Prodigy Plus™
Operator's Manual

As an Energy Star Partner, Datamax Corporation has determined that this product meets the Energy Star guidelines for energy efficiency.

Agency Compliance and Approvals:

UL: UL1950 Information Technology Equipment, file number E156091.
CSA: C22.2 No. 950-M1986, file number LR68943-13.
TUV-GS: EN60950/03.88, certificate number S9371819.
VDE: Class B Vfg. 1046/1984.

1. Nur für Gebrauch innerhalb eines Gebäudes geeignet.
2. Bei Gefahr, Kabel aus der Steckdose herausziehen
3. Falls kein Kabel mitgeliefert wurde, bitte Folgendes bei der Anschaffung eines Kabels beachten:

   Für 230 Volt (Europa): Benützen Sie ein Kabel, das mit "HAR" markiert ist, bestehend mindestens aus einem H05VV-F Kabel, das mindestens 0,75 Quadratmillimeter Drahtdurchmesser hat; sowie eine IEC320 Steckdose und einen für das Land geeigneten Stecker, 6A, 250 Volt.

1. This unit is intended for indoor use only.
2. Disconnect power supply cord in case of emergency.
3. When power supply cord is not provided; for proper power supply cord selection please see below:

   For 230 Volt Operation (Europe): Use a cord set, marked "HAR," consisting of a min H05VV-F cord which has a minimum 0.75 square mm diameter conductors, provided with an IEC 320 receptacle and a male plug for the country of installation rated 6A, 250V.

FCC: This device complies with Part 15 of FCC rules.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important Safety Instructions

Your Barcode Printer has been designed to give you many years of safe, reliable service. As with all electrical equipment, there are a few basic precautions you should take to avoid getting hurt or damaging the Printer.

- Carefully read the installation and operating instructions provided with your Printer.

- Read and follow all warning instruction labels on the Printer itself.

- Place the Printer on a flat, firm, solid surface.

- To protect your Printer from overheating, make sure all openings on the Printer are not blocked.

- Do not place the Printer on or near a heat source, (i.e., a radiator or heat register).

- Do not use your Printer near water, or spill liquid of any kind into it.

- Be certain that your power source matches the rating listed on the back of the Printer. If you are unsure, check with your dealer or with your local power company.

- Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.

- Do not insert anything into the ventilation slots or openings on the Printer.

- Only qualified, trained service technicians should attempt to repair your Printer.

♦ **Contents**

♦ **Getting Started**

Figure 1-1   Printer Overview

1.0   Introduction

The Prodigy Plus, hereafter referred to as the "Printer", incorporates high-performance/low cost thermal label printing capabilities. The combination of powerful capabilities, easy-to-use features, a contemporary look and affordable pricing set a new standard for thermal label printing in retail, office and industrial applications.

1.1 Unpacking and Inspection

Inspect the shipping container(s), if damage is evident, contact the carrier to specify the nature and extent of the damage.

The Printer is packed in Corrupad™ recycled packaging and is enclosed in a plastic bag to reduce the chance of moisture damage during shipment. Remove the Printer from the plastic bag before use.

Along with this manual, the shipping container(s) should include the following items:

- Label Printer
- Printer's front door panel (packaged separately)
- Special or additional items purchased.

1.2 Supplies Necessary to Print Labels

In order for the Printer to generate labels you will need the necessary software and media. There are many different types of media and software packages available, therefore it is a good idea to contact your local reseller on which software and media is best suited for your needs.

1.3 Location of Parts on your Printer

The following illustrations show the major components of your Printer. Figure 1-2 is the front panel with the cover open, Figure 1-3 is the mechanism detail and Figure 1-4 is the rear view.
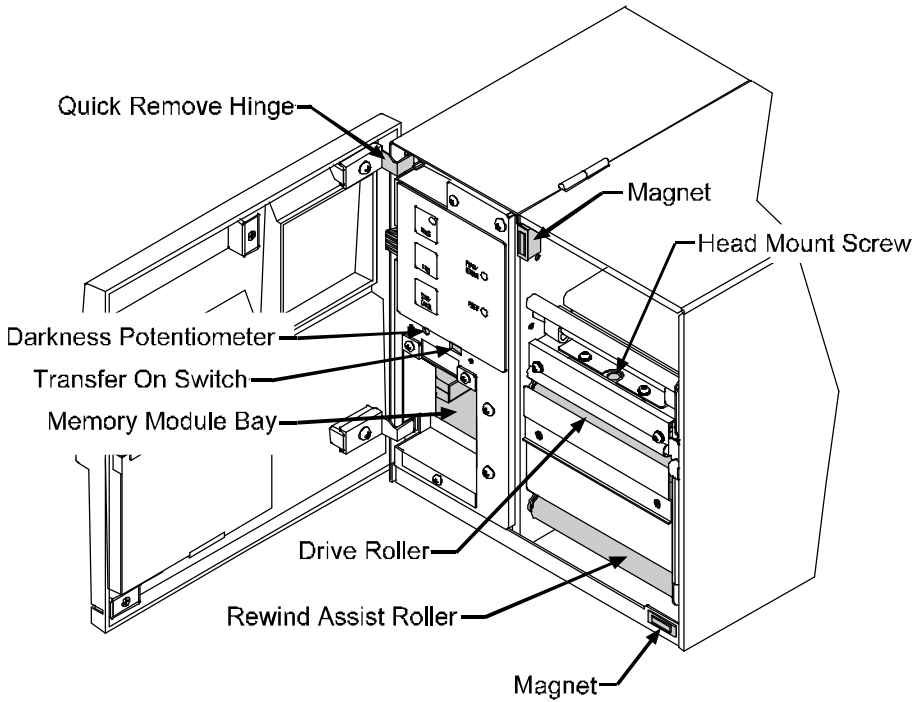
Figure 1-2   Front Panel (Front Cover Open)
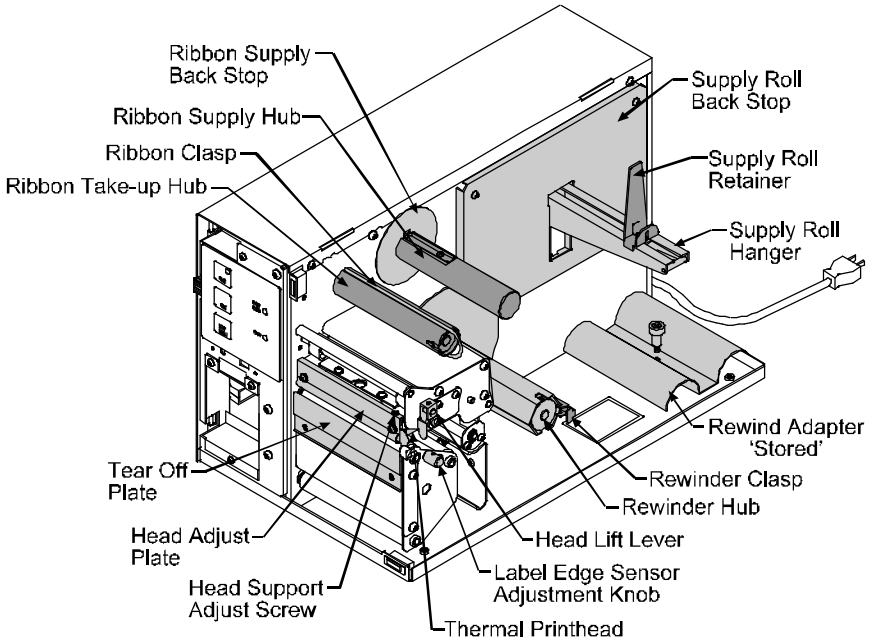
Figure 1-3   Mechanism Detail
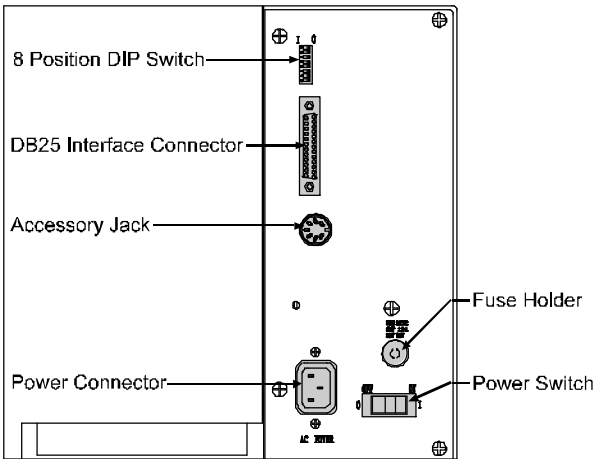
Figure 1-4   Rear View

1.4 Installing the Front Door

Prior to operating the Printer the front door must be installed. Complete the following steps when installing the front door.

1. Remove the door and Printer from its packaging.

2. With the hinges lined up to the proper location on the Printer, gently slide the door into the Printer's hinge slots.
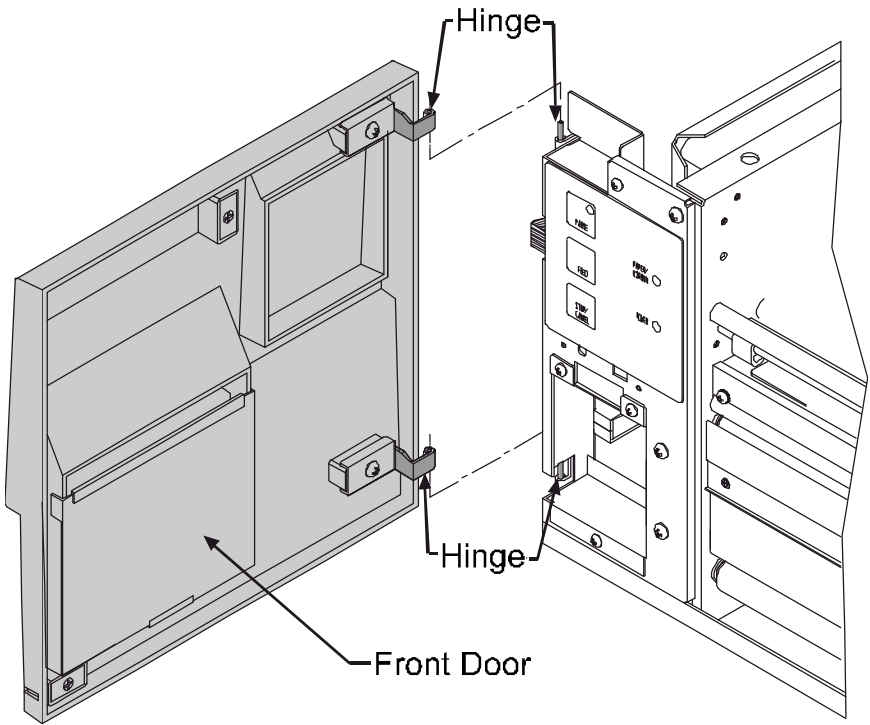
Figure 1-5   Installing the Door

1.5 Using the Printer's Control Panel

The Printer has three operator-accessible buttons, three indicator lights (LEDs), one switch, and one POT, (see Figure 1-6). A brief description of the buttons, light, switches and POT are listed in this section.
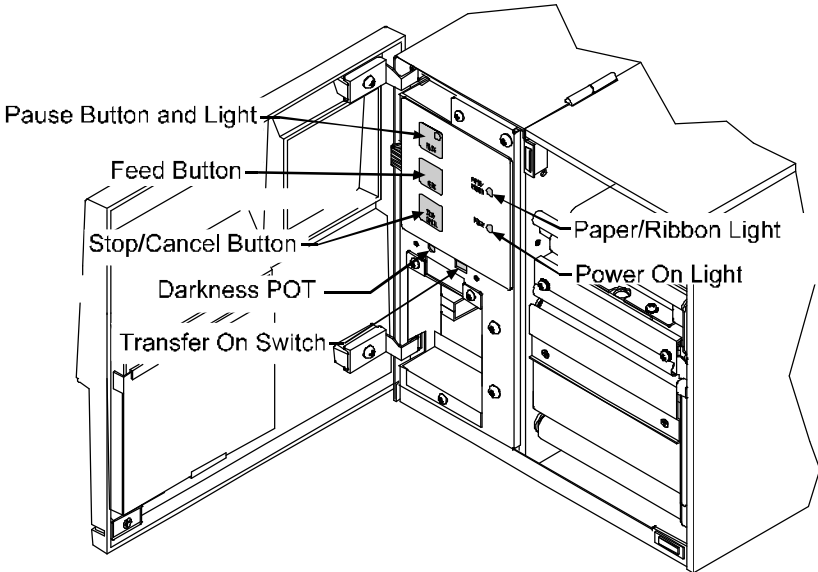
Figure 1-6   Switches and Indicators

Power Light: This light is turned on after the Power Switch on the rear of the Printer is activated.

Pause Light: This light will turn on if any of the following occurs: the Pause Button is pressed; a print job is canceled with the Stop/CancelButton, or; a fault occurs with the Cutter.

Pause Button: This button allows the operator to stop the printing of a run of labels and then complete the job by pressing the switch again. Activation of the switch will: stop the print mechanism when the label printing is complete; turn on the Pause Light; stop the label counter, but maintain the count balance, and; hold all data in memory. Pressing the switch a second time will: restart the Printer; print the balance of labels on the counter unless interrupted, and; turn 'off' the Pause Indicator.

Stop/Cancel Button: This Button allows the operator to stop and cancel a run of labels in the process of being produced and continue on to the next run in the Printer's buffer.

Feed Button: Pressing the Feed Button causes the paper to automatically advance to the first print position of the next label. On a new size label, multiple labels may be fed before registration occurs.

Paper/Ribbon Light: The Paper/Ribbon light is activated when a label and/or ribbon is not detected

Transfer on Switch: This switch should be in the 'off' position for Direct-Thermal Printing and in the 'on' position for Thermal-Transfer Printing. When on, it has two functions: the ribbon sensor is enabled, and; the Printhead temperature is reduced, since most Thermal-Transfer Printing does not require as much heat as Direct-Thermal Printing.

Darkness Control POT: This potentiometer (POT) is used to fine adjust darkness to variations in the media.

1.6 Using Print Media

Installation for Media Loading

1. Slide the Media Retainer to outer end of Media Supply Mount.

2. Place the new media supply roll on the Media Supply Mount and slide the Media Retainer firmly back against it.
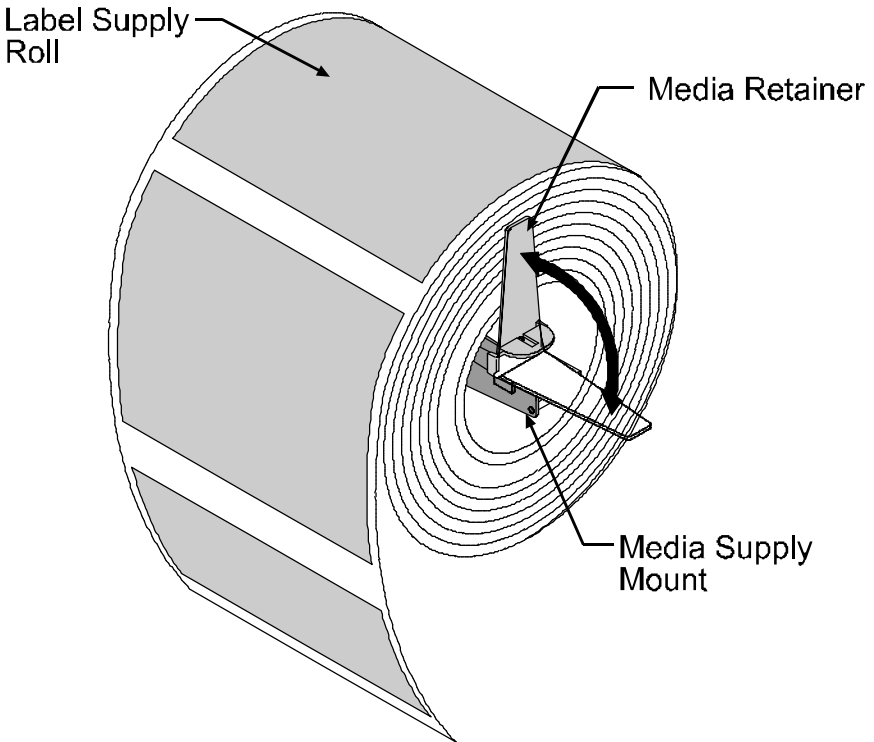
Figure 1-7   Media Supply Mount

3. Disengage the Printhead by rotating head-lift lever clockwise to the 'up' position.

4. Rotate the media Guide down.

5. Insert the label stock as shown in Figure 1-8.

6. Rotate the media guide up and slide to the edge of the media.
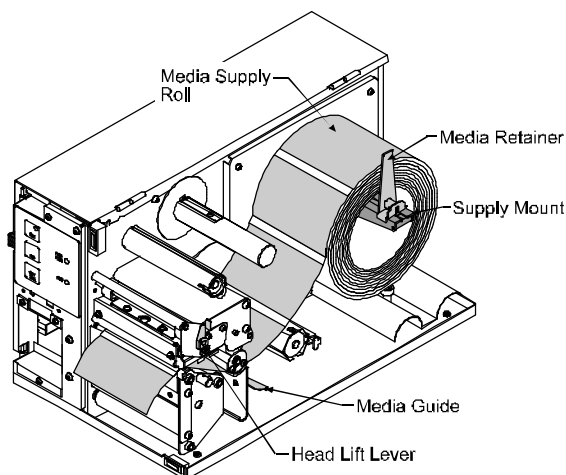
Figure 1-8   Media Routing

7. Engage Printhead by rotating the head lift lever counterclockwise to the "down" position

If the media is not sensing, try adjusting the sensor position by turning the adjusting knob for the movable sensor. The gauge behind and below the Printhead can be viewed for making the adjustment. If a label is not detected within 12″ of feeding, the Printer will stop and the Paper Out Indicator will remain lit. In this case, check the threading of the media around the bottom of the upper and lower media guides.

If the paper feeds forward only about 1″ each time you press the 'Feed' button and does not seem to be stopping on a label's edge, the Thermal/Thermal Transfer switch has probably been turned on without thermal-transfer ribbon being installed. Slide the switch back to the left side for direct-thermal printing.

1.7   Media Rewind Instructions

1.   Remove the window cover from the front door.

2.   Fasten the rewind adapter to the front of the Printer as shown in Figure 1-9.
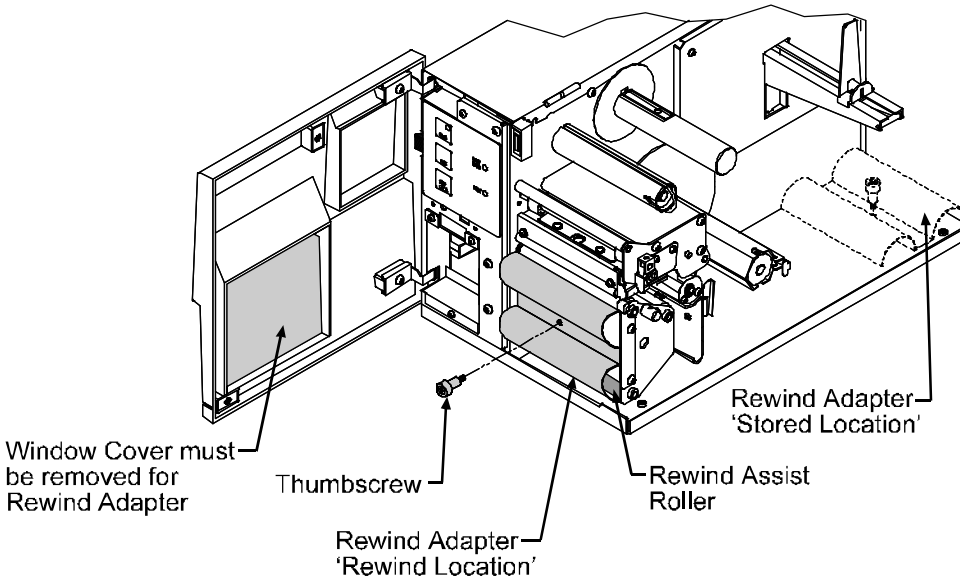
Figure 1-9   Attaching the Rewind Adapter

3. Route the media so that it slides over the rewind adapter as shown in Figure 1-10.

4. Partially wrap media around the Media Rewinder and install the clasp over the media.
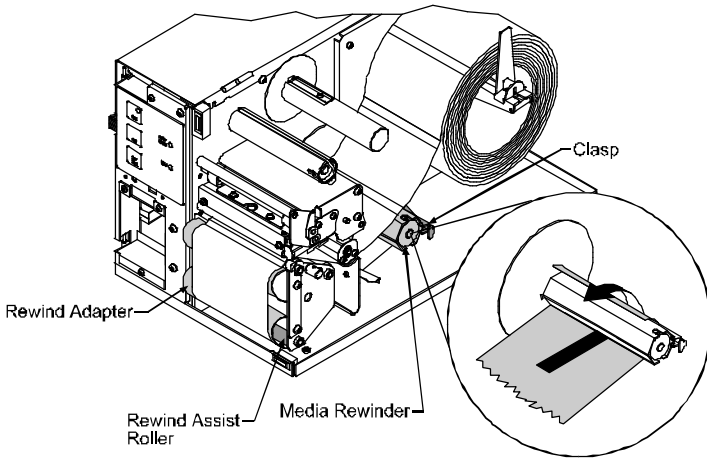
Figure 1-10   Routing the Media for Rewinding

1.7.1 Peel-off Mode

1. If the Peel-off Mode is desired, route the media backing down past the Rewind Assist Roller, (see Figure 1-10) to the media rewinder and reverse the serrated tear off plate.

Note*:* Do not install the rewind adapter when using the Peel-off Mode.

| ⚠ **Caution** | Using the Peel-off Mode without the Present Sensor installed and enabled can cause labels to become jammed in the Printer. |

1.8 Ribbon Loading Instructions

Load ribbon as shown below in Figure 1-11. The ribbon can be wound directly onto the hub and held with a clasp, or a used ribbon core can be placed on the hub.

Ribbon Loading Instructions

1. Disengage the Printhead by rotating the Head-Lift Lever clockwise to the 'up' position.

2. Slide the Ribbon onto the Ribbon Supply Hub. Route the ribbon, (see Figure 1-11), and attach the ribbon to the Ribbon Take-up Hub.

