the interfacing hardware.

Printer response: aaaaaaaabbbbbbbb

Where: any ‘a’ may be:

P - program success
? - hardware problem
e - module error

and any ‘b’ may be:

v - verify success
? - hardware problem
e - module error

Sample: <STX>w

Printer Response: pppppppvvvvvvvv =Good or
???????????????? =Hardware problem or
eeeeeeeeeeeeeeee =Memory error

All Other Printers

The printer responds with a ‘good’ or ‘bad’ message results for each module tested. No modules present will result in no printer response.

Printer response format: Module a: xxxxK Flash Tested results

Where: a - module = lot A or B
xxxx - module size in Kilobytes
results - test results, Good, Bad

Notes: This command is not available on the Prodigy.

STX X Set Default Module

The default module command is used when downloading information to module memory and is designed to allow the user to select between memory modules. If C is entered to select a memory bank, the data will go to whichever bank was set by the set default module bank command. If the printer uses only one bank, this command is not necessary.

<STX>X*a*

Where: *a* = A,B, C, D, E memory module (bank) name (See Appendix L)

Sample: <STX>XB

The above sample sets the printer's default module to memory module B.

The default module is one of the following:

1. The first alpha designator of existing modules if 2 or 3 have not occurred.
2. The most recent module to be inserted into the printer while power is on.
3. The module selected by this command.

Note: This is typically used prior to font loading of PCL-4-bit-mapped fonts, (see font-loading commands).

STX x Delete File from Module

This command removes a specific file from the specified module. The file name is removed from the module directory and thus the file cannot be accessed. The actual storage space occupied by the file is not released. The pack command can be issued to reclaim all deleted file storage space, (see STX z).

Sample: <STX>**x**mtnn...<CR>

Where:

x	ASCII x (0x78)
m	The module identification character, A - E, see Appendix
t	The file type identification code.
'G'	Graphic (Image) file type
	'L' - Label Format file type
'F'	Bit Mapped file type
'S'	Smooth Scalable Font file type
nn...n	The file name to delete. Up to 16 characters for graphic (Image) or label format files. Three digits for bit-mapped Font files and two digits for smooth scalable Font files.

Note: This command is only available on the DMX 600 (version 2.01 or greater), DMX 800, Prodigy Max, Ovation, Ovation2, 6200, PE42 and PE43.

STX Y *Output Sensor Values*

This command causes the printer to respond with the sensor value status. The printer must be in test mode, controlled from the operator's panel, or DIP switch (depending on model printer). When STXY is received, the printer will respond with the printer sensor values. To repeat the display of values, send the printer a 'SPACE' (20 hexadecimal). Send <ESC> to terminate the function.

Sample: <STX>Y

From the Printer:

```
Thermistor ADC: 0071 Reflective ADC:0000 Transmissive ADC
0179  Paperout ADC: 0225 Battery Level:  GOOD <CR>
```

Where:

Paperout ADC: 0225	indicates paper is present, 0000 indicates paper is not present.
Battery level: Good	indicates battery is sufficiently charged, 'low'. indicates battery is insufficiently charged.

> ✍**Note:** This format is somewhat different for all printers. Some printers require printer controlled paper movement for the paperout sensor to indicate meaningful value.

STX y *Select Font Symbol Set*

This command selects the scalable font's symbol set. The selected symbol set is active until another symbol set is selected. See Appendix's E and I, in addition to STX KS for additional information.

Command: <STX>ySxx

Where: S = single byte symbol sets
xx = Symbol set selection.

Example: <STX>ySPM

Selects PC-850 multilingual set

> ✓**Note:** This command is only available on printers that support scalable fonts.

STX Z Print Internal Information and Dot Pattern

This command prints the human-readable test data and the dot pattern test labels. The results are similar to performing the power up self-test, but the printer does not enter Character Hex Dump Mode. In order to be sure all of the information will fit, use the labels as wide as the print width and at least 4 in. (101.6mm) long.

Sample: <STX>Z

STX z Pack Module

This command causes the printer to reclaim all storage space associated with all deleted files on the specified module. A flash module cannot be packed.

Sample: <STX>zm

Where: m The module identification character, A-E. (see Appendix L, <STX>X and <STX>x for additional information.

> ✓**Note:** This command is only available on the DMX 600 (version 2.01 or greater), DMX 800, Prodigy Max, 6200, Ovation, Ovation 2, 6200, PE42and PE43.

Extended-System Commands <STX>K

Extended-system commands are additional system-level commands that provide extra printer control and are issued in contexts the same as system-level commands.

Command Character	Command
-	Top-of-Form, Offset Distance
f	Set Present Distance
D	Database Configuration
I	GPIO Input
M	Configure Internal Memory Module Size
O	GPIO Output
Q	Query Memory Configuration
R	Reset Memory Configuration
r	Reset Internal Counters
S	Configure Scalable Font Cache Size
W	Configure Print Width Size

Table 4-1 Command Characters

STX K Offset Distance, Top-of-Form (Prodigy Plus only)

This system-level command allows the start-of-print to be fine tuned. Values less than 0 cause print to begin earlier, at a position lower on the label. Large negative values may cause start of print to begin on the preceding label. This value is stored in non-volatile memory for subsequent power-ups.

<STX>Ksnn

Where: s = Minus sign (-) for negative values, Not included for positive values
nn = 00 to 64 inches/100, in metric mode mm/10.

STX KD Configuration (Ovation and Ovation2 only)

The configuration command (<STX>KD) controls the printer's environment and operates like a pseudo DIP switch in that the command is stored in non-volatile memory and is retained for future power-ups.

Syntax: <STX>KDxyz<CR>

x,y, and z are binary values with respective bit settings are defined in the following tables. Bit 0 is least significant.

Where x:

Bit #	Function	Value - Meaning
0-2	Baud Rate	0=9600, 1=600, 2=2400, 3=19200, 4=4800, 5=300, 6=1200, 7=9600 Test Mode
3	Word Length and parity	0=8 bits and no parity, 1=7 bits and even parity
4 & 5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

Where: y

Bit #	Function	Value
0	Print Method	0=direct, 1=transfer
1	Present Sensor	0=not equipped, 1=equipped
2	*Control Character	0=standard, 1=main frame
3	Cutter	0=disabled, 1=enabled
4 & 5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

* Selects the control character's value(s), see the Control Character Sets Table on the following page. See Chapter 1 'Control Codes'

Where: z

Bit #	Function	Value
0 & 1	Paper Type	0=gap (edge), 1= reflective, 2=continous 3” default, (see <STX>c
2	Linerless	0=not equipped, 1=equipped
3-5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

STX Kf Set Present Distance (Ovation, Ovation 2, PE42 and PE43)

This command specifies the additional amount to advance the label after print. This command has the same effect as the set form stop position (STX f) command but specifies the distance to advance relative to the start of print of the next label. The label’s advanced position, when set with <STX>Kf, is effected by the set start of print position (STX O) command.

<STX>Kf nnnn

Where: nnnn = a four-digit present distance, in/100 or mm/10

Sample: <STX>Kf 0100

The above sample represents a one-inch label advance unless the printer is in metric mode, (see <STX>m).

STX KI GPIO Input DMX600 / 800, PE42, PE43, Prodigy Max, 6200

This system-level command is used to configure the general purpose I/O input channels. It provides for external control of the printer via discrete lines. User input controls labeled I1 through I8 are for use in conjunction with the Software Developer's Kit (SDK), Applications Program Interface (API). The PS, PRINT_START input allows the user to determine when label printing (paper movement) begins, (label formatting generally begins when formatting data is received). A Signal name is attached to a selected pin and given a signal characteristic as per the command syntax.

<STX>KIff;p;s;a;www

where:

ff - 2-character function name (not case sensitive):

- PS - PRINT_START

for DPL / API Users

- I1 - USER_INPUT1
- I2 - USER_INPUT2
- I3 - USER_INPUT3

...

- I8 - USER_INPUT8

p 1 character pin number, 1..8

s 1 character signal type, not case sensitive

- L - Level input, www = minimum time signal present, else ignore
- P - Positive Pulsed input
- N - Negative Pulsed input
- & - AND inputs (pin number field specifies a bit mask)
- + - OR inputs (pin number specifies a bit mask)

a 1 character active polarity

- 0 - Active Low
- 1 - Active High

www 3-digit pulse width 000..999

Sample:

<STX>KIps;5;L;0;020<cr>

Start of print occurs when input pin #5 remains low for at least 20 mS.

✓**Notes:**	All user I/O occurs at a fixed periodic rate of one sample every 5ms. This command is only available on the DMX 600, 800, PE42, Prodigy Max and 6200. The pin number field bit masks are expressed in ASCII decimal numeric representation. Each bit represents an input pin I1, I2, I3,... I8. All pins used in the bit mask will have the same signal characteristics.

STX KM Memory Configuration

DMX 600, 800, Prodigy Max, Ovation, Ovation 2, PE42 and PE43

This system-level command specifies the configuration of the printer's available internal DRAM memory. The internal DRAM memory is inclusive of the standard DRAM and any additional optional DRAM installed. This command provides a method for managing internal memory configuration of the printer. Memory can be assigned to specific entities or functions in units of 4KB blocks. The configuration is stored in non-volatile memory and is reinstated upon a power-up or reset of the printer. If the total requested memory allocation exceeds the configurable memory available, the command will be rejected and the printer will assume its previous memory configuration.

A memory configuration command that contains no fields causes the memory configuration to be left as is. Any internal memory configurations not specified by the command results in ‘No Changes’ to those configurations. The memory configuration specified by the command is executed by the printer during the next idle period following receipt of the command.

The query memory configuration command STX KQ will provide the label print buffer space-available information. The memory allocation(s), as set by this command, draw from the same memory pool inevitably effecting maximum print length, as well as throughput.

Syntax:

<STX>Kix[:jy][:kz]<CR>

Where: i, j, k are M, S, or W as described in the following paragraphs, x, y, z are four-digit maximum number of 4K byte blocks or in/100 or (mm/10) as described below.

Any of the three fields is optional and are separated by the colon. Brackets indicate optional fields.

M This represents the start of a sequence (up to five characters), that assigns memory to the internal memory module. If this field does not appear, then the internal memory module is not affected. If no internal memory module exists, it will be created and formatted. If the internal memory module already exists, it will be erased, re-sized and formatted. The number that follows the M is a decimal number (up to four digits) that specifies the size of memory in 4KB blocks, to assign to the internal memory module. A value of "0000" will delete the internal memory module, (see Appendix L for additional information).

S Represents the start of a sequence (up to five-characters), that assigns the amount of internal memory allocated to the smooth scalable font processor. This field is optional and if it does not appear, the current amount of memory assigned to the smooth scalable font processor is left unchanged. This must be at least 15 to print scalable fonts, 60 for Kanji fonts. The number that follows the S is a decimal number (up to four digits) that specifies the size of memory, in 4 KB blocks, to assign to the smooth scalable font processor. The minimum requirement is 0015 (60KB). Any value less than this results in the amount of memory assigned to be zero (0000) and disables the printing of smooth scalable fonts. The recommended value is 0025 (100KB).

W Represents the start of a sequence, (up to five-characters), that sets the printable label width. Setting a width smaller than the natural (maximum) width of the printer effectively extends printable label length. This field is optional and if it does not appear, the current printable label width is left unchanged. The number that follows the W is a decimal number (up to four digits) that specifies the printable label width in either 100th's of inches or millimeters, depending on the current units setting of the printer (English or Metric). If the value specified exceeds the natural (maximum) width of the printer, the printable label width is set to its maximum. If the value specified is less than the minimum value allowed, then the printable label width is set to the minimum allowed value. The minimum allowed value is 200 and maximum value is the maximum printer width.

Only one field M, S, or W is required, any two fields are separated with a colon as shown.

Label printing requirements may be computed as bytes (label print length * width allocation* printhead resolution/8). For maximum throughput the memory allocated should allow for three times the computed requirement. Or available label length as determined by <STX>KQ should be three times label print length.

STX KO GPIO Output DMX600 / 800, PE42, Prodigy Max

This system-level command is used to configure the general purpose I/O output channels. It provides for external signals from the printer via discrete lines. User output controls labeled O1 through O8 are used in conjunction with the Software Developer’s Kit (SDK), Applications Program Interface (API).

Other signal names provide the information the signal names imply and may be attached to the selected pin, with a selected signal type per the command syntax. See Appendix J for detailed a hardware description.

Sample:

<STX>KOff;p;s;a;ddd;ppp;ttt;www

where:

ff	2-character function, not case sensitive	
	CF	CUTTER_FAULT
	CO	COVER_OPEN
	CS	CUT_SIGNAL
	LC	LABEL_COMPLETE
	LM	LABEL_MOVEMENT
	LO	LABEL_OUT
	LW	LABEL_WAIT
	PC	PERIODIC_CLOCK
	PJ	PAPER_JAM
	PO	PEEL_OFF_COMPLETE
	RF	RIBBON_SAVER_FAULT
	RO	RIBBON_OUT
	RS	RIBBON_SAVER
	for DPL / API Users	
	O1	USER_OUTPUT1
	O2	USER_OUTPUT2
	O3	USER_OUTPUT3
		...
	O8	USER_OUTPUT8
p -	1 digit pin number 1..8	
s -	1 character signal type not case sensitive	
	L - Level output	
	P - Pulsed output	
a -	1 digit active polarity	
	0 = Active Low	
	1 = Active High	
ddd	3-digit TRUE delay time 000..999	
ppp	3-digit TRUE pulse width 000..999	
ttt	3-digit FALSE delay time 000..999	
www	3-digit FALSE pulse width 000..999	

Sample:

<STX>KOLC;2;L;1;020;000;050;000<cr>

Label complete on output pin 2 will go high 20 mS after the label completes printing. 50 mS after a new label starts printing, the label complete output will go low.

> ✓**Note:** All user I/O occurs at a fixed periodic rate of 5 mS per tic. This command is available only on the DMX 600, DMX 800, PE42, Prodigy Max and 6200.

STX KQ Query Memory Configuration

DMX 600, 800, Prodigy Max, Ovation, Ovation 2, PE42, PE43 and 6200

This system-level command causes the printer to transmit its internal DRAM memory configuration to the host device. The transmitted data provides information as to the total amount of internal DRAM memory installed, the total amount available for configuration and the amounts of memory currently assigned to specific functions or entities.

Syntax: <STX>KQ

Printer Response Format:

INTERNAL MEMORY<CR>
VER: ab-cdd.ee mm/dd/yy<CR>
INSTALLED: iiii<CR>
AVAILABLE: vvvv<CR>
MODULE: X:xxxx<CR>
SCALABLE: ssss<CR>
LABEL MEM: LLLL<CR>
LABEL SIZE: wwww:gggg:oo<CR>

Where:

<CR>ab	ASCII Carriage Return (0x0D) record delimiter.
aa-cdd.ee mm/dd/yy	ASCII string sequence that represents the firmware version number string.
iiii	The number of 4KB blocks of installed internal DRAM memory.
vvvv	The number of 4KB blocks of internal DRAM memory available for configuration.
X:	ASCII character identifying memory module, followed by an ASCII colon ":". If no internal DRAM memory module is present, then this field and it's associated legend will not appear
xxxx	The number of 4KB blocks of internal memory allocated for the internal DRAM memory module.
ssss	The number of 4 KB blocks of internal memory assigned to the smooth scalable font processor cache.
LLLL	The number of 4 KB blocks assigned to label print buffers.
wwww	Current maximum printable label width (in 100ths of inches or millimeters).
gggg	Current printable length (in 100ths of inches or millimeters). 200 min. / 640 max.
oo	Current label dimension unit's designation. "IN" for inches and "MM" for millimeters.

STX KR Reset Memory Configuration

DMX 600, 800, Prodigy Max, Ovation, Ovation 2, PE43, PE43 and 6200

This system-level command resets the printer's internal DRAM memory configuration to its default settings. See STX KM

Syntax: <STX>KR

STX Kr Resettable Counter Reset (Ovation)

This command resets the internal counters. The internal counters require the time and date option.

Syntax: <STX>Kr

STX KS Scalable Cache Configuration

See STX KM

STX KW Width Label Memory Configuration

See STX KM

Label-Formatting Commands

An STX L command switches the printer from the system level to the label- formatting command processor. All commands after STX L are interpreted as label-formatting commands. Label-formatting command can be used to override default parameter values. Selectable parameter value defaults may be assigned via the menu selection on printers so equipped. Menu-selectable parameters are shown in the printer's operators manual. Label formats do not contain commands overriding printer default values will assume the defaults.

Command Character	Description
:	Sets cut by amount (4-Digit)
+	Makes last field entered increment numeric
-	Makes last field entered decrement numeric
>	Makes last field entered increment alphanumeric
<	Makes last field entered decrement alphanumeric
^	Sets count by amount
A	Sets format attribute
C	Sets column offset amount
c	Sets cut by amount (2-Digit)
D	Sets width and height dot size
E	Terminates label formatting mode and print label
G	Places data in global register
H	Enters the heat setting
M	Sets mirroring mode
m	Sets metric mode
n	Sets inch mode
P	Sets speed for print cycle
p	Sets label backup speed
Q	Enters quantity of labels to print
R	Sets row offset amount
r	Recalls stored label format

Table 5-1 Label-Formatting Commands (continued)

Command Character	Description
S	Sets slew rate speed for feeding labels
s	Stores label format in module
T	Sets field data line terminator
U	Makes previous field a string - replaces the field
W	Wait mode (Prodigy only)
X	Terminates label formatting mode
y	Selects font symbol set
Z	Zip mode (Prodigy only)
z	Zero (0) conversion to "O" to eliminate slash (/)
<STX>S	Recall global data
<STX>T	Print time and date

Table 5-1 Label-Formatting Commands (concluded)

: *Set Cut By Amount*

This command allows a predetermined number of labels to be printed before a cut is made. This feature is useful when it is necessary to print an uncut strip of labels. Between 0001 and 9999 labels may be printed before a cut is made. The amount must be smaller than the quantity of labels printed.

:*nnnn*

Where: *nnnn-* is a four digit decimal number indicating the number of labels to be printed before a cut is made.

Sample:
```
<STX>L<CR>
:0005
141100001000100SAMPLE LABEL<CR>
Q0021
E
```

The above sample instructs the printer to make cut after labels 5, 10, and 20 have been printed. Label 21 will be cut at the start of a subsequent label format (batch) unless a default (cut by amount) greater than one (1) has been entered via the operator's panel.

Note: The cutter must be enabled and the cutter shield in place before the cutter will operate.

This command is not available on the Prodigy.

A Set Format Attribute

This command specifies the type of format operation and remains in effect until another format command is specified or another label format has begun (<STX>L). Each label format defaults to attribute 1 - XOR.

