

DMX 600 & 800

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Part Number: 88-2133-01
Revision A2

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

Your Bar Code 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.

As a safety device, your Printer has a grounded, 3-prong plug that will only fit into a grounded outlet. If you cannot plug it in, chances are you have an older, non-grounded outlet. Contact an electrician to have the outlet replaced. Do not use an adapter to defeat the grounding.

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.

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Getting Started

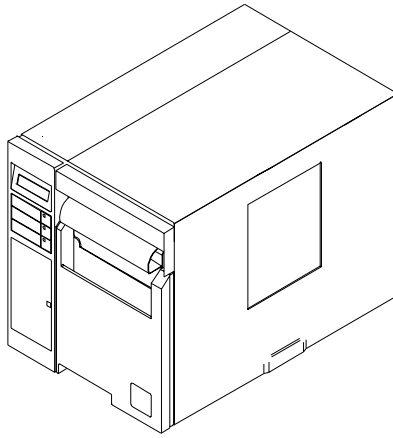


Figure 1-1 Printer Overview

1.0 Introduction

This manual covers all operation and setup procedures for the DMX 600 and DMX 800. The major difference between the two printers is the DMX 600 can produce a print width of 6.4" (162.6mm) and the DMX 800 can produce a print width of 8.5" (216mm).

The DMX 600 and DMX 800, hereafter referred to as 'the Printer', offer high-performance, low-cost direct thermal and thermal transfer label printing. Their powerful capabilities, easy-to-use features, contemporary look, and affordable pricing set a new standard for thermal label printers in retail, office, and industrial applications.

This manual provides all the information necessary for the daily operation of your printer.

To create and print labels refer to the instructions included with the software you have chosen or if you wish to write a custom program, visit our website at <http://www.datamaxcorp.com> for a copy of the *Programmer's Manual* (part number 88-2051-01).

1.1 Features

Features of the Printer include:

- Industrial look, metal constructed cabinet
- Media window with ribbon and supply view
- Front bezel and front panel made of ABS injection molded plastic
- Operators panel with a back lit LCD display for setting Printer default values
- Adjustable label edge sensor
- Label backfeed for use with optional cutter or peel and present mechanism
- International characters included for most European, Scandinavian, and Spanish speaking countries
- English/metric label data input
- User-selectable bar code ratios and heights
- Printing on label, ticket, and tag stock
- Internal rewind mechanism, peel and present mode accepts up to 8" of labels, or label backing
- Easy to load label stock and transfer ribbon mechanism
- Diagnostics self-test
- Downloadable soft fonts in optional programmable memory modules
- using HP-LaserJet™ II (PCL-4) compatibility
- Twin-AX/Coax device connectivity
- Standard 1 meg DRAM expandable to 17 meg
- Standard 2 meg EPROM expandable to 4 meg
- Standard 128K of non-volatile RAM
- 2- 32 bit font cartridge slots
- 300dpi (11.8 dot per mm) 6.7" wide Printhead
- String buffer size of 10,000 characters
- Inverse text capability
- Graphics drawing capability
- Fill patterns
- Bar code printing
- New bar codes
- DPI fixed point font cartridges

1.2 Printer Specifications

Printing

<i>Type:</i>	Direct thermal or thermal transfer
<i>Resolution:</i>	300 dots per inch (11.8 dots/mm)
<i>Print Speed:</i>	6" Printer: 2.0" (51mm) to 8.0" (203.2mm) per sec. 8" Printer: 2.0" (51mm) to 5.0" (127mm) per sec.
<i>Bar Code Modules:</i>	3.3 mil to 110 mil "X" dimension in picket or ladder orientation
<i>Maximum Print Width:</i>	6" Printer: 6.4" (162.6mm) 8" Printer: 8.5" (216mm)
<i>Maximum Print Length:</i>	6" Printer: 10.0" (254mm) with 1 MB memory 99"(2575mm) with optional 17 MB memory 8" Printer: 8.0" (203mm) with 1 MB memory 64.0" (1626mm) with optional 17 MB memory

NOTE: Use of Scalable Fonts and/or allocation of DRAM memory to the Internal Memory Bank will reduce maximum print length.