3. Engage the Printhead by rotating the Head-Lift Lever counterclockwise to the 'down' position.
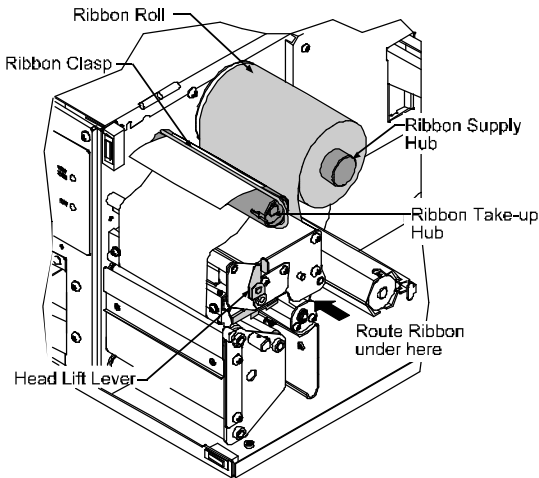
Figure 1-11   Ribbon Loading

4. Ensure that the Transfer Switch is in the 'on' position.

Note: If using a ribbon that is translucent, (i.e., color other than black), it may be necessary to turn on switch 1-7 located on the back of the Printer.

♦ **Printing Labels**

2.0 Introduction

Labels can be generated using RS-232 or parallel communications to a host computer or a PC with a compatible labeling software package. This chapter explains some of the basic programming commands that are required when writing programs to generate label formats. A programmer's manual can be obtained by mailing or faxing the request card located in the back of this manual.

2.1 Programming Commands

In order to be ready for a command sequence, the Printer must first receive a special character called an "attention getter" that 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.

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

Table 2-1 Attention Getters

When the Printer receives an Immediate Command it will cease whatever it is doing and perform that command. Commands of all types must be in this sequence:

1. Attention Getter
2. Command Character
3. Parameters that must be entered by the user (if any).

Command Character	Must Enter Parameters	Printer Responds	Command
#	N	Y	Reset
A	N	Y	Send ASCII status string
B	N	N	Toggle pause
C	N	N	Cancel
D	N	N	SOH shutdown
E	N	Y	Send batch quantity
F	N	Y	Send status byte

Table 2-2   Immediate Commands

The System-Level Commands are used to create formats, load and store graphic information, and control the Printer. Table 2-3 provides a brief description and format of each System-Level Command Character.

Char	Description	Format
A	Set time and date	Format: A*wmmddyyyyhhMMjjj* 16 digits total. *w* = 1 digit day, 1 is Monday *mm* = 2 digits for month *dd* = 2 digits for day *yyyy* = 4 digits for year *hh* = 2 digits for hour (24 hr ft) *MM* = 2 digits for minutes *jjj* = 3 digits for Julian I.D. value
a	Enable feedback characters	Returns 30 after each label and 31 after each batch of labels
B	Get Printer time and date information	Print time and date to port
b	Set Cutter signal time	Sets Cutter's signal time Format: bnnnn Where: nnnn=4 digits*24, low/delay time
c	Set continuous paper length	c*nnnn* = length of paper to feed per label
d	Set Printer to double buffer mode	Used to print a label while a second is formatting in memory
E	Set quantity for stored label	E*nnnn* = Set Quantity for stored label
e	Select edge sensor	Used for "see through" media sensing
F	Form feed	Feeds one label at a time
f	Set form stop position (Backfeed)	Set distance to peel (tear off) position f*nnn* = 3 digits from sensor
G	Print last label format	
H	Set Cutter signal/time	Format: Hnnnn Where: nnnn=4 digits, usec*24 delay time
I	Input graphics data block "See Programmer's Manual for format"	A bank designation, an optional word length modifier, a format designation, and up to a 16-character string to identify the stored image data
J	Set pause for each label	
K	Start of print, (fine tune Printer matching)	K[-]nn Where: nn plus or minus (.50 inches in hundredths of an inch increments)
k	Test RS-232 Port Y=ok	Sends character "Y" to RS-232 port
L	Enter Label Formatting Mode	
M	Set maximum label length	M*nnnn* = 4 digits (default)

Table 2-3   System-Level Commands

Char	Description	Format
m	Set metric flag, enter metric mode	All references set to metric until reset
O	Form edge offset (start of print position)	O*nnnn* = 4 digits, in/100 or mm/10
o	Cycle cutter	
P	Enter character dump mode	
p	Controlled pause	
Q	Clear all memory modules	
q	Clear module	q*x* = Module I.D. (Uppercase)
r	Select reflective sensor	Used for "black-strip" media sensing, (e.g. continuous tags, butt-cut labels. Stripe must be printed on back side of media)
S	Slew (feed) speed	S*x* *x* = C-0, 2-8 ips
s	Set up for one print buffer	
T	Printhead dot pattern test label	
t	Test RAM memory module (Must be in Test Mode)	a bbbK 'Module Good' A=1(top slot) B=2 (bottom slot) bbb = 256 or 512, for size of module
U	Label format field replacement	
V	Software switch settings	Vn n = 4-Label Present, 2-color ribbon, 1-Cutter Enable
v	Firmware version information	Sends version string to Host
W	Request memory module information	Wx x = F-font, G-graphic, L-label
w	Test FLASH module memory	Takes about 90 seconds
X	Set default module bank	X*a* *a* - A = Memory Module A
Y	Output sensor values	Dumps sensor values status to RS-232 port
Z	Print internal information and dot pattern	

Table 2-3   System-Level Commands (Continued)

A STX L Command switches the Printer from the System Level to the Label-Formatting Mode. All command characters after STX L are interpreted as Label Formatting Commands until the Label-Formatting Mode is terminated with the Command Character E, X or s. All Label -Formatting Commands are terminated with hex value 0D.

CC	Description	Format
:	Set cut by amount (4 digits) The cutter function will perform a cutting action after the number of labels specified	**:***nnnn* *nnnn* = 4 digits of labels printed before cut. Default = 0001
C	Set column offset amount	C*nnnn nnnn*= in/100 or mm/10
c	Set cut by amount (2 digits)	c*nn nn* = 2 cut amount
D	Set height and width dot size	h = Horiz. dot size; can be 1 or 2 v = Vert. dot size; can be 1,2, or 3 (0.005" steps) Default is "D22"
E	Terminate label format and print label	
G	Place data in global register	
H	Enter heat setting (The amount of heat applied per dot row, can be used to help control print quality)	H*nn nn* = 2 digits. 1 - 20 10 is nominal and default
m	Set metric mode	The Printer must be reset in order to return to standard measure
P	Print speed	P*x x* = C -O (2 to 8 ips)
p	Set label backup speed	p*x x x* = C -I (2 to 5 ips)
Q	Enter quantity of labels to print	Q*nnnn nnnn* = quantity
R	Set row offset amount	R*nnnn nnnn* = in/100 or mm/10
r	Recall stored label format	r*nn...n nn...n* Label name of up to 16 char. terminated by CR
S	Slew (feed) speed	S*x x* = C - 0 (2 - 8ips)
s	Store label format in module	**s**a*nn...n* a - destination module A= Memory Module A B =Memory Module B C= Default Module *nn...n* - label name (16 char. max)
T	Set field data line terminator	T*nn nn* = 2 digit ASCII Hex 00 - FF
U	Make previous field a string replace field	

Table 2-4   Label-Formatting Commands

CC	Description	Format
X	Terminate label formatting mode	
z	Zero (**0**) conversion to "O" eliminates slash (/)	
+	Make last field entered increment numeric	+*pii* Make last entered field incrementing *p* = Zero fill character *ii* = Data added to field
-	Make last field entered decrement numeric	-*pii* Make last entered field decrementing *p* = Zero fill character *ii* = Data subtracted from field
>	Make last field entered increment alphanumeric	>*pii* Make last entered field incrementing Z - 0 *p* = Zero fill character *ii* = Data added to field
<	Make last field entered decrement alphanumeric	<*pii* Make last entered field decrementing 0 - Z *p* = Zero fill character *ii* = Data subtracted from field
^	Set count by amount	^*nn* Set count by amount *nn* = 2 digits Skip # of labels before updating count fields and time fields

Table 2-4   Label-Formatting Commands (Continued)

There are two special commands used by the Printer, the STX S, (Recall Global Data), and the STX T (print date and time) Commands. Unlike the other Label-Formatting Commands, which follow the STX L Command, these special commands are entered directly into the data field.

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

Table 2-5   Special Label-Formatting Commands

The commands used for bit mapped font loading are usually generated by font-creation software. However, the Assign Font ID Number command <u>must</u> be sent to the Printer <u>before</u> the font file. Font-Loading Commands are listed in Table 2-6.

CC	P	PR	Description
*c###D	N	N	Assign Font ID Number ### = ID Number 100 to 999
)s#W	Y	N	Font Descriptor
*c#E	N	N	Character Code # = ASCII Value of Character
(s#W	Y	N	Character Download Data # = Bytes of Bit-mapped Data

Table 2-6   Font-Loading Commands

CC = Command Character
P = Must Supply Parameters? (Y/N)
PR = Printer Responds? (Y/N)

2.2   Programming Examples

```
<STX> L <CR>
H07 <CR>
D11 <CR>
19110080100002510K OHM 1/4 WATT <CR>
1a6210000000050590PCS <CR>
E
```

Figure 2-1   Sample Label

The example shown below prints out a Code 3 of 9 bar code with a wide to narrow bar ratio of 3:1 and can be used to print any of the bar codes shown in Appendix B by altering the example's fields. Refer to Figures 2-2 and 2-3 for a brief explanation of the data fields that appear in the barcode shown below.

```
<STX>L<CR>
D11<CR>
1A930400015010000123456789<CR>
121100000000100Barcode A<CR>
E
```


<STX>L   <STX>L on line 1 is used to enter the label formatting mode.
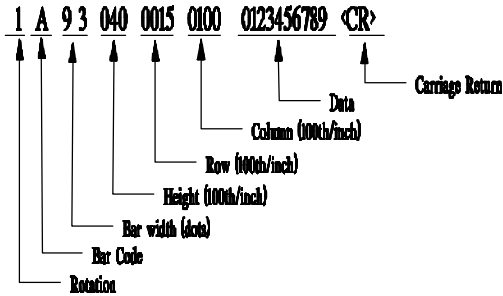
Figure 2-2 Example line 3
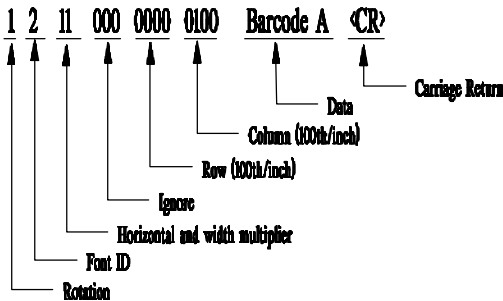
Figure 2-3 Example line 4

2.3　Configuration and Test Labels

The Printer is capable of printing both a Configuration Label and a Test Label. The Configuration Label is used to quickly determine the configuration setup of the Printer while the Test Label is used as an aid in Printhead adjustments and determining bad Printheads.

2.3.1　Configuration Label

Below is an illustration of an actual Configuration Label. The label contains information about the Printer's current setup settings, as well as the date/time, RAM and ROM checksums, and other Important information. To print a Configuration and Test Label follow the outlined steps:

1. Hold in the Feed Button and turn on the Printer until the Printer feeds one label.

2. After the Printer feeds one label release the Feed Button, after a brief hesitation the Configuration and Test Label will print.

```
THU   MARCH    17, 1997  12:25    077
VER   BA - 03.02    04/08/97
SYSTEM ROM CHECKSUM 8F7B  IS   GOOD
FONT   ROM CHECKSUM 2E7A  IS   GOOD
TOTAL  ROM CHECKSUM BDF5  IS   GOOD
SYSTEM RAM CHECKS GOOD
SERIAL PORT BAUD RATE IS 9600

TRANSFER SWITCH IS ON
SETUP SWITCH 1    2    3    4    5    6    7    8
             OFF OFF OFF OFF OFF OFF OFF OFF

ANALOG INPUT VALUES:
PAPER: 236  EDGE: 184  TEMP  064
POT ADJ: 139 BAT VOL: 204

INCH COUNTER    DATE SET          4/07/97
TOTAL LABEL LENGTH IN INCHES   000000170
```

Figure 2-4　Configuration Label

2.3.2   Print Test Label

The Print Test Label consists of a test pattern of printed bars and can be used to isolate problems with the print quality, along with determining bad Printheads or rollers.
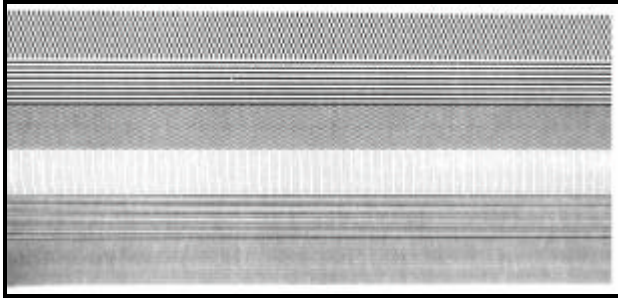
Figure 2-5   Print Test Label

2.3.3 Loop back Test Plug

A Loop Back Test Plug can be installed for serial communications testing. Below are examples of the Loop Back Test Plugs. If the Test Plug is installed the following two lines will be added to the Configuration Label.

```
SERIAL LOOP BACK CHECK GOOD
CTS & DTR LOOP BACK CHECK IS GOOD
```
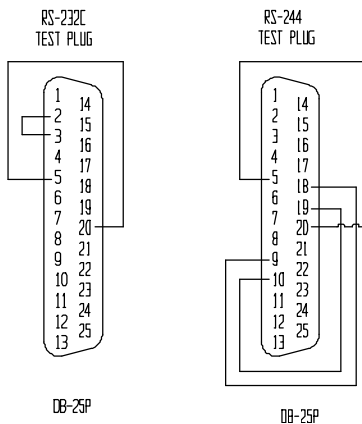

Figure 2-6   Loop Back Test Plugs

♦ Troubleshooting

3.0 Introduction

This chapter provides general guidelines to help maintain the print quality when using media other than the recommended 4 mil stock. It also provides basic ideas to help identify common installation and communication interfacing problems. If there is any doubt about your ability to perform the procedures outlined in this chapter, contact a qualified service technician before making any adjustments.

3.1   Controlling Print Quality

The Printer provides maximum flexibility by offering both direct-thermal and thermal-transfer printing capabilities. To support these printing options, the Printer has a flexible set of printing controls.

The amount of heat applied to the Printhead and the location of the Printhead to the label media have the most effect on the images that are printed on labels. The Printer provides print quality adjustments, but limits them to prevent the Printer from printing an image that could be damaging to the Printhead. For example, low cost direct-thermal stocks have high reaction temperatures therefore it takes a great deal of heat to make clear images on this type of paper. The Printer has two ways to compensate for this: first set the burn time to a higher value by using the H Label-Formatting Command. This causes more heat to be transferred into the media, and consequently generates a darker image; second, adjust the Printhead position. The Printer has been factory set to maintain good print quality on the majority of media. However, when using media other than the recommended 4 mil thick stock the Printhead position, ribbon, and media tracking may require slight adjustment to maintain its print quality. If poor print quality is apparent, follow the procedures outlined in sections 3.2.1 and 3.2.2.

3.2   Aligning the Printhead

Components used for Printhead alignment are illustrated in Figure 3-1.

3.2.1 Direct-Thermal Stock

For best results when using direct-thermal label stock, turn the head adjustment screws 1/4 turn clockwise to move the Printhead 0.006" (0.15 mm) back on the roller. When the Printhead is aligned with thermal-transfer stock the Printhead is forward on the roller so that the ribbon will separate from the label while the wax ink is still liquid ensuring good print quality. With direct-thermal stock, the Printhead burn line needs to be further back on the roller where there is more contact with the roller. This causes heat to transfer to the paper more efficiently.

3.2.2 Tag Stock or Stiff Media

The Printer is adjusted at the factory using 5 mil thick label stock. If heavier tag stock is used, the Printhead may need to be adjusted forward.

3.2.3 Mechanical Adjustments

The Printhead is precisely positioned on mount plate locating pins that are adjusted at the factory. Once adjusted, the locating pins will ensure correct alignment of all future replacement heads. It should not be necessary to realign each new Printhead; however, an alignment procedure is required if the Printhead Mount Assembly has been removed or disassembled.
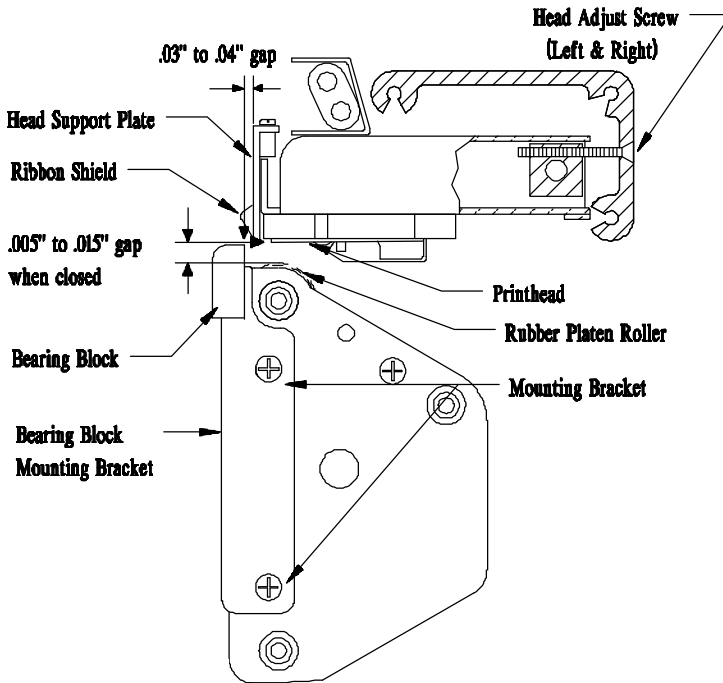
Figure 3-1   Components for Printhead alignment

Print rotated bars and inspect the quality. With a 1/16" hex key, turn the left and right head adjust screws counter-clockwise 1/4 to 1/2 turn until the desired print quality is achieved.

The horizontal placement of the Printhead is adjusted by turning the right and left head-adjustment screws that correspond to the right and left sides of the Printhead. Turning the screws 1/2 turn counter-clockwise will move the Printhead 0.012" (0.305 mm) forward. Likewise, a 1/2 turn clockwise will move the Printhead back 0.012" (0.305 mm). Therefore, only a small adjustment of even a 1/4 turn will cause a big difference in print quality.

⚠️ **Caution**	Do not turn the head-adjustment screws more than 2 complete turns in either direction. Damage to the Head Mount Assembly will result if the adjustment screws are turned too far.

The alignment procedure and the sequence that should be followed is described in section 3.2.1. This procedure should correct poor print quality; however, all adjustments must be performed with label stock that is at least 4" (102 mm) wide. If the final media used is different, then make the specific adjustments needed after the standard adjustments are completed.

3.3   Printhead Alignment Procedure

Depending on the degree of alignment necessary to your Printhead, one or perhaps all of the steps mentioned below may need to be completed.

3.3.1 Label Stock Tracking Adjustment

To ensure that the stock feeds straight use a full roll of 4" (102 mm) or 4.25" (108 mm) wide stock and complete the following steps:

1. Rotate the Media Guide 'down' and install the stock, keep the Media Guide in the down position.

2. Press the feed button to feed the labels until the stock begins to track at a stable position.

3. Rotate the Media Guide to the up position and slide the Media Guide in or out until the inside edge of the stock is gently resting against the inner Media Guide.

3.3.2 Ribbon Feed and Tracking Adjustments

Complete the following steps to complete the ribbon feed and tracking adjustment.

Turn the power switch 'on' and use full width paper and ribbon for this adjustment. Install a thermal-transfer ribbon/ media in the Printer and secure the ribbon to the Ribbon Take-up Hub in a counter-clockwise direction (see Chapter 1, Figure 1-11).

1. Press the feed button several times to normalize the feeding of the ribbon and media. Check the ribbon for rippling as it travels from the Ribbon Supply Hub and goes under the Printhead assembly. If rippling or bagging occurs, follow the procedures outlined in steps 2 through 6.

2. To adjust the Ribbon Shield (see Figure 3-2), temporarily move the ribbon and loosen the screw located on the left end of the Head-Support Plate, (do not remove the screw). This end of the shield can be adjusted up or down in order to even out the ribbon tension across the full width of the ribbon.

> **Note:** The mount screws that secure the Ribbon Shield also secure the Head-Support Plate. When loosening these screws, be aware that both the shield and the plate may be affected.

3. Position the shield so that there is no rippling in the ribbon as it travels from the Ribbon Supply Hub. The ribbon should also be adjusted so that tension is even across the entire width of the ribbon.

4. Once the Ribbon Shield is properly positioned, tighten the left screw that supports the Ribbon Shield to the Printhead Mount Assembly. Re-check the ribbon travel to make certain that the ribbon tension is even across the entire width of the ribbon.

5. Feed three or four labels and observe the ribbon as it travels from the Ribbon Supply Hub.

6. Feed the ribbon and paper out the front of the Printer together and check the ribbon for drifting. If the ribbon overlaps one edge of the paper stock, the ribbon and paper are not following the same path. In this case, the paper tracking may need to be re-adjusted. If there is no ribbon overlap, then continue.

3.4 Adjusting Printhead Pressure and Support

The Head-Support Plate supports the outer end of the Printhead when narrow media is used. Without this support, the Printhead would bear down on the drive roller, causing diminished print quality and premature wear. The Head-Support Plate needs to be engaged only when the media width is less than 3.5" (89 mm), (see Figure 3.2).

The Printer's Printhead support requires adjustment if media widths of 3.5" (89 mm) or less are used. To make this adjustment, loosen the two mount screws that fasten the Head to the Support Plate, leaving the screw on the left slightly snug. Load the media and engage the Printhead by rotating the Head-Lift Lever to the 'down' position. Turn the adjustment screw clockwise until the support plate moves down and contacts the bearing plate underneath. Finally, tighten the two mount screws to secure the Support Plate.

Note: The mount screws that secure the Head-Support Plate also secure the Ribbon Shield. When loosening these screws, be aware that both the plate and the shield may move.
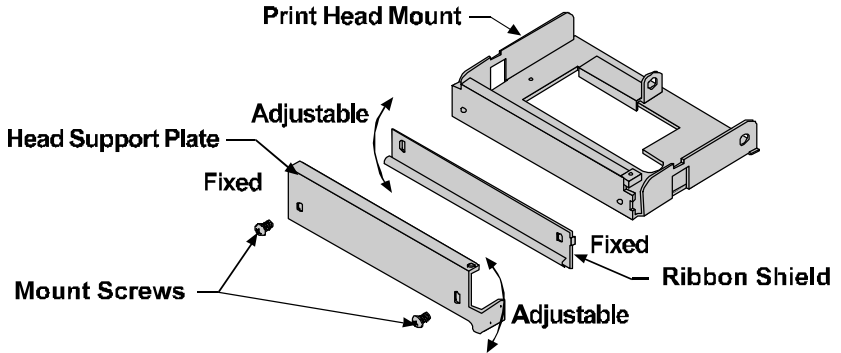
Figure 3-2 Printhead Mount Assembly

3.5   Troubleshooting

Occasionally, situations occur that require some troubleshooting skills. Possible problem situations and potential solutions are listed in this section. While not every situation is addressed, you may find some of these tips helpful. After the corrective action is taken press the feed button to clear the alarm. Contact a qualified service technician for problems that persist or are not covered in this section.