A*n*

Where: *n*- is either a 1, 2, 3 or 5

1 =	**XOR Mode**:	This is the default mode regions, where text strings, images, or barcodes intersect will not be printed, (an odd number of overlapping objects will print).
2 =	**Transparent Mode:**	This optional mode allows the intersection of text strings, images, and barcodes to print. This allows the user to print fields on top of one another. (i.e., the letter I printed on top of a dash would combine to show a plus).
3 =	**Opaque Mode:**	Interacting text is obliterated by the text formatted last, each character cell is treated as opaque.
5 =	**Inverse Mode:**	This mode allows inverse (white on black) printing. A proportionally sized border and background are printed as in a photographic negative.

Sample:

```
<STX>L
A2
141100001000100DATAMAX<CR>
141100001100110DATAMAX<CR>
E
```

The above sample sets the printer to transparent mode and prints one label showing overlapping text..

Default setting: XOR for all printers except the DMX 600/800, which is set via the operator's panel.

> ✓**Note:** This command is not valid on the Prodigy, Prodigy Plus, Allegro, or Allegro 2.

Examples of attributes:

Inverse Mode

Opaque Mode

Transparent Mode

XOR Mode

C Set Column Offset Amount

This command allows horizontal adjustment of the point where printing begins. This feature is useful when a single format must be printed on several different types of labels that already have printed information. If the pre-printed data does not appear in the same place on every label, the new data may overlap the pre-printed data. The ‘C’ command instructs the printer to print label formats **nnnn** units to the right of the position that the format specifies.

C*nnnn*

Where: *nnnn*- is a four-digit number for the column offset, in/100 or mm/10. The printer default is 0 for offset.

Sample: <STX>L
C0050
141100001000100DATAMAX<CR>

The above sample will shift all format data .5 inches to the right, unless the printer is in metric mode, (see label-formatting command M).

c Set Cut By Amount

This command is the same as the ‘:’ command except that only a two-digit value can be entered. This command allows a predetermined number of labels to be printed before a cut is made. This feature is useful when it is necessary to print an uncut strip of labels, you may print 01 to 99 labels before a label is cut.

c*nn*

Where: *nn*- is a two-digit number indicating the number of labels to be printed before a cut is made. The printer default is one.

Sample: <STX>L<CR>
c07<CR>
141100001000100SAMPLE LABEL<CR>
Q0021<CR>
E

The above sample instructs the printer to make a cut after labels 7, 14, and 21 have been printed. See label-formatting command: set cut by amount.

> ✓**Note:** The cutter must be enabled and the cutter shield in place before the cutter will operate.
>
> This option is not available on Prodigy.

D Set Width and Height Dot Size

This command is used to change the size of a printed dot, hence the print resolution, {dots per inch (dpi)} of the printer. By changing the height of a dot, the maximum length of a label can be increased or decreased. The table below lists the step sizes available.

D*wh*

Where: *w*- is Dot Width multiplier 1 or 2.
h-is Dot Height multiplier 1, 2, or 3.

	Dot Size	
Printhead Resolution (DPI)	**Inches**	**Millimeters**
203	. 049	.13
300	.0033	.08
152	.0065	.16
289 (DMX 430)	.0035	.09

Default setting: D22 for all printers except the DMX 600/800. Is set via the operator's panel for the DMX 600/800.

E Terminate Label Formatting Mode and Print Label

When the printer is processing label-formatting commands and receives an '**E**' command, it will immediately print a label based on the data it has received. Even if no printable data has been received, the printer will generate and feed a label, (other termination commands are '**X**' and both '**s**' label-formatting commands). Commands sent to the printer after a terminate label command must be of either immediate, system, or font download.

E

Sample: <STX>L<CR>
121100000000000Testing<CR>
E<CR>

The above label format will print a label.

G Place Data In Global Register

The '**G**' command is sent to the printer following a print format record and the print data in the format record is placed in a global register, (temporary storage). This data may be retrieved and copied in another record in the same label format by using the special label-formatting command STX S. Global registers are named in the order received, beginning with register A and ending at register P, incrementing for each instance of the G command.

G

Sample: <STX>L<CR>
121100000000000Testing<CR>
G<CR>
1A2210001000000<STX>SA<CR>
E<CR>

The above sample stores, retrieves and prints the data in global register A. One label is printed containing "testing" in two locations.

H Enter Heat Setting

This command changes the "on time" of dots on the printhead. The printer powers up with a default setting of 10, except in the case of printers with LCD/keypad front panels where the default setting can be changed through the front panel. Varying this number changes the amount of time the dots are "turned on" which in turn changes the amount of heat transferred from the printhead to the media. The range of valid settings is 00 to 20*.

This command is helpful when the printer is used with several different media types. When a label format is sent to the printer and the media requires more or less heat than the amount set by the default temperature, the host device can send a command before or after the format to correct the heat setting for the media being used.

H*nn*

Where:

nn- is a two-digit heat value (00-20)

Sample:
```
<STX>L<CR>
H15<CR>
141100001000100SAMPLE LABEL<CR>
E
```

The above sample sets the printer for a heat value of 15 and prints one label.

✓**Notes:**	The darker potentiometer on printers <u>without</u> LCD/keypad front panels and the darkness menu function on printers <u>with</u> LCD/keypad front panels is intended for matching replacement printheads to the printer after a head replacement procedure. It has very little control over the actual burn temperature used for imaging. *The Prodigy Max, Ovation, Ovation 2, PE42 PE43 and 6200 have a maximum value of 30. The printer automatically compensates for varying print speed by internally adjusting heat. Higher speeds result in the maximum heat even with heat settings less than 30, depending on the darkness setting and the direct-thermal setting.

M Select Mirror Mode

This command instructs the printer to "mirror" all subsequent print field records. This command toggles the mirroring mode.

Mirrored fields are transposed visually as if the object is viewed in a mirror.

<STX>L

Sample: 161100003200010 NOT MIRRORED<CR>
M<CR>
161100003000400 MIRRORED<CR>
E

Results Printed:

NOT MIRRORED

MIRRORED

✓**Note:**	This command is only available on the DMX 600 (version 2.01 or greater), 800, Prodigy Max, PE42, PE43, Ovation, Ovation 2 and 6200.

m *Set Metric Mode*

This command sets the printer to measure in metric. When this command is sent, all measurements will be interpreted as metric values, (e.g., a column offset of 0010 will be interpreted as 1.0mm while in metric mode, and as 0.10in while in inches mode). All printers default to English units.

Sample:

```
<STX>L<CR>
m
141100001000100SAMPLE LABEL<CR>
E
```

The above sample will result in the text “sample label” printed at starting location coordinates 10.0mm, 10.0mm.

n *Set Inch Mode*

This command sets the printer to measure in inches. When this command is sent all measurements will change to inches. All printers default to English units.

Sample:

```
<STX>L<CR>
n
:
141100001000100SAMPLE LABEL<CR>
E
```

The above sample will result in the text, “sample label”, printed at starting location coordinates 1.00in, 1.00in.

Note: This command is not available on the Prodigy, Prodigy Plus, Allegro and Allegro 2 printers.

P Set Print Speed

This command is used to set a print speed for a label or batch of labels where the command is issued.

P*a*

Where: *a*- is a single character (A to P) representing a speed, see Appendix O.

Sample:

```
<STX>L
PC
141100001000100LABEL1<CR>
E
<STX>L
141100001000100LABEL2>CR>
E
```

The above sample prints two labels, the first at speed 3.0ips/76mms and the second at the printer default.

✓**Note:**	See Appendix M for print speed ranges.

p *Set Label Backup Speed*

This command is used for Peel and Present and Cut Label Operations. It allows the user to specify the rate at which the printer will rewind the label to align with the start of print position, (this is used if the peel-off offset is specified), see <STX>f. Backup speed set via this command remains in effect until another backup speed command is received, the backup speed is modified via the LCD keypad, or when the printer is reset.

p*a*

Where: *a*- is a single character (C to I) setting a particular backup speed, see Appendix M.

Sample: <STX>L
pF
:

The above sample sets the printer to a backup speed of 3.5 ips.

Notes: This command is not available on the Prodigy, Allegro, or Allegro 2 label printers.

See Appendix M for backup speed ranges.

Q Set Quantity Of Labels To Print

This command is used to set the number of the label copies to be printed. All printers default to 1.

Q*nnnn*

Where: *n-* is a four-digit value setting for the number of labels to be printed.

Sample:

```
<STX>L
121100000000000Testing<CR>
Q0020<CR>
E<CR>
```

The above sample will print 20 identical labels.

R Set Row Offset Amount

This command allows vertical adjustment of the point where printing begins. This feature is useful when a single format must be printed on several different types of labels that already contain printed information. If the pre-printed data does not appear in the same place on every label, new data may overprint the pre-printed data. The ‘R’ command instructs the printer to print label formats **nnnn** increments above the position the format specifies. Valid input values are numbers between 0000 and 9999, (refer to the C, Set Column Offset Amount Command.)

R*nnnn*

Where: *nnnn* = is a four-digit offset 0000-9999, in/100 or mm/10

Sample: <STX>L
R0037<CR>
141100001000100SAMPLE LABEL<CR>
E

The above sample sets the printer's offset row amount to 37 hundredths of an inch, unless the printer is in metric mode.

r *Recall Stored Label Format*

This command is used to retrieve entire label formats that have been stored on a memory module.

r*nn...n* *<CR>*

Where: *nn...n*- is a label name up to 16 characters long, followed by a <CR>

The following examples show how to recall label formats. To view a list of available label formats, use the memory module directory (STX WL) command.

	String Sent to Printer	**Printer Interpretation**
Sample 1:	<STX>L<CR>	Begin label format
	TEST<CR>	Retrieve format named test
	Q0002<CR>	Quantity requested=2
	E<CR>	Terminate formatting and print
Sample 2:	<STX>L<CR>	Begin label format
	rTEST<CR>	Retrieve format named test
	X<CR>	Terminate formatting
	<STX>G<CR>	Print
Sample 3:	<STX>L<CR>	Begin label format
	D11<CR>	Dot size =1x1
	PO<CR>	Print speed 0
	SO<CR>	Slew speed 0
	rTEST<CR>	Retrieve format named test
	E<CR>	Terminate formatting and print

Note: This command is not available on the Prodigy.

S Set Slew Rate

This command sets the rate for the printer to feed un-printed labels, and the rate blank portions of label will be advanced through the printer. The slew rate remains unchanged unless another slew rate command is sent, the printer is reset or the rate is set via the LCD/keypad.

S*a*

Where: *a*= is a one character value (C to S) which sets a maximum speed for label feeding. See Appendix M and N.

Sample:

```
<STX>L
SE
141100001000100LABEL1<CR>
E
<STX>L
1411000010001000LABEL2<CR>
E
```

The above sample sets the printer's slew rate to 3.0 ips (76mms) and prints two labels. The slew rate for the second label is the same as the first.

s Store Label Format In Module

This command stores a label format in a specified module. Supplying module name A, B, D or E will store the label to that module, while using C will cause the label format to be stored in whichever module has been set as the default module, (refer to the Set Default Module Command, STX X). The store label-formatting command terminates label-formatting command.

s*ann...n*

Where: *a*= A-E, represents a single character module name (Appendix L)
nn...n= represents the label name (maximum 16 characters).

The following example stores a label called ‘Test’ in memory module A. To recall the label format from the module, use the label-formatting command ‘r’.

Sample:
```
<STX>L<CR>
D11<CR>
191100501000000123456789012<CR>
19110050200000001234567<CR>
191100500000000Sample<CR>
1X1100000000000B250250002002<CR>
Q0001<CR>
sATEST<CR>
```

Note: This command is not available on the Prodigy.

T Set Field Data Line Terminator

This command is valid only for the next format record, after which the terminator defaults to a carriage return. This allows the user to embed special binary control codes (i.e., carriage returns) into the data to be printed. It is intended to be used with record types, (e.g., PDF417), that will accept binary data.

T*nn*

Where: *nn* = is an ASCII two-character representation of a HEX code to be used for the end of data terminator.

Sample:

```
<STX>L<CR>
T00<CR>
191100200000000TEST<NULL>
141100001000100TERMIATOR<CR>
Q0001<CR>
E<CR>
```

The above sample sets the terminator code to use a NULL terminator (ASCII NULL, DEC 0, HEX 00) for the end of data line. The terminator is immediately restored to a carriage return <CR> as seen in the format record containing the text ‘TERMINATOR’.

✓**Note:**	This command is not available on the Prodigy, Allegro, Allegro 2.

U Make Previous Field A String Replace Field

This command is not necessary to use an updated field (register loading), the command only controls the way the bit-mapped data is formatted. If the command is used, only the changing data will be reformatted; if this command is not used the entire label will be formatted. The U command is used in conjunction with the system command STX U to reformat only portions of a label. This results in faster label generation.

✓**Notes:**	The data string length of any register is set by the length of the string when it is created. A new string must be the same length as the old string. This command is not available on the Prodigy.

Sample:

```
<STX>L
D11
121100001000000123456789012<CR>
U<CR>
121100002000000123456 7<CR>
U<CR>
161100000000000Sample<CR>
1X1100000000000B250250002002<CR>
Q0001
E
<STX>U01ABCDEFGHIJKL<CR>
<STX>U028901234<CR>
<STX>G
```

The above sample sets up the label format for register loading and prints two labels. The fist two of the four format records have been designated replacement (or update fields). The second label is generated with system commands for field replacement and print last label.

W Wait Mode (Prodigy only)

The wait mode is the default formatting mode for the Prodigy printer. In this mode the printer will format 560 dot rows into bit-mapped RAM before the first dot row is printed on the media. Once the printer starts printing it will print until the bit-mapped buffer is empty and then it will automatically jump into zip mode until the entire label is printed out. The entire process will start over with the next label. The other formatting mode is the zip mode Z.

The Prodigy printer has only enough on board RAM to format 560 dot rows.

Sample:
```
<STX>L
W
121100000000000Testing<CR>
E
```

X Terminate Label-Formatting Mode

When the printer is in label-formatting mode and receives an **X** command, it will immediately switch to the system-command mode and generate a label format based on whatever data it has already received. However, unlike the '**E**' command, it will not print a label. (Other termination commands are the '**E**' and '**s**' label-formatting commands.)

Sample:
```
<STX>L<CR>
141100001000100SAMPLE<CR>
X<CR>
```

The above sample will result in label formatting, but no label will be printed. The system command STX G will cause the label to print.

yS Select Font Symbol Set

Same as a system command with "STX", (see STX y). Symbol sets are used only with scalable fonts, (see Generating Label Formats; see <STX> I, Symbol Sets, Code Pages and Character Maps in Appendix E and I, also see <STX> KS).

Sample:
```
<STX>L
ySSW<CR>
:
```

The example above selects the Swedish symbol set for use with all succeeding format records that use scalable fonts.

Z Zip Mode (Prodigy only)

The Zip Mode is only available for the Prodigy printer. In this mode the printer will format ten dot rows into bit-mapped RAM before the first dot row is printed on the media. Once the printer starts printing it will print until the bit-mapped buffer is empty and then it will automatically adjust the print speed until some more bit-mapped area can be formatted. If there is a lot of formatting to be done the printer will stop and wait before it continues. This mode of formatting can cause noise to be generated by the changing speeds of the printer.

Sample:
```
<STX>L
Z
121100000000000Testing<CR>
E
```

z Zero (Ø) Conversion to "0"

This command removes the slashes from zeros in fonts 0 to 8 and barcodes. The command is effective only for the label format in which it appears, and applies to all format records containing fonts 0 through 8 or barcodes A through Z. None of the smooth fonts (font 9) have a slash in the zero.

Sample: <STX>L
z
121100000000000Test0000<CR>
E

+ (>) Make Last Field Entered Increment Numeric (Alphanumeric)

The printer is capable of automatically incrementing fields on each label of a batch printed. This command is useful to print labels numbered in sequence. The data in the field will increment by the value after the + sign each time a label is printed. The + character may be replaced by a > character to make the field increment alphabetically rather than numerically. This command has effect only on the label-format record that it follows. It is intended to be used in conjunction with the label batch quantity Q or the system commands for quantities and reprint, STX E, STX G.

******pii*

Where: * - Is + for numeric increment, or > for alphanumeric increment.

p - Is the fill character for the far left-hand characters of the field.

ii - Is the amount to increment the field by.

Sample: <STX>L<CR>
1322000000000012345<CR>
+01<CR>
Q0003<CR>
E<CR>

The above sample will generate a single field label format that prints the initial label with a value of 12345 and then increments by one for the next two labels.

- *(<)* *Make Last Field Entered Decrement Numeric (Alphanumeric)*

The printer is capable of automatically deincrementing fields on each label of a batch printed. This command is useful when printing labels that are numbered in reverse sequence. The data in the field will decrement by the value after the minus sign each time a label is printed. The minus character may be replaced by a < character in order to make the field decrement alphabetically rather than numerically. This command has effect on only the format record that it follows. It is intended to be used in conjunction with the label batch quantity Q, or the system commands for quantity and reprint, STX E, STX G.

pii

Where: * - Is for numeric decrement, or < for alphanumeric decrement.

p - Is the fill character for the far left-hand characters of the field.

ii - Is the amount to decrement the field by.

Sample: <STX>L<CR>
13220000000000012345<CR>
-01<CR>
Q0003<CR>
E<CR>

The above sample will generate a single field label format that prints the initial label with a value of 12345 and then decrements by one for the next two labels.

^ *Set Count By Amount*

An application using incrementing or deincrementing fields (+, -, >, <) will occasionally require that more than one label be printed with the same values before the field data is updated. This situation is handled with the ^*nn* command. All printers default to 1.

^*nn*

Where: *nn*- is a two-digit value that specifies the number of labels to be generated before the incrementing or deincrementing fields on the label.

✓**Note:**	This command can only be sent once per label format**.**

Sample: <STX>L<CR>
13220000000000012345<CR>
-01<CR>
^02<CR>
Q0006<CR>
E<CR>

The above sample prints two labels with the same field value before deincrementing the field. Six labels are printed.

Special Label-Formatting Commands

There are two special commands used by DMX printers, the STX S (recall global data) and the STX T (print date and time) commands. Unlike the other label-formatting commands, these special commands are entered directly into the data field of format records. These should not be confused with system commands, although the same control character is used.

Character	Description
<STX>S	Recall global data and place in field
<STX>T	Print time and date

Table 5-2 Special Label-Formatting Commands

STX S Recall Global Data And Place In Field

Once a global register has been defined, its contents can be used as data in other fields. When the printer receives the command STX S*n* in a format record data field, it will place data from the specified global register into the data field, (see label-formatting command G). Global registers contain the data in the first A through P format record data fields.

<STX>S*n*

Where: *n*= specifies the global register containing the data to copy into the data field, A – P.

Sample:

```
<STX>L<CR>
121100000000000DMX<CR>
 G<CR>
 1A2210001000000<STX>SA<CR>
 E<CR>
```

In the sample on the previous page, the label-formatting command '**G**' (line 3) places the string "DMX" into the next available global register (in this case register A). The <STX>SA (line 4) is effectively replaced by the data from global register A.

STX T Print Time and Date

Time and date string data is selected by choosing the string characters A through Z, and a through f to retrieve data from the printer's internal clock. The date string characters are not printed, instead the printed label will show the corresponding print values, shown in the table below.

<STX> T string<CR>

where: string is any set of characters A through Z or a through f.

String Characters	Print Values	String Markers	Print Values
A	Day of the week; (1 = Mon.)	VW	hour in 24 hour format
BCD	Day of week name	XY	hour in 12 hour format
EF	Month number	Za	minutes
GH...O.	Month name	bc	AM or PM
PQ	Day	def	Julian date
RSTU	year		

Sample: Assuming the current printer date is December 21, 1998.

<STX>L<CR>
121100001000100<STX>TBCD GHI PQ, TU<CR>
E<CR>

The printed label will show: SUN DEC 21, 98

Note: This command is not available on the Prodigy .

Font-Loading Commands <ESC>

The commands used for font loading are usually generated by font creation software; however, the assign font ID number command must be sent to the printer before the font file. Font-loading commands are listed in Table 5-1. All font-loading commands begin with <ESC>. <ESC> represents the ASCII control character 27.

The downloaded Font will be stored in the "default" Module, (refer to the STX X command.)

Command	Description
*c###D	Assign Font ID Number
)s#Wnn...n	Font Descriptor
*c#E	Character Code
(s#W	Character Download Data

Table 6-1 Font-Loading Commands

The commands in the table above are listed in their order of appearance, top to bottom, during font downloading, see SOH D.

*c###D *Assign Font ID Number*

This command is the first command required for downloading a font to either RAM or flash memory modules. Esc represents the ASCII control character 27.

<ESC>*c###D

Where: ###- is the font ID number 100-999, (000-099) are reserved for resident fonts.

)s###W *Font Descriptor*

This command, (typically first data in a font file), contains all of the information about the font contained in the file. Different font generation software will create different length header information, but the initial 64 bytes will remain consistent with the PCL-4 (HP LaserJet II) format.

<ESC>)s*###*Wddd...d

Where: *###* = Is the number of bytes of font descriptor data from 1 to 3 ASCII decimal digits.

ddd...d = Is the descriptor.

**c###E* *Character Code*

This code is the ASCII decimal value corresponding to the next downloaded character.

<ESC>*c*###*E

Where: *###* = Is the ASCII value of the character, three digits maximum, 0 to 999.

(s#W Character Download Data

This command contains all of the information for one downloaded character.

<ESC>(s*###*W*nn...n*

Where: *###* = Is the number of bytes of bit-mapped data, three digits maximum, 1 to 999.

nn...n = Is the bit-mapped data.

When a label format record data field calls for the letter A to be printed, the A is used to index the downloaded bit map font data with character code 65.

Generating Label Formats

This section explains how to use the fields in a print format record.

Figure 7-1 is an example of a label format as the printer sees it. Figure 7-2 is a label generated from that format. The printer receives the data sequentially, left to right, top to bottom.

Strings Sent to Printer	Printer Interpretation
<STX>L<CR>	Begin label format
D11<CR>	Set dot size
121100000050005HOME POSITION<CR>	Format text
191100602000200ROTATION 1<CR>	Format text
291100602000200ROTATION 2<CR>	Format text
391100602000200ROTATION 3CR>	Format text
491100602000200ROTATION 4CR>	Format text
1A3104003000260123456<CR>	Format barcode with text
4a6210002500140123456<CR>	Format barcode
1X1100000000000B400400003003<CR>	Format box
1X1100002000000L400001<CR>	Format line
1X1100000000200L001400<CR>	Format line
121100004100010The Printer is here<CR>	Format text
Q0002<CR>	Number of labels
E<CR>	End formatting, begin print

Table 7-1 Sample Label Format

Note: This example assumes that the printer was in ‘inch’ mode, (see <STX>m and <STX>n), when printing the label on the following page.

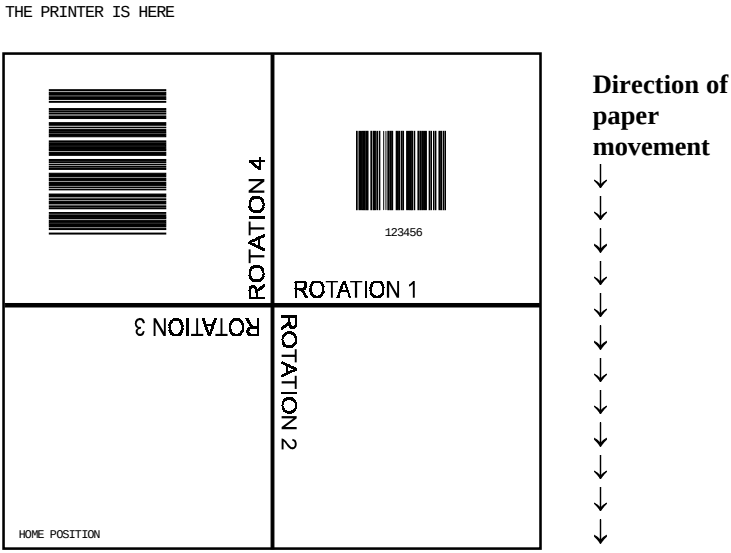


Figure 7-1 Printed Label

The first line in the sample format (Figure 6-1) is the system-level command directing the printer to begin label formatting. Other system-level commands may precede the <STX>L for printer setup. Lines 2, 14, and 15 are label-formatting commands (explained in label-formatting commands and special label-formatting commands). Line 15 is the exit and print command. The remaining lines (3-13) are print format records, explained in this chapter.

A record is a data string that contains the information to be printed on the labels. Records are the building blocks of label formats. Every record must end with a termination character (usually a carriage return, <CR>). Omitting termination characters will result in the concatenation of records. Omitting the carriage return that precedes the termination character E, which is necessary to complete the label formatting and begin printing, will cause the printer to continue interpreting all subsequent data as label print format records.

Generating Records

Every record is made of three parts: (1) A header that is 15 bytes in length, (2) the data to be printed, and (3) a termination character (e.g., <CR>) that marks the end of the field. The header is used to select the appearance of the data when printed by choosing rotation, font type, size, and position options. Every header contains similar information, but this information may be used in different ways by different types of records.

There are six types of records:

1. Internal Bitmapped Font
2. Smooth Font
3. Scalable font
4. Barcode
5. Images
6. Graphics

The Structure of a Record

The basic structure of the record is described below. Details for the various interpretations of the six types begin on page 99.

The third line of the label format example in Figure 6-1 consists of the following:

121100000050005HOME POSITION<CR>

This string forms the complete record divided into its three basic components as shown below:

Header	Data	Termination Character
121100000050005	HOME POSITION	<CR>

The record conforms to the following fixed field format (spaces have been added for visual clarity). Identifying lower case letters have been placed below field values for reference in the following sections:

1 2 1 1 000 0005 0005 HOME POSITION <CR>
a b c d eee f f f f gggg [hhhh i i i i] j...

Where:

Location	Field Name
a	Rotation
b	Font, Barcodes, Graphic & Image
c	Width Multiplier
d	Height Multiplier
eee	Barcode Height (font size/ID)
ffff	Row Position
gggg	Column Position
hhhh	Optional Scalable Font height
iiii	Optional Scalable Font width
j...	Data String

This scalable font field example shows the scalable font height and width fields:

1911S5001000100P010P020 SCALABLE<CR>

The Header Fields

Each of the fields in the record header are described below. The field names are preceded with a reference letter from the preceding table. All characters within the header fields are ASCII, alphanumeric.

a: Rotation

The first field of a header is a single ASCII character that selects the degree of rotation for the data to be printed on a label. Valid rotation values are **1** (0º), **2** (90º), **3** (180º), and **4** (270º). Figure 6-2 shows the direction and amount of rotation clockwise, relative to the label feed direction.

b: Fonts, barcodes, graphic and image

The second character determines how the rest of the fields are interpreted as shown in the table below. Values **0** through **9** select human-readable fonts. Values **A** through **z** select barcode fonts**.** 0 through 8 will select standard Datamax fonts, value 9 selects the CG Triumvirate smooth font (internal), *CG Triumvirate Bold Condensed smooth scalable font (internal), or a cartridge (module) font (external). When 9 is used to select a cartridge font or scalable, the font size (font I.D. number) is chosen by entering a value in the barcode height field (-**eee**-).

Values **A** through **T**, (uppercase) will print barcodes with human-readable interpretations. Values **a** through **z**, (lowercase), will print barcodes only. The postnet font, because it is not capable of printing human readable data, may only be entered as **p** (lowercase), likewise Maxicode **u**, and PDF417z.

A font field value **X** selects a drawing object (line, box, circle or polygon), and value **Y** is used to print an image stored in a module.

Font Field Value	Interpretation
0-9	Font
A-T	Barcode with human readable text.
a-z	Barcode without human readable text.
X	Line, box, polygon, circle
Y	Image

Note: Circle and polygon are not legal drawing objects for Allegro, Allegro 2, Prodigy, or Prodigy Plus.

c: Width Multiplier

Values 1-9 and A-O represent multiplication factors (base 25 numbers).

For human-readable fonts, the width multiplier represents the number of times the selected font dot tables are multiplied and has no effect on the character height. For barcodes, this character specifies the wide bar width or ratio. Values 1 through 9 and A through O will give a wide bar width of from 0.0033" (0.085mm) to 0.792" (2.011mm) at a resolution dependent on the printer model.

d: Height Multiplier

The height multiplier has the same range and function as the width multiplier, but vertical. When used in the context of barcodes, this field is the ratio denominator, or the small bar (module) width.

Values 1 through 9 and A through O will give a narrow bar width of from 0.0033" (0.085mm) to 0.792" (2.011mm) at a resolution dependent on the model printer.

	Resolution	
Printer	**D.P.I**	**DOTS/mm**
400 / Prodigy Max / Ovation / Ovation2/ PE42 / PE43 / 6200	203	8.0
430	289.56	11.4
*Prodigy Max / 600 / 800 /Ovation	300	11.8

***** With optional 300 D.P.I. printhead

eee: Barcode Height (Font Size/Selection)

This field has interpretations dependent on the value of the fonts b field as shown in the following table.

Font Field Value	Barcode Height Field Interpretation
0-8	Not used
9	Font height, font selection
A-T	Barcode height with text
a-z	Barcode height
X,Y	Not used

For barcode fonts, this field represents the barcode height. The valid range is from 001 to 999, which translates to bar heights ranging from 0.01in. (0.254mm) to 9.99in. (253.7mm).

For graphics, lines, boxes and human-readable fonts 0 through 8, the barcode height segment (-eee-) must be entered as 000.

When the font field -b- is set to 9 (to select internal smooth fonts, internal scalable fonts or external cartridge fonts), the barcode height field should be set to a number between 001 and 999. Values from A04 to A72 select a font size for the CG Triumvirate smooth font. Values S00 to S9z, (s00 to s9) and U00 to U9z (u00 to u9z), select a scalable font, either internal or downloaded. Values 100 through 999 select individual fonts stored on RAM, Flash, or ROM font memory modules. See Table 6-3 and Appendix G.

ffff: Row Position

The lower left corner of a label is considered the “home position”. The row position field is a vertical coordinate that determines how far above the home position the data is to be printed. Field data is interpreted in hundredths of an inch or tenths of millimeters.

gggg: Column Position

This field is a horizontal offset that determines how far to the right of home position the data will be printed.

hhhh: Optional Scalable Font Height

The height of a scalable font can be specified in two ways, points and dots. To specify the height in points the first character of the field is a 'P' followed by the number of points, 004 to 999 points. To specify in dots, use only digits.

iiii: Optional Scalable Font Width

The width of a scalable font can be specified in two ways, points and dots. To specify the width in points , the first character of the field is a ‘P’ followed by the number of points, 004 to 999 points. To specify in dots, use only digits.

Note: To ensure that the data stream is portable to different Datamax printers, specify the font size in points. If the font is specified in dots, it will output differently on printers with different dpi/mmpi resolutions.

There are 72, 307 points per 1 inch.

jj..j: Data Field

The final field contains the data that will actually be printed on the label. A string of data can be up to 255 characters in length, (except when using the PDF 417 font, which may be up to 3000 characters long) ending with a carriage return. Characters placed in the data field will be printed so long as they fall within the physical range of the printhead. For example, on 4-inch wide media if the printer is directed to print "HELLO WORLD" in rotation 1, font 6, magnified 2x in both the horizontal and vertical dimensions, the characters "HELLO W" and part of the "O" will appear at the bottom of the label. The "RLD" will not appear on the label since it is outside the limits of the printhead.

The DMX 600 and 800 will accept up to 10,000 characters in o 400 fields per label, the DMX 400 and 430 will accept up to 5000 characters in 200 fields per label.

When the last field is sent to the printer, the formatting session is ended by sending one of the terminator label formatting commands, E, X, s.

Record Structure Types

Each of the six record types has its own field structure and they are described in the following tables. These record types allow for quick reference to the field types and their valid data inputs for the field. There are similar, but unique, record structures for each: internal, bit-mapped fonts, internal smooth fonts, font modules, downloaded bit-mapped fonts, scalable fonts, barcodes, images, and graphics.

1. Internal Bit-mapped Font

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	0 to 8	Font
c	1 to 9 and A to O	Dot width
d	1 to 9 and A to O	Dot height
eee	000	N/A
ffff	Row Height 0000 to 9999	Row
gggg	Dependent on printer. See Table 6-2	Column
jj..j	Valid ASCII character string up to 255 characters followed by a termination character.	Data

Table 7-1 Internal Bit-mapped Font Record Structure

The width of the **gggg** field is dependent on the model printer being used. Table 6-2 lists the **gggg** field maximum value by printer.

Printer	D.P.I	Maximum Column Value Inch / Metric
Allegro, Allgero 2	203	0410 / 1041
Prodigy	203	
Prodigy Plus	152	0410 / 1041
Prodigy Plus	203	0410 / 1041
400	203	0410 / 1041
430	289.56	0398 / 1011
Prodigy Max, PE42 and PE43	203 and 300	0410 / 1041
600	300	0640 / 1625
800	300	0860 / 2184
6200	203	0661 / 1680

Table 7-3 gggg Field Maximum Values

2. Smooth Font, Modules, Downloaded Bit-mapped Fonts

Using internal smooth fonts (CG Triumvirate), an external font module, or a bitmapped font downloaded to a memory module. (Appendix K identifies the different font cartridges and their sizes.)

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	9	Fixed value
c	1 to 9 and A to O	Dot width
d	1 to 9 and A to O	Dot height
eee	001 to 999 (001 to 099 Reserved), A04 to A72	Font/size
ffff	0000 to 9999	Row
gggg	Dependent on printer. See Table 6-2	Column
jj..j	Valid ASCII character string up to 255 characters followed by a termination character.	Data

Table 7-4 Smooth Font Record Structure

When 9 is entered in field -b-, the barcode height field (-eee-) determines the font size. The internal smooth font (CG Triumvirate) has up to 13 font sizes. The available font sizes are listed in the Table 6.4.

Font 9 bitmapped fonts specifications (barcode height) Point Sizes by Printer						
Points	**MAX300dpi**	**600 / 800**	**Ovation!**	**PE42 and Max**	**430 and 6200**	**All**
4	A04	A04	A04	-	A04	-
5	A05	A05	A05	-	A05	000
6	A06	A06	A06	A06	A06	001
8	A08	A08	A08	A08	A08	002
10	A10	A10	A10	A10	A10	003
12	A12	A12	A12	A12	A12	004
14	A14	A14	A14	A14	A14	005
18	A18	A18	A18	A18	A18	006
24	A24	A24	A24	A24	A24	007
30	A30	A30	A30	A30	A30	008
36	A36	A36	A36*	A36	A36	009
48	A48	A48	A48*	A48	A48	010
72	-	A72	-	-	-	-

*legal font size specifies, printer multiplies dots for A36 and A48 from smaller fonts

Table 7-5 Smooth Font Point Size Chart

3. Scalable Font

The Smooth Scalable Font Technology has been licensed from AGFA. Both IntelliFont (.CDI) and True Type (.TTF) Scalable Font file formats are supported.

The eee field identifies the scalable font, and data type, normal (binary) or hex ASCII. Uppercase S or U - binary, lowercase s, u - Hex ASCII. See Appendix H for additional information.

> ☑**Note:** Smooth scalable font technology is available on the DMX 600, (version 2.01 or greater), DMX 800, Prodigy Max, PE42, PE43 and 6200.

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b	9	Fixed value
c	1 to 9 and A to O	Dot width
d	1 to 9 and A to O	Dot height
eee	S00 to Szz, s00-szz, U00-Uzz, u00-uzz	Font data type
ffff	0000 to 9999	Row
gggg	Dependent on printer. See Table 6-2	Column
hhhh	P004-P999, 0016-4163*	Character height, points, dots
iiii	P004-P999, 0014-4163*	Character width, points, dots
jj..j	Valid ASCII character string up to 255 characters followed by a termination character.	Data

* Character size specifications are printhead resolution dependent as shown in the following table.

Table 7-6 Scalable Font Record Structure

Printhead Resolution	Width	Height
203	16-2817	16-2817
289.56	16-4018	16-4018
300	14-4163	16-4163

Note: Scalable font cache must be allocated to print. Minimum cache size is 15, (see extend-system command <STX> KS for syntax). Kanji option requires 5 additional units of cache.

4. Barcode

Valid inputs for the font field (**-b-**) are letters. Uppercase letters will print a human-readable text below the barcode. Lowercase letters will print the barcode only. Entering a **p** in the font position segment sets the postnet barcode. Because the postnet font does not provide human-readable data the uppercase P is not valid. Other barcodes without a human-readable counterpart include u-Maxicode, and z-PDF417. For module-based barcodes field c is a fixed value of 1.

For ratio-based barcodes field C is the wide bar width in dots; field d is the narrow width in dots. See Appendix G for specific barcode information and variations in record format field usage. A zero in both c and d causes the printer, (except Prodigy Plus), to use a default ratio or module size. The barcode default height can be printed by using 000 in the height field.

Field	Valid Inputs	Meaning
a	1, 2, 3 and 4	Rotation
b [bb]	A to Z and a to z (except P, u,v,z), or Wna where n is 1 to 9 and a is A to S and a to s. No n is an implied 1.	Barcode
c	1 to 9 and A to O	Ratio numerator/ Fixed 1
d	1 to 9 and A to O	Ratio denominator/ module size
eee	001 to 999	Symbol height
ffff	0000 to 9999	Row
gggg	See Table 6-2	Column
jj..j	Valid ASCII character string up to 255 characters followed by a termination character.	Data

Table 7-7 Barcode Record Structure

5. Images

An image record is necessary to print an image that is stored in a memory module. Images can be printed only in rotation 1, (see Input Image Data, <STX>I).