Unacceptable print quality

- The Printhead may be dirty, clean the Printhead, (see Section 4.1).

- The Printhead temperature is too high. Use the software control to adjust the burn time and/or heat setting .

- Incorrect ribbon/paper combination being used. Be sure to use the correct ribbon type.

The Printer does not print or prints several labels at once

- The labels are incorrectly loaded, see the loading instructions on the inside cover of the Printer.

- The Media Sensor may be out of adjustment.

- The Media Sensor or Media Sensor Circuitry may be defective, call for service.

Erratic printing

- The Printer is in the test mode. Reset the Printer via software, or simultaneously press the cancel and pause buttons, or turn the Printer 'off' and then 'on' again.

- The Printer is set for 8-data bits but the transmitting device is set for 7- data bits (or vice versa). Check the current data bits setting, (switch 4 on the back of the Printer).

The ribbon does not advance

- The ribbon is installed incorrectly. Make sure that the dull side (side with ink) is facing the paper.

- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Skips every other label

- The label is formatted too close to the top edge of the form. Leave white space equal to 8-dot rows at the top of the label, approximately .02" (.5 mm).

- Check operation of the Top-of-Form Sensor.

Unable to print in rotation 4

- The characters are formatted outside the dimensions of the label. Check that the row/column values provide enough room for the height of the characters or bar code to be printed.

Prints light on the right side of the label

- The Printhead is adjusted for thick media or cardstock.

- The Printhead is not properly aligned, call for service.

Printer fails to turn on

- A fuse may be blown, call for service.

- Faulty AC cord.

- A bad power switch may exist on the Printer, call for service.

- A faulty AC wall outlet.

Label advances 1-2 inches before a fault indication

- The ribbon is installed incorrectly. Make sure that the dull side (side with ink) is facing the paper.

- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Label advances 12 inches before a fault indication

- A hardware problem may exist, call for service.

- The Media Sensor may be out of adjustment.

- The Media Sensor, or Media Sensor Circuitry may be defective, call for service.

♦ Maintenance

4.0 Cleaning the Printer

Interior and Exterior

- **Interior** During normal operation dust particles from label stock can build up inside the Printer. To prevent build-up, use a soft bristle brush or vacuum cleaner as needed.

- **Exterior** The exterior surface can be cleaned using a general purpose cleaner and a damp soft cloth or sponge. Do not use abrasive cleansers or solvents.

Drive Roller

Print quality may be affected if the drive roller becomes contaminated with grit, label adhesive, or ink. To clean the Drive Roller complete the following steps:

1. Remove the Tear-off Plate, see Figure 1-3.

2. Turn the Head-Lift Lever to raise the Printhead to the 'up' position.

3. Dampen a clean, soft cloth with Isopropyl Alcohol and wipe off any debris from the Drive Roller.

Note: If the Drive Roller contains excessive build-up that is unable to be removed using Isopropyl Alcohol you can try acetone; however, this should be used sparingly.

4.1 Cleaning the Printhead

The Printhead should be cleaned on an 'as needed' basis. To determine when to clean the Printhead look for characters or bar codes that appear light or faded, or labels that contain spots or light streaks. Once you notice these signs follow the steps below to clean the Printhead.

1.   Turn off the power and unplug the Printer.

2.   Raise the cover and turn the Head-Lift Lever to the 'up' position.

3.   Dampen a cotton swab with isopropyl alcohol and insert into the Printhead as shown below. Gently rub the underside of the Printhead with the moistened swab.
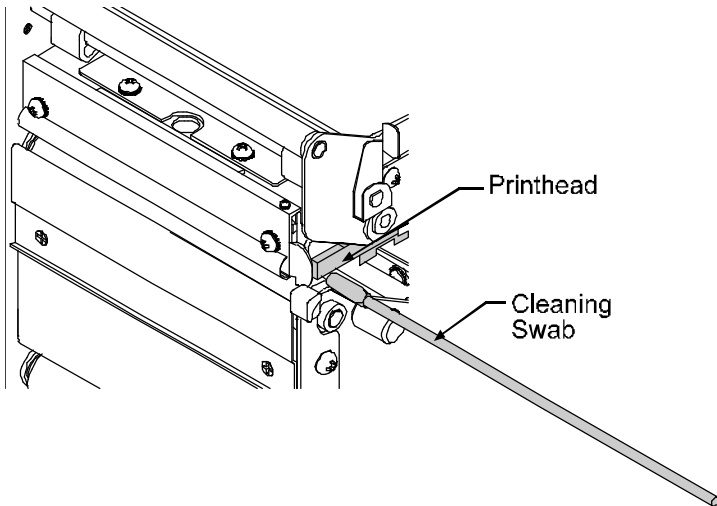
Figure 4-2   Cleaning the Printhead

Appendix A

ASCII Control Code Chart

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

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	Đ	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
ƒ	159	9F		191	BF		223	DF		255	FF

Appendix B

Switch Settings and Cable Interfacing

Baud	9600	4800	2400	1200	600	300	9600 Test
SW-1	off	off	off	off	on	on	on
SW-2	off	off	on	on	off	off	on
SW-3	off	on	off	on	off	on	on

Table B-1 Baud Rate

SW-4	Data Bits	Parity	Stop Bits
on	7	None	2
off	8	None	1

Table B-2 Word Length

SW-5	Prodigy Compatible
On	Prodigy
Off	Prodigy Plus
SW-6	Present Sensor
On	Enabled
Off	Disabled
SW-7	Ribbon Sensor
On	Color (translucent)
Off	Black (opaque)
SW-8	Cutter
On	Cutter Enabled
Off	Cutter Disabled

Table B-3 Options

Printer Cabling and Interfacing:

When the Printer receives data from any host system, it will not properly function with an incorrectly wired cable. Proper wiring diagrams can be found in Appendix E. Table B-1 contains a list of the signals that if correctly wired to the host system will cause the Printer to operate properly.

Signal	Pin
TX	2
RX	3
BUSY	20
Ground	7
Jumper	4 to 5
Shield	1

Table B-1 I/O Port Wiring

When the Printer is turned on, it will default to pre-determined interfacing parameters. The default values are in Table B-2.

Parameter	Default Value
BAUD	9600
Data Bits	8
Parity	None
Stop Bits	1

Table B-2 Printer Default Communication Parameters

Altering the switch positions of Dip Switch S1 on the back of the Printer will configure the Printer for different applications. Appendix B shows the switch positions and configurations supported by each setting.

Appendix C

Available Fonts and Barcodes

All character fonts and barcodes available with the Printer are described in this section. Each font and barcode has a name associated with it for use in programming. Human-readable fonts have numeric names while barcode fonts have alpha names. Uppercase alpha names will print barcodes with human readable interpretations. Lowercase alpha names will print barcodes only.

Fonts

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) fonts; all of the characters take up the same amount of space when printed.

The Triumvirate font number 9 is a proportional font; each character will take up a different amount of space when printed.

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

Table C-1   Valid Human-Readable Font ASCII Characters

Table C-2 lists the font sizes. The numbers indicate the number of dots.

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

Table C-2   Font Sizes

Font 0: 96 character alphanumeric, upper and lower case:

Prodigy Plus

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

Prodigy Plus 152

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

Font 1: 145-character upper and lower case alphanumeric with descenders and ascenders:

<div style="display:flex">

Prodigy Plus

```
 ! " # $ % & ' ( ) * + , - . /
0123456789 : ; < = > ?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmno
pqrstuvwxyz{|}~▓
ÇüéâäàåçêëèïîìÄÅ
ÉæÆôöòûùÿÖÜ¢£Ø×ƒ
áíóúñÑªº¿⌐¬½¼¡«»
ß
```

Prodigy Plus 152

```
 ! " # $ % & ' ( ) * + , - /
0123456789 : ; < = > ?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmno
pqrstuvwxyz<|>~▓
ÇüéâäàåçêëèïîìÄÅ
ÉæÆôöòûùÿÖÜø£Ø×ƒ
áíóúñÑªº¿íóú⌐½¼¡ß
```

</div>

Font 2: 138-character alphanumeric, upper and lower case.

<div style="display:flex">

Prodigy Plus

```
 ! " # $ % & ' ( ) * + , - . /
0123456789 : ; < = > ?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]
`abcdefghijklmno
pqrstuvwxyz{|}~▓
ÇüéâäàåçêëèïîìÄÅ
ÉæÆôöòûùÿÖÜ¢£Ø×ƒ
áíóúñÑªº¿ ⌐½¼
ß
```

Prodigy Plus 152

```
 ! " # $ % & ' ( ) * + , - /
0123456789 : ; < = > ?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmno
pqrstuvwxyz<|>~▓
ÇüéâäàåçêëèïîìÄÅ
ÉæÆôöòûùÿÖÜø£Ø×ƒ
áíóúñÑªº¿ ½¼ ß
```

</div>

Font 3: 62-character alphanumeric, uppercase.

<div align="center">

Prodigy Plus　　　　　　**Prodigy Plus 152**

#$%& ()*+,-./

0123456789:

ABCDEFGHIJKLMNO

PQRSTUVWXYZ

ÇÄÅÉÆÖÜØ£Ñ¿ß

</div>

Font 4: 62-character alphanumeric, uppercase.

<div align="center">

Prodigy Plus

#$%& ()*+,-./

0123456789:

ABCDEFGHIJKLMNO

PQRSTUVWXYZ

ÇÄÅÉÆÖÜØ£Ñ¿ß

</div>

Prodigy Plus 152 (Font 4, continued)

#$%& ( )*+,-
0123456789:
ABCDEFGHIJKLM
PQRSTUVWXYZ
ÇÄÅÉÆÖÜ£Ñ¿ß

Font 5: 62-character alphanumeric, uppercase

Prodigy Plus

#$%& ()*+,-./
0123456789:
ABCDEFGHIJKLMNO
PQRSTUVWXYZ
ÇÄÅÉÆÖÜØ£Ñ¿ß

Prodigy Plus 152

#$%& ()*+,-
0123456789:
ABCDEFGHIJKLMN
OPQRSTUVWXYZ
ÇÄÅÉÆÖÜ£Ñ¿ß

Font 6: 62-character, alphanumeric, uppercase

Prodigy Plus

#$%& ( )*+,-./
0123456789:
ABCDEFGHIJKLMNO
PQRSTUVWXYZ
ÇÄÅÉÆŒÖÜØ£Ñ¿ß

Prodigy Plus 152   (Font 6, continued)

#$%( )*+

01234567

ABCDEFGH

OPQRSTUV

WXYZ

IJKLMN

, — . /

ÇÄÅÉﬀÖÜ£

Font 7: OCR-A, size I

Prodigy Plus	**Prodigy Plus 152**

.,:;=+/*"{}%?&
'-$^[]<>( )!#@\
0123456789
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklm
nopqrstuvwxyz

.,:;=+/*"{}%?&
'-$^[]<>( )!#@`
0123456789
ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklm
nopqrstuvwxyz

Font 8: OCR-B, size III

Prodigy Plus	Prodigy Plus 152

CENSTXZ+<>|

0123456789

CENSTXZ+<>|

0123456789

Font 9: Identifies the internal Triumvirate font. Point sizes are selected by number in the bar code height.

Prodigy Plus

6pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLM

8pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdefghijklmnopqrstuvw

10pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdefg

12pt ABCDEFGHIJKLMNOPQRST1234567abcdefghij

14pt ABCDEFGHIJKLM1234567abcdefghijkl

18pt ABCEFGHIJKLM1234567abcd

24pt ABCDE12345abcdefg

30pt ABCDE123abcd

36pt ABC123abc

48pt ABC123

ABCDEFGHIJKLMNOPQRSTUVW
XYZ0123456789abcdefghijklmnopq
rstuvwxyz !"#$%&'()* + ,-./012345
6789:;< = >?@[\]^_`{|}~Çüéâäàå
èïîìÄÅÉæÆôöòûùÿÖÜø£Ø × ƒáíóúñ
®½¼¡ÁÂÀ©¢¥ãÃðÐÊËÈıÍÎÏìßÔÒõÕ
µþÞÚÛÙýÝ ± ¾ ÷ ¸ ° ¨·

Prodigy Plus 152   (Font 9, continued)

6pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLM

8pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdefghijklmnopqrstu

10pt ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890abcdef

12pt ABCDEFGHIJKLMNOPQRST1234567abcdefghi

14pt ABCDEFGHIJKLM1234567abcdefghijkl

18pt ABCEFGHIJKLM1234567abcd

24pt ABCDE12345abcdef

30pt ABCDE123abcd

36pt ABC123abc

48pt ABC123

ABCDEFGHIJKLMNOPQRSTUVW
XYZ0123456789abcdefghijklmnopq
rstuvwxyz !"#$%"()* + ,-./012345
6789:;< = > ?@[\]^_'{|}~Çüéâäàå
çêëèïîìÄÅÉæÆôöòûùÿÖÜø£Ø × f áí
Ñ¿®½¼¡ÁÂÀ©¢¥ãÃðÐÊËÈ ı íÎÏÌßÔÒ
þÞÚÛÙýÝ ± ¾ ÷ ¸ ° ¨ · & ' ‘

Barcodes

Font	Length	Cksum	Valid ASCII Characters	Bar widths Ratios
A	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90	2:1 - 3:1
B	11	Yes	48-57 Numeric only Option V used in the 6th & 7th position	N/A
C	6	Yes	48-57 Numeric only	N/A
D	Varies	No	48-57 Numeric only	2:1 - 3:1
E	Varies	M-103	32-127	N/A
F	12	Yes	48-57 Numeric only Option V used in the 7th & 8th position	N/A
G	7	Yes	48-57 Numeric only	N/A
H	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90	2:1 - 3:1
I	Varies	No	36, 43, 45-58, 65-68	2:1 - 3:1
J	Varies	M-10	48-57 Numeric only	2:1 - 3:1
K	Up to 14	M-10	48-57 Numeric only Option + is Last Character for Second M-11 Checksum	2:1 - 3:1
L	13	M-10	48-57 Numeric only	2:1 - 3:1
M	2	Yes	48-57 Numeric only	N/A
N	5	Yes	48-57 Numeric only	N/A
O	Varies	No	0 - 127 ASCII characters	N/A
p	Varies	Yes	48-57 Numeric only	Same as fonts
Q	19	Yes	48-57 Numeric only	N/A
R	18	Yes	48-57 Numeric only	N/A
z	varies	Yes	All ASCII characters	N/A

Table C-3   Barcode Characteristics

Uppercase Barcode identifiers (I.D's) have corresponding lowercase I.D's that when selected suppress printing of associated human-readable text.

Barcode A Code 3 of 9

0123456789

Barcode B UPC-A

0 12345 67890 5

Barcode C UPC-E

0 012345 7

Barcode D Interleaved 2 of 5

0123456790

Barcode E Code 128

01234567890

Barcode F EAN-13

0 123456 789012

Barcode G EAN-8

0123 4565

Barcode H Health Industry Barcode (HBIC)

+012345678900

Barcode I Codabar

01234567890

Barcode J Interleaved 2 of 5
w/module 10 checksum

012345678905

Barcode K Plessey

01234567890

Barcode L Interleaved 2 of 5
w/module 10 checksum and
shipping bearer bars

0 12 34567 89012 8

Barcode M 2 Digit UPC
addendum

42

Barcode N 5 Digit UPC
addendum

01234
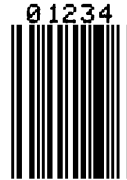
Barcode O Code 93

Barcode p Postnet

Barcode Q UCC/EAN Code 128

Barcode R UCC/EAN Code 128
KMART NON EDI

(01) 2 3456789 012345678

34 567890 123 4567

Bar Code z PDF-417
(Prodigy Plus, 203DPI only)

Appendix D

Error Codes

The error codes that may be transmitted by the Printer are described here.

Lowercase "c"
The Printer received a data byte from the host that contains a framing error due to noise.

Lowercase "v"
Input buffer overflow.

Uppercase "I"
An invalid command sequence was sent to the Printer. The Printer did not understand the command sequence and therefore terminated the command interpreter.

Uppercase "R"
This code is sent every time the Printer is turned on. It signals that there was a hardware reset.

Uppercase "T"
This code signals that there was a software reset. A software reset results from sending the <SOH># command sequence to the Printer or by doing a front panel reset.

BELL HEX "07"
This is usually returned on a corrupt image dowload, or if you try to load an image that is already installed in the module.

Appendix E

Cable Listings

Part Number	Description
556000	Printer to CRT Terminal (DB25P) RS-232
556001	Printer to PC 9 Pin (DB9S) RS-232
556002	Printer to PC 25 Pin (DB25S) RS-232
899516	Printer to PC Parallel Port (DB25P)

Table E-1   Printer Interface Cables

Pin	Description
1	CHASSIS
2	TXD (RS-232)
3	RXD (RS-232)
4	RTS (4.7k ohm to +5VDC)
5	CTS (input)
7	LOGIC GROUND
14	+5 VDC (100 mA maximum)
20	BUSY (output)

Table E-2   Printer Pin Connections
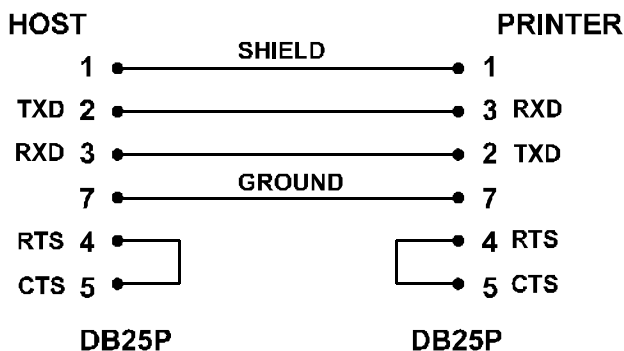
STRAIGHT CABLE (MXM)

Figure E-1 Null Modem Cable (MXM)

Note: Cable is used for typical connection to other DCE equipment with Xon/Xoff flow control.
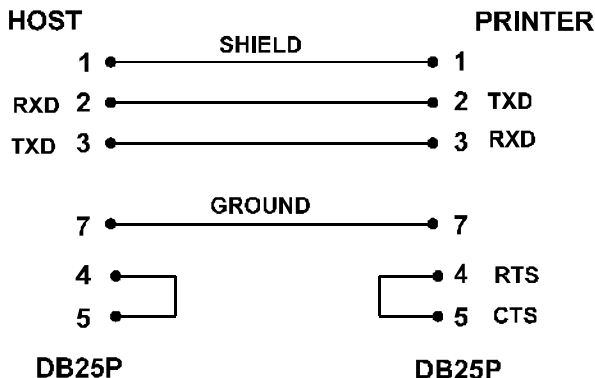
STRAIGHT CABLE (MM)

Figure E-2   Straight Cable (MM)

Note: Cable is used for typical connection to other DCE equipment with Xon/Xoff flow control.
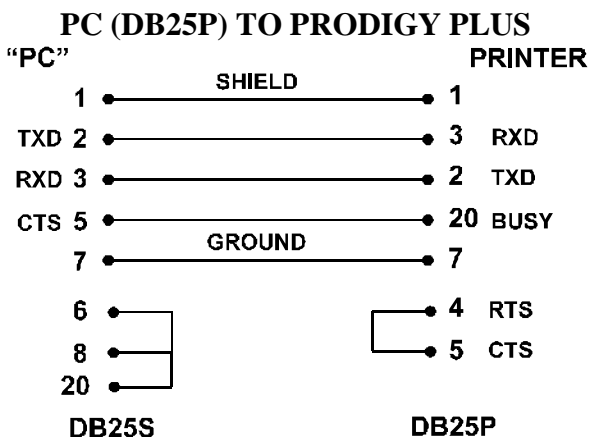
PC (DB25P) TO PRODIGY PLUS

Figure E-3   PC (DB25P) to Printer

Note: Cable is used for connection to a PC compatible with DB25P communication ports. Flow control is either Xon/Xoff or CTS/DTR.
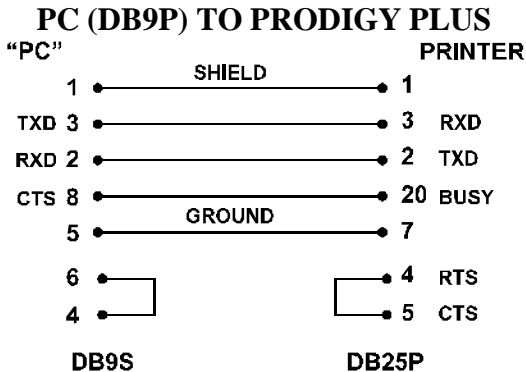
PC (DB9P) TO PRODIGY PLUS

Figure E-4   PC (DB9P) to Printer

Note: Cable is used for connection to a PC compatible with DB9P communication ports. Flow control is either Xon/Xoff or CTS/DTR.

- **Parallel to Serial Adapter (Part Number: 899516)**

If the Printer is being set up for parallel to serial communications a special Parallel to Serial Interface Adapter is needed, (Figure E-5). The Parallel to Serial Interface Adapter is designed specifically for use with your Label Printers. The adapter is a one-way communication self-powered device. No external power source is required.

The adapter has a sophisticated microprocessor built into the head assembly that converts standard Centronics parallel to RS-232 serial communication. This cable is useful when using the Printer with a PC that has only a parallel Printer port available.
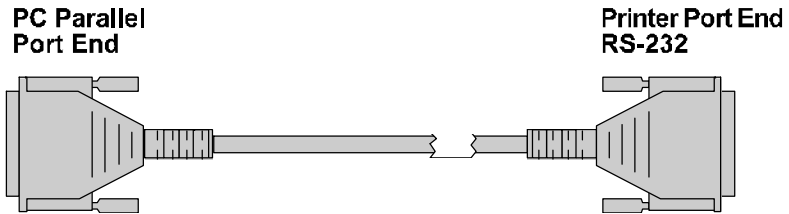
**PC Parallel
Port End**
                                                          **Printer Port End
                                                          RS-232**

Figure E-5 Centronics Parallel Interface Converter

Cable is used for connection to a PC compatible with DB25M parallel communication ports. Flow control is CTS/DTR only. Part Number: 899516.