Field	Valid Inputs	Meaning
a	1	Fixed Value
b	Y	Image
c	1 to 9 and A to O	Dot width
d	1 to 9 and A to O	Dot height
eee	000	Fixed value
ffff	0000 to 9999	Row
gggg	See Table 6-2	Column
jj..j	ASCII string, up to 8 characters followed by a termination character.	Image name

Table 7-8 Image Fields

6. Graphics

Lines, boxes, polygons, and circles can be produced by using graphics. This function is selected by entering an **X** in field **-b-**. The values entered in the data field determine the sizes and shapes of the objects to be drawn.

Lines and Boxes

Lines and boxes are drawn by values that determine column and row sizes, length, size, wall thickness, and position of the line or box, (see Table 6-8). All measurements are interpreted as inches (100) or millimeters (10), depending on the printer's mode, (see <STX>m).

Segment	Valid Inputs	Meaning
a	1	Fixed value
b	X	Line box
c	1	Fixed value
d	1	Fixed value
eee	000	Fixed value
ffff	0000 to 9999	Row
gggg	See Table 6-2	Column
jj..j	Lhhhvvv - Line Drawing lhhhhvvvv - Line Drawing Bhhhvvvtttsss - Box Drawing bhhhhvvvvttttssss - Box Drawing	Line * Line ** Box *** Box ****

Table 7-9 Line and Box Parameters

*** LINES:** Lhhhvvv

Where: L = "L" and specifies line drawing,
hhh = horizontal width of line,
vvv = vertical height of line.

**** LINES:** lhhhhvvvv

Where: l = "l" and specifies line drawing,
hhhh = horizontal width of line,
vvvv = vertical height of line.

***** BOXES:** Bhhhvvvbbbsss

Where: B = "B" and specifies box drawing,
hhh = horizontal width of box,
vvv = vertical height of box,
bbb = thickness of bottom and top box edge,
sss = thickness of sides of box.

**** BOXES: bhhhhvvvvbbbbssss

Where: b = "b" specifies box drawing,
hhhh = horizontal width of box,
vvvv = vertical height of box,
bbbb = thickness of bottom and top box edges,
ssss = thickness of sides of box.

Polygons and Circles

Polygons are created by defining the positions of the corners. Circles are created by defining the center and radius. Polygons and circles may be filled with a variety of different patterns. Using the drawings field, the programmer can easily create forms with shaded boxes, complex logos, or even a simple diagonal line without the need to download a graphics file to the printer.

> ✓**Notes:** The DMX 400 with firmware revision levels below 2.01 do not support polygon and circle commands.
>
> Not available on Allegro, Allegro 2, Prodigy, Prodigy Plus.

Polygons

A polygon is an object that can be defined by specifying a number of data points that represent the vertices of the object, which can range from a simple line (two points), or a triangle (three points), to any free-form outline. All row/column specifies are interpreted as inches/100 or millimeters/10 depending on the printer mode, (see <STX>m).

Record structure for a polygon

1 X 11 ppp rrrr cccc P ppp bbbb rrrr cccc rrrr cccc ... <CR>

1	rotation (must be 1)	ppp	line fill pattern # - must be 1
X	graphic field ID	bbbb	line brush patt. # - must be 1
1	multiplier (must be 1)	rrrr	row of point 2
1	multiplier (must be 1)	cccc	column of point 2
ppp	fill pattern #	rrrr	row of point 3
rrrr	row of point 1	cccc	column of point 3
cccc	column of point 1	**.....**	continue listing points
P	Polygon ID	<CR>	termination character

Table 7-10 Polygon Record Structure

Note: The points must be specified in the order that they are to be drawn. The last point specified is automatically connected to the first point specified, thereby closing the polygon. If only two points are specified, a single line will be drawn. See label-formatting commands A.

Circles

A circle is defined by its center point and its radius. Row, column, and radius are interpreted as inches (100) or millimeters (10) depending on printer mode.

Record structure for a circle.
1 X 11 ppp rrrr cccc C ppp bbbb rrrr <CR>

Explanation of field segments:

1	rotation (must be 1)	cccc	column of the center point
X	graphic field	C	Circle ID
1	multiplier (must be 1)	ppp	line fill pattern # -must be 1
1	multiplier (must be 1)	bbbb	line brush pattern-must be 1
ppp	fill pattern #	rrrr	radius of the circle
rrrr	row of the center point	<CR>	termination character

Table 7-11 Circle Record Structure

The following 12 fill patterns are currently available.

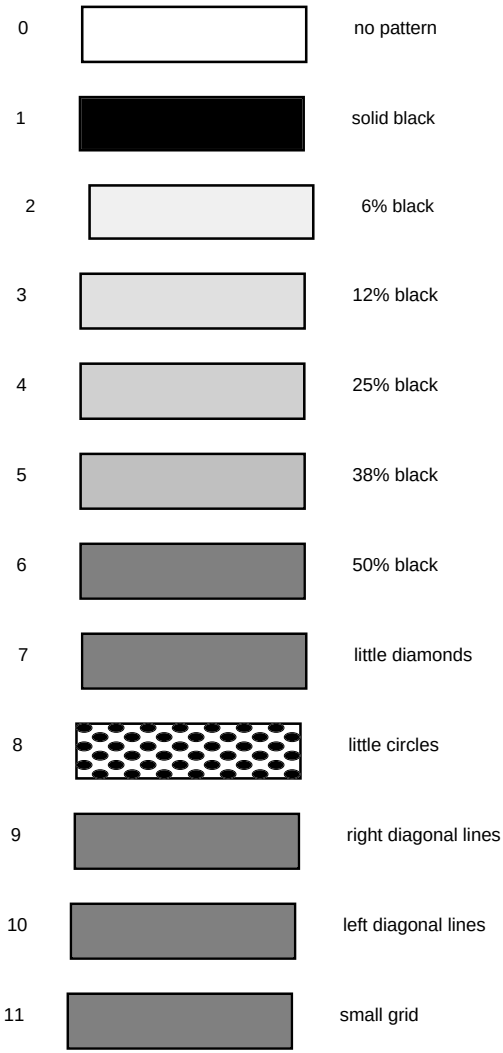


Figure 7-2 Fill Patterns

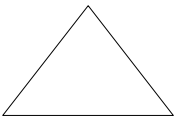
Graphic Examples:

1. Triangle

The record:
1 X 11 000 0010 0010 P 001 0001 0040 0025 0010 0040<CR>

produces a triangle with no fill pattern:

(row 40, column 25)



(row 10, column 10) (row 10, column 40)

2. Rectangle with Fill

The record:

1 X 11 004 0010 0010 P 001 0001 0050 0010 0050 0200 0010 0200 <CR>

produces a rectangle filled with pattern 4 (25% black):

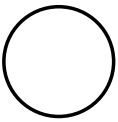
(row 10, column 10) (row 10, column 200)

3. Circle

The field:

1 X 11 000 0100 0100 C 001 0001 0025 <CR>

produces a circle centered at row 100, column 100 with a radius of .25 and no fill pattern:



4. Circle with Fill

The field:

1 X 11 009 0100 0100 C 001 0001 0025 <CR>

produces a circle centered at row 100, column 100 with a radius of .25 and filled with pattern 9 (right diagonal lines):

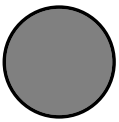


Image Loading

The printer will accept four types of image files: .BMP, .IMG, .PCX and a special Datamax 7-bit ASCII file (as defined in this section). Using the Datamax 7-bit ASCII format will require at least twice as much data transmission time as the other formats, see STX I. The Datamax ASCII image file format is made up of a set of records, with identical formats, each representing a dot row of the image, the last of these records is followed by a terminator.

dot-row record
•
•
•
•
dot-row record
terminator

Each dot-row record has the following format: 80nndd...d<CR>

Where: nn = number character pairs in dd...d, represented in ASCII hex.

dd...d = dot data, character pairs, ASCII hex, 00-FF

Duplicate records may be encoded using a repeat data record following the data record that needs duplicating. The repeat data record format is: 0000FFnn<CR>

Where: nn = is the number of duplicates, ASCII hex, 00-FF
The terminator, last record, at the image download is: FFFF<CR>

```
^BqA(CR)
^BIAAFLOGO(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFC00000007FFC0003FFFFC001FC0001FC0003FFFFC0018000FFC001FF8000C0003FFFFE000000FFFFE0001FFFFF0000(CR)
8030FFC00000000FFC0003FFFFC001FC0001FC0003FFFFC0018000FFC001FF800040001FFFFE0000007FFFC0001FFFFF0000(CR)
8030FFC000000003FC0001FFFFC001FC0001FC0001FFFFC0018000FFC001FF800040001FFFFE0000003FFFC0001FFFFF0000(CR)
8030FFC000000000FC0001FFFFC001FE0001FE0001FFFFC00180007FC000FF800060001FFFFE0000003FFFC0003FFFFF0000(CR)
8030FFE0000000007E0001FFFFC001FE0001FE0001FFFFC00180007FC000FFC00060000FFFFE0000001FFFC0003FFFFF0000(CR)
8030FFE0000000003E0000FFFFC001FE0000FE0000FFFFC00180007FC0007FC00020000FFFFE0000001FFF80003FFFFF0000(CR)
8030FFE0000000001E0000FFFFC001FE0000FF0000FFFFC001C0007FC0007FC00030000FFFFE0010000FFF80003FFFFF0000(CR)
8030FFE0000000000F0000FFFFC001FE0000FF0000FFFFC001C0007FC0007FC00030000FFFFE00180007FF80007FFFFF0000(CR)
8030FFE000000000700007FFFC001FF0000FF80007FFFC001C0007FC0003FC000380007FFFE00180007FF80007FFFFF0000(CR)
8030FFF000000000380007FFFC001FF0000FF80007FFFC001C0003FC0003FE000380007FFFE001C0003FF80007FFFFF0000(CR)
8030FFF000000000380007FFFC001FF0000FF80007FFFC001C0003FC0003FE000380007FFFE001E0003FF80007FFFFF0000(CR)
8030FFF000000000180003FFFC001FF00007FC0003FFFC001C0003FC0001FE0001C0003FFFE001E0001FF0000FFFFF0000(CR)
8030FFF00000000001C0003FFFC001FF00007FC0003FFFC001E0003FC0001FE0001C0003FFFE001F0000FF0000FFFFFF0000(CR)
8030FFF00007C00000C0003FFFC001FF00007FE0003FFFC001E0003FC0000FF0001E0003FFFE001F0000FF0000FFFFFF0000(CR)
8030FFF80007F80000E0001FFFC001FF80007FE0001FFFC001E0003FC0000FF0001E0001FFFE001F80007F0000FFFFFF0000(CR)
8030FFF80007FC0000E00000000001FF80007FE00000000001E0001FC0000FF0001E00000000001FC0007F0000FFFFFF0000(CR)
8030FFF80007FE0000600000000001FF80003FF00000000001E0001FC00007F0000F00000000001FC0003F0001FFFFFF0000(CR)
8030FFF80003FF0000700000000001FF80003FF00000000001F0001FC00007F0000F00000000001FE0001E0001FFFFFF0000(CR)
8030FFF80003FF0000700000000001FF80003FF00000000001F0001FC00007F8000F00000000001FE0001E0001FFFFFF0000(CR)
8030FFFC0001FFC0003C0000000001FFE0001FFE0000000001F8000FC00000FC0007E0000000001FFE00000003FFFFFF0000(CR)
8030FFFE0001FFC0001E0000000001FFE0001FFE0000000001F8000FC00000FC0007E0000000001FFF00000003FFFFFF0000(CR)
8030FFFE0001FFC0001E0000000001FFE0001FFE0000000001F8000FC00000FC0007F0000000001FFF00000007FFFFFF0000(CR)
8030FFFE0000FFC0001F0000000001FFE0000FFF0000000001F8000FC000007C0003F0000000001FFF80000007FFFFFF0000(CR)
8030FFFE0000FFC0001F0000000001FFE0000FFF0000000001FC0007C000007E0003F0000000001FFF80000007FFFFFF0000(CR)
8030FFFE0000FFE0001F0001FFC001FFE0000FFF8001FFC001FC0007C000003E0003F8000FFE001FFFC0000007FFFFFF0000(CR)
8030FFFE0000FFE0000F8001FFC001FFF0000FFF8000FFC001FC0007C000003E0003F8000FFE001FFFE000000FFFFFFF0000(CR)
8030FFFF0000FFE0000F8000FFC001FFF0000FFF8000FFC001FC0007C000003E0003F8000FFE001FFFE000000FFFFFFF0000(CR)
8030FFFF0000FFE0000F8000FFC001FFF00007FFC000FFC001FC0007C000001F0001FC000FFE001FFFF000000FFFFFFF0000(CR)
8030FFFF00007FE0000FC000FFC001FFF00007FFC0007FC001FE0007C002001F0001FC0007FE001FFFF000000FFFFFFF0000(CR)
8030FFFF00007FF0000FC0007FC001FFF00007FFE0007FC001FE0003C002001F0001FE0007FE001FFFF800000FFFFFFF0000(CR)
8030FFFF00007FF0000FE0007FC001FFF80007FFE0007FC001FE0003C003000F0001FE0007FE001FFFFC00001FFFFFFF0000(CR)
8030FFFF80007FF00007E0007FC001FFF80007FFE0003FC001FE0003C003000F0001FE0003FE001FFFFC00001FFFFFFF0000(CR)
8030FFFF80007FF00007E0003FC001FFF80003FFF0003FC001FE0003C00300078001FF0003FE001FFFFE00001FFFFFFF0000(CR)
8030FFFF80003FF00007F0003FC001FFF80003FFF0003FC001FE0003C00380078000FF0003FE001FFFFE00001FFFFFFF0000(CR)
8030FFFF80003FF80007F0003FC001FFF80003FFF0001FC001FF0003C00380078000FF8001FE001FFFFE00001FFFFFFF0000(CR)
8030FFFF80003FF80007F0001FC001FFF80003FFF8001FC001FF0001C003C0038000FF8001FE001FFFFE00001FFFFFFF0000(CR)
8030FFFFFFC000000007FFC000001F80000000000FC000001FFF0000003FFE0000007FFC000001FFFC0003F80007FFF0000(CR)
8030FFFFFFE00000000FFFC000001F80000000000FE000001FFF8000003FFE0000007FFE000001FFFC0003FC0003FFF0000(CR)
8030FFFFFFF00000000FFFE000001F80000000000FE000001FFF8000003FFF0000007FFE000001FFFC0003FC0003FFF0000(CR)
8030FFFFFFFC0000000FFFE000001FC0000000000FE000001FFF8000003FFF0000007FFE000001FFFC0003FE0001FFF0000(CR)
8030FFFFFFFE0000000FFFE000001FC00000000007F000001FFF8000003FFF0000007FFF000001FFFC0003FE0001FFF0000(CR)
8030FFFFFFFF0000001FFFF000001FC00000000007F000001FFF8000003FFF8000007FFF000001FFF80003FF0000FFF0000(CR)
8030FFFFFFFFC0000001FFFF000001FC00000000007F000001FFF8000003FFF8000003FFF800001FFF80007FF0000FFF0000(CR)
8030FFFFFFFFE0000003FFFF800001FC00000000007F800001FFFC000003FFF8000003FFF800001FFF80007FF80007FF0000(CR)
8030FFFFFFFFF0000007FFFF800001FC00000000007F800001FFFC000003FFFC000003FFF800001FFF80007FF80007FF0000(CR)
8030FFFFFFFFF800000FFFFF800001FE00000000003FC00001FFFC000003FFFC000003FFFC00001FFF00007FFC0003FF0000(CR)
8030FFFFFFFFFE00001FFFFFC00001FE00000000003FC00001FFFC000003FFFE000003FFFC00001FFF00007FFC0003FF0000(CR)
8030FFFFFFFFFF00007FFFFFC00001FE00000000003FC00001FFFC000003FFFE000003FFFE00001FFF00007FFE0001FF0000(CR)
8030FFFFFFFFFF8003FFFFFFC00001FE00000000003FE00001FFFC000003FFFF000003FFFE00001FFF00007FFE0001FF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
8030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0000(CR)
FFFF(CR)
^BL(CR)
1Y1100000000000LOGO(CR)
E(CR)
```

Figure 7-3 Sample Datamax 7-bit ASCII File Image

Figure 7-4 Sample Label

Early Warning
IPR2024-01221
Ex. 1042-122

Appendix A

ASCII Control Chart (continued)

	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ctrl **@**	NUL	0	00		32	20	@	64	40	`	96	60
Ctrl **A**	SOH	1	01	!	33	21	A	65	41	a	97	61
Ctrl **B**	STX	2	02	Ò	34	22	B	66	42	b	98	62
Ctrl **C**	EXT	3	03	#	35	23	C	67	43	c	99	63
Ctrl **D**	EOT	4	04	$	36	24	D	68	44	d	100	64
Ctrl **E**	ENQ	5	05	%	37	25	E	69	45	e	101	65
Ctrl **F**	ACK	6	06	&	38	26	F	70	46	f	102	66
Ctrl **G**	BEL	7	07	Ô	39	27	G	71	47	g	103	67
Ctrl **H**	BS	8	08	(	40	28	H	72	48	h	104	68
Ctrl **I**	HT	9	09	)	41	29	I	73	49	i	105	69
Ctrl **J**	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl **K**	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl **L**	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl **M**	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl **N**	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl **O**	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl **P**	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl **Q**	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl **R**	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl **S**	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl **T**	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl **U**	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl **V**	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl **W**	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl **X**	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl **Y**	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl **Z**	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl **[**	ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl \	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl **]**	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl ^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl **_**	US	31	1F	?	63	3F	_	95	5F		127	7F

ASCII Control Chart (concluded)

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ç	128	80	á	160	A0		192	C0	Ó	224	E0
ü	129	81	í	161	A1		193	C1	ß	225	E1
é	130	82	ó	162	A2		194	C2	Ô	226	E2
â	131	83	ú	163	A3		195	C3	Ò	227	E3
ä	132	84	ñ	164	A4		196	C4	õ	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
å	134	86	ª	166	A6	ã	198	C6	µ	230	E6
ç	135	87	°	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	Þ	232	E8
ë	137	89	®	169	A9		201	C9	Ú	233	E9
è	138	8A		170	AA		202	CA	Û	234	EA
ï	139	8B	1/2	171	AB		203	CB	Ù	235	EB
î	140	8C	1/4	172	AC		204	CC	ý	236	EC
ì	141	8D	¡	173	AD		205	CD	Ý	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F	¯	175	AF		207	CF		239	EF
É	144	90		176	B0	ð	208	D0		240	F0
æ	145	91		177	B1	Ð	209	D1	±	241	F1
Æ	146	92	²	178	B2	Ê	210	D2		242	F2
ô	147	93	³	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	È	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	À	183	B7	Î	215	D7	¸	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	º	248	F8
Ö	153	99	¹	185	B9		217	D9	¨	249	F9
Ü	154	9A		186	BA		218	DA	·	250	FA
ø	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
Ø	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	Ì	222	DE		254	FE
f	159	9F		191	BF		223	DF		255	FF

Notes: For the hardware handshake XON/XOFF commands
XON = Ctrl Q (DC1)
XOFF = Ctrl S (DC3)

Appendix B

Sample Programs

The following sample basic language program is included for reference. Values are assigned to the variables in the main section and sent to the printer in the section titled ‘Send Data’. The sample below shows the output generated by this program.

```
START:
  OPEN "COM1:9600,N,8,1,FOR RANDOM" AS #1

MAIN:
  CLS
  PRINT "DMX Printer Test Program (press any key)"

  WHILE I$= ""
  I$=INKEY$
  WEND

  desc$="10K OHM 1/4 WATT"
  pcs=590

SENDDATA:
  CR$ = CHR$(13)
  PRINT #1, CHR$(2);"L"; CR$;
  PRINT #1,"H07";CR$;
  'set burn time to 7
  PRINT #1,"D11";CR$;
  'set for 300 DPI
  PRINT #1,"191100801000025";desc$;CR$;
  'send description line
  PRINT #1,"1a6210000000050";pcs; CR$;
  'send barcode
  PRINT #1,"E";CR$;
  ' end of format and print
GOTO MAIN
```

The following C language program will also generate a label. This program will send data through the COM1 port only.