Appendix F

Specifications

Printing

Type:	Direct thermal or thermal transfer
Resolution:	Prodigy Plus: 203 dots per inch (8 dots/mm) Prodigy Plus 152: 152 dots per inch
Print Speed:	2.0 −8.0" (51 mm −203 mm) per second
Barcode Modules:	5 mil to 110 mil (.005" - .110") "X" dimension in picket or ladder orientation
Maximum Print Width:	4.1 W (104mm) @203 dpi
Maximum Print Length:	5.25" (133mm) with standard RAM; up to 20.25" (514mm) with optional 512K Memory Module.
White Space Slew Rate:	2.0"−8.0" (51mm−203 mm) per second
Maximum Fields Per Label:	200; 5K data per label maximum
Minimum Dot Size:	Prodigy Plus: 0.005" (0.127 mm) square Prodigy Plus 152: .0065" (.165mm) square
Optional Dot Sizes:	Prodigy Plus: 0.010" (0.25mm), 0.015 (0.38mm) vertical, 0.010" (0.254mm) horiz. Prodigy Plus 152: .013" (.33 mm)0.0195" (.495mm) vertical, .013" (.33 mm) horiz.

Label Backfeed: For use with optional Cutter or Peel and Present

Fonts

Resident Fonts: Nine alphanumeric fonts from 0.035"H (0.9mm) to 16"H (406mm) including OCR-A, OCR-B; CG Triumvirate smooth font (size and character set III) and a CG Triumvirate smooth font (10 point sizes)

Optional Fonts: Proportional and monospaced available

Character Density: Prodigy Plus: 33.83 cpi font 0 at 1X, .70 cpi font at 6 at 8X.

Prodigy Plus 152: 25.64 cpi font 0 at 1X .54 cpi font at 6 at 8X

Barcodes: Code 39, Interleaved 2 of 5, Code 128 Codabar, LOGMARS, UPC-A, and UPC-E, EAN-8 and EAN-13, MSI Plessey, Universal Shipping Container Symbology, Code 39 variations to produce all industry standards (i.e., HIBC, AIAG, PDF-417 (203 DPI only), Postnet, and UCC/EAN 128, and PDF 417.

Barcode Density: Prodigy Plus: 12.63 cpi, Code 39, 0.005" narrow bar, 3:1 ratio 6.34 cpi, Code 39, 0.010" narrow bar, 3:1 ratio.

Prodigy Plus 152: 9.6 cpi, Code 39, 0.0066" narrow bar, 0.013" narrow 3.1 ratio.4.81 cpi, Code 39, 3:1 ratio.

Media

Width:	0.75" (19mm) to 4.65" (118mm)
Length:	Prodigy Plus: 0.50" (13mm) to 50" (1270mm)
	Prodigy Plus 152: 0.50" (13mm) to 50" (1270mm)
Thickness:	0.0025" (0.0635mm) to 0.0100" (0.254mm)
Type:	Roll-fed, die-cut tags, tickets or continuos forms with black-stripe sensing
Supply Roll:	8" (203mm) maximum diameter on 1.5" (38mm) to 3" (76mm) cores
Optional Front Rewind:	8" (203mm) maximum O.D. capacity (full supply roll)
Label Material:	Thermal transfer plain-coated papers, vinyl, Mylar, metalized paper, nonwoven fabric, fine woven fabric, thermal-visible light scalable paper, infrared scalable paper, thermal ticket/tag stock, thermally sensitive plastic stock.
Thermal -Transfer Ribbons:	Black or colored inks; 1182′ (360 meters) long, 4.6 microns thick, back coated, ±10% label width, 1-inch cores, no notch required.
Media Sensing:	Moveable "see-through" for die-cut labels and reflective for tags with black striping

> **Note:** The reflective sensor mark must be carbon based. The sensor is infrared and will reflect off of a plain black mark.
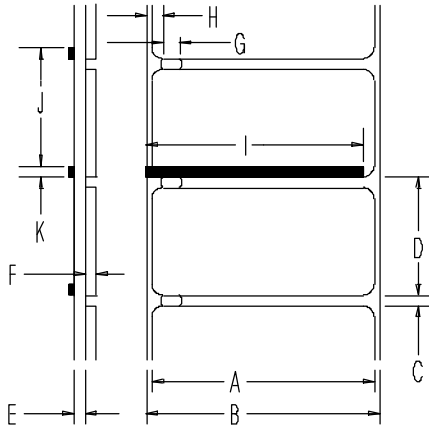
Label/Tag Media Specifications:

Figure F-1 Media Specifications

	Description	MAX*	MIN*
A	Label width	4.650	0.750
B	Backing width	4.650	0.750
C	Gap between labels	99.99	0.100
D	Label length	99.99	0.500
E	Backing thickness	0.005	0.0023
F	Label thickness	0.005	0.0023
G	Width of sensor opening	0.500	0.200
H	Distance from edge of Media to edge of sensor opening	2.250	0.200
I	Reflective sensor mark width	4.00	1.000
K	Reflective sensor mark length	99.99	0.100
J	Distance between reflective mark	99.99	0.500

* Units of measure are in inches

Table F-1 Media Dimensions

Lists of Approved Media

For a current list approved standard Media for use in Thermal and
Thermal-Transfer Printers, please contact your customer support
representative.

Indicators and Switches

Indicator Lights*:*   Power, Paper/Ribbon, Pause

Switches: Power, Pause, Feed, Stop/Cancel, Thermal/Thermal
Transfer, Rear communications DIP switch (SW I)
and darkness potentiometer.

Communications Interfacing

Communications	IEEE RS-232C IRS-422 at 300, 600, 1200, 2400, 4800, or 9600 baud
Character Set:	ANSI ASCII character set
Word Length:	Selectable 7-bit or 8-bit data format
Handshaking:	XOn/XOff (in receive mode only) and CTS/DTR
Input Buffer:	Approximately 7000 bytes. Xon/XOff is transmitted and DTR goes low when 768 bytes are available in the buffer. Xon is transmitted and DTR goes high when 1000 bytes are left in the buffer.

Electrical

Input Voltage:	115 VAC ± 10%, single phase 50/60 Hz
	230 VAC ± 10%, single phase 50/60 Hz
Circuit Protection:	At 115V = 1.5A Slo Blo
	At 230V = circuit breaker at 1.2A
Grounding:	Unit must be connected to a properly-grounded receptacle

Environmental

Operating Temperature:	40°F to 90°F (4°C to 32°C)
Humidity:	10% to 95% non-condensing
Ventilation:	Free air movement
Dust:	Non-conducting, non-corrosive
Electromagnetic Radiation:	Moderate RF fields can be tolerated

Physical

Dimensions:	10"H x 10"W x 18"D (254mm H x 254mm W x 457 mm D)
Weight:	36 lbs. (16.33 kg)

Options

  Ribbon Saver: This factory-installed option reduces consumable costs by stopping the ribbon feed in unprinted label areas.

  Cutter with Tray: Used for cutting, printing and dispensing labels, tags or tickets. Maximum thickness of 0.010" (.254mm).

  Font Memory Cartridges: Six preloaded 512K byte ROM font modules are available as follows: CG Triumvirate bold, CG Triumvirate italic, CG Times, CG Times bold, Futura extra bold condensed and Plantin.

  Present Sensor: This option will not allow the next label to be printed until the last label is removed from the Printer.

  256K RAM
  Memory Module: Fonts can be loaded into the RAM module by most programs that are capable of transmitting fonts in HP PCL4 format.

  512 RAM
  Memory Module: Same as the 256K module except when the 512K module is in slot A, the dot memory (printable length) is doubled.

  256K and 512K Flash
  ROM Memory Module: Provides the same feature of the RAM modules but with the added benefit of permanent storage. In addition, the 512K module provides twice as much storage as the 256K module.

  Centronics Parallel
  Interface adapter: Converts Centronics Parallel type data to RS-232C.

PC-Batch Software: Label-creation software for IBM-PC or compatible.

Twinax/Coax: This device supports printing from IBM and IBM-compatible computers.

On-Line Verification: Used to guarantee barcode quality and compliance.

Kanji: A Japanese font that supports the full 24x24 and 16x16 dot gothic-style Kanji characters.

♦ Appendix G

Warranty Information

Prodigy Plus and Prodigy Plus 152

Printer

Datamax warrants to Purchaser that under normal use and service, the Prodigy Plus and Prodigy Plus 152 purchased hereunder shall be free from defects in material and workmanship for a period of (365) days from the date of shipment by Datamax.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts which have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead

This warranty is limited to a period of 365 days, or 1,000,000 linear inches of use, whichever comes first, for the Prodigy Plus and Prodigy Plus 152 thermal Printhead. This 365 day warranty is valid only if a Datamax- approved thermal or thermal transfer label media is used, as defined in the then current Datamax list of approved Thermal/Thermal Transfer Media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this thermal Printhead warranty. This warranty does not cover Printheads which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to Datamax at: 4724 Parkway Commerce Blvd., Orlando, Florida, 32808. A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA please call Datamax Customer Service Support Department at (407) 523-5540. Please include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost.

With respect to a defect in Hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for sixty (60) days after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

Software is licensed on an "as is" basis without warranty. Except and to the extent expressly provided in this warranty and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax's products.

Limitation of Liability

In no event shall Datamax be liable to the purchaser for any indirect, special or consequential damages or lost profits arising out of or relating to Datamax's products, or the performance or a breach thereof, even if Datamax has been advised of the possibility thereof. Datamax's liability, if any, to the purchaser or to the customer of the purchaser hereunder shall in no event exceed the total amounts paid to Datamax hereunder by the purchaser for a defective product.

In no event shall Datamax be liable to the purchaser for any damages resulting from or related to any failure or delay of Datamax in the delivery or installation of the computer hardware, supplies or software or in the performance of any services.

Some States do not permit the exclusion of incidental or consequential damages, and in those States the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from State to State.

Prodigy Max
Operator's Manual

HP PCL-4, and HP Laser Jet II are Trademarks of Hewlett packard Corporation
CG Triumvirate is a trademark of Agfa Corporation.
CG Times, based upon Times New Roman under license from The Monotype Corporation
plc, is a product of Agfa Corporation.
Futura is a registered trademark of Fundición Tipográfica Neufville, S.A.
Prodigy Max is a Trademark of Datamax Bar Code Products Corporation.
SEAQ PC and Batch are trademarks of Datamax Bar Code Products Corporation.

As an Energy Star Partner, Datamax Corporation has determined that this product meets the Energy Star guidelines for energy efficiency.

Firmware (Software) Agreement: The enclosed Firmware (Software) resident in the EPROM's is owned by Licensor or its suppliers and is licensed for used only on a single printer in the user's Trade or Business. **The User agrees not to, and not to authorize or permit any other person or party to, duplicate or copy the EPROM's or the information contained in the EPROM's.** The firmware (Software) is protected by applicable copyright laws and Licensor retains all rights not expressly granted. In no event will Licensor or its suppliers be liable for any damages or loss, including direct, incidental, economic, special, or consequential damages, arising out of the use or inability to use the Firmware (Software).

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Part Number: 88-2073-01
Revision: D1

Agency Compliance and Approvals:

UL: UL1950 Information Technology Equipment
CSA: C22.2 No. 950-M93
TUV: EN60950, IEC950

1. Nur für Gebrauch innerhalb eines Gebäudes geeignet.
2. Bei Gefahr, Kabel aus der Steckdose herausziehen
3. Falls kein Kabel mitgeliefert wurde, bitte Folgendes bei der Anschaffung
   eines Kabels beachten:

Für 230 Volt (Europa): Benützen Sie ein Kabel, das mit "HAR" markiert ist,
bestehend mindestens aus einem H05VV-F Kabel, das mindestens 0,75
Quadratmillimeter Drahtdurchmesser hat; sowie eine IEC320 Steckdose und
einen für das Land geeigneten Stecker, 6A, 250 Volt.

1. This unit is intended for indoor use only.
2. Disconnect power supply cord in case of emergency.
3. When power supply cord is not provided; for proper power supply cord
   selection please see below:

For 230 Volt Operation (Europe): Use a cord set, marked "HAR," consisting of
a min H05VV-F cord which has a minimum 0.75 square mm diameter
conductors, provided with an IEC 320 receptacle and a male plug for the
country of installation rated 6A, 250V

FCC: This device complies with Part 15 of FCC rules.

Note: This equipment has been tested and found to comply with the limits for
a Class A digital device, pursuant to Part 15 of the FCC Rules. These
limits are designed to provide reasonable protection against harmful
interference when the equipment is operated in a commercial
environment. This equipment generates, uses, and can radiate radio
frequency energy, and if not installed and used in accordance with the
instructions in this manual, it may cause harmful interference to radio
communications. Operation of this equipment in a residential area is
likely to cause harmful interference in which case the user will be
required to correct the interference at his own expense.

.

Important Safety Instructions

This printer has been carefully designed to give you many years of safe, reliable performance. As with all electrical equipment, however, there are a few basic precautions you should take to avoid hurting yourself or damaging the printer:

Carefully read the installation and operating instructions provided with your printer.

Read and follow all warning instruction labels on the printer.

Place the printer on a flat, firm, solid surface.

To protect your printer from overheating, make sure all openings on the printer are not blocked.

Do not place the printer on or near a heat source.

Do not use your printer near water, or spill liquid into it.

Be certain that your power source matches the rating listed on your printer. If you are unsure, check with your dealer or with your local power company.

Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.

Do not insert anything into the ventilation slots or openings on the printer.

Only qualified, trained service technicians should attempt to repair your printer.

Contents

i

Printing Labels

Maintenance and Adjustments

Appendix's

Printer Overview

1.0   Introduction

The Prodigy Max™, hereafter referred to as 'the Printer', is a high performance, low cost, direct thermal or thermal transfer label printer that uses Reduced Instruction Set Computing (RISC) technology. With its standard 203 DPI (Dots Per Inch) printhead, the Printer can print labels at speeds of up to 10" per second. The thermal transfer model allows for the use of thermal transfer ribbons.

An innovative dot history control circuit called SEAQ , (Sequential Energy Adjustment for Quality), provides exceptional print quality by monitoring the printhead data and automatically adjusting the printhead element temperatures to provide maximum printhead quality and performance.
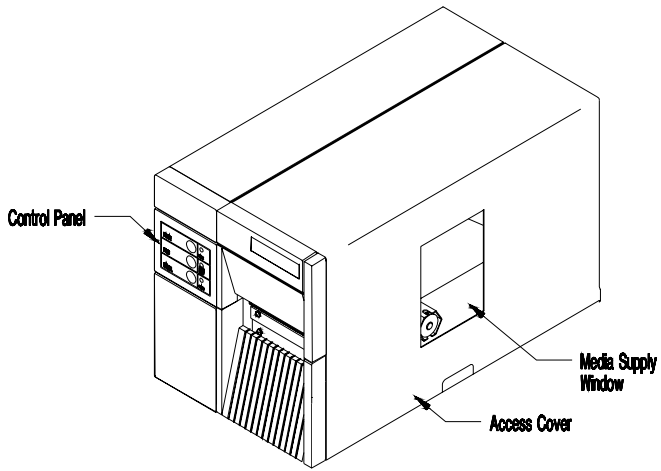
Figure 1-1   Overall View

The Printer can be connected to almost any computer through its RS-232C/RS422 serial interfaces, IEEE parallel option, or to an IBM or IBM compatible mainframe through its optional twinax/coax interface.

The Printer can be equipped with operator and field-installed options such as a Cutter, Peel and Present (requires factory installed Internal Rewind), On-line Verification, DRAM, Internal Batch Cartridge, and Memory Cartridges. In addition, the Printer can be purchased with factory installed options, (i.e., Internal Rewind, Ribbon Saver, 300 DPI printhead, and LCD\Keypad front panel), that expand the Printer's capabilities.

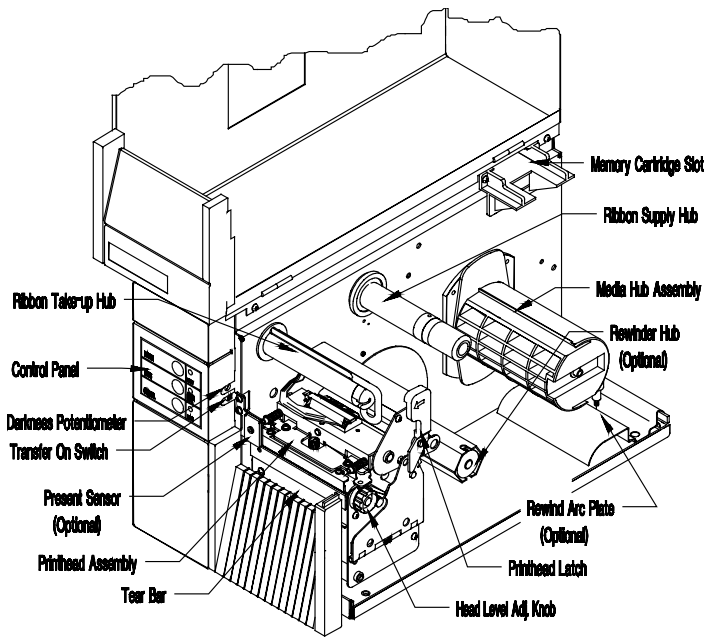Figures 1-1 and 1-2 depict the Printer's parts placement.

Figure 1-2   Mechanism Detail

1.1 Technical Specifications

Print Technology: Direct Thermal   standard
Thermal Transfer   optional

Resolution: 203 DPI (8 dots/mm) Standard
Optional 300 DPI (factory installed)

Print Speed: 203 DPI 2 to 10 IPS
300 DPI 2 to 8 IPS

Bar Code Modules: 5 mil to 110 mil "X" dimension in picket or ladder orientations @ 203 DPI.
3.3 mil to 80 mil "X" dimension in picket or ladder orientations @ 300 DPI.

Print Width: 4.1" (104mm) maximum

Media Width: .75" (19mm)   4.65" (118mm)

Label Length: 12" @ 203 DPI w/512KB (standard)
.25" minimum in batch mode
.75" minimum in tear off or peel mode

12" @ 300 DPI w/1MB (standard)
.25" minimum in batch mode
.75" minimum in tear off or peel mode

Media Type: Roll-Fed, Die-Cut Continuous, Fan Fold, Tags or *Tickets*

Media Thickness: .0025 - 0.010" (.0635mm to .254mm), standard widths (.0050 - .0080 for .75"   1" label widths)

Media Supply: 8" (203mm) maximum diameter on 3"(76mm) cores

Bar Codes: Code 39, Interleaved 2 of 5, Code 128 (Subsets A, B, and C) Codabar, UPC-A, UPC-E, UPC 2 and 5 digit addendums, EAN-8, EAN-13, EAN 2 and 5 digit addendums, Code 93, UPC random weight, Universal Shipping Container Symbology Plessy, Postnet, UCC/EAN 128, PDF 417 and Maxicode

Internal Fonts: CG Triumvirate Bold/Condensed (scalable)
CG Triumvirate (smooth bit mapped font 6 - 48 pt)

Cartridge Slots:	One Cartridge Slot (Memory)
Standard DRAM:	512KB w/203DPI, 1 MB w/300DPI
Standard EPROM:	2048KB w/203 DPI, 2048KB w/300DPI
Counters:	2 Linear Inch Counters; one absolute and one resettable
Interface:	RS232, RS422 @ 300 -19,200 baud, XON/XOFF, CTS/RTS
Dimensions:	11.38" H x 10" W x 18.25" D (289mm H x 254mm W x 463mm D)
Operating Temperature:	40 F to 105 F (5 C to 40 C)
Power Source:	115 VAC or 230 VAC 60HZ/50HZ

Additional Options

LCD/Keypad:	Front panel with a 2 row x 16 character LCD display and a 6 key operator's keypad
Ribbon Saver:	Eliminates ribbon waste when feeding past non-printing areas
DRAM:	Expandable to 4MB (via a daughter board)
256KB/512KB Flash Cartridge:	Permanent Storage of Custom Fonts, Graphics, and Formats
Cutter with Tray:	Maximum Thickness: 0.010" (.254mm)
Internal Rewinder:	5½" maximum O.D. capacity with no core
Twinax/Coax:	Supports IBM Mid-range and Mainframe Computers
High Speed Interface:	IEEE Parallel Interface plus Serial I/F up to 56K BPS
Present Sensor:	On-demand label dispensing
Internal Batch:	Cartridge with VT 100 emulation and storage Cartridge with Link MCII emulation and storage

1.2 Standard Ribbon Sizes

The manufacturer stocks the following standard ribbon sizes:

General Purpose	Super Durable	Color
1.00" (25.4 mm)		
1.50" (38.1 mm)		
2.00" (50.8 mm)	2.00" (50.8 mm)	2.00" (50.8 mm)
2.50" (64.0 mm)		
3.00" (76.2 mm)	3.00" (76.2 mm)	3.00" (76.2 mm)
3.50" (89.0 mm)		
4.00" (101.6 mm)	4.00" (101.6 mm)	
4.25" (108.0 mm)	4.25" (108.0 mm)	4.25" (108.0 mm)
4.50" (114.3 mm)	4.50" (114.3 mm)	4.50" (114.3 mm)

The standard ribbon length is 1478' (450m). It is recommended that the width of the thermal-transfer ribbon be within 10% of the label width. Additional sizes other than those listed above are available on a custom-order basis.
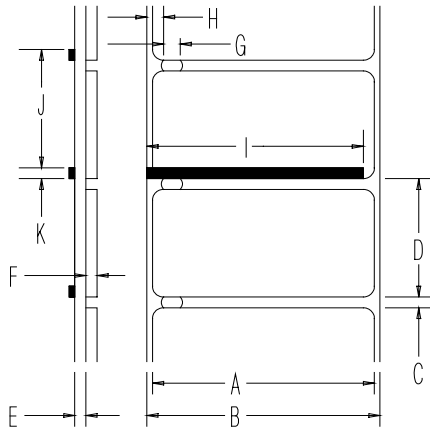
1.3 Label/Tag Media Specifications

Figure 1-3   Media Dimensions

	Description	MAX. (inches)	MIN. (inches)
A	Label width	4.650	0.750
B	Backing width	4.650	0.750
C	Gap between labels	99.99	0.100
D	Label length	99.99	0.250
E	Backing thickness	0.010	0.0023
F	Label thickness	0.010	0.0025
G	Width of sensor opening	0.500	0.200
H	Distance media edge to sensor opening	2.250	0.200
I	Reflective sensor mark width. It is recommended that the entire width of the label is marked.	4.00	1.000
J	Distance between reflective mark	99.99	0.500
K	Reflective sensor mark length	99.99	0.100

Table 1-1   Media Specifications

> **Note:** The reflective sensor mark must be carbon based. The sensor is infrared and will reflect off of a plain black mark.
> The total thickness of label and backing is .010 inches max.

Getting Started

2.0   Introduction

This chapter will assist you in unpacking, configuring the communications, connecting your Printer, loading media stock, and installing the ribbon, (if equipped for thermal transfer).

2.1   Unpacking

Inspect the shipping container(s) for signs of shipment damage. If damage is evident, contact the carrier directly to specify the nature and extent of the damage.

The printer is packed in molded styrofoam packaging. The Printer is enclosed in a plastic bag to reduce the chance of moisture damage during shipment. Remove the Printer from the plastic bag.

In addition to this manual, the shipping container(s) should include the following standard items:

        Label printer
        AC power cord
        Special or additional items purchased.