☛**Note:**	With C++ be sure to add the following line: # include <string.h>)

```
/* DMX SERIES Sample C program.
Program written under QuickC. */

# include <stdio.h>

    main()
    {
            int d;
            int e;
            char pcs[10] = "590";
            char desc[21] = "10K OHM 1/4 WATT";
            char dataout[500];
            printf("DMX Printer Test Program\n");
            strcpy(dataout,"\x02L\x0d");
            strcat(dataout,"H07\x0d");
            strcat(dataout,"D11\x0d");
            strcat(dataout,"191100801000025");
            strcat(dataout,desc);
            strcat(dataout,"\x0d");
            strcat(dataout,"1a6210000000050");
            strcat(dataout,pcs);
            strcat(dataout,"PCS\x0d");
            strcat(dataout,"E\x0d");
            e = strlen(dataout);
            for (d=0; d<=e-1; d++)
            putc(dataout [d],stdaux);
    }
```

This ASCII text file will also generate the label shown in Figure B-1.

```
^BL
H07
D11
19110080100002510K OHM 1/4 WATT<CR>
1a6210000000050590PCS<CR>
E<CR>
```

Figure B-1 Sample Label

Appendix C

Available Fonts

All character bit-mapped fonts available on the DMX printers are described in this section. Each font has a name (font I.D.) associated with it for use in programming. Human-readable fonts have numeric names.

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the alphabetic O. The slash can be removed with the label-formatting command Z. These fonts are non-proportional (monospaced); therefore, all of the characters take up the same amount of space when printed. This is helpful when using variable data in a fixed area. The sizes of these fonts are shown on the following pages.

The triumvirate font number 9 is a proportional font, each character will take up a different amount of space when printed. For example, the letter W will be larger than the letter I.

Human-Readable Fonts

Font	Valid ASCII Characters
0	32-127
1	32-168, 171, 172, 225
2	32-168, 171, 172, 225
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
7	32-126
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224-237, 241, 243, 246-250
Scalable font	Dependent on selected symbol set. (see Appendix F)

Table C-1 Valid Human-Readable Font ASCII Characters

Font sizes are dependent upon the model printer being used. Table C-3 lists the font sizes by printer. All dimensions are in dots.

Allegro, Allegro 2, Prodigy, Prodigy Plus 152 dpi

FONT	HEIGHT	WIDTH	SPACING
Font 0	7	5	1
Font 1	13	7	2
Font 2	18	10	2
Font 3	27	14	2
Font 4	36	18	3
Font 5	52	18	3
Font 6	64	32	4
Font 7	32	15	5
Font 8	28	15	5

DMX 400 / Prodigy Max / 6200 203dpi

FONT	HEIGHT	WIDTH	SPACING
Font 0	7	5	1
Font 1	13	7	2
Font 2	18	10	2
Font 3	27	14	2
Font 4	36	18	3
Font 5	52	18	3
Font 6	64	32	4
Font 7	32	15	5
Font 8	28	15	5

DMX 430 289.56 dpi

FONT	HEIGHT	WIDTH	SPACING
Font 0	10	7	1
Font 1	18	10	3
Font 2	26	14	3
Font 3	39	20	3
Font 4	52	26	4
Font 5	75	26	4
Font 6	92	46	6
Font 7	46	22	7
Font 8	40	22	7

Table C-2 Font Sizes (continued)

DMX 600 / 800 and Prodigy Max 300dpi

FONT	HEIGHT	WIDTH	SPACING
Font 0	10	7	1
Font 1	19	10	3
Font 2	27	15	3
Font 3	40	21	3
Font 4	53	27	4
Font 5	77	27	4
Font 6	95	47	6
Font 7	47	22	7
Font 8	41	22	7

Table C-2 Font Sizes (concluded)

Internal Bitmapped Font 9 Point Size Specifiers by Printer

Label format records with font code 9 can specify any of the following bitmapped font sizes with the associated specification in the font size/selection (barcode height) field. The associated printer, as shown in the table below, will produce the printed string “four point font” using a 4pt bitmapped font on a Prodigy Max 300DPI, DMX 600, DMX 800, Ovation!, Ovation! 300DPI, and DMX 430 printer.

e.g., 1911**A04**00100010four point font<CR>

Font 9 bitmapped fonts specifications (barcode height) point sizes by Printer

	Printer Model					
Points	MAX300dpi 6200	600 / 800	Ovation!	PE42 and Max	430	All
4	A04	A04	A04	-	A04	-
5	A05	A05	A05	-	A05	000[1]
6	A06	A06	A06	A06	A06	001
8	A08	A08	A08	A08	A08	002
10	A10	A10	A10	A10	A10	003
12	A12	A12	A12	A12	A12	004
14	A14	A14	A14	A14	A14	005
18	A18	A18	A18	A18	A18	006
24	A24	A24	A24	A24	A24	007
30	A30	A30	A30	A30	A30	008
36	A36	A36	A36*	A36	A36	009
48	A48	A48	A48*	A48	A48	010
72	-	A72	-	-	-	-

*Legal font size specifies, printer multiplies dots for A36 and A48 from smaller fonts.
1 = Except Allegro, Allegro 2 and Prodigy Plus.

Table C-3 Internal Bitmapped Font 9 sizes

0: Identifies a 96-character alphanumeric font, uppercase and lowercase.

```
Font 0
!"#$%& '()*+,-./
0123456789:;<=>?@
ABCDEFGHIJKLMNOP
QRSTUVWXYZ[\]^_`
abcdefghijklmnop
qrstuvwxyz{|}~
```

1: Identifies a 145-character uppercase and lowercase alphanumeric font that includes desenders and ascenders.

```
Font 1:
!"#$%& '()*+,- ./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéâäàçêëèïîìÄÅÉæÆôöò
ûùÿÖÜø£Ø×ƒáíóúñÑªº¿½¼¡«
```

2: Identifies a 138-character alphanumeric upper and lowercase font.

```
Font 2:
!"#$%& '()*+,- ./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéâäàçêëèïîìÄÅÉæÆôöò
ûùÿÖÜø£Ø×ƒáíóúñÑªº¿½¼¡«
```

3: Identifies a 62-character alphanumeric uppercase font.

FONT 3:
#$%&()*+.-,/0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß

4: Identifies a 62-character alphanumeric uppercase font.

FONT 4:
#$%&()*+.-,/0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß

5: Identifies a 62-character alphanumeric upper case font.

FONT 5:
#$%&()*+.-,/0123456769:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß

6: Identifies a 62-character alphanumeric uppercase font.

FONT 6:
#$%&()*+ .- ./
0123456789:
ABCDEFGHIJKL
MNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß

7: Identifies a font that prints OCR-A, size I.

Font 7:
!"#$%&'()*+,-./
0123456789:;<=>?@
ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
abcdefghijklmno
pqrstuvwxyz{|}~

8: Identifies a font that prints OCR-B, size III.

Font 8:

0123456789

<>CENSTXZI

9: Identifies the internal Triumvirate font. Point sizes are selected by the number in the barcode height. See page C-3.

4 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789

5 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789

6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789

8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz01234

10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnop

12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef

14 pt ABCDEFGHIJKLMNOPQRSTUVWXYZ

18 pt ABCDEFGHIJKLMNOPQRST

24 pt ABCDEFGHIJKLMN

30 pt ABCDEFGHIJK

36 pt ABCDEFGH

48 pt ABCDE

72 pt AB

Appendix D

Error Codes

The most common error codes that could be transmitted by the Datamax printers are described below.

Lowercase "c"

The printer received a data byte from the host computer that contained a framing error (corrupted data) usually due to noise.

Lowercase "v"

There is an input buffer overflow situation. This is caused when an overflow of data is sent to the printer.

Uppercase "I"

An invalid command sequence was sent to the printer. The printer did not understand the command sequence and terminated the command interpreter.

Uppercase "R"

This code is sent every time the printer is turned on signaling that there was a hardware reset.

Uppercase "T"

This code signals there was a software reset. A software reset is made by sending the command sequence to the printer or by doing a front panel reset.

BELL HEX "07"

This code is usually returned on a corrupt image download, or if you try to load an image that already resides in the module.

Appendix E

Single Byte Symbol Sets

(US) ISO 6: ASCII Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	·	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒

(DN) ISO 60: Danish / Norwegian Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	Æ	Ø	Å	^	_
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	æ	ø	å	¯	▒

(IT) ISO 15: Italian Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	£	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	§	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	º	ç	é	^	_
60	ù	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	à	ò	è	ì	▒

(GR) ISO 21: German Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	§	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	Ä	Ö	Ü	^	_
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	ä	ö	ü	ß	▒

(FR) ISO 69: French Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	£	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	à	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	º	ç	§	^	_
60	µ	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	é	ù	è	¨	▒

(E5) ISO 8859/5 Latin 5 Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90																
A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
B0	º	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0		Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü			ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0		ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	I		ÿ

(E2) ISO 8859/2 Latin 2 Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90																
A0			°	˛	¤			§	¨	˚	Š			·	Ž	
B0	°			˛	´			·	¸	¹	š			”	ž	
C0		Á	Â		Ä	Å		Ç		É		Ë		Í	Î	
D0	Đ			Ó	Ô		Ö	×	Ø		Ú		Ü	Ý		ß
E0		á	â		ä			ç		é		ë		í	î	
F0				ó	ô		ö	÷			ú		ü	ý		

(E1) ISO 8859/1 Latin 1 Symbol Set. Font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90																
A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
B0	°	±	²	³	´	µ	¶	·	¸	¹	¹	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

(DT) DeskTop Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90																
A0		¶	§	†	‡	©	®	™	[illegible]	¢	–	—	…	fi	fl	
B0	“	”	µ	‰	•	●	º	○	■	■	•	•	’	¬	¦	=
C0	–	±	×	÷	°	′	″	¼	½	¾	¹	²	³	/		
D0	(	)	«	»	‚	„	’	¡	¿	Pt	l	£	¥	¤	ƒ	ß
E0	ª	º	æ	Æ	ð	Ð	ij	IJ	ɪ	ʇ	œ	Œ	ø	Ø	þ	Þ
F0	‘	’	ˆ	¨	˜			˝	°	˙	¯	¸	˛	'	l	

(LG) Legal Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	=	=	⦀	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[		]	^	_
60	°	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	§	¶	†	™	▒

(R8) Roman-8 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	-
60	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90																
A0		À	Â	È	Ê	Ë	Î	Ï	’	‘	ˆ	¨	˜	Ù	Û	£
B0	-	Ý	ý	º	Ç	ç	Ñ	ñ	¡	¿	¤	£	¥	§	*f*	⦀
C0	â	ê	ô	û	á	é	ó	ú	à	è	ò	ù	ä	ë	ö	ü
D0	Å	î	Ø	Æ	å	Í	ø	æ	Ä	ì	Ö	Ü	É	Ï	ß	Ô
E0	Á	Ã	ã	Ð	ð	Í	Ì	Ó	Ò	Õ	õ	Š	š	Ú	Ÿ	ÿ
F0	Þ	þ	·	*µ*	¶	¾	—	¼	½	ª	°	«	■	»	±	

(PT) PC-8 TK, Code Page 437T Symbol Set, font code S00*																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00		☺		♥	♦	♣	♠	●	◘	○		♂	♀		♪	☼
10	►	◄	↕	‼	¶	§	▬	↨	↑	↓	→	←	∟	↔	▲	▼
20		!	"	#	$	%	&	'	(	)	*	+	,	-	·	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
80	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90	É	æ	Æ	ô	ö	ò	û	ù		Ö	Ü	¢	£	¥		
A0	á	í	ó	ú	ñ	Ñ			¿	⌐	¬	½	¼	¡	«	»
B0	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C0	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D0	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▄	▌	▐	▀
E0	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	∅	ε	∩
F0	≡	±	≥	≤	⌠	⌡	÷	≈	°	•	·	√	ⁿ	²	■	

*** New Default**

(PM) PC-850 Multilingual Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00		☺		♥	♦	♣	♠	●	◘	○		♂	♀		♪	☼
10	►	◄	↕	‼	¶	§	▬	↨	↑	↓	→	←	∟	↔	▲	▼
20		!	"	#	$	%	&	'	(	)	*	+	,	¨	·	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
80	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	ƒ
A0	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
B0	░	▒	▓	│	┤	Á	Â	À	©	╣	║	╗	╝	¢	¥	┐
C0	└	┴	┬	├	─	┼	ã	Ã	╚	╔	╩	╦	╠	═	╬	¤
D0	ð	Ð	Ê	Ë	È	ì	Í	Î	Ï	┘	┌	█	▄	▌	▐	▀
E0	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	¯	´
F0	-	±	=	¾	¶	§	÷	¸	°	¨	·	¹	³	²	■	

(WT) Windows 3.1 Latin 5 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80			‚	ƒ	„	…	†	‡	ˆ	‰	Š	‹	Œ			
90		‘	’	“	”	•	–	—	˜	™	š	›	œ			Ÿ
A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
B0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0		Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü			ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0		ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	¹		ÿ

(PE) PC-852 Latin 2 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00		☺		♥	♦	♣	♠	●	◘	○		♂	♀		♪	☼
10	►	◄	↕	!!	¶	§	▬	↨	↑	↓	→	←	∟	↔	▲	▼
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
80	Ç	ü	é	â	ä			ç		ë			î		Ä	
90	É			ô	ö					Ö	Ü				×	
A0	á	í	ó	ú											«	»
B0	░	▒	▓	│	┤	Á	Â			╣	║	╗	╝			┐
C0	└	┴	┬	├	─	┼			╚	╔	╩	╦	╠	═	╬	¤
D0		Đ		Ë			Í	Î		┘	┌	■	▄			▀
E0	Ó	ß	Ô				Š	š		Ú			ý	Ý		´
F0		"	¸			§	÷		°	¨	˙				■	

(W1) Windows 3.’ Latin 1 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80			‚	ƒ	„	…	†	‡	ˆ	‰	Š	‹	Œ			
90		‘	’	“	”	•	–	—	˜	™	š	›	œ			Ÿ
A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
B0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

(PD) PC-8 D/N, Code Page 437N Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00		☺		♥	♦	♣	♠	●	◘	○			♀		♪	☼
10	▶	◀	↕	!!	¶	§	▬	↨	↑	↓	→	←		↔	▲	▼
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
80	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	
A0	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬			¡	«	»
B0	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C0	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D0	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▄	▌	▐	▀
E0	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	ø	ε	∩
F0	≡	±	≥	≤	⌠	⌡	÷	≈	°	∙	·	√	ⁿ	²	■	

(PC) PC-8 Code Page 437 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00		☺		♥	♦	♣	♠	●	◘							☼
10	▶	◀	↕	!!	¶	§	▬	↨	↑	↓	→	←		↔	▲	▼
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
80	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	Pt	ƒ
A0	á	í	ó	ú	ñ	Ñ	õ	Õ	¿	⌐	¬	½	¼	¡	«	»
B0	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C0	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D0	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▄	▌	▐	▀
E0	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	∅	ε	∩
F0	≡	±	≥	≤	⌠	⌡	÷	≈	°	•	·	√	ⁿ	²	■	

(MC) Macintosh Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	
80	Ä	Å	Ç	É	Ñ	Ö	Ü	á	à	â	ä	ã	å	ç	é	è
90	ê	ë	í	ì	î	ï	ñ	ó	ò	ô	ö	õ	ú	ù	û	ü
A0	†	°	¢	£	§	•	¶	ß	®	©	™	´	¨	≠	Æ	Ø
B0	∞	±	≥	≤	¥	µ	∂	∑	∏	π	∫	ª	º	Ω	æ	ø
C0	¿	¡	¬	√	ƒ	≈	Δ	«	»	…		À	Ã	Õ	Œ	œ
D0	–	—	“	”	‘	’	÷	◊	ÿ	Ÿ	/	¤	<	>	fi	fl
E0	‡	`	,	„	‰	Â	Ê	Á	Ë	È	Í	Î	Ï	Ì	Ó	Ô
F0		Ò	Ú	Û	Ù	|	ˆ	˜	¯	˘	˙	˚	¸	¨	˛	

(VU) Ventura US Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	
80																
90												↵	➡	␣	▪	•
A0	„								©	®	™					
B0	‰	“	”	º										§		¢
C0																
D0																
E0																
F0			¶	†	‡	—	–						●			…

(VI) Ventura International Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	
80																
90												↵	➡	␣	▪	•
A0	„	À	Â	È	Ê	Ë	Î	Ï	©	®	™	‹	›	Û	Ú	
B0	‰	“	”	º	Ç	ç	Ñ	ñ	¡	¿	¤	£	¥	§	ƒ	¢
C0	â	ê	ô	û	á	é	ó	ú	à	è	ò	ù	ä	ë	ö	ü
D0	Å	î	Ø	Æ	å	í	ø	æ	Ä	ì	Ö	Ü	É	ï	ß	Ô
E0	Á	Ã	ã			Í	Ì	Ó	Ò	Õ	õ	Š	š	Ú	Ÿ	ÿ
F0	Œ	œ	¶	†	‡	—	–			ª	º	«	●	»		…

(SW) ISO 11: Swedish Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	¤	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	É	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	Ä	Ö	Å	Ü	_
60	é	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	ä	ö	å	ü	▒

(SP) ISO 17: Spanish Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	£	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	§	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	¡	Ñ	¿	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	º	ñ	ç	~	▒

(UK) ISO 4: United Kingdom Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	£	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒

(TS) PS Text Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	£	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	
80																
90																
A0		¡	¢	£	/	¥	*f*	§	¤	'	“	«	‹	›	fi	fl
B0		-	†	‡	·		¶	•	‚	„	”	»	…	‰		¿
C0		`	´	ˆ	˜	¯		˙	¨		°			”		
D0	—															
E0		Æ		ª					Ł	Ø	Œ	º				
F0		æ				|			ł	ø	œ	ß				

(WE) Windows 3.1 Latin 2 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80			‚		„	…	†	‡		‰	Š	‹			Ž	
90		‘	’	“	”	•	–	—		™	š	›			ž	
A0				Ł	¤		¦	§	¨	©		«	¬	•	®	
B0	º	±		ł	´	*µ*	¶	·				»		”		
C0		Á	Â		Ä			Ç		É		Ë		Í	Î	
D0	Đ			Ó	Ô		Ö	×			Ú		Ü	Ý		ß
E0		á	â		ä			ç		é		ë		í	î	
F0				ó	ô		ö	÷			ú		ü	ý		

(WO) Windows 3.0 Latin 1 Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒
80																
90		`	'													
A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
B0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

(PI) PI Font Symbol Set, font code S00																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20			‟	‚	“	”	‘	’	〈	〉	™	℠	®	©		
30	⎺	⎽			↗	↘	↙	↖	∆	▷	▽	◁	«	§	»	¶
40	::	∆					*F*		ℏ				L	ℓ		
50	P	p	℞	∑								⟦	‖	⟧	‹	›
60	┌	└	⎛	⎝	┼	├	─	│	∪	∩	╔	╚	□ □ □ □ •	◊		
70	┐	┘	⎞	⎠	┬	┤	┴	⎪	∐	∏	╗	╝	■	◆		▒
80																

Appendix F

Barcodes Summary Data (continued)

Barcode fonts have alpha names. Uppercase alpha names will print barcodes with human-readable interpretations. Lowercase alpha names will print barcodes only.

Font	Type	Length	Cksum	Valid ASCII Characters, decimal value representation
A	Code 3 of 9	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B	UPC-A	11	Yes	48-57 Numeric only. Option V used in the 6th & 7th position
C	UPC-E	6	Yes	48-57 Numeric only
D	Interleaved 2 of 5 (I 2 of 5)	Varies	No	48-57 Numeric only
E	Code 128	Varies	M-103	32-127
F	EAN-13	12	Yes	48-57 Numeric only. Option V used in the 7th & 8th position
G	EAN-8	7	Yes	48-57 Numeric only
H	HBIC	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I	Codabar	Varies	No	36, 43, 45-58, 65-68
J	Interleaved 2 of 5 with a modulo 10 checksum	Varies	M-10	48-57 Numeric only
K	Plessey	Up to 14	M-10	48-57 Numeric only. Option + is Last Character for Second M-11 Checksum
L	Interleaved 2 of 5 with a modulo 10 checksum & shipping bearer bars	13	M-10	48-57 Numeric only
M	2 digit UPC addendum	2	Yes	48-57 Numeric only
N	5 digit UPC addendum	5	Yes	48-57 Numeric only
O	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only

Barcodes Summary Data (concluded)

Font	Type	Length	Cksum	Valid ASCII Characters, decimal value representation
Q	UCC/EAN Code 128	19	Yes	48-57 Numeric only
R	UCC/EAN Code 128 K-Mart NON EDI barcode	18	Yes	48-57 Numeric only
S	UCC/EAN Code 128 Random Weight	34 +	Yes	48-57 Numeric only
T	Telepen	Varies	Yes	Alphanumeric
U	UPS Maxicode	84	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF-417	Varies	Yes	All
W1C	Datamatric	Varies	Yes	All 8-bit values

Appendix G

Barcode Details

All barcode symbols shown here were printed using the ratio/module values of 00 causing the printer to print symbols with default bar widths. The barcode height fields are also 000 causing default heights to be used.

A: Code 3 of 9

Valid Characters: 0-9, A-Z, -. *$/+% and the space character.

Variable Length.

Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

The following example prints out a code 3 of 9 barcode with a wide to narrow bar ratio of 3:1.

<STX>L
D11
1A0000000150100012345678 9<CR>
121100000000100Barcode A<CR>
E

B: UPC-A

Valid Characters: 0-9

Length: 12 digits. If the user provides 11 digits, the printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.

Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a UPC-A barcode.

```
<STX>L
D11
1B0000000150100012345678 90<CR>
121100000000100Barcode B<CR>
E
```

C: UPC-E

Valid Characters: 0-9

Length: Seven digits. If the user provides six digits, he printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.

Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a UPC-E barcode.

```
<STX>L
D11
1C0000000150100012345<CR>
121100000000100Barcode C<CR>
E
```

D: Interleaved 2 of 5 (I 2 of 5)

Valid Characters: 0-9

Variable Length.

Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

The following example prints out a interleaved 2 of 5 barcode with a wide to narrow bar ratio of 3:1. Bar codes J and L also print out different forms of the I 2 of 5 barcode.

<STX>L
D11
1D00000001501000123456789 0<CR>
121100000000100Barcode D<CR>
E

E: Code 128

Valid Characters: The entire 128 ASCII character set.

Variable Length:

Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

This printer supports the Code 128 subsets A, B, and C. You can select the printer to start on any code subset and switch to another within the data stream. The default code subset is B, otherwise the first character (A, B, C) of the data field determines the subset. Subset switching is only performed in response to code switch command. These commands are placed in the data to be encoded at appropriate locations, see table on Special ASCII Commands, page 149.

Code 128 Subset A: Includes all of the standard uppercase alphanumeric keyboard characters plus the

control and special characters. To select Code 128 Subset A, place an ASCII A (DEC 65, HEX 41) before the data to be encoded.

Code 128 Subset B: Includes all of the standard uppercase alphanumeric keyboard characters plus the lowercase alphabetic and special characters. To select Code 128 Subset B, place an ASCII B (DEC 66, HEX 42) before the data to be encoded. If no start character is sent for the 128 font, Code 128 Subset B will be selected by default.

Code 128 Subset C: Includes the set of 100 digit pairs from 00 through 99 inclusive, as well as special characters. Code 128 Subset C is used for double density encoding of numeric data. To select Code 128 Subset C, place an ASCII C (DEC 67, HEX 43) before the data to be encoded. Subset C can only encode an even number of numeric characters. When the data to be encoded includes an odd number of numeric characters, the last character causes the printer to automatically generate a ‘switch to subset B’ and encode the last character appropriately in subset B.

Note: It is recommended to use a B as the first character to prevent an A or C from changing the subset.

Special Character Handling: Characters with an ASCII value greater than 95 are considered special characters. To access these values, a two-character reference table is built into the printer. Table B-4 describes this table.

ASCII	2 CHAR	CODEA	CODEB	CODEC
96	&A	FNC3	FNC3	-NA-

97	&B	FNC2	FNC2	-NA-
98	&C	SHIFT	SHIFT	-NA-
99	&D	CODEC	CODEC	-NA-
100	&E	CODEB	FNC4	CODEB
101	&F	FNC4	CODEA	CODEA
102	&G	FNC1	FNC1	FNC1

As an example, to encode FNC2 into a Code 128 Subset A barcode, send the ASCII & (DEC 38, HEX 26) followed by an ASCII B (DEC 66, HEX 41). Code FNC2 will be encoded.

Example:

ATEST&B123 Data Encoded: TEST<FNC2>123

Control Codes: Control characters can be encoded into Code 128 Subset A by sending control codes;

`	= NUL
a through z	= 1 - 26
{	= ESC
|	= FS
}	= GS
~	= RS
ASCII 127	= US

The following example prints out a Code 128 barcode.

<STX>L
D11
1E0000000150100001234567890<CR>
121100000000100Barcode E<CR>
E

F: EAN-13

Valid Characters: 0-9

Length:	13 digits. If the user provides 12 digits, the printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width), see page 171.

The following example prints out a EAN-13 barcode.

```
<STX>L
D11
1F0000000150100012345678901<CR>
121100000000100Barcode F<CR>
E
```

G: EAN-8

Valid Characters:	0-9
Length:	8 digits. If the user provides 7 digits, the printer will compute the checksum. If the user provides the checksum, the printer will check that it matches the expected checksum. If it does not match, the printer will print out all zeros and the expected checksum.
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a EAN-8 barcode.

```
<STX>L
D11
1G00000001501000123456<CR>
121100000000100Barcode G<CR>
E
```

H: Health Industry Bar Code (HBIC) (Code 39 barcode with a modulo 43 checksum).

Valid Characters: 0-9, A-Z, -$ /. %

Variable Length.

Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

The host must supply leading "+"'s

The following example prints out a HBIC barcode with a wide to narrow bar ratio of 3:1.

```
<STX>L
D11
1H0000000150050+0123456789<CR>
121100000000100Barcode H<CR>
E
```

I: Codabar

Valid Characters:	0-9, A-D, -, ., $, :, /, +, (comma is not valid).
Variable Length:	Must have at least three characters.
Valid bar widths:	The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

Valid codabar symbols require start and stop characters, (characters A-D). These characters should be placed in the data field along with other data to be included in the symbol. The following example prints out a Codabar barcode with a wide to narrow bar ratio of 3:1.

Internal Batch Fields:
1I63040001501000A1234567890D
121100000000100Barcode I

Barcode I

J: Interleaved 2 of 5 with a modulo 10 checksum.

Valid Characters:	0-9
Variable Length.	
Valid bar widths:	The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

The following example prints out a interleaved 2 of 5 barcode with a modulo 10 checksum added with a wide to narrow bar ratio of 3:1. Bar codes D and L also print out different forms of the I 2 of 5 barcode.

<STX>L
D11
1J00000001501000123456789 0<CR>
121100000000100Barcode J<CR>
E

Barcode J

K: **Plessey**

Valid Characters: 0-9

Length: 1 to 14 digits

Valid bar widths: The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

If a + character is the last data character, an additional MSI checksum will be added to the barcode in place of the + character.

The following example prints out a Plessey barcode with a wide to narrow bar ratio of 3:1.

<STX>L
D11
1K0000000150100001234567890<CR>
121100000000100Barcode K<CR>
E

L: Interleaved 2 of 5 with a modulo 10 checksum and shipping bearer bars.

Valid Characters:	0-9
Variable Length	For the bearer bars to be printed, 14 characters are required.
Valid bar widths:	The expected ratio of wide to narrow bars can range from 2:1 to 3:1.

The following example prints out a interleaved 2 of 5 barcode with a modulo 10 checksum and bearer bars with a wide to narrow bar ratio of 3:1. Bar codes J and L also print out different forms of the I 2 of 5 barcode.

```
<STX>L
D11
1L00000001501000123456789012<CR>
121100000000100Barcode L<CR>
E
```

M: 2-digit UPC addendum

Valid Characters:	0-9
Length:	2 digits.
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a 2 digit UPC barcode addendum.

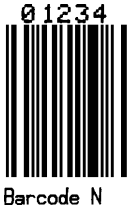
<STX>L
D11
1M000000015010042<CR>
121100000000100Barcode M<CR>
E

N: 5-digit UPC addendum

Valid Characters:	0-9
Length:	5 digits.
Valid bar widths:	The width multiplier is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a 5 digit UPC barcode addendum.

<STX>L
D11
1N000000015010001234<CR>
121100000000100Barcode N<CR>
E



O: Code 93

Valid Characters:	0-9, A-Z, -.$/+% and the space character.
Variable Length.	
Valid bar widths:	The width multiplier is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The following example prints out a code 93 barcode.

```
<STX>L
D11
1O0000000150100Datamax42<CR>
121100000000100Barcode O<CR>
E
```

p: Postnet

Valid Characters:	0-9
Length:	5, 9, 11 digits
Valid bar widths:	The width and height multiplier values of 00 will produce a valid postnet symbol.
Usage:	The barcode height filed is ignored since the symbol height is U.S.P.S specific. This barcode is to display the zip code on a letter or package for the US Postal Service.

The following example prints out a postnet barcode:

```
<STX>L
D11
1p000000015010032569<CR>
121100000000100Barcode p<CR>
E
```

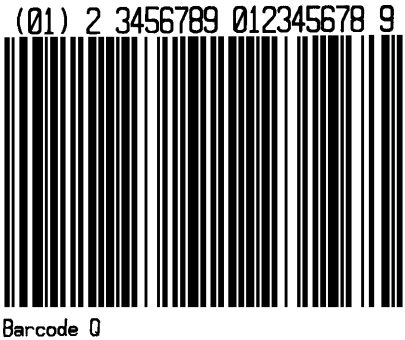
Q: UCC/EAN Code 128

Valid Characters:	0-9
Length: 1	9 digits.
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

The printer spreads a weighted, module 103, check sum.

The following example prints out a UCC/EAN Code 128 barcode.

```
<STX>L
D11
1Q00000001501000123456789012345678<CR>
121100000000100Barcode Q<CR>
E
```



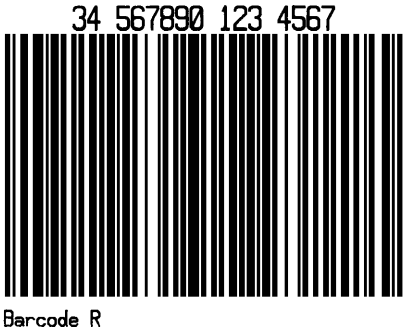
R: UCC/EAN Code128 K-MART NON EDI barcode.

Valid Characters:	0-9
Length:	18 digits
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

This barcode is set up according to K-MART specifications.

The following example prints out a KMART barcode.

```
<STX>L
D11
1R00000001501000123456789012345 67<CR>
121100000000100Barcode R<CR>
E
```



S: UCC/EAN Code 128 Random Weight

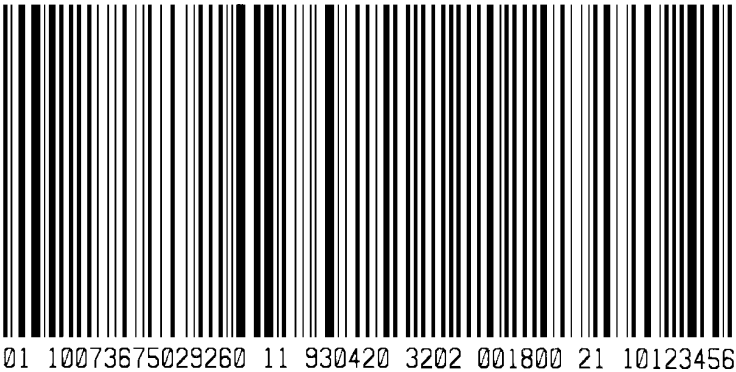
Valid Characters:	0-9
Length:	At least 34 digits.
Valid bar widths:	The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

This barcode is commonly used by the food and grocery industry.

The following example prints out a UCC/EAN Code 128 Random Weight barcode.

> ✓**Note:** Not available on Allegro, Allegro 2, Prodigy or Prodigy Plus.

```
<STX>L
D11
1S00000001500500110073675029260119304203202001800211
0123456<CR>
121100000000100Barcode S<CR>
E
```



T: Telepen

Valid Characters: All 128 ASCII characters.

Variable Length

Valid bar widths: The fourth character of record is the width of the narrow bar in dots. All other bars are a ratio of the narrow bar (2 times the narrow bar width, 3 times the narrow bar width, and 4 times the narrow bar width).

> ☑**Note:** Not available on Allegro, Allegro 2, Prodigy or Prodigy Plus.

The following example prints out a Telepen barcode.

```
<STX>L
D11
1T0000000150100ABCDEF<CR>
121100000000100Barcode T<CR>
E
```

u: UPS MaxiCode

The following examples illustrate the various label format record message syntax's for encoding data as MaxiCode. The UPS 3.0 Message data formats and special characters are defined by UPS. Please refer to specifications Guide to Bar Coding with UPS, Version 3.0, appendix 3 or Uniform Symbology Specification - MaxiCode, AIM.

In the following examples special formatting is used to denote special ASCII characters as shown in the table:

Symbol	Hexadecimal Value
$^{R}{}_{S}$	1E
$^{G}{}_{S}$	1D
$^{E}O_{T}$	04

printer message syntax allows for $^{E}O_{T}$ to be substituted with <CR> or the use of both $^{E}O_{T}$<CR>.

Datamax MaxiCode fixed field format:

example:

1u0000001000100327895555840666THIS PACKAGE IS GOING TO DATAMAX CORP.<CR>

where:

32789	5 digit ASCII, Zip code
5555	4 digit ASCII, +4 Zip code
840	3 digit ASCII, country code
666	3 digit ASCII, class of service
THIS...	84 maximum ASCII characters, data string

In the UPS 3.0 protocol examples that follow, Primary Message control characters $^{G}{}_{S}$ will not be encoded in the MaxiCode symbol. All characters, with the exception of the leading $^{G}{}_{S}$, in the Secondary Message are encoded.