2.2   Checking the AC Power Requirements

The standard Printer is configured for 115 VAC +10% single-phase 50/60 Hz with a properly-grounded outlet. A small sticker next to the power cord connection states the power requirements.

The Printer is also manufactured for 230 VAC operation, most of these Printers are shipped to international markets. If you are uncertain as to the power requirements of the Printer, or the outlet you are connecting to, check with a qualified service technician to verify the installation before connecting AC power.
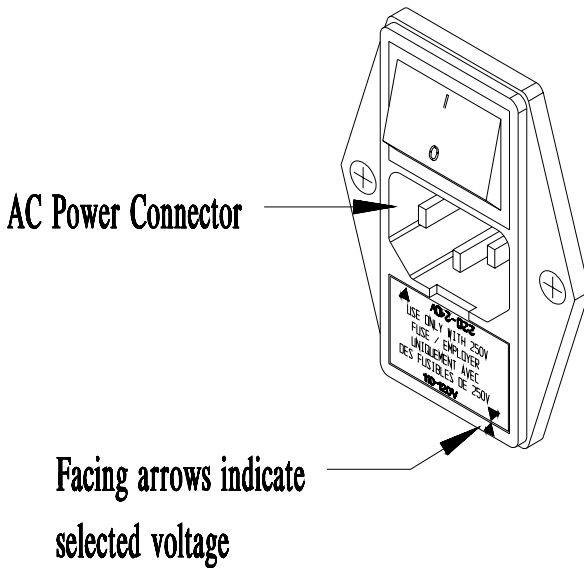
![caution triangle] **CAUTION**	Check the rear AC switch settings before applying power. The facing arrows must by selected to match the supplied voltage rating, (115VAC or 230VAC).

2.2.1   Selecting 230 VAC Operation

If your Printer's AC power requirements do not match your AC power, the rear AC voltage selection switch can be changed. If you wish to change from 115 VAC to 230 VAC, follow the instructions outlined below.

1.   Remove the AC power cord (if installed).

2.   Insert a flat bladed-screwdriver into the release slot and push out the fuse holder/voltage selector switch.

3.   Flip/rotate the fuse holder/voltage selection switch over and re-insert it.
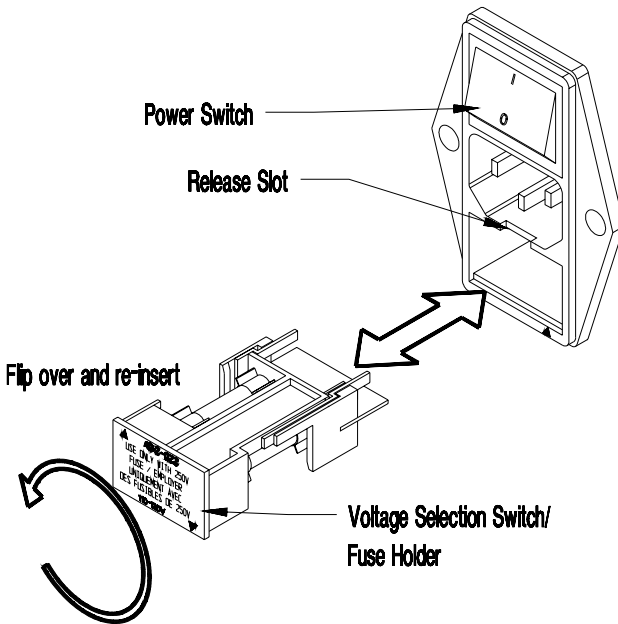
4.   Attach the 230V power cord.

Figure 2-1   Selecting 230 VAC

2.3   Connecting the Printer

You will need a serial cable to connect your computer to the Printer's RS232/RS422 serial interface connector. Connect your Printer's cables as outlined below.

1. Make sure both the Printer and host computer are turned off.

2. Plug the serial cable connector securely into the Printer's serial connector and then attach it to the connector.

3. Plug the other end of the cable into the computer's serial interface.

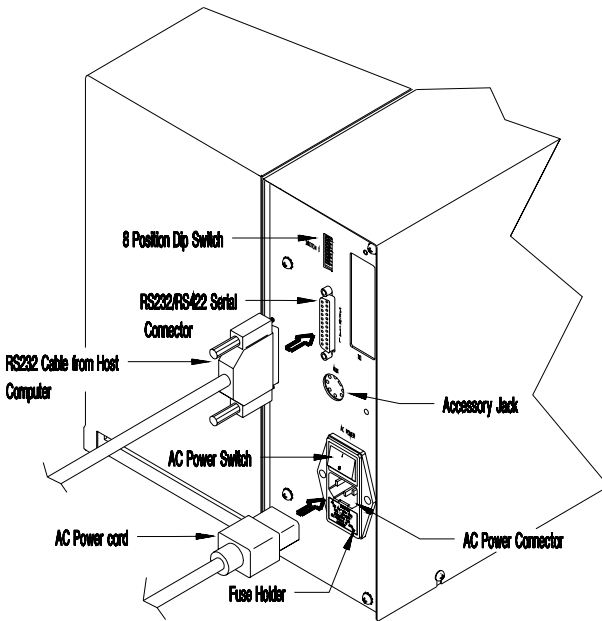| Note:	An optional parallel port is available. See your retailer for details.

Figure 2-2   Rear Printer Connections

2.3.1   Interfacing to the Printer

For most applications, the interface between the Printer and the host device will be RS-232C. The interface cable is connected between the Printer and the host via the DB-25 connector. The DB-25 connector is labeled "serial" and is located on the back of the Printer. Several typical cable interfaces are listed in Table 2-1.

The Printer supports both XON/XOFF and CTS/DTR handshaking. For connection to most host systems, the XON/XOFF handshaking works to reduce the number of wires needed in the interface cable. For interfacing RS-422 devices, the XON/XOFF handshake is the only appropriate method. Refer to Table 2-2 for the appropriate communications cable needed for your configuration.

When a serial (RS-232C) interface between the Printer and the host will be used, a serial interface cable is needed to connect the Printer to the host. Cable configurations for typical interfaces are shown below, (Contact your reseller for part numbers and ordering information).

Null Modem (MXM)	"PC" (DB25P) to Printer

HOST (DTE)   PRINTER (DTE)
1 ——— SHIELD ——— 1
TXD 2 ———————— 3 RXD
RXD 3 ———————— 2 TXD
7 ——— GROUND ——— 7
RTS 4 ⌐
CTS 5 ⌐   4 RTS ⌐
      5 CTS ⌐
DB25P   DB25P
	"PC" (DTE) PRINTER (DTE)
	1 ——— SHIELD ——— 1
	TXD 2 ———————— 3 RXD
	RXD 3 ———————— 2 TXD
	CTS 5 ———————— 20 BUSY
	7 ——— GROUND ——— 7
	6 ⌐
	8 ⌐
	20 ⌐ 4 RTS ⌐
	      5 CTS ⌐
	DB25P DB25P

"PC" (DB9P) to Printer	RS-422 Connection

"PC" (DCE)   PRINTER (DTE)
NC ——— SHIELD ——— 1
TXD 3 ———————— 3 RXD
RXD 2 ———————— 2 TXD
CTS 8 ———————— 20 BUSY
5 ——— GROUND ——— 7
6 ⌐
4 ⌐   4 RTS ⌐
      5 CTS ⌐
DB9S   DB25P
	HOST SYSTEM PRINTER PORT
	RXD + ———————— 9 TXD +
	RXD - ———————— 10 TXD -
	TXD + ———————— 18 RXD +
	TXD - ———————— 19 RXD -
	      4 ⌐
	      5 ⌐
	      DB25P

Table 2-1   Interface Cable Applications

Other applications may require a parallel connection from the Printer to the host. The Printer can be connected to the host with a standard parallel printer cable if the Printer is equipped with the optional parallel interface option.

2.3.2   Dip Switch Settings

For proper operation, you must set the baud rate, parity, and stop bits of the Printer's interface. On the rear of the Printer, you will find Switch 1 (S1), an eight-position dip switch used to set the Printer's communications parameters, (see Table 2-3*)*.
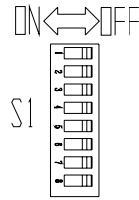
> **Note:**   Switch 1 (S1) is not available with the LCD/Keypad Front Panel Option, (see Section 3.2 when setting the communications parameters for this option).

	S1-1	S1-2	S1-3	S1-4	S1-5	S1-6	S1-7	S1-8
Baud Rate								
9600	OFF	OFF	OFF	X	X	X	X	X
4800	OFF	OFF	ON	X	X	X	X	X
2400	OFF	ON	OFF	X	X	X	X	X
1200	OFF	ON	ON	X	X	X	X	X
600	ON	OFF	OFF	X	X	X	X	X
300	ON	OFF	ON	X	X	X	X	X
19200	ON	ON	OFF	X	X	X	X	X
TEST/9600	ON	ON	ON	X	X	X	X	X
Word length/Parity								
7-Bit /Even	X	X	X	ON	X	X	X	X
8-Bit /None	X	X	X	OFF	X	X	X	X
Compatibility Mode (Form Edge Offset)								
Offset =1.10" (27.9mm)	X	X	X	X	OFF	X	X	X
Offset =2.20" (55.9mm)	X	X	X	X	ON	X	X	X
Present Sensor								
Enable	X	X	X	X	X	ON	X	X
Disable	X	X	X	X	X	OFF	X	X
Control Codes								
Standard	X	X	X	X	X	X	OFF	X
Alternate	X	X	X	X	X	X	ON	X
Cutter Enable								
Disable	X	X	X	X	X	X	X	OFF
Enable	X	X	X	X	X	X	X	ON

Table 2-2   Communications Dip Switch Settings

> **Note:**   Select the 8-bit word length if you wish to access the foreign language characters from the ASCII Code chart. These characters are available in fonts 1–6 and 9.

2.4   Memory Cartridges

The Printer has one standard memory cartridge slot. The primary use of the memory cartridges is for storing label formats, graphic images, fonts and for internal batch. Follow the instructions outlined below when installing memory cartridges.

1.   Ensure that all printing has been completed.

2.   Open the Side Access Cover.

3.   Plug the Memory Cartridge into the Memory Cartridge Slot with the label face-up.
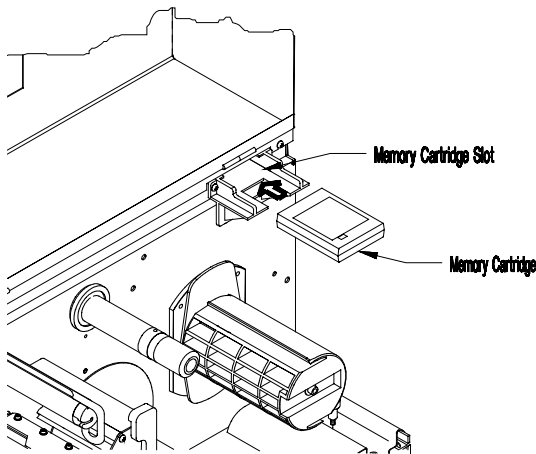
Figure 2-3   Installation of a Memory Cartridge

Note: Use only memory cartridges designed specifically for your Printer, flash modules have a Write Protect Switch.

2.5   Media Loading

The Printer supports up to an 8" (203mm) diameter roll of media, (if media less than 4 inches wide is used, refer to Section 5.3.1 before loading media). Follow the instructions outlined below when installing the media stock.

1.   Open the Printer's Side Access Cover.

2.   Rotate the Printhead Latch (1) counterclockwise to unlatch and raise the Printhead to an upright position.

3.   Lower the Hinge Plate (2).

4.   Slide the Media Edge Guide (3) to the outer edge and rotate it to the down position.
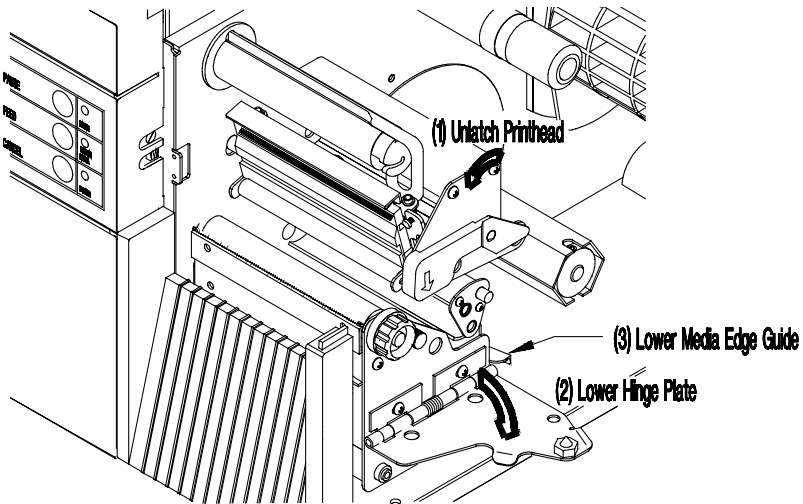
Figure 2-4   Media Access

> **Note:** If using fanfold media, skip steps 5 and 6. Install fanfold media as shown in figure 2-5b.

5. Place the Media Supply Roll on the Media Hub Assembly. Slide the media retainer against the supply roll and tighten the thumb screw.
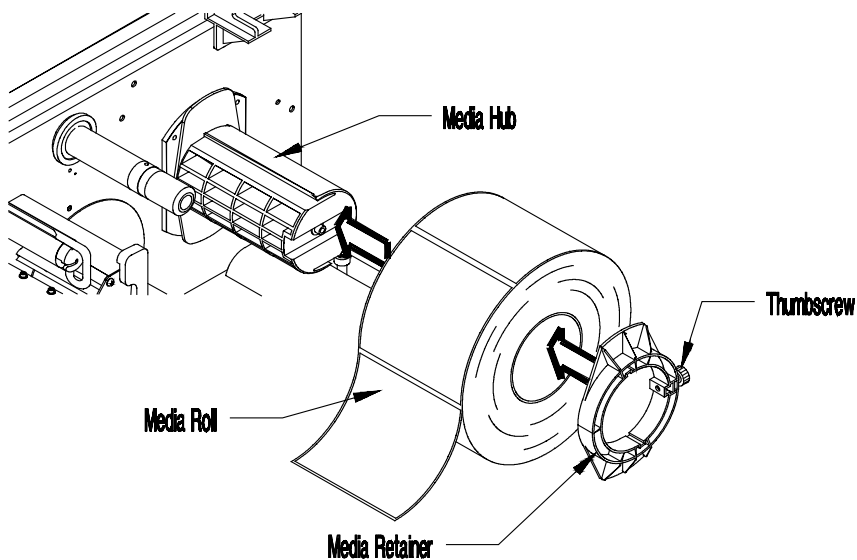
Figure 2-5a   Media Installation

> **Note:** Do not use the media retainer if the Media Supply Roll is wider than 4 inches (102mm).

6. Route the media over the Guide Plate, between the Media Sensor, and over the Platen Roller, (located beneath the Printhead), as shown in Figure 2-5b.

7. Rotate the Media Edge Guide up and slide it to the media's edge.

8. Close the Hinge Plate and lower the Printhead by rotating the Printhead Latch clockwise to the latched position.
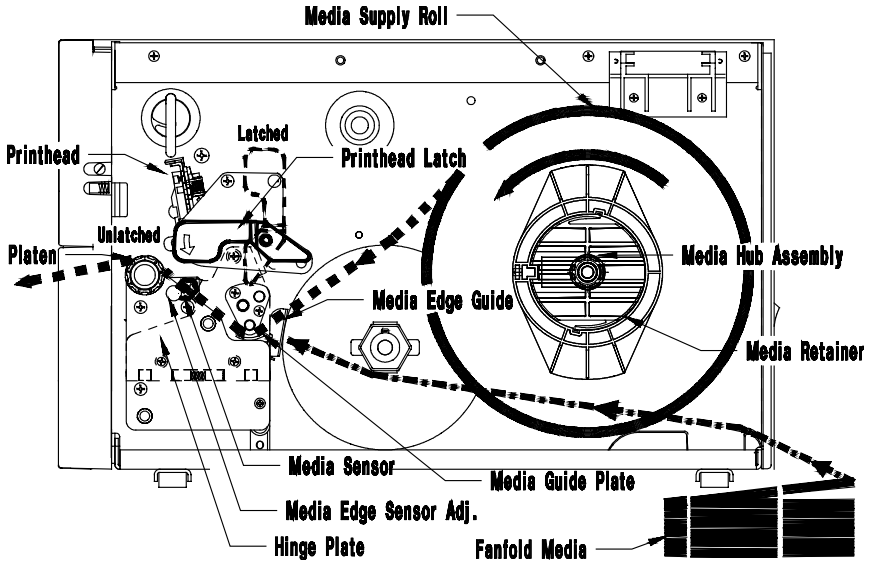
Figure 2-5b   Media Installation

Note:	If the media is not sensing, try adjusting the Media Edge Sensor by turning the Media Edge Sensor Adjustment knob, (see Section 5.3.2).

2.5.1   Using the Optional Internal Rewind

If the Internal Rewind Option is installed in your Printer, then the media and Arc Plate should be installed as described below.

Note: The Arc Plate is supplied only with the Internal Rewind Option.

1. Turn off the Printer and open the Side Access Cover.

2. Follow steps 2, 3, and 4 of Section 2.5 before installing media.

3. Open the Lower Right Front Panel.

4. Remove the Arc Plate from its stored position and install it on the front of the Printer as shown in Figure 2-6.
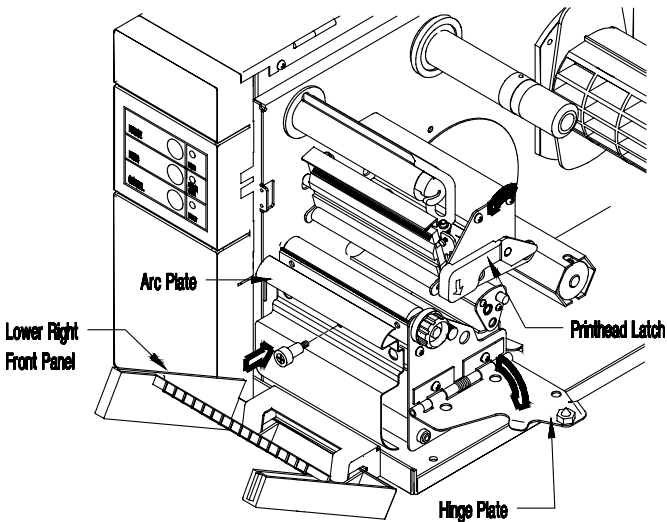
Figure 2-6   Installing the Arc Plate for Internal rewind

5. Place the Media Supply Roll on the Media Hub Assembly. Slide the media retainer against the Media Supply Roll and tighten the thumb screw.

Note:	Do not use the media retainer if the media is wider than 4" (102 mm).

6. Route the media over the Guide Plate, between the Media Sensor, and over the Platen Roller, (located beneath the Printhead), around the Arc Plate and to the Media Rewinder as shown Figure 2-7.

7. Place the Clasp over the end of the media and rotate the Media Rewinder a few turns.

8. Rotate the Media Edge Guide up and slide it to the media's edge.

9. Close the Hinge Plate and latch the Printhead by rotating the Printhead Latch upward to the latched position. Close the side cover.
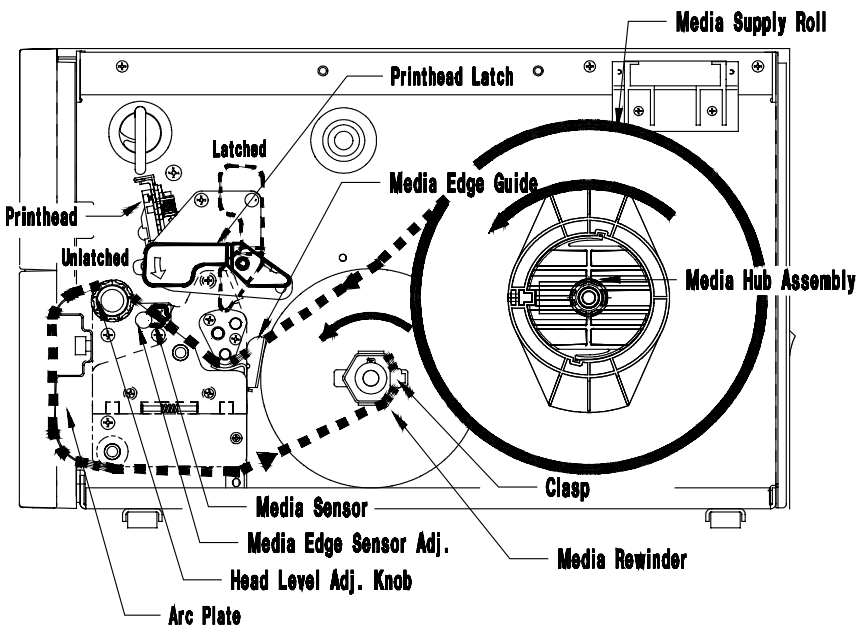
Figure 2-7   Installing Media with Internal Rewind Option

2.5.2   Using the Peel and Present Option

The Peel and Present Option allows for on-demand label dispensing and requires the Internal Rewind Option. To use this option follow the instructions outlined below.

1.   Turn off the Printer and open the Side Access Cover.

2.   Follow steps 2, 3, and 4 of Section 2.5 before installing media.

3.   Open the Lower Front Panel.

4.   Using a phillips screw driver, remove the Tear Bar, invert it (flip it over), and re-install it as shown in Figure 2-8.
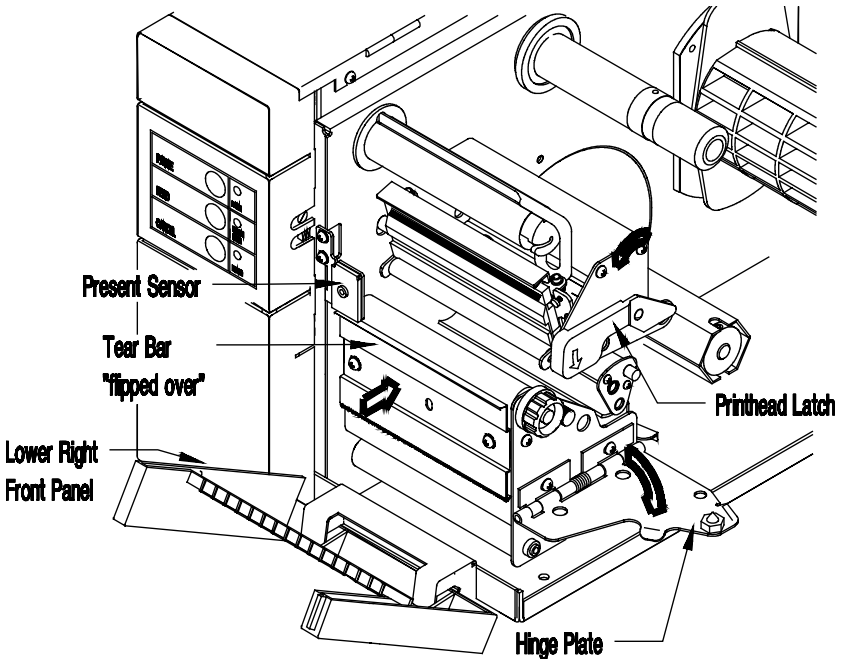
Figure 2-8   Using the Peel and Present Option

Note: If media narrower than 4 inches is used, refer to Section 5.3.1 before loading media.