The UPS 3.0 zip + 4 with Message data format and message header:

example:

1u0000001200120[)>$^{R}{}_{S}$01$^{G}{}_{S}$96**84170**6672$^{G}{}_{S}$**840**$^{G}{}_{S}$**001**$^{G}{}_{S}$1Z12345675$^{G}{}_{S}$UPSN$^{G}{}_{S}$12345E$^{G}{}_{S}$089G$^{G}{}_{S}$1/1$^{G}{}_{S}$10.1$^{G}{}_{S}$Y$^{G}{}_{S}$$^{G}{}_{S}$$^{G}{}_{S}UT^{R}{}_{S}$$^{E}{}_{O}{}_{T}$

where:

[)>$^{R}{}_{S}$01$^{G}{}_{S}$96 message header

The UPS 3.0 international zip “V6C3E2” with Message data format and message header:

example:

1u0000001200120[)>$^{R}{}_{S}$01$^{G}{}_{S}$96**V6C3E2**$^{G}{}_{S}$**068**$^{G}{}_{S}$**001**$^{G}{}_{S}$1Z12345675$^{G}{}_{S}$UPSN$^{G}{}_{S}$12345E$^{G}{}_{S}$089G$^{G}{}_{S}$1/1$^{G}{}_{S}$10.1$^{G}{}_{S}$Y$^{G}{}_{S}$$^{G}{}_{S}$$^{G}{}_{S}UT^{R}{}_{S}^{E}O_{T}$

where:

[)>$^{R}{}_{S}$01$^{G}{}_{S}$ 96	message header	
V6C3E2	maximum 6 alphanumeric ASCII, International Zip code	Primary message
068	country code	
001	class	
$^{G}{}_{S}$1Z1**...**		Secondary Message
...T$^{R}{}_{S}$^{E}O$_{T}$		

The UPS 3.0 international zip “V6C3E2” without Message data format and message header:

example:

1u0000001200120**V6C3E2**$^{G}{}_{S}$**068**$^{G}{}_{S}$**001**$^{G}{}_{S}$1Z12345675$^{G}{}_{S}$UPSN$^{G}{}_{S}$12345E$^{G}{}_{S}$089G$^{G}{}_{S}$1/1$^{G}{}_{S}$10.1$^{G}{}_{S}$Y$^{G}{}_{S}$$^{G}{}_{S}$$^{G}{}_{S}UT^{R}{}_{S}^{E}O_{T}$

where:

V6C3E2	maximum 6 alphanumeric ASCII, International Zip code	Primary message
068	country code	
001	class	
$^{G}{}_{S}$1Z1**...**		Secondary Message
...T$^{R}{}_{S}$^{E}O$_{T}$		

The UPS 3.0 zip + 4 “32707-3270” without Message data format and message header:

example:

1u0000001200120**32707**3270$^{G}{}_{S}$**068**$^{G}{}_{S}$**001**$^{G}{}_{S}$1Z12345675$^{G}{}_{S}$UPSN$^{G}{}_{S}$123 45E$^{G}{}_{S}$089G$^{G}{}_{S}$1/1$^{G}{}_{S}$10.1$^{G}{}_{S}$Y$^{G}{}_{S}{}^{G}{}_{S}{}^{G}{}_{S}UT^{R}{}_{S}{}^{E}{}_{O}{}_{T}$

where:

32707	5 digit ASCII, Zip code	Primary message
3270	4 digit ASCII, +4 Zip code (not required)	
068	country code	
001	class	
$^{G}{}_{S}$1Z1**...**		Secondary Message
...T$^{R}{}_{S}{}^{E}{}_{O}{}_{T}$		

☑**Note::** Not available on the Prodigy, Prodigy Plus, Allegro or Allegro 2.

v: FIM

Valid Characters:	A, B, C, or D
Length:	1 character
Valid bar widths:	The width and height multiplier work the same as for fonts on this barcode.
Usage:	This barcode is to display the Facing Identification Mark (FIM) that is used on certain types of letter mail for the U S Postal Service.
FIM A :	Courtesy reply mail with postnet.
FIM B:	business reply, penalty or franked mail without postnet.
FIM C:	Business reply, penalty or franked mail with postnet.
FIM D:	OCR readable mail without postnet (usually used on courtesy reply window envelopes).

✓**Note:** Not available on Allegro, Allegro 2, Prodigy or Prodigy Plus.

The following example prints out a FIM A barcode:

```
<STX>L
D11
1v0000000150100A<CR>
121100000000100Barcode v<CR>
E
```

z: PDF-417

Valid Characters: All ASCII characters. This is a 2 dimensional barcode that is capable of holding large amounts of data in a small area. It provides a high level of redundancy and error checking if requested.

Variable Length

The barcode's data stream consists of six different sections:

1. 1 character specifying a normal or truncated barcode, (T to truncate, F for normal).
2. 1-digit security level ranging from 0 to 8.
3. 2-digit aspect ratio. This is specified as a fraction with the first digit being the numerator and the second being the denominator. Use “00” for the default of 1:2. Valid range is from "00" to "99."
4. 2-digit number specifying the number of rows requested. Use “00” to let the printer find the best fit. Valid range is from “03” to “90”. Values less than 3 are set to 3, and values greater than 90 are set to 90.
5. 2-digit number specifying the number of columns requested. Use “00” to let the printer find the best fit. Valid range is from “01” to “30”. Values greater than 30 are set to 30.
6. A data stream to be encoded.

Note: Not available on the Allegro, Allegro 2, Prodigy, or Prodigy Plus prior to Version 3.2.

The following example prints out a PDF-417 barcode, not truncated, a security level of 1, a default aspect ratio, and the best fit rows and columns:

<STX>L
D11
1z0000000150100F1000000PDF417<CR>
121100000000100Barcode z<CR>
E

Wc: DATAMATRIX

Valid Characters: Any 8-bit byte data

Variable Length

both ‘1c’, and ‘c’ can be used to encode data using the Data Matrix symbology.

Data Matrix is a two-dimensional variable length matrix symbology which is made up of square modules arranged within a perimeter finder pattern. There are two types of Data Matrix symbols, ECC 000-140 and ECC 200.

ECC 000 - 140 symbols:

These square symbols can be any odd sizes from 9x9 to 49x49, which may be specified in fields iii, and jjj. If an ECC 000-140 symbol is specified with even numbers of rows or columns, the next largest odd value will be used. Input values greater than 49 or less than 9 will cause the symbol to be automatically sized for the input character stream. The record format is shown here, expanded with spaces.

a W b[b] c d eee ffff gggg hhh i jjj kkk ll..l

Field	Valid Inputs	Meaning
a	1,2,3, and 4	Rotation
W	W	Fixed value, extended barcode set
b[b]	c, 1c	Selects Datamatrix Barcode - the two differing values have no other significance.
c	1 to 9 and A to O	module size horizontal multiplier
d	1 to 9 and A to O	module size vertical multiplier
eee	000 to 999	No Effect; Must be numeric
ffff	0000 to 9999	label position, row
gggg	0000 to 9999	label position, column
hhh	000, 050, 080, 100, 140	A 3 digit convolutional error correction level If any number other than one of these options is entered then the nearest lesser value from the valid entries is used. Example: selecting an ECC value of 099 will cause the actual ECC value of 080 to be used.
i	0 - 6	1 digit format identification 0 -Automatically choose the encodation scheme based on the characters to be encoded. 1 - Numeric data. 2 - Upper-case alphabetic. 3 - Upper-case alphanumeric and punctuation characters (period, comma, hyphen, slash). 4 - Upper-case alphanumeric. 5 - ASCII, the full 128 ASCII character set. 6 - any 8-bit byte. If a format identifier is selected which will not encode the input character stream then the barcode symbol will not be printed. It is recommended to use the auto-encodation format identification since it will select the best possible encodation scheme for the input stream.

ECC 200 symbols:

There are 24 square symbol sizes available, with both row and column dimensions, which may be specified in fields iii, and jjj, measured in modules as indicated in the following list - 10, 12, 14, 16, 18, 20, 22, 24, 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, and 144. If an ECC 200 symbol is specified with odd numbers of rows or columns, the next largest even value will be used. Input values greater than 144 or less than 10 will cause the symbol to be automatically sized for the input character stream. The record format is shown here, expanded with spaces.

a W b[b] c d eee ffff gggg hhh i jjj kkk ll..l

Field	Valid Inputs	Meaning
a	1,2,3, and 4	Rotation
W	W	Fixed value, extended barcode set
b[b]	c, 1c	Selects DataMatrix Barcode - the two differing values have no other significance.
c	1 to 9 and A to O	module size horizontal multiplier
d	1 to 9 and A to O	module size vertical multiplier
eee	000 to 999	No Effect; Must be numeric
ffff	0000 to 9999	label position, row
gggg	0000 to 9999	label position, column
hhh	200	ECC 200 uses Reed-Solomon error correction..
i	0	Fixed value, not used
jjj	10, 12, 14, ..., 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, and 144.	A 3 digit even number (or 000) of rows requested. 000 causes rows to be automatically determined. The symbol will be sized to a square if the rows and columns do not match by taking the larger of the two values.
kkk	10, 12, 14, ..., 26, 32, 36, 40, 44, 48, 52, 64, 72, 80, 88, 96, 104, 120, 132, and 144.	A 3 digit even number (or 000) of columns requested. 000 causes columns to be automatically determined. The symbol will be sized to a square if the rows and columns do not match by taking the larger of the two values.
ll...l	8-bit data	Data to be encoded in the symbol

> **Note:** The Datamatrix barcode is only available on printer's equipped with Datamatrix.
>
> Rectangular symbols or concatenation are not supported. If the data to be encoded does not fit within the symbol specified, no barcode will print.

UPC-A and EAN-13: Variable Price or Weight Bar Code

The EAN/UPC standard allows for an additional checksum to be generated in the middle of the barcode based on the data. This is used when the price or weight of an item is embedded into the barcode data (this is commonly used in the food industry.)

For the printer to generate this checksum, a 'V' must be placed in the data stream in the position the checksum is requested. If the 'V' is placed in the 6th position for UPC-A or the 7th position for EAN-13, a checksum will be generated using the next 5 digits in the data stream. If the 'V' is placed in the 7th position for UPC-A or the 8th position for EAN-13, a checksum will be generated using the next 4 digits in the data stream. The checksum is generated as per the EAN/UPC barcode standard.

Examples:

1B110000200020012345V01199

Prints a UPC-A barcode with the variable price checksum in the 6th position.

1B110000200020012345 6V0150

Prints a UPC-A barcode with the variable price checksum in the 7th position..

1F110000200020012345 6V01199

Prints a EAN-13 barcode with the variable price checksum in the 7th position.

1F110000200020012345 67V0150

Prints a EAN-13 barcode with the variable price checksum in the 8th position.

Appendix H

Font Mapping, Single Byte and Double Byte (Kanji) Characters

Label format records with font code 9 can specify any of the following bitmapped or scaleable fonts with the associated specification in the font size/selection (barcode height) field, as shown in the tables on the following pages.

Example: 1911**096**00100010A0215134<CR>

The example above will produce a printed string consisting of the two Kanji characters referenced by the two HEXASCII pairs A0, 21, and 51, 34, on appropriately equipped printers.

Example: 1911U4001000100P012P012<0x38><0x77><0x00>

The above example will produce a printed string consisting of the one 12 point Kanji character referenced by the byte pair with hex values 38 and 77 on appropriately equipped printers. Note that double byte hex representations for Kanji character strings terminate with a null byte.

The alphanumeric portion (nn) of the scaleable font specifiers, Snn, snn, Unn, unn, numbering system is a base 62 numbering system, 0,1,2,...8,9,A,B,C,...X,Y,Z,a,b,c,...x,y,z. For scaleable fonts the S designation signifies single byte characters and U designates double byte. Their lower case counterparts signify that print data in the label format record is in a hex-ASCII format. A Hex-ASCII format for a single byte with hex value 0xFF would be two ASCII character bytes FF (0x4646). Fonts that have been downloaded with designators of the form nn, where nn are alphanumeric, as seen in the font size specifier (barcode height) column below, may be referenced in label format records by their upper or lower case specifies as needed. However, fonts created for double-byte access cannot be accessed using Snn or snn as the font designator, and vice versa, single-byte fonts cannot be accessed using Unn or unn.

Font 9, Fonts Specifications (Bar Code Height) and Associated Characteristics			
Font Name	**Character Mapping**	**Font Size Specifier (barcode height)**	**Point Size**
Font 9 Bitmapped Resident fonts specifications			
CG Triumvirate Bold	Single Byte	000 - 010	5, 6, 8, 10, 12, 14, 18, 24, 30, 36, 48 respectively
CG Triumvirate Bold	Single Byte	A04, A05, A06, A08, A10, A12, A14, A18, A24, A30, A36, A48, A72	4, 5, 6, 8, 10, 12, 14, 18, 24, 30, 36, 48, 72 respectively
Gothic Kanji Scaleable	Double Byte, (HEXASCII)	096	6 (16x16 dots)
Gothic Kanji Scaleable	Double Byte (Binary)	098	6 (16x16 dots)
Gothic Kanji Scaleable	Double Byte (HEXASCII)	097	9 (24x24 dots)
Gothic Kanji Scaleable	Double Byte (Binary)	099	9 (24x24 dots)
Font 9 Bitmapped Cartridge fonts specifications			
CG Triumvirate Italic	Single Byte	B04 - B72	4-72 respectively
CG Triumvirate Bold	Single Byte	C04 - C72	4-72 respectively
CG Triumvirate Bold Condensed	Single Byte	D04 - D72	4-72 respectively
CG Times	Single Byte	E04 - E72	4-72 respectively
CG Times Bold	Single Byte	F04 - F72	4-72 respectively
Futura Extra Bold Condensed	Single Byte	G04 - G72	4-72 respectively

Font 9 Bitmapped Downloaded fonts specifications			
User downloaded Bitmapped typeface	Single Byte	100 - 999	user defined
Font 9 Scaleable Resident fonts specifications			
CG Triumvirate Bold Condensed Scaleable	Single Byte	S00	scaleable
CG Triumvirate Bold Condensed Scaleable	Single Byte (HEXASCII)	s00	scaleable
Gothic B Kanji Scalable	Double Byte (Binary)	U40	scaleable
Gothic B Kanji Scalable	Double Byte (HEXASCII)	u40	scaleable
Gothic B Kanji Scalable	Double Byte (Binary)	UK0	scaleable
Gothic B Kanji Scalable	Double Byte (HEXASCII)	uK0	scaleable
Gothic E Kanji Scalable	Double Byte (Binary)	UK1	scaleable
Gothic E Kanji Scalable	Double Byte (HEXASCII)	uK1	scaleable
Font 9 Scaleable Cartridge fonts specifications			
CG Times Family Scaleable	Single Byte	SA0 - SAz	scaleable
CG Times Family Scaleable	Single Byte (HEXASCII)	sA0 - sAz	scaleable
Kanji Gothic, Family Scaleable	Single Byte (Binary)	UA0 - UAz	scaleable
Kanji Gothic, Family Scaleable	Single Byte (HEXASCII)	uA0 - uAz	scaleable

Font 9 Scaleable Downloaded fonts specifications [1]			
User downloaded Scaleable typeface	Single Byte (Binary)	S50 - S5z... S90 - S9z	scaleable
User downloaded Scaleable typeface	Single Byte (HEXASCII)	s50 - s5z... s90 - s9z	scaleable
User downloaded Scaleable typeface	Double Byte (Binary)	U50...,U5z...,...U90...,U9z	scaleable
User downloaded Scaleable typeface	Double Byte (HEXASCII)	u50...,u5z...,...u90...,u9z	scaleable

Downloading scaleable fonts requires specifying the font ID, a two character alphanumeric. The S, s or U, u used in referencing the font within label format records is not used in the download specification. Attempting to utilize a scaleable font with an inappropriate byte-size designation, (e.g. S, s, on double byte or U, u) on single byte will have unpredictable results.

The DMX 400 and DMX 430 can be purchased with an option for fixed-pitched Kanji fonts (bitmapped resident). The Datamax printer language commands, used on the DMX 400 and DMX 430, for printing the Kanji characters are supported by the optional Scaleable Kanji firmware on the DMX 600 and DMX 800. In particular the font selections 096 through 099 used on DMX 400/430 printers can be used on DMX 600/800 printers. The DMX 600/800 printers will utilize a scaleable Kanji font to generate characters of the sizes implied by the font selection number.

Appendix I

Symbol Sets, Code Pages, and Character Maps

Symbol Set Selection

Scalable fonts are mapped through a symbol set sometimes referred to as a ‘code page’. This mapping allows the host application to select a variety of characters to match the application. For example in the code page (CP), character code 0xE4 causes character Φ to be printed. In CP E7 the character code 0xE4 causes δ to be printed. Each of the code pages allow the host application to “emulate” a character set for their application.

Datamax printers that support scalable fonts contain either a standard group or an enhanced group of code pages (symbol sets) as defined below. The CP (symbol set) is selected using a DPL Command, <stx>ySxx, where xx is the two letter CP Identifier.

Note: Not all fonts contain an entire compliment of character codes for a given code page (symbol set).

Single Byte Code Pages						
Code page identifier		Datamax Code page family		Font format		
Data-max	HP*	Std**	Enhanced **	Intellifont	True Type	Description
AR			√	√		Arabic-8
CP			√	√		Cyrillic
DN		√	√	√	√	ISO 60 Danish / Norwegian
DT	7J	√	√	√	√	DeskTop
D1	11L		√	√		ITC Zapf Dingbats/100
D2	12L		√	√		ITC Zapf Dingbats/200
D3	13L		√	√		ITC Zapf Dingbats/300
DS	10L		√	√		PS ITC Zapf Dingbats
E1	0N	√	√	√	√	ISO 8859/1 Latin 1
E2	2N	√	√	√	√	ISO 8859/2 Latin 2

Single Byte Code Pages						
Code page identifier		Datamax Code page family		Font format		
Data-max	HP*	Std**	Enhanced **	Intellifont	True Type	Description
E5	5N	√	√	√	√	ISO 8859/5 Latin 5
E6	6N		√	√	√	ISO 8859/10 Latin 6
E7			√	√	√	ISO 8859/7 Latin/Greek
EG			√	√	√	ISO 8859/7 Latin/Greek
EH			√	√		ISO 8859/8 Latin/Hebrew
ER			√	√		ISO 8859/5 Latin/Cyrillic
FR		√	√	√	√	ISO 69: French Symbol Set
G8			√	√		Greek-8
GK			√	√		PC-8 Greek
GR		√	√	√	√	ISO 21: German
H0			√	√		Hebrew-7
H8			√	√		Hebrew-8
IT		√	√	√	√	ISO 15: Italian
LG	1U	√	√	√	√	Legal
M8	8M		√	√	√	Math-8
MC	12J	√	√	√	√	Macintosh
MS	5M		√	√	√	PS Math
PB	6J		√	√	√	Microsoft Publishing
PC	10U	√	√	√	√	PC-8, Code Page 437
PD	11U	√	√	√	√	PC-8 D/N, Code Page 437N
PE	17U	√	√	√	√	PC-852 Latin 2
PG			√	√		PC-851 Latin/Greek
PH			√	√		PC-862 Latin/Hebrew
PI	15U	√	√	√	√	Pi Font
PM	12U	√	√	√	√	PC-850 Multilingual
PR			√	√		PC-864 Latin/Arabic
PT	9T	√	√	√	√	PC-8 TK, Code Page 437T
PU	9J		√	√	√	PC-1004
PV	26U		√	√	√	PC-775 Baltic
PX		√	√	√		PTXT3000
R8	8U	√	√	√	√	Roman-8
SP		√	√	√	√	ISO 17: Spanish
SW		√	√	√	√	ISO 11: Swedish
SY			√	√	√	Symbol
TS	10J	√	√	√	√	PS Text
TK			√	√		Turkish-8
UK		√	√	√	√	ISO 4: United Kingdom

Single Byte Code Pages						
Code page identifier		Datamax Code page family		Font format		
Data-max	HP*	Std**	Enhanced **	Intellifont	True Type	Description
US		√	√	√	√	ISO 6: ASCII
VI	13J	√	√	√	√	Ventura International
VU	14J	√	√	√	√	Ventura US
VM	6M		√	√		Ventura Math
W1	19U	√	√	√	√	Windows 3.1 Latin 1
WA			√	√		Windows Latin/Arabic
WD			√	√	√	AgfaTidbits
WE	9E	√	√	√	√	Windows 3.1 Latin 2
WG			√	√		Windows Latin/Greek
WL	19L		√	√	√	Windows 3.1 Latin 5
WN			√	√		Windows
WO	9U	√	√	√	√	Windows 3.0 Latin 1
WR			√	√		Windows Latin/Cyrillic
WT	5T	√	√	√	√	Windows 3.1 Latin 5

* HP - Hewlett Packard PCL-5 Comparison Guide, Edition 1, Internal Symbol Set Charts, Chart B, for comparison.

** Standard and Enhanced Code Page Families are printer configuration respective.

Double-Byte Symbols, Kanji Symbol Sets

Character Map Selection:

Double byte scalable fonts are mapped through a ‘character map’. This mapping allows the host application to select a variety of characters to match the application. Each of the CPs allow the host application to emulate a character set for their application.

The character map is selected using a DPL command, <stx>ySxx, where xx is the two letter character map identifier.

Note: Not all fonts contain an entire compliment of character codes for a given character map.

Double Byte Character Map				
Character Map	**Code page family**	**Font format**		
Identifier	**Standard**	**Intellifont**	**True Type**	**Description**
EU	√		√	EUC
JS	√		√	JIS (Japanese Industry Standard) (default)
SJ	√		√	Shift JIS
UC	√		√	Unicode

The double-byte Kanji symbol set is selected using <STX>ySxx command. The single-byte non-Kanji symbol set selection set is selected using the same command <STX>ySxx. Each effects an independent database selection, and has no impact on the other.

Note: Availability of Kanji fonts and their symbol sets are respective of the appropriate printer configuration.

Appendix J

General Purpose I/O Signals

DMX 600 & DMX 800 GPIO Signal Descriptions

Pin #	Input / Output	GPIO Number	Description
1	N/A		Signal ground
2	Output		Not connected
3	Output	Output 2	TTL open collector output with 4.7KΩ pull-up.
4	Output		Not connected
5	Output	Output 4	TTL open collector output
6	Output	Output 6	TTL open collector output
7	Output	Output 8	TTL open collector output
8	Output		+5VDC, fused @ 1AMP
9	Input	Input 4	TTL (74HCT14) input with 22 KΩ pull-up resistor
10	Input	Input 6	TTL (74HCT14) input with 22 KΩ pull-up resistor.
11	Input	Input 8	TTL (74HCT14) input with 22 KΩ pull-up resistor
12	NC		+9VDC, unregulated, fused @1 AMP
13	N/A		Analogue ground
14	Output	Output 1	TTL open collector output with 4.7KΩ pull-up
15	Input	Input 1	TTL (74HCT14) input with 22 KΩ pull-up resistor
16	Input	Input 2	TTL (74HCT14) input with 22 KΩ pull-up resistor
17	Output	Output 3	TTL open collector output
18	Output	Output 5	TTL open collector output
19	Output	Output 7	TTL open collector output
20	Output		+12VDC, fused @1 AMP
21	Input	Input 3	TTL (74HCT14) input with 22 KΩ pull-up resistor
22	Input	Input 5	TTL (74HCT14) input with 22 KΩ pull-up resistor
23	Input	Input 7	TTL (74HCT14) input with 22 KΩ pull-up resistor
24	NC		On board jumper selectable to +35 VDC or +24 VDC fused @1 AMP
25	NC		Not connected

Titan 6200 GPIO Signal Descriptions

Pin #	Input Output	GPIO Number	Description
1			Signal ground
2	Output		Not connected
3	Output	Output 2	TTL open collector output with 4.7KΩ pull-up
4			Not connected
5			Not connected
6			Not connected
7			Not connected
8	Output		+5VDC, fused @ 1AMP
9	Input	Input 2	TTL (74HCT14) input with 22 KΩ pull-up resistor
10	Input	Input 2	TTL (74HCT14) input with 22 KΩ pull-up resistor
11			Not connected
12	Output		+9VDC, unregulated, fused @1 AMP
13			Analogue ground
14	Output	Output1	TTL open collector output with 4.7KΩ pull-up
15			Not connected
16			Not connected
17			Not connected
18			Not connected
19			Not connected
20			Not connected
21			Not connected
22	Input	Input 2	TTL (74HCT14) input with 22 KΩ pull-up resistor
23	Input	Input 2	TTL (74HCT14) input with 22 KΩ pull-up resistor
24	Output		On board jumper selectable to +35 VDC or +24 VDC, fused @1 AMP
25	Input	Input1	TTL (74HCT14) input with 22 KΩ pull-up resistor

Prodigy MAX GPIO DIN (J14) Signal Descriptions

Pin #	Input Output	GPIO Number	Description
1	N/A		Signal ground
2	Output		Connected through a 100Ω resistor to the collector of a 2N2222A transistor which is pulled to Vcc through a 4.7K resistor
3	Output		+24 VDC, unregulated, fused @ 1.5AMP
4	Input	Input 7	Input to 74HCT541 via 100Ω series resistor and 10K pullup resistor
5	Output	Output 7	Connected through a 100Ω resistor to the collector of a 2N2222A transistor which is pulled to Vcc through a 4.7K resistor
6	Input	Input 8	Input to 74HCT541 via 100Ω series resistor and 270K pulldown resistor.
7	Output		+9 VDC, unregulated, fused @ 1.5AMP

PE 42 / 43 GPIO Signal Descriptions

Pin #	Input Output	GPIO Number	Description
1	Output		+5VDC, fused @ 1AMP
2	Output	Output1	TTL open collector output with 4.7KΩ pull-up
3	Output	Output2	TTL open collector output with 4.7KΩ pull-up
4	Output	Output3	TTL open collector output
5	Input	Input1	TTL (74HCT14) input with 22 KΩ pull-up resistor
6	Input	Input2	TTL (74HCT14) input with 22 KΩ pull-up resistor
7	Input	Input3	TTL (74HCT14) input with 22 KΩ pull-up resistor
8	Input	Input4	TTL (74HCT14) input with 22 KΩ pull-up resistor
9	n/a		Analog ground

Appendix K

Font Cartridge Names and Sizes

Font cartridges available for the DMX 430 are pre-loaded with 13 sizes of each typeface in both portrait and landscape orientations. To print a particular size, specify a "name" by which that size was stored on the cartridge. The DMX 400's font cartridges; in addition to the Allegro, Allegro 2, and Prodigy Plus, only work with the old numbering system and only contain 10 sizes of each type face. A portrait font can be used with rotation filed values 1 and 3, landscape fonts can be used with rotation field values 3 and 4.

The following are the names of each font and size available for all Datamax Bar Code Products Font Cartridges:

CG Triumvirate Italic

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	B04		
5	B05		
6	B06	101	111
8	B08	102	112
10	B10	103	113
12	B12	104	114
14	B14	105	115
18	B18	106	116
24	B24	107	117
30	B30	108	118
36	B36	109	119
48	B48	110	120
72	B72		

CG Triumvirate Bold

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	C04		
5	C05		
6	C06	121	131
8	C08	122	132
10	C10	123	133
12	C12	124	134
14	C14	125	135
18	C18	126	136
24	C24	127	137
30	C30	128	138
36	C36	129	139
48	C48	130	140
72	C72		

CG Triumvirate Bold Condensed

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	D04		
5	D05		
6	D06	141	151
8	D08	142	152
10	D10	143	153
12	D12	144	154
14	D14	145	155
18	D18	146	156
24	D24	147	157
30	D30	148	158
36	D36	149	159
48	D48	150	160
72	D72		

CG Times

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	E04		
5	E05		
6	E06	201	211
8	E08	202	212
10	E10	203	213
12	E12	204	214
14	E14	205	215
18	E18	206	216
24	E24	207	217
30	E30	208	218
36	E36	209	219
48	E48	210	220
72	E72		

CG Times Bold

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	F04		
5	F05		
6	F06	221	231
8	F08	222	232
10	F10	223	233
12	F12	224	234
14	F14	225	235
18	F18	226	236
24	F24	227	237
30	F30	228	238
36	F36	229	239
48	F48	230	240
72	F72		

Futura Extra Bold Condensed

	New Numbering system	Old Numbering system	
Point Size	**Portrait / Landscape Font ID**	**Portrait Font ID**	**Landscape Font ID**
4	G04		
5	G05		
6	G06	301	311
8	G08	302	312
10	G10	303	313
12	G12	304	314
14	G14	305	315
18	G18	306	316
24	G24	307	317
30	G30	308	318
36	G36	309	319
48	G48	310	320
72	G72		

Appendix L

Module Identifiers by Product and Maximum Label Format Fields

Module ID (Memory Bank)	Allegro 400/430	Prodigy	Prodigy Plus	600/800	Prodigy Max PE42, PE43 Ovation & Ovation 2 6200
A	Internal RAM	plug-in[1]	plug-in	plug-in	RAM[3]
B	plug-in	plug in[1]	plug-in	plug-in	plug-in
C	Default	Default	Default	Default	Default
D		N/A	N/A	NVRAM[2,5]	NVRAM[2,4]
E	N/A	N/A	N/A	RAM[3]	N/A

1 - Physically the same module
2 - Internal 128K non-volatile
3 - Internal configurable
4 - Internal optional JA Prodigy Max only
5 - Scalable font supported in PCB 51-2170 and 51-2221

Maximum Label Format Fields

Printer Name	Fields	Characters per Field
Allegro	200	5,000
Allegro 2	200	5,000
Prodigy	100	3,000
Prodigy Plus	200	5,000
DMX400	199	5,000
DMX430	399	10,000

Maximum Label Format Fields (concluded)

Printer Name	Fields	Characters per Field
DMX600	399	10,000
DMX800	399	10,000
PE42	319	7,000
PE43	319	7,000
Prodigy Max	319	7,000
Print & Apply	319	7,000
Ovation 2	319	7,000
Ovation!	319	7,000
Titan 6200	399	10,000

Notes: When the product of fields and characters per filed exceed the available printer memory, the memory size is the limiting factor. Exceeding these limits may cause portions of the label to not print.

Printer Resolution and Size (continued)

Printer Name	Head x Gearing, dpi	Print Width (inches)
Allegro	200 x 200	4.1
Allegro2	200 x 200	4.1
Prodigy	203 x 203	4.1
Prodigy 152	152 x 152	4.15
Prodigy Plus	200 x 200	4.1
Prodigy Plus 152	152 x 152	4.21
DMX 400	200 x 200	4.1
DMX 430	289 x 289	1.0
DMX 600	300 x 300	6.4
DMX 800	300 x 300	8.64 (Kyocera) 8.53 (TDK)
Prodigy Max 203	203 x 203	4.1
Prodigy Max 300	300 x 300	4.16

Printer Resolution and Size (concluded)

Printer Name	Head x Gearing, dpi	Print Width (inches)
PE 42	203 x 203	4.1
PE 43	300 x 300	4.16
Ovation!	203 x 203	4.1
Ovation!2	203 x 203	4.256
Ovation! 300	300 x 300	4.16
Titan 6200	203 x 203	6.62

Appendix M

Printer Speed Ranges and Defaults

Command Value	Speed ips / mms	Command Value	Speed ips / mms
A*	1.0 / 25	K	6.0 / 152
B*	1.5 / 38	L	6.5 / 165
C	2.0 / 51	M	7.0 / 178
D	2.5 / 63	N	7.5 / 191
E	3.0 / 76	O	8.0 / 203
F	3.5 / 89	P	8.5 / 216
G	4.0 / 102	Q	9.0 / 227
H	4.5 / 114	R	9.5 / 241
I	5.0 / 127	S	10.0 / 254
J	5.5 / 140		

* For Prodigy and Ovation only

Printer Speed Ranges and Defaults						
	Print		Slew		Backup	
Pinter Name	Range	Default	Range	Default	Range	Default
Allegro	C	C	C	C	C	C
Allegro 2	C-E	C	C-E	C	C-E	C
Prodigy	A-G	E	A-G	G	N/A	E
Prodigy Plus	C-O	K	C-O	K	C-I	E
DMX400	C-G	G	C-I	K	C-I	E
DMX430	C-K	G	C-K	K	C-I	E
DMX600	C-O	K	C-S	O	C-I	E
DMX800	C-I	G	C-K	K	C-I	E
Prodigy Max 203	C-S	K	C-S	O	C-I	I
Prodigy Max 300	C-O	K	C-O	O	C-I	E
PE-42	C-S	K	C-S	O	C-I	E
PE-43	C-O	K	C-O	M	C-I	E
Ovation!	A-C	C	A-C	C	A-C	C
Ovation! 300dpi	A-C	C	A-C	C	A-c	C
Ovation!2	A-C	C	A-C	C	A-C	C
Titan 6200	C-K	G	C-K	K	C-G	C

Appendix N

Commands by Function

Commands by Function	
Function	Command
Assign font ID number	<ESC>*cnnnD
Backup speed	pa
Batch Quantity Request	<SOH> E
Cancel	<SOH> C
Character bitmapped data	<ESC>(snnnWdata
Character code	<ESC>*cnnnE
Character dump mode	<STX> P
Column offset amount	Cnnnn
Config label and dot pattern Print	<STX> Z
Continuous paper length	<STX> cnnnn
Count by	^nn
Cut	<STX> o
Cut by	:nnnn
Cut by	cnn
Cutter signal time and equal print delay time	<STX> bnnnn
Cutter signal 5µsec & slected delay time	<STX> Hnnnn
Database Configuration Bits Set	<STX>KDwxyz
Decrement Alphanumeric tag	<fii
Decrement Numeric tag	- fii
DIP switch, Host controlled settings	<STX> Vn
Dot Buffer Clear	<STX> N
Dot Size Height and width	Dwh
Double buffer mode enable	<STX> d
Dump module B in Motorola format	<STX>j
Edge sensor enable	<STX> e
Feed rate	<STX> Sa
Feedback Characters Enable	<STX> a
Field data line terminator	Tnn
File Delete from module	<STX>xmfname
Firmware Version Request	<STX> v
Font descriptor	<ESC>)snnnW
Form feed	<STX> F
Form Stop Position, head print line relative	<STX>Kfnnnn
Form stop position, present distance	<STX> fnnn
Format 32K SRAM Module	<STX> Xm
Format attribute	An

Commands by Function	
Function	Command
Graphic Image Remove	<STX> Rx
Graphics Image Download	<STX> Iabfname$^{c}_{r}$
Heat setting	Hnn
Inches	<STX>n
Increment Alphanumeric tag	>fii
Increment Numeric tag	+fii
Internal Batch	<STX> N
Internal batch software mode	<STX> g
Label format field replacement	<STX> Unnstring
Label Formatting Start	<STX> L
Label Length Maximum	<STX> Mnnnn
Memory Dump	<STX>Dbb[mm]aaaa
Memory dump	<STX>xbbtsssseeee
Memory query	<STX>KQ
Memory reset internal	<STX>KR
Memory set configuration	<STX>Kix[:jy][:kz] $^{c}_{r}$
Metric	<STX> m
Metric	m
Mirror	M
Module Clear	<STX> qm
Module Compress	<STX>zm
Module Copy	<STX> C
Module Directory Request	<STX> Wa
Module Request status	<STX> J
Module Set default (special dump mode)	<STX> Xm
Module, FLASH memory Test	<STX> w
Module, Memory Test	<STX>STEST
Module, RAM memory Test	<STX> t
Modules Clear all	<STX> Q
None	h
None	l
None	u
Offset distance, Top of Form distance	<STX>Ksnn
Pause for each label	<STX> J
Pause Toggle	<SOH> B
Pause, Controlled	<STX> p
Place data in global register	G
Print last label format	<STX> G
Print speed	Pa
Print time and date	<STX> Tstring
Printhead dot pattern test label	<STX> T
Quantity labels printed	<STX> Ennnn
Quantity of labels	Qnnnn
Recall global data and place in field	<STX> Sa
Recall stored label	rname

Commands by Function	
Function	Command
Reflective Sensor Select	<STX> r
Replacement Field tag	U
Reset	<SOH> #
Resettable Counters reset	<STX>Kr
Ribbon Saver	<STX> Rx
Row offset amount	Rnnnn
RS-232 port Test	<STX> k
Scalable Font Download	<STX>imtaabbb...b$^{c}_{r}$xxxxxxxxfff...f
Sensor Values Request	<STX> Y
Single buffer mode	<STX> s
Slew rate	Sa
SOH shutdown	<SOH> D
Start of print position (TOF)	<STX>Onnnn
Status ASCII String Request	<SOH> A
Status Byte Request	<SOH> F
Store label in module & Terminate formatting	smname
Symbol Set select	<STX> ySaa
Symbol Set select	ySaa
Terminate formatting - print label format	E
Terminate label format, do not print label	X
Time and Date Request	<STX> B
Time and Date Set	<STX>AwMMddyearhhmmjjj
Wait mode	W
Zero (Ø) conversion to "0"	Z
Zero (Ø) conversion to "0"	z
Zip mode	Z

Appendix O

Bar Code Symbology Information Sources

AIM International, Inc.
11860 Sunrise Valley Drive, Suite 101
Reston, VA 22091 USA
Tel: 703-391-7621 Fax: 703-391-7624

AIM JAPAN
Aios Gotanda Bldg. 6F
1-10-7 Higashigotanda
Shinagawa-ku Tokyo 141 Japan
Tel: 03-3440-9085 Fax: 03-3440-9086

AIM EUROPE
The Old Vicarage
Haley Hill, Halifax HX3 6DR
West Yorkshire, England
Tel: 44-1422-359161 Fax: 44-1422-3556904

AIM UK
The Old Vicarage
Haley Hill, Halifax HX3 6DR
United Kingdom
Tel: 44-1422-359161 Fax: 44-1422-355604

AIM USA
634 Alpha Drive
Pittsburgh, PA 15238-2802
Tel: 412-963-8588 Fax: 412-963-8753

American National Standards Institute
Tel: 212-642-4900

Automotive Industry Action Group
26200 Lahser Road
Suite 200
Southfield, MI 48034
Tel: 313-358-3570 Fax: 313-358-3253

Computing Technology Industry Association
450 E. 22 Street Suite 230
Lombard, IL 60148-6158
Tel: 630 268-1818 Fax: 630 278-1384

Health Industry Business Communications Council
PO Box 53528
Phoenix, AZ 85018
Tel 602-318-1091

International Article Numbering Association (EAN)
Rue Royal 29
B-1000 Bruxelles
Belgium
Tel: 32-22-187674 Fax: 32-22-187585

Uniform Code Council, Inc. (UCC)
8163 Old Yankee Rd. Suite J
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