5. Place the Media Supply Roll on the Media Hub Assembly. Slide the media retainer against the supply roll and tighten the thumb screw.

6. Route the media over the Guide Plate, between the Media Sensor, and over the Platen Roller (located beneath the Printhead).

7. Route the media liner (backing) around the Tear Bar to the Media Rewinder as shown in Figure 2-9.

8. Place the Clasp over the end of the media and rotate the Media Rewinder a few turns.

9. Rotate the Media Edge Guide up and slide it to the media's edge.

10. Lift and snap the Lower Right Front Panel closed.

11. Close the Hinge Plate and latch the Printhead by rotating the Printhead Latch clockwise to the latched position. Close the side cover.
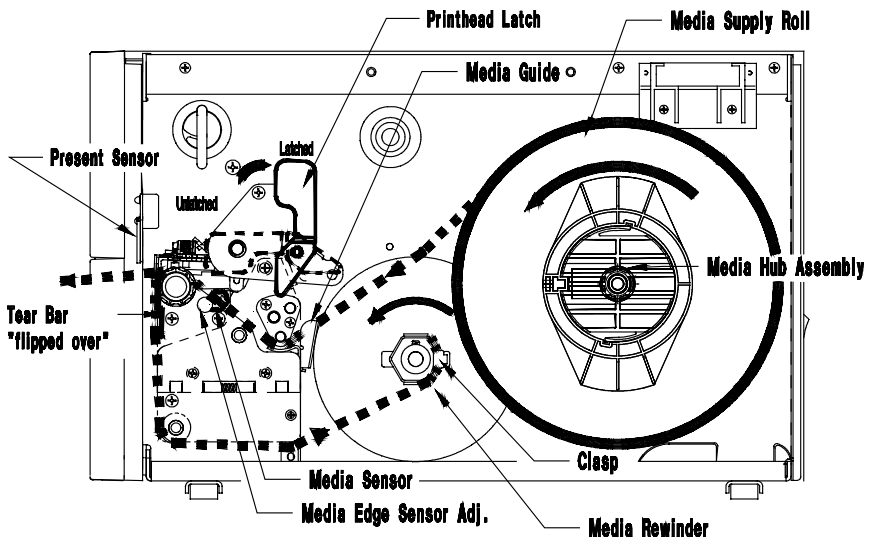
Figure 2-9   Installing Media using Peel and Present Option

2.6   Ribbon Installation and Removal

To use a ribbon, the Printer must first be equipped with the factory-installed Thermal Transfer Option. Follow the instructions below when installing the thermal transfer ribbon.

Ribbon Installation:

1.   Open the Side Access Cover.

2.   Rotate the Printhead latch counterclockwise to unlatch and raise the Printhead.

3.   Lower the Hinge Plate.

4.   Place the new Ribbon Supply Roll on the Supply Hub, making sure that the ribbon roll is pushed up against the hub flange.
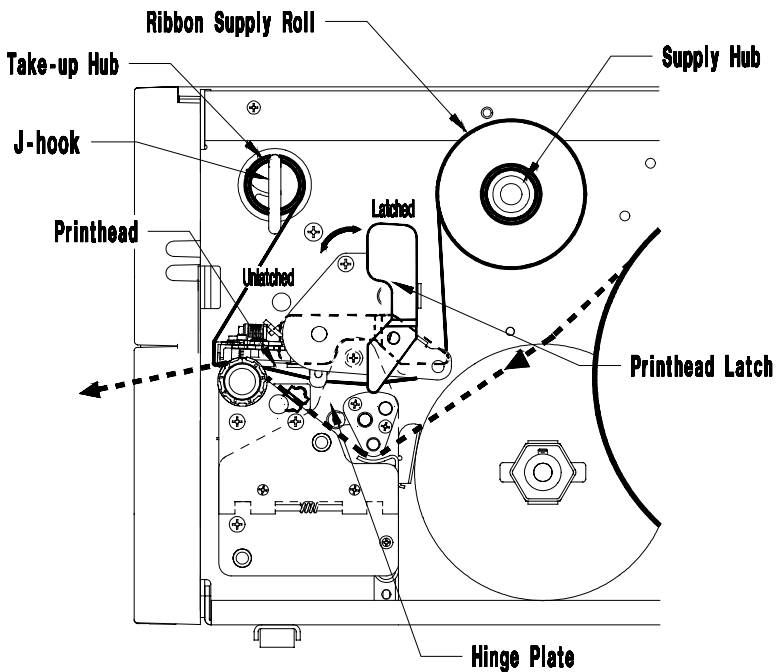
Figure 2-10   Ribbon Installation

5.   Route the ribbon as shown in Figure 2-10 to the Take-Up Hub.

6.   While holding the ribbon Take-Up Hub, rotate the J-hook clockwise to unlatch it.

7.   Raise the J-hook upward and place the end of the ribbon over the Take-Up Hub.
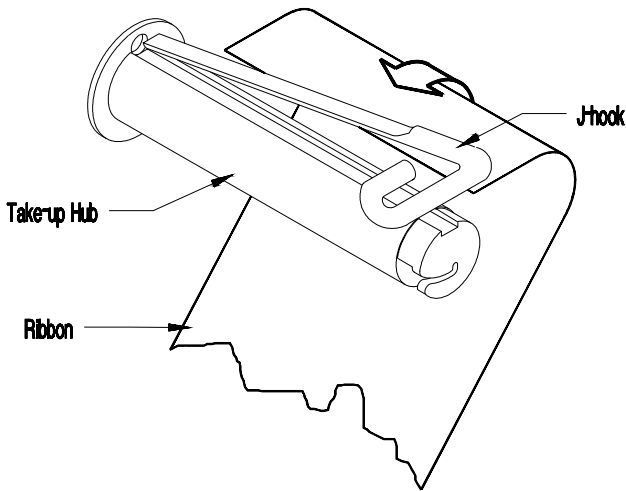
Figure 2-11   Ribbon Installation showing J-hook

8.   Slide the J-hook back into place as shown in Figure 2-11. While holding the ribbon Take-Up Hub, rotate the J-hook counter-clockwise to latch.

9.   Turn the Take-Up Hub until all of the ribbon slack is removed.

10. Raise the Hinge Plate and close the Printhead by rotating the Printhead Latch clockwise.

11. Locate the Ribbon ON/OFF switch, (see Figure 2-12), and slide the switch to the right to select Thermal Transfer (ribbon on). If no ribbon is used, place the switch in the off position for direct thermal. This Switch is not available with the LCD/Keypad Front Panel Option, (see Section 3.2).
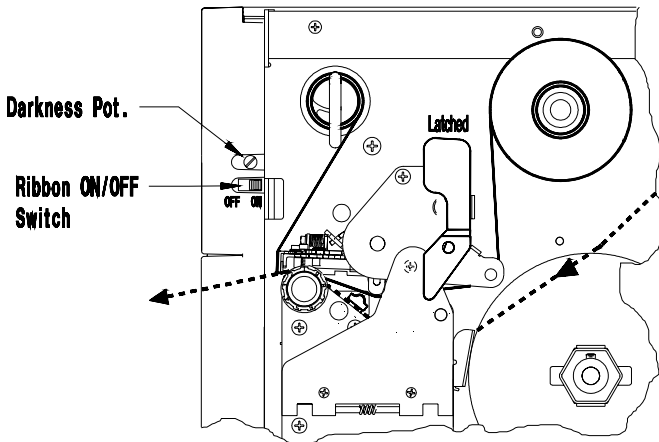
Figure 2-12   Selecting Ribbon On (Thermal Transfer)

Ribbon Removal:

1. Cut the ribbon anywhere between the Take-Up Hub and Printhead.

2. Rotate the Printhead Latch counterclockwise to raise the Printhead, then lower the hinge plate.

3. While holding the ribbon Take-Up Hub, rotate the J-hook clockwise to unlatch it, then slide off the used ribbon.

4. Turn the Ribbon Supply Hub clockwise to draw the unused portion of the ribbon back onto the Ribbon Supply Roll.

5. Raise the Hinge Plate and close the Printhead by rotating the Printhead Latch clockwise.

Using Your Printer

3.0   Introduction

This chapter will explain the front panel operation, how to install memory cartridges, and replace the fuse.

3.1   Front Control Panel

The Printer has five (5) operator accessible switches and three (3) LED indicators, (see Figure 3-1). A brief description of the switches and LED indicators is listed in this section.
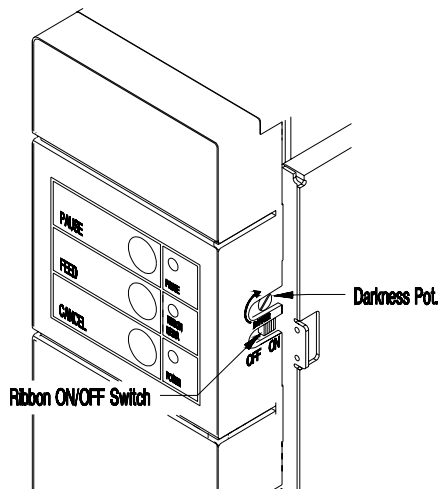
Figure 3-1   Front Panel

POWER

The POWER indicator light is lit when power is available and the rear POWER switch is activated.

RIBBON MEDIA

This indicator is lit when no media edge and/or no ribbon motion is detected; a fault condition.

PAUSE

The PAUSE indicator will turn on if any of the following occurs:
- The PAUSE switch is pressed.
- A print job is canceled with the CANCEL switch.

PAUSE

This switch temporarily interrupts the printing process illuminating the Pause LED. A second press allows printing to resume and extinguishes the LED.

FEED
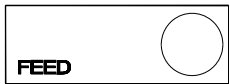
When pressed the paper will advance to the first print position of the next label. In addition this button is used to clear fault conditions indicated by the Ribbon Media LED.

CANCEL

Interrupts and deletes the active print job.

RIBBON ON/OFF SWITCH:

For direct thermal printing, (no ribbon), slide the switch to the "off " position. For thermal transfer printing, (ribbon installed), slide the switch to the "on" position. This Switch is not present on the LCD/Keypad Front Panel Option.

DARKNESS POT:

This potentiometer is used to fine adjust print darkness to variations in the media. This potentiometer is not present on the LCD/Keypad Front Panel Option.

3.1.1   Optional LCD/Keypad Front Panel

The Printer can be equipped with an optional, factory-installed LCD/Keypad front panel. If this option is installed on your Printer, refer to this section for menu and function information.

The front panel is equipped with a 2 row x 16 character LCD display and a (six) 6 key operator's keypad. The three (3) control switches and indicators operate the same as indicated in Section 3.1.
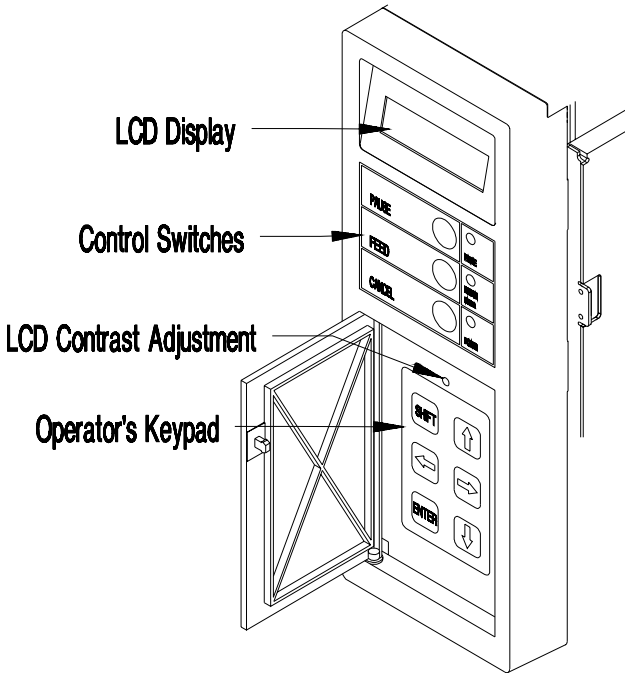
Figure 3-2   Optional LCD/Keypad Front Panel

Note:	If the Printer was purchased with the optional LCD/Keypad front panel, the configuration for the Printer will be set via the keypad. On the standard Printer, these configurations are set through the rear dip switches.

The operator's keypad consists of six (6) pressure sensitive switches. The function of each keypad switch is described as follows:

SHIFT   Moves to the next available field

⇦ ⇨   Scrolls through the current menu selection
                            Increases and decreases values

⇧   Returns to the previous menu level

⇩   Moves to the next menu level

ENTER   Selects a function or value
                            Used to respond "yes" to an operator query

Display Contrast   used to adjust the LCD display brightness

3.2   Using the Optional LCD/Keypad Front Panel

The menu structure is divided into two primary menus, Basic Function and Advanced Setup. Use the ⇩ arrow key to move to the primary Basic Function menu, then use the ⇦ ⇨ arrow keys to scroll to the desired sub menu. Once in the desired sub menu, use the ⇩⇧ arrow keys to move into or out of the desired sub menu. Use the ⇦ ⇨ arrow keys to display the available values. Use the enter key to set the desired value or condition.

When the enter key is pressed, an asterisk (*) will appear indicating that the selection has been made. The asterisk (*) also indicates the current default setting.

Upon exiting the Advanced Setup Menu, the Printer prompts 'CHANGES DEFAULT'. By pressing the enter key the changes are saved as defaults. Pressing the ⇧ arrow key exits without saving the changes, except under Date/Time, and areas where no asterisk (*) is used for default. Exiting without saving will cause all changes to return to the default values when the Printer is turned off.

Basic Function

| **BASIC FUNCTION PRINT METHOD** | • Selects the type of printing desired |

| DIRECT* | • Selects direct thermal printing (no ribbon installed) |
| TRANSFER | • Selects thermal transfer printing (ribbon installed) |

| **BASIC FUNCTION SELECT TOF** | • Top Of Form |

GAP*	• Default looks for gap between labels
REFLECTIVE	• Senses black stripe on back side on media
CONTINUOUS	• No Top Of Form sensing

| **BASIC FUNCTION DARKNESS** | • Used to balance a new printhead's level of darkness |

| Values 1-64 | • 1 indicates the lightest and 64 indicates darkest setting |

| **BASIC FUNCTION COMM SETUP** | • Sets the parameters for the communication port |

*PORTA 9600
 8 N 1 BOTH

• Communications port and Baud rate, Word length, Parity, Stop Bits, Protocol.

Word lengths = 7, 8
Parity   =   None, Even, Odd
Stop Bits   =   1, 2
Protocols   =   BOTH, DTR, XON/XOFF
Baud rates   =   300, 600, 1200, 2400, 4800, 9600, 19200

| **BASIC FUNCTION LABEL PRESET** | • Selects the Peel and Present Option |

| ENABLE | • Selects the Present Sensor |
| DISABLE* | • No Present Sensor selected |

| **BASIC FUNCTION CUTTER** | • Controls Cutter Option, if installed |

| ENABLE | • Cutter Option installed or selected |
| DISABLE* | • No Cutter Option installed or used |

| **BASIC FUNCTION RIBBON SAVER** | • Controls Ribbon Saver Option, if installed |

| ENABLE | • Ribbon Saver selected (stops ribbon from advancing during voids of .95 inches or larger) |
| DISABLE* | • Ribbon Saver not installed or selected |

* represents default settings

BASIC FUNCTION INTERNAL BATCH	• Allows internal label creation with Internal Batch Cartridge

ENABLE
DISABLE*

BASIC FUNCTION CONVERSION	• Used to set the Printer's system of measurement

METRIC	• Printer interprets all measurements as metric values
DECIMAL*	• Printer interprets all measurements as decimal values

BASIC FUNCTION TOF ADJUST	• Selects the point where the label's edge is detected by the sensor

• Set start of print from the label's edge. 128 sets the start of print approximately .3 inches, (7.6 mm) from the label's edge

Advanced Setup

ADVANCED SETUP COUNTERS	

ABSOLUTE VALS.	• Non-resettable counter (viewed only)
RESETTABLE VALS.	• User resettable counter (can keep track of labels)
RESET COUNTERS	• Resettable values re-start at 0

ADVANCED SETUP DATE/TIME	• Allows current date and time to be set

SET DAY NAME day
hh:mm a dd mon yr

ADVANCED SETUP LABEL OPTIONS	

HEAT SETTING	• Values: 00 to 30, (*10) (0 = lightest, 30 =darkest)
PRINT SPEED	• Values: 2ips to 10ips, (*6) (Print speed/ inches per sec)
SLEW SPEED	• Values: 2ips to 10ips, (*7) (Label feed rate/ inches per sec.
BACKFEED SPEED	• Values: 2ips to 5ips, (*3.5), (rate the printer backs up label
ROW ADJUST	• Vertical position where printing begins, (*0) (shifts up)
COLUMN ADJUST	• Values 0 to 410, (0*)
CONT. LABEL LEN	• Values 0000 to 9999, (*0) (00.00 to 99.99") (label page length)

* represents default setting

LABEL WIDTH	• Values 75 to 410 (.75 to 4.1"), label printing width in inches (*410)
PRESENT DIST.	• Distance from the printhead to where the label stops (*0)

**ADVANCED SETUP
SYSTEM OPTIONS**

FACTORY SETTING	• Returns the Printer to its original factory settings
SECURITY CHECK	• Selects security features to protect Advanced Setup
PASSWORD	
DIP SWITCH #1	
NONE*	
MODIFY PASSWORD	• Allows the user to change the entry password
INTERNAL MODULE	• Internal Module (ID-A). Memory size- 4K byte blocks;
0 - 1000	default 15
SCALABLE FONT	• Scalable font cache allocation 4K byte blocks (*0)
0 - 1000	
SYMBOL SET	• Scalable font symbol set selection, see Programmer's
28 SELECTIONS	Manual

**ADVANCED SETUP
OPERATION**

PAUSE MODE	• Suspends printing between each label until the pause
ENABLE	button is pressed
DISABLE*	
FEEDBACK MODE	• Returns ASCII character 30 after each label and
ENABLE	character 31 after each batch of labels are printed
DISABLE*	
TEST MODE	• Sends debug characters to host while printing
ENABLE	
DISABLE*	

**ADVANCED SETUP
COMMUNICATIONS**

SERIAL PORT A	
CONTROL CODES	• Standard and alternate control codes

* represents default setting

ADVANCED SETUP
MAINTENANCE

TEST PRINT
  CURRENT CONFIG   • Prints a configuration test label of current selections
  DATABASE CONFIG   • Prints a configuration label of default menu selections
  TEST RIBBON   • Test reflects the status of the ribbon type
  TEST PATTERN   • Prints label with a test pattern (to check dot elements)

FRONT PANEL
  LED TEST   • Exercises the front panel indicator LEDs
  KEYPAD TEST   • Checks the operation of the front panel keypad
  DISPLAY TEST   • Exercises the front panel LED display

TEST I/O
  MONITOR GP INPUT   • Allows monitoring of the General Purpose Input
  TEST GP OUTPUT   • Allows testing of the General Purpose Output
  SENSOR READINGS   • Displays the status of the digital and analog sensors
  DIGITAL SENSORS   • Displays digital sensors with active values below them

HD = Head	D=Down	U=Up
CT = cutter	D=Down	U=Up
LP = label present	Y=Blocked	N= Not Blocked
RS = ribbon saver	D=Down	U=Up

  ANALOG SENSORS   • Displays 4 analog sensors with sensor values below each

    THR = Thermal   RF* = reflective TOF mode
    RIB = Ribbon motion   TR* = Transmissive
        (* only the active mode is displayed)

  SERIAL LOOPBACK   • Serial loopback connector must be installed for test
  SERIAL PORTA   • Initiates test (see Self-Test, Section 3.3.)
INSTALLED OPTION   • Lists options
  CUTTER   * = installed
  RIBBON SAVER

ADVANCED SETUP
MODULES

• The optional modules are available
  Module Slot A   External Flash

  PRINT DIRECTORY   • Prints contents of selected memory modules
  PRINT FILE   • Prints label, font, or image from selected module
  COPY MODULE   • Copies data from one module to another
  TEST MODULE   • Tests Read/Write operation of selected modules
  FORMAT MODULE   • Formats the selected memory modules

3.3   Self-Test

Power On Self-Test

If the Printer's power switch is off, begin the Self-Test by using the Power-On method. With the Printer OFF, load the media (at least 4 inches wide) to be used and ribbon, (if equipped and/or desired), optionally install one of the Self-Test Plugs. Press and hold the feedbutton and turn the Printer on. Release the Feed switch after the Ribbon/Media LED indicator flashes once. The Printer will then print the two test labels and operation will continue in the Character Dump Mode.
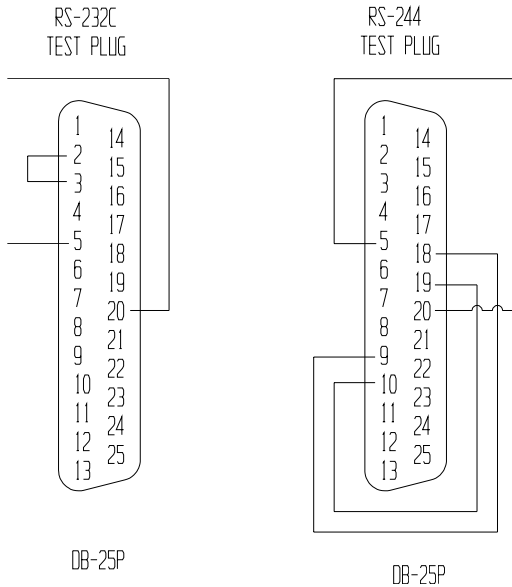
Figure 3-3   Self-Test Plugs

Note:	After performing a Power-Up and Self-Test the Printer will be in 'Character Dump Mode'. Turn the Printer off momentarily, then back onto restore normal operation.

The Self-Test may also be initiated while the power is on by simultaneously pressing the pause and cancel buttons. Simultaneously release them and immediately press and hold the feed button until the ribbon/media LED flashes.

> **Note:** If any configuration errors are indicated by the Self-Tests, check the Printer's dip switch settings or configuration setup.

3.3.1 Test Label Examples

The first test label printed will be the Configuration Label, this label lists the Printer's configuration and status. The following sample was produced on a standard printer without the test plugs installed.

```
FRI    SEPTEMBER 23,  1996 10:12 340
VER:   GA  -        1.14    01/30/96
ROM    CHECKSUMS
 U13    47-2091-01P
 U24    47-2090-01P
 U34    47-2088-01B
 U2     47-2089-01B
SYSTEM RAM CHECKS____GOOD  SYSTEM RAM SIZE__ 512 KBYTES


SERIAL  PORT   BAUD   RATE IS 9600      TRANSFER SWITCH IS ON

SWITCH 1     1    2    3    4    5    6    7    8
             ON   ON   ON   OFF  OFF  OFF  OFF  OFF
INTERNAL     1    2    3    4    5    6
             OFF  OFF  OFF  OFF  OFF  OFF


INPUT  VALUES
PAPER: 255    EDGE:   253   REFL:  0  TEMP:     76
POT  : 120    TOFA:   120   RIBN:    10  RWND:    0

COUNTER INFORMATION
 ABSOLUTE VALUES  2-21-1996      RESETABLE VALUES 9- 5-1995
 LENGTH____      2317 INCHES     LENGTH____            2317      TIME____
__              1 HOURS     TIME_____      1 HOURS

MEMORY CONFIGURATION
 INTERNAL MODULE_____  15   SCALABLE FONTS_____  0
```

Figure 3-4   Configuration Test Label

The second of the two test labels is the Test Pattern Label. This label is used to determine whether the Printhead is in need of replacement. 'Good' and 'Bad" test pattern labels are shown in Figure 3-5.

Good test label indicates Printhead is operating normally.
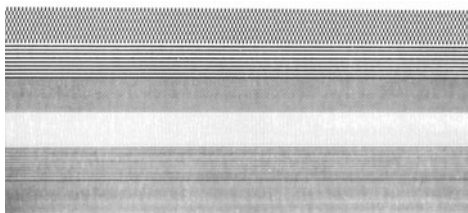
Streaks in test label indicate a dirty or faulty Printhead. (See Chapter 3 for cleaning and replacement).
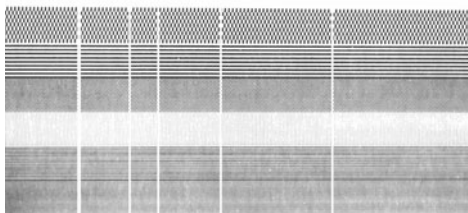
Figure 3-5   Printhead Test Label

3.3.2 Configuration Test Label

The following are explanations of the Configuration Test Label elements, top to bottom, (see Figure 3-5).

Rom Checksums   indicates whether the ROMs that store the Printer's program and resident fonts are 'good' or 'bad'. Good part numbers are displayed normally. Checksum values replace the part numbers to indicate an error. If either the ROM or RAM test is bad, service is required.

System Ram Checks   indicates 'good' or 'bad'.

System Ram Size   indicates the amount of available RAM in the Printer.

Thermal Transfer Switch   Should be 'on' if using a ribbon, and 'off ' if in the direct-thermal mode (no ribbon).

Switch 1   indicates the status of dip switch 1 on the rear of the printer, (see Section 2.3.2, Table 2-3).

Internal   indicates the status of the Printer's internal dip switch located on the main logic board (see Table 3-1).

Paper   this value indicates when paper is present in the sensor.

Edge and Refl   indicates when media is present at the respective sensor. These sensors tell the Printer where the start of the label is located. Refer to the Programmer's Manual when determining which sensing mode to use.

Switch Functions	1	2	3	4	5	6	7
RS-422 Disabled	OFF	OFF	OFF	X	X	X	X
RS-422 Address 1	ON	OFF	OFF	X	X	X	X
RS-422 Address 2	OFF	ON	OFF	X	X	X	X
RS-422 Address 3	ON	ON	OFF	X	X	X	X
RS-422 Address 4	OFF	OFF	ON	X	X	X	X
RS-422 Address 5	ON	OFF	ON	X	X	X	X
RS-422 Address 6	OFF	ON	ON	X	X	X	X
RS-422 Address 7	ON	ON	ON	X	X	X	X
Spare	X	X	X	OFF	X	X	X
Resettable Counter Reset	X	X	X	X	OFF	X	X
Spare	X	X	X	X	X	OFF	X
RS-422 Termination (hw)	X	X	X	X	X	X	OFF

Table 3-1   Internal Dip Switch Settings

Temp   this reading is the feedback voltage of the printhead thermistor. At power up or in an idle condition, this value should be in the range of 060 to 065. A reading of 175 is high and could decrease the life of the printhead. An average amount of printing will give readings that range from 070 to 120.

Pot   this reading comes from the darkness potentiometer located on the front panel board. It will vary from 000 (darkest) to 255 (lightest). Adjust this value for a midrange value of 128.

TOFA   (Top of Form Adjustment) determines where the first position of print begins on the label.

RIBN   this value indicates the operation of the ribbon mechanism, this value will vary.

RWND   this value indicates the operation of the internal rewind mechanism, this value will vary.

Counter Information   is the values and dates of the absolute and resettable counters.

Memory Configuration   lists the current size of the 'Internal Module' RAM in 4K byte blocks, and the 'Scalable Fonts' current cache setup for scalable font calculations.

3.3.3 Character Dump Mode

After printing the configuration test labels, the Printer will automatically enter the Character Dump Mode. This mode allows the user to input strings of data and compare them with the output data from the Printer. This label can readily uncover a buffer overflow problem identified by large gaps of data in the character string.

```
0000   02 4C 0D 44 31 31 0D 31    ^L.D11.1
0008   36 31 31 30 30 30 30 33    61100003
0010   32 30 30 30 31 30 46 4F    200010FO
0018   4E 54 20 36 3A 20 41 4C    NT 6: AL
0020   4C 20 56 41 4C 49 44 20    L VALID
0028   20 20 20 20 20 20 20 20
0030   20 20 20 0D 31 36 31 31        .1611
0038   30 30 30 30 32 38 30 30    00002800
0040   30 31 30 20 20 20 20 20    010
0048   20 20 20 43 48 41 52 41       CHARA
0050   43 54 45 52 53 3A 0D 31    CTERS:.1
0058   36 31 31 30 30 30 30 32    61100002
0060   34 30 30 30 31 30 23 24    400010#$
0068   25 26 28 29 2A 2B 2E 2D    %&()*+.-
```

Figure 3-5   ASCII Character Dump Label

3.4 Factory Default Setup

With the Printer off, press and hold the feed, cancel, and pause buttons while turning the Printer on. Continue to hold the buttons until the Ribbon Media LED illuminates a second time. The Printer will now be set to the 'Factory Defaults'.

3.5   Fuse Replacement

The Printer uses a 2.0 amp/250V slo-blo fuse, which is located within the voltage selection switch, just below the power switch.

Turn off the Printer and remove the AC power cord.

Insert a flat-bladed screwdriver in the release slot and push out the fuse holder/voltage selector switch.

Replace the fuse with the same type and rating, (250volts, 2Amp, slo-blo).
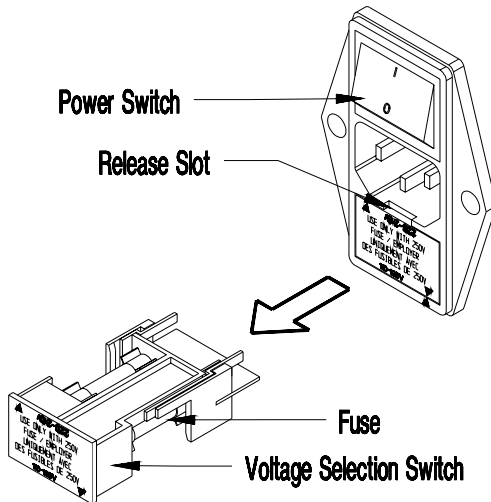
Figure 3-6   Fuse Replacement

Printing Labels

4.0   Introduction

This chapter explains how to generate labels using several different methods, and how to print different bar codes. An optional Internal Batch Cartridge is available for generating label formats using the Printer as a stand-alone device.

A VT 100 or LINK MCII compatible CRT is required if the optional Internal Batch Cartridge is used to generate labels. The Internal Batch Cartridge Program works much like a PC compatible software package, but uses internal batch modules instead of a hard or floppy disk drive to store and retrieve label formats.

Labels can also be generated using RS-232 to a host computer or by using a PC with a compatible labeling software package. This chapter explains some of the basic programming commands that are required when writing programs to generate label formats.

Note:	The programming information contained in this manual is for reference purposes only. Refer to the Programmer's Manual for detailed descriptions and programming formats.

4.1　Programming Commands

To prompt the Printer for a command sequence, the Printer must first receive a special character called an "attention getter", which 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.

ASCII Char.	Decimal Value	HEX Value	DOS Prompt	Attention Getter For
SOH	1	01	Ctrl A	Immediate Commands
STX	2	02	Ctrl B	System Level Commands
ESC	27	1B	Crtl [	Bitmapped Font Loading Commands

Table 4-1　Attention Getters

When the Printer receives an "immediate" command it will stop whatever it is doing and perform that command. Commands of all types must be in the following sequence:

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

Command Character	Printer Responds?	Command
#	Y	Reset
A	Y	Send ASCII Status String to Host
B	N	Toggle Pause
C	N	Cancel
D	N	SOH Shutdown
E	Y	Send Batch Quantity
F	Y	Send Status Byte

Table 4-2　Immediate Commands

The System Level Commands are used to create formats, load and store graphic information, and control the Printer. Table 4-3 provides a brief description and format of each System Level Command character.

Char	Description	Format
A	Set time and date	FORMAT: A*wmmddyyyyhhMMjjj* 16 digits total *w*　　= 1 digit week, 1 is Monday *mm*　= 2 digits for month *dd*　 = 2 digits for day *yyyy* = 4 digits for year *hh*　 = 2 digits for hour (24 hr ft) *MM*　= 2 digits for minutes *jjj*　　= 3 digits for Julian I.D. value
a	Enable feedback characters	Returns decimal 30 after each label and 31 after each batch of labels
B	Get Printer time and date information	Print time and date to port
c	Set continuous paper length	*nnnn*= length of paper to feed per label
d	Set Printer to double buffer mode	Use to print a label while a second is formatting in memory
E	Set quantity for stored label	E*nnnn* = Set quantity for stored label
e	Select edge sensor	For "see through" media sensing, etc.
F	Form feed	Feeds one label at a time
f	Set form stop position (BACKFEED) Distance to peel off or present position	f*nnn* *nnn* = 3 digits from sensor
G	Print last label format	
I	Input graphics data block See the Programmer's Manual for format	A bank designation, an optional word length modifier, a format designation, and up to a 16-character string to identify the stored image data
i	Download scalable font	
J	Set pause for each label	
K	Extended System Commands Refer to the Programmer's Manual for proper format *n* = M,S, or W for set memory config. <STX>K*M*xxxx:*S*yyyy:*W*zzzz	K*n*　 *n* = Q - for query 　　　　　 *M* - Set configuration 　　　　　 *S* - Scalable font cache 　　　　　 *W* - Label width 　　　　　 *R* - Reset memory config. 　　　　　 *f* - Set form stop position <STX>K*f*xxxx defines distance between the Printhead and stop position

Table 4-3　System Level Commands

Char	Description	Format
k	Test RS-232 Port With a Y if OK	Sends character "Y" to RS-232 port
L	Enter label formatting mode	
M	Set maximum label length	4 digits (nnnn) Max. 99.99 inch.
m	Set metric flag, enter metric mode	All measurements set to metric until reset
n	Clear metric flag, return to inch mode	
O	Form edge offset (start of print position)	O*nnnn* nnnn = in/100 or mm/10
o	Cycle cutter	
P	Enter character dump mode	
p	Controlled pause	
Q	Clear all memory modules	
q	Clear module "q(A/B)"	q*a* *a* = Module ID, upper case
R	Ribbon Saver	R*x* *x* = (Y/N) default = Dip switch or front panel (Ribbon Saver Option only)
r	Select reflective sensor	Used for "black-strip" media sensing, i.e. continuous tags, butt-cut labels. Stripe must be printed on back side of media
S	Feed rate	S*r* *r* = C - W, 2.0 - 12.0 ips.
s	Set for 1 dot buffer processing. Used for full length dot buffer processing	
T	Printhead dot pattern test label	
U	Label format field replacement	
V	Software switch settings	V*n* *n* = 4 -label present, 2 -Internal batch 1 -Cutter enabled
v	Firmware version information	Sends version string to Host
W	Request memory module Information	W*a* *a* = F -font, G -graphic, L -label
w	Test FLASH module memory	Takes about 90 seconds
X	Set default module bank	X*a* *a* = Memory Module ID, A or B
x	Delete module file	x*MFname* M = A/B module ID, F = F,G,L file type
Y	Output sensor values	Sends sensor values status to RS-232 port
y	Symbol set select	y*Saa* aa = Symbol set ID, see B-1
Z	Print internal information and dot pattern	
z	Pack module	Z*a* *a* = Memory Module ID, upper case

Table 4-3   System Level Commands (Continued)

The STX L command switches the Printer from the system level to the label-formatting command. All command characters after STX L are interpreted as Label Formatting Commands until terminated with E,X, or s. All label formatting commands are terminated with 0D HEX.

CC	Description	Format
:	Set cut by amount (4 digits) The cutter function will perform a cutting action after the number of labels specified	:*nnnn* *nnnn* = 4 digits of labels printed before cut. Default = 0001
A	Set format attribute	A*n* *n* = 1 - XOR 2 - Transparent 3 - Opaque 5 - Inverse
C	Set column offset amount	C*nnnn* *nnnn* = Inches/100
c	Set cut by amount (2 digits)	c*nn* *nn* = 2 cut amount
D	Set height and width dot size	h = Horiz. dot size; can be 1 or 2 v = Vert. dot size; can be 1,2, or 3 (0.005" steps) Default is "D22"
E	Terminate field generation and print label	
G	Place data in global register	
H	Enter heat setting (The amount of heat applied per dot row can be used to help control print quality)	H*nn* *nn* = 2 digits. 1 - 30 10 is nominal and default Print contrast is relative to speed
M	Mirror text/bar code	Second transmission restores print
m	Set metric mode	
P	Print speed Enter maximum speed for print cycle, 1 character	P*a* *a* = single char. C 2.0 ips I 5.0 ips O 8.0 ips D 2.5 ips J 5.5 ips P 8.5 ips E 3.0 ips K 6.0 ips Q 9.0 ips F 3.5 ips L 6.5 ips R 9.5 ips G 4.0 ips M 7.0 ips S 10.0 ips H 4.5 ips N 7.5 ips
p	Set label backup speed	p*a* *a* = single char. (C - I)
Q	Enter quantity of labels to print	Q*nnnn* *nnnn* = quantity
R	Set row offset amount	R*nnnn* *nnnn* = row offset
r	Recall stored label format	r*nn...n* *nn...n* label name of up to 16 char. terminated by CR
S	Slew speed Sets maximum speed for label feeding. 1 digit.	S*a* *a* = single character C 2.0 ips I 5.0 ips O 8.0 ips D 2.5 ips J 5.5 ips P 8.5 ips E 3.0 ips K 6.0 ips Q 9.0 ips F 3.5 ips L 6.5 ips R 9.5 ips G 4.0 ips M 7.0 ips S 10.0 ips H 4.5 ips N 7.5 ips

Table 4-4   Label Formatting Commands

CC	Description	Format
s	Store label format in module	**s**a*nn...n* a - destination module A Memory Module A B Memory Module B C Default memory bank D Memory module D E Memory module E *nn...n* - label name (16 char. max)
T	Set field data line terminator	T*nn* - *nn* = 00-FF, 2 digit ASCII
U	Make previous field a string replace field	
X	Terminate label formatting node	
Z z	Zero (0) conversion to "O" to eliminate slash (/)	
+	Make last field entered increment numeric	+*pii* Make last entered field incrementing *p* = Zero fill character *ii* = Data added to field
-	Make last field entered decrement numeric	-*pii* Make last entered field decrementing *p* = Zero fill character *ii* = Data subtracted from field
>	Make last field entered increment alphanumeric	>*pii* Make last entered field incrementing. 0 - Z *p* = Zero fill character *ii* = Data added to field
<	Make last field entered decrement alphanumeric	<*pii* Make last entered field decrementing. 0 - Z *p* = Zero fill character *ii* = Data subtracted from field
^	Set count by amount	^*nn* Specifies the number of labels printed before field data is updated *nn* = 2 digits, number of labels

Table 4-4   Label Formatting Commands (Continued)

There are two special commands used by the Printer, the STX S (Recall Global Data) and the STX T (Print Date and Time) commands. Unlike the other Label Format Commands, which follow the STX L command, these special commands are entered directly into the data field.

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

Table 4-5   Special Label Formatting Commands

Bitmapped font loading commands are usually generated by font creation software. However, the assigned font ID number command must be sent to the Printer before the font file. Refer to Table 4-6 for the font loading command characters.

The downloaded font will be stored in the "default" module,
(see STX X).

Command Character	Description	Format
*c###D	Assign Font ID Number	<**ESC**>*c###D ### = font ID Number 100 to 999
)s###W	Font Descripton	<**ESC**>)s#W # = Bytes of Font Descriptor Data
*c###E	Character Code	<**ESC**>*c###E # = ASCII Value of Character
(s#W	Character Download Data	<**ESC**>(s###W*nn...n* # = Bytes of Bit-mapped Data *nn..n* = Bit mapped data

Table 4-6   Bitmapped Font Loading Commands

4.2   Programming Example

The following ASCII text file will generate the label shown in Figure 4-1.

```
<STX>L<CR>
H07<CR>
D11<CR>
19110080100002510K OHM 1/4 WATT<CR>
1a6210000000050590PCS<CR>
E
```


Figure 4-1   Sample Label

4.3   Printing Bar Codes

The example shown below prints out a Code 3 of 9 bar code with a wide to narrow bar ratio of 3:1, and can be used to print any of the bar codes shown in Appendix B by altering the examples fields. Refer to Figures 4-2 and 4-3 for a brief explanation of the data fields.

```
<STX>L<CR>
D11<CR>
1A9304000150100012345 6789<CR>
121100000000100Barcode A<CR>
E
```

Field	DESCRIPTION
Rotation	1 = 0 deg. 2 = 90 deg. 3 = 180 deg. 4 = 270 deg.
Bar Code/Font ID	Any valid font character or bar code type. Bar codes automatically select bar code field format. Bar code types designated by uppercase ALPHA letters print with human-readable interpretations. Lowercase ALPHA bar code fonts print as bars only. Font designated by 0 - 9.
Width multiplier	Represents the number of times the dot tables are multiplied for the selected font or the specific width for Bar Codes. .005 increments. They both accept 1-9 and A-K. For UPC and 128 fonts, only 1,2,3,4,6, & 8 are valid when interpretation is printed.
Height	Must be 3 digits. 001-999 (in/100 or mm/10)
Row	Must be 4 digits. 0000-9999 (in/100 or mm/10)
Column	Must be 4 digits. 0000-0410 (in/100 or mm/10)
Data string	ASCII printable data for font/bar code selected. Terminate with a <CR>.
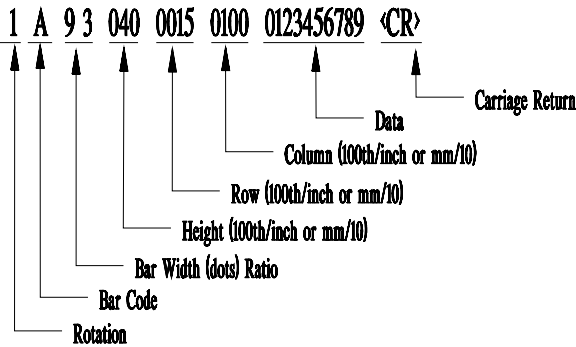
Figure 4-2   Example line 3
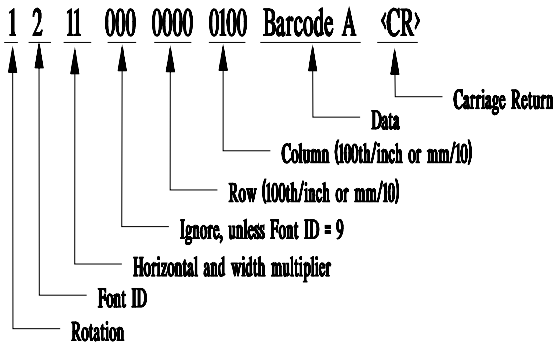
Figure 4-3   Example line 4

4.4   Printing Lines and Boxes

Lines and boxes can be created by requesting font "X". The horizontal and vertical multipliers, and row/column position work with the line and box routines in the same manner as human-readable fonts. The format of the data area is as follows:

LINES: Lhhhvvv

        L = "L" specifies line drawing
        hhh = horizontal width of line
        vvv = vertical height of line

LINES: lhhhhvvvv

        1 = "1" specifies line drawing
        hhhh = horizontal width of line
        vvvv = vertical height of line

BOXES: Bhhhvvvbbbsss

        B = "B" specifies box drawing
        hhh = horizontal width of box
        vvv = vertical height of box
        bbb = thickness of bottom and top box edges
        sss = thickness of sides of box

BOXES: bhhhhvvvv*bbbb*ssss

        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

Maintenance and Adjustments

5.0   Introduction

This chapter contains information about maintaining your Printer, troubleshooting tips, solutions, and Printer adjustment information.

5.1   Printer Maintenance schedules

If your Printer is equipped with an optional Rotary Cutter, it is recommended that the cutter's blades are cleaned every 25,000 cuts. The blades in the Rotary Cutter, although reversible, can not be sharpened and must be replaced if they become dull.

The Media Path and Printhead should be cleaned each time a new roll of media is installed in the Printer.

The Tear Bar can become gummed up from the media backing. The Tear Bar should be cleaned with Isopropyl Alcohol when build-up is noticeable.

5.1.1   Cleaning the Printhead

The thermal printhead should be cleaned periodically, or when the print quality is affected by a dirty printhead. Follow the instructions outlined below when cleaning is required.

1. Turn off the Printer and open the Side Access Cover.

2. Unlatch the Printhead by rotating the Printhead Latch counter-clockwise.

3. Lower the Hinge Plate.

4. Using a cotton swab dipped in Isopropyl Alcohol, clean the printhead by rubbing the cotton swab left and right along the Printhead Element. Care should be taken not to scratch the Printhead with the cotton swab.

5. Raise the Hinge Plate and engage the Printhead Latch by rotating it clockwise.

6. Close the Side Access Cover.

> ⚠️ **CAUTION**
>
> Allow the printhead surface to cool 2 3 minutes before cleaning. Do not touch the printhead with your fingers or lubricant of any kind.
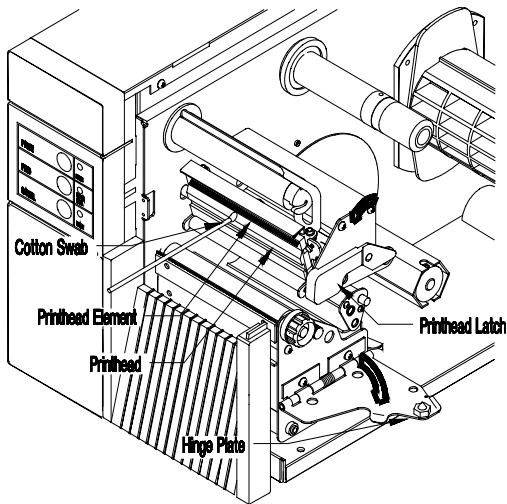
Figure 5-1   Cleaning the Printhead

5.2   Troubleshooting

This section identifies some causes and solutions to specific problems that may effect the Printer.

1) The Printer prints strange characters or garbage instead of the label:

Possible cause and solution:

The Printer is in the dump mode, perform a reset by pressing and releasing the pause and cancel switches simultaneously, or by turning the Printer off and back on again.

The Printer is set up for 8 data bits but the host PC is set up for 7 data bits, see Section 2.3.2, (or 3.2 if equipped with optional LCD/Keypad front panel) for instructions.

2) The Printer does not print:

Possible cause and solution:

The media is incorrectly loaded , (see Section 2.5).

The Printhead is incorrectly latched, (see Section 2.5).

If the Direct Thermal Mode is selected, make sure that direct thermal media is installed, (see Section 3.1 or 3.2).

The Media Sensor is incorrectly adjusted, re-adjust the sensor, (see Section 5.3.2).

The Media Sensor may be bad, return the Printer for service.

3) The media slips or does not properly advance:

Possible cause and solution:

The Head Level Adjustment Knob setting is adjusted too high, re-adjust the Head Level Adjustment Knob, (see Section 5.3.1).

The Platen Roller is dirty, clean the Platen Roller.

4) Uneven printing or print too light:

Possible cause and solution:

The Hinge Plate is open or unlatched, re-latch the hinge plate, (see Section 5.1, steps 6, 7, and 8).

The Head Level Adjustment Knob setting is adjusted too high, re-adjust the head level adjustment knob, (see Section 5.3.1).

The darkness is adjusted too low, readjust.

5) Poor print quality:

Possible cause and solution:

The Printhead is dirty, clean the printhead, (see Section 5.1).

The wrong ribbon/paper combination is being used, use a different type of ribbon and/or paper.

The Printhead temperature is too high or too low. Use software control to adjust the heat settings or darkness via the optional LCD/Keypad Front Panel.

The Printhead is bad, (see Section 5.3.3).

6) No display   power light is on (LCD/Keypad front panel):

Possible cause and solution:

Display contrast set too low, turn the contrast adjustment clockwise until the display appears.

The LCD display is defective, return the Printer for service.

5.2.1　Optional LCD/Keypad Front Panel Alarms

If the Printer is equipped with the Optional LCD/Keypad Front Panel, it has built in monitors for the Printer status and stock conditions. The alarm messages will be displayed on the front panel LCD display indicating the present status of the Printer, stock levels, or whether the Printer's electronics have detected an error condition.

LCD Display	Alarm Description
PROM FAULT	Power up initialization detected a PROM failure, call for service.
RAM FAULT	Power up initialization detected a RAM failure, call for service.
RTC RAM FAULT	The RTC Non Volatile RAM failed its checksum test, call for service.
PRINT HEAD FAULT	The Thermal Printhead Control Circuit failed, call for service.
ADC FAULT	The Analog to digital converter failed, call for service.
TOF FAULT	The Printer failed to find the top of form position. Possible causes: Defective stock Maximum Label Length, (set from communications or front panel), is smaller than one form.
OUT OF STOCK	The Printer is out of stock.
RIBBON FAULT	The ribbon system detected a fault Possible causes: Out of ribbon Ribbon motion was prohibited Obstructions in the paper movement may cause ribbon faults.

LCD Display	Alarm Description

CUTTER FAULT — The cutter operation failed
Possible causes:
    Cutter not installed
    Jam in cutter
    Defective cutter hardware, call for service.

> **Warning:**
> Turn **OFF** the Printer and remove the AC power cord before attempting to remove any jam or obstruction from the cutter.

RIB SAVER FAULT — The Ribbon Saver operation failed
Possible causes:
    Obstruction in ribbon area
    Ribbon Saver Option is not installed
    Defective ribbon saver hardware, call for service.

CUTTER NotEQP — The Cutter Option is enabled and the cutter is not present

RIBSVR NotEQP — The Ribbon Saver Option is enabled and the ribbon saver is not present

5.3　Mechanical Adjustments

The following mechanical adjustments should be performed only when required, additional sections that follow provide detailed descriptions for each adjustment.

Media Width adjustment, (see Section 5.3.1).

Media sensor adjustment, (see Section 5.3.2).

Printhead Replacement, (see Section 5.3.3).

5.3.1   Media Width Adjustment

This adjustment allows the use of narrower media, (less than 4 inches wide) in the Printer.

1. Rotate the Head Level Adjustment Knob clockwise to raise the minimum printhead to platen position for narrow media.

> **Note:**   Rotate the head level adjustment knob counterclockwise to lower the minimum printhead to position.

2. Install the media, (see Section 2.5).

3. Print a Self-Test Label, (see Section 3.3).
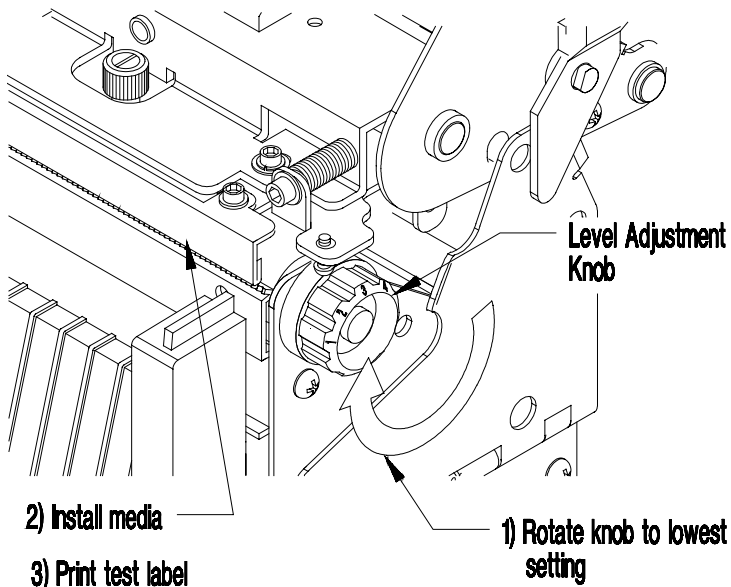
Figure 5-2   Media Width Adjustment

4. If the print quality is unacceptable, repeat steps 1 and 3 until the print quality is acceptable.

5.3.2   Media Sensor Adjustment

To detect the media's edge for different media widths, the Media Sensor can be adjusted across half the media path. The Media Sensor may require adjustment when changing to a media of a different width. The gauge behind and below the printhead can be viewed for making this adjustment

1. Open the Side Access Cover.

2. Make sure that the media guide is moved to the edge of the media.

3. Rotate the Media Sensor Adjustment knob clockwise to adjust for narrower media and counterclockwise for standard width media.

Note:	Do not force or over tighten the Media Sensor Adjustment Knob.
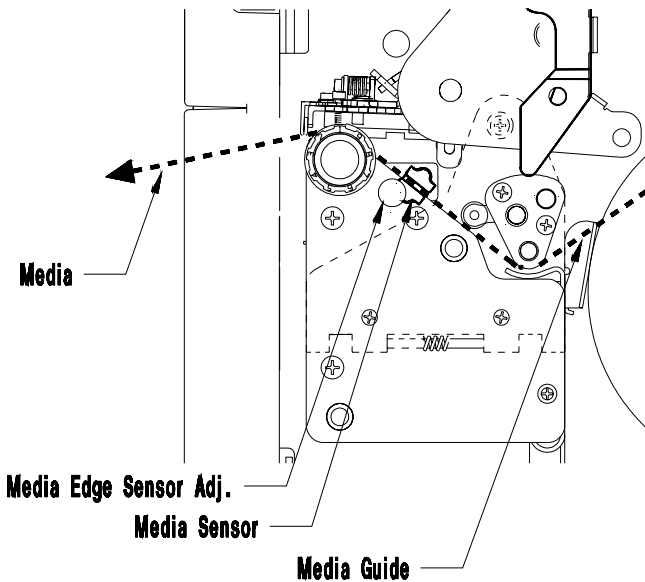
Figure 5-3   Media Sensor Adjustment

5.3.3   Printhead Replacement

The Printhead is operator replaceable and can be replaced with a flat-bladed screw driver. If dot patterns on the Configuration Test Label indicate lines of missing dots, (as shown in Figure 5-4), the printhead is dirty or may require replacement.

Missing Printhead Dots
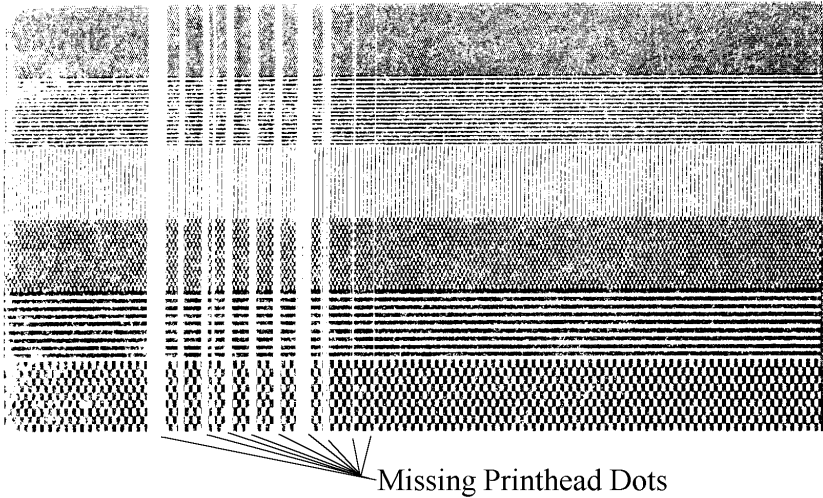
Figure 5-4   Configuration Test Label

A single missing dot, or two non-adjacent dots, does not indicate a bad printhead; however, multiple adjacent missing dots do indicate a bad printhead.

Removal:

Follow the procedure below when replacing the printhead, (see Figure 5-5).

1. Turn off the Printer and open the Side Access Cover.

2. Rotate the Printhead Latch downward to unlatch the Printhead, then raise the Printhead to an upright position and lower the Hinge Plate.

3. Using a flat-bladed screw driver, loosen the Thumb Screw and lower the Printhead from the Printhead Mounting Plate.

4. Using the screw driver, push against the Printhead connector's guide to free the connector from its socket, then remove the Printhead.

Replacement:

5. Push the new Printhead into the connector. Align the Printhead with the alignment pins, (located on the bottom of the Printhead Mounting Plate), and secure with the Thumb Screw, (do not overtighten).

6. The Printhead must be cleaned if touched by any fingers or oils, (see Section 5.1.1).

7. Lower the Printhead, raise the Hinge Plate, and rotate the Printhead Latch until it is closed.
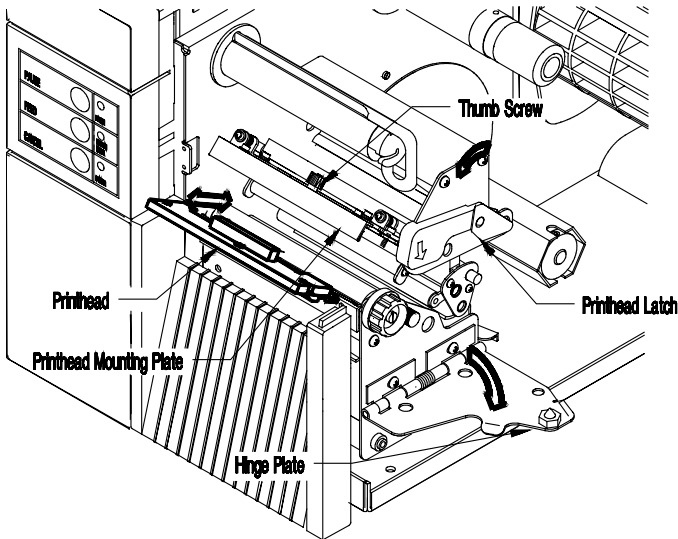
Figure 5-5   Printhead Removal

Appendix A

ASCII Control Chart

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

US	31	1F	?	63	3F	_	95	5F		127	7F

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		178	B2	Ê	210	D2		242	F2
ô	147	93		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	°	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
ƒ	159	9F		191	BF		223	DF		255	FF

The printable characters shown are from the font 9, internal Triumvirate, character set.

Note: For the hardware handshake XON/XOFF commands
XON = (DC1)   **XOFF** = (DC3)

Appendix B

Available Fonts and Barcodes

All character fonts and bar codes available with the Printer are described in this section. Each font and bar code has a name associated with it for use in programming. Human-readable fonts have numeric names while bar code fonts have alpha names. Uppercase alpha names will print bar codes with human-readable interpretations, while lowercase alpha names will print bar codes only.

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the letter O. The slash can be removed with the label formatting command Z. These fonts are non-proportional (monospaced) fonts, 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 in Table B-1.

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.

There are 29 scalable font symbol sets that are accessible:

(US) ISO 6: ASCII Symbol Set, font code S00
(DN) ISO 60 Danish / Norwegian Symbol Set, font code S00
(IT) ISO 15: Italian Symbol Set, font code S00
(GR) ISO 21: German Symbol Set, font code S00
(FR) ISO 69: French Symbol Set, font code S00
(E5) ISO 8859/5 Latin 5 Set, font code S00

(E2) ISO 8859/2 Latin 2 Set, font code S00
(E1) ISO 8859/1 Latin 1 Symbol Set, font code S00
(DT) DeskTop Symbol Set, font code S00

For a complete list of the scalable fonts symbol sets, ASCII codes, and charts, please refer to the Programmer's Manual.

B.1   Human-Readable Fonts

Font Matrix Sizes				Charac. Per Inch
Font	Dot Height	Dot Width	Dot Spacing	203 DPI
0	7	5	1	33.83
1	13	7	2	22.56
2	18	10	2	16.92
3	27	14	2	12.69
4	36	18	3	9.67
5	52	18	3	9.67
6	64	32	4	5.64
7	32	15	5	10.15
8	28	15	5	10.15

Table B-1   Human-Readable Font Sizes

Font	Valid ASCII Characters, Decimal
0	32-126
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

Table B-2   Valid Human-Readable Font ASCII Characters

0 - Identifies a 96-character alphanumeric font.

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

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

```
Font 1:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéâäàåçêëèïîìÄÅÉæÆôöò
ûùÿÖÜ¢£¥₧ƒáíóúñÑªº¿⌐¬½¼¡«»ß
```

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

```
Font 2:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéâäàåçêëèïîìÄÅÉæÆôöò
ûùÿÖÜ¢£¥₧ƒáíóúñÑªº¿⌐¬½¼ß
```

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

6 - Identifies a 62-character alphanumeric uppercase font.

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

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

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

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

Font 8:
0123456789
<>CENSTXZ|

9 - Identifies the internal Triumvirate font.

6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmi
12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabc
14 pt ABCDEFGHIJKLMNOPQRSTUVWX
18 pt ABCDEFGHIJKLMNOPQR
24 pt ABCDEFGHIJKLM
30 pt ABCDEFGHIJ
36 pt ABCDEFG
48 pt ABCD

B.2   Bar Code Fonts

Font	Bar Code	Length	Cksum	Valid Characters
A	3 of 9	Varies	No	0-9, A-Z, -. *$/+% and space char.
B	UPC-A	11 digits	Yes	0-9
C	UPC-E	6 digits	Yes	0-9
D	Interleaved 2 of 5	Varies	No	0-9
E	Code 128 (A,B,C)	Varies	M-103	entire 128 ASCII character set.
F	EAN-13	12 digits	Yes	0-9
G	EAN-8	7 digits	Yes	0-9
H	Health Industry Bar Code (HIBC)	Varies	M-43	0-9, A-Z, -$:/. The Host must supply leading "+"'s
I	Codabar	Varies (Min. 3)	No	0-9, -, ., $, :, /, +, and the start/stop codes: a, b, c, and d.
J	Interleaved 2 of 5 without Bars	Varies	M-10	0-9
K	MSI Plessey	Varies	M-10	0-9. If + is last character, additional MSI checksum will be added to the bar code in place of the + character.
L	Interleaved 2 of 5 (UPC CASE)	13	M-10	0-9
M	UPC 2 digit add.	2 digits	Yes	0-9
N	UPC 5 digit add.	5 digits	Yes	0-9
O	Code 93	Varies	No	All 128 ASCII characters
p	Postnet	Varies	Yes	0-9
Q	UCC/EAN Code 128	19 digits	Yes	0-9
R	UCC/EAN Code 128 K-MART NON EDI	18 digits	Yes	0-9
S	UCC/EAN Code 128 Random Weight	Varies. At least 34 digits	Yes	0-9
T	Telepen	Varies	Yes	All 128 ASCII characters
u	UPS MaxiCode	84	Yes	0-9, A-Z
v	FIM	1 char.	No	A, B, C, or D
z	PDF-417	Varies	Yes	All ASCII characters

Table B-3   Valid Bar Code Font ASCII Characters

Barcode B

0 12345 67890 5

Barcode A

0123456789
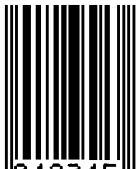
Barcode D

0123456790

Barcode C

0 012345 7

Barcode E

01234567890

Barcode F

0 123456 789012

Barcode G

0 123 4565

Barcode H

+012345678900

01234567890

Barcode I
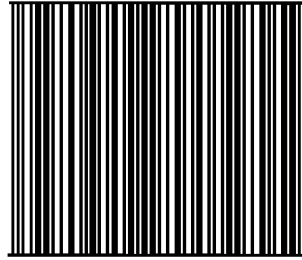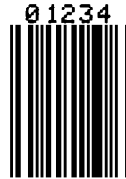
012345678905

Barcode J

01234567890

Barcode K

0 12 34567 89012 8
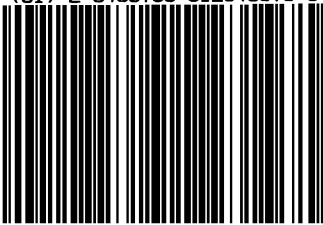
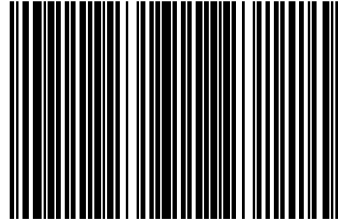Barcode L

42

Barcode M

0 1234

Barcode N

42

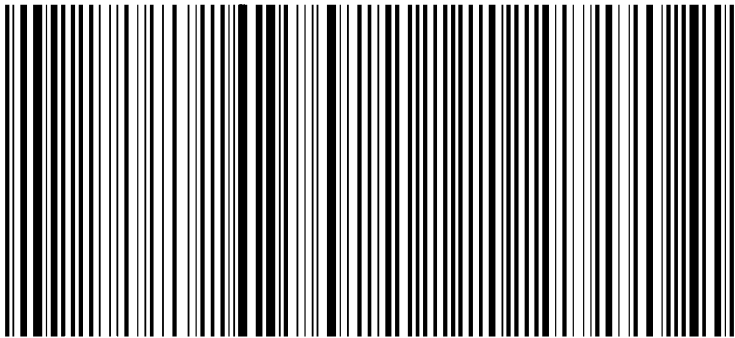Barcode O

Barcode P

(01) 2 3456789 012345678 9

Barcode Q
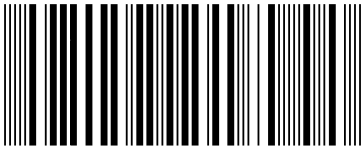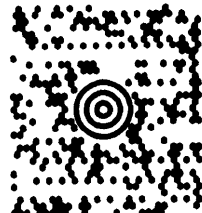
34 567890 123 4567

Barcode R

01 10073675029260 11 930420 3202 001800 21 10123456

Barcode S

ABCDEF

Barcode T

Barcode u

Barcode v

Barcode z

Appendix C

Error Codes

The most common error codes transmitted by the Printer are described below.

Lower case "c"   Printer received a data byte from the host that contains a framing error (corrupted) due to noise.

Lower case "e"   Memory module won't clear. Retry after a <STX> W command.

Lower case "v"   Input buffer overflow.

Upper case "I"   This means that an invalid command sequence was sent to the Printer. The Printer did not understand the command sequence and terminated the command interpreter.

Upper case "R"   This code will be sent every time the Printer is turned on, this means there was a hardware reset.

Upper case "T"   This means that the Printer has had a watchdog time-out condition. This is how a software reset occurs. A software reset is made by sending the command sequence to the Printer or by doing a front panel reset.

BELL HEX "07"   This is usually returned on a corrupt image download, or if you try to load an image that is already installed in the module.

Appendix D

Limited Warranty Statement

Prodigy Max   Label Printer

Printer

Datamax warrants to Purchaser that under normal use and service, the Prodigy Max , purchased hereunder shall be free from defects in material and workmanship for a period of (365) days from the date of shipment by Datamax.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts which have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead

This warranty is limited to a period of one year (365) days, or 1,000,000 linear inches of use, whichever comes first, for the Prodigy Max thermal printhead. This warranty is valid only if a Datamax- approved thermal or thermal transfer label media is used, as defined in the then current Datamax list of approved thermal/thermal transfer media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this thermal printhead warranty.

This warranty does not cover printheads which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to Datamax at: 4724 Parkway Commerce Blvd., Orlando, Florida, 32808. A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA please call Datamax Technical Support Department at (407) 523-5540. Please include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost.

With respect to a defect in hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for sixty (60) days after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

Software is licensed on an "as is" basis without warranty. Except and to the extent expressly provided in this warranty and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax's products.

Limitation of Liability

In no event shall Datamax be liable to the purchaser for any indirect, special or consequential damages or lost profits arising out of or relating to Datamax's products, or the performance or a breach thereof, even if Datamax has been advised of the possibility thereof. Datamax's liability, if any, to the purchaser or to the customer of the purchaser hereunder shall in no event exceed the total amounts paid to Datamax hereunder by the purchaser for a defective product.

In no event shall Datamax be liable to the purchaser for any damages resulting from or related to any failure or delay of Datamax in the delivery or installation of the computer hardware, supplies or software or in the performance of any services.

Some states do not permit the exclusion of incidental or consequential damages, and in those states the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from state to state.

Do not include this page in the manual   this serves only as a reminder:

Insert Business Reply Card to receive copy of Programmer's Manual

{7 point matte-coated, right angle perf. card (US Post Office approved stock}.

Note: This card should not say "Business Reply Mail".