<i>Minimum Print Length:</i>	0.5" (12.7mm)
<i>White Space Slew Rate:</i>	6" Printer: 2.0" (51mm) to 8.0" (203.2mm) per sec. 8" Printer: 2.0" (51mm) to 5.0" (127mm) per sec.
<i>Maximum Fields/Label:</i>	400; 10K data per label maximum
<i>Minimum Dot Size:</i>	0.0033" (0.08mm) square
<i>Label Backfeed:</i>	For use with optional cutter

Fonts

<i>Resident Fonts:</i>	Ten alphanumeric fonts from 0.035"H (0.89mm) to 0.64"H (16mm) and OCR-A, OCR-B; CG Triumvirate smooth font (12 point sizes) from Agfa in both portrait and landscape orientations.
<i>Optional Fonts:</i>	Proportional and monospaced available.

Font Expansion: All fonts expandable vertically and horizontally up to 8x; fonts and graphics can be printed in four directions: 0°, 90°, 180° and 270°

Character Density: 33.83 CPI in font 0 at 1x; 0.70 CPI in font 6 at 8x

Media

<i>Width:</i>	6" Printer: 2.0" (51mm) to 6.7" (170mm) 8" Printer: 3.0" (76mm) to 9.0" (229mm)
<i>Length:</i>	0.50" (13mm) to 99.99" (2539mm)
<i>Thickness:</i>	0.0025" (0.0635mm) to 0.0100" (0.254mm)
<i>Type:</i>	Roll-fed, die-cut continuous or fan-fold labels, tags or tickets; most direct thermal or thermal transfer materials.
<i>Supply Roll:</i>	8.25" (210mm) maximum diameter on 1.5"(38mm) to 3" (76mm) cores
<i>Internal Rewind:</i>	6" Printer: 8" (203mm) max. roll dia. 8" Printer: 8.25" (210mm) max. roll dia. Rewind spindle accepts 1.5", and a 3" core.
<i>Label Material:</i>	Thermal transfer plain-coated papers, vinyl, Mylar, metalized paper, non-woven fabric, fine woven fabric, thermal-visible light scannable paper, infrared scannable paper, thermal ticket/tag stock, thermally sensitive plastic stock.
<i>Thermal Ribbons:</i>	6" Printer: Industry Standard cores; 25, 38, 51, 64, 76, 89, 110, up to 170mm; 1182' in length 8" Printer: Industry Standard cores; 25, 38, 51, 64, 76, 89, 110, up to 216mm; 1476' in length
<i>Media Sensing:</i>	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 not reflect off of a plain black mark.

Bar Codes

Code 39, Interleaved 2 of 5, Code 128 (subsets A, B, and C), Codabar, LOGMARS, UPC-A, UPC-E, UPC 2 & 5 digit addendums, EAN-8, EAN-13, EAN 2 & 5 digit addendums, UPC random weight, Code 93, MSI Plessey, Universal Shipping Container Symbology, UCC/EAN Code 128, Postnet, PDF 417, Telepen, UPS MaxiCode, and FIM.

Indicators and Switches

<i>Indicator Lights:</i>	Power, Ribbon/Media, Pause
<i>Switches:</i>	Power, Pause, Feed, Stop/Cancel
<i>LCD Display:</i>	2 x 16 characters for error messages, print status, and recalling stored formats

Communications Interfacing

(RS-232C or RS-422 at 300 to 19,200 baud; Twin-Ax/Coax optional)

<i>Character Set:</i>	ANSI ASCII character set
<i>Word Length:</i>	Selectable 7-bit or 8-bit data format
<i>Handshaking:</i>	XON/XOFF (in receive mode only) and CTS/DTR
<i>Input Buffer:</i>	Approximately 6144 bytes. XOFF is transmitted and DTR goes low when 768 bytes are available in the buffer. XON is transmitted and DTR goes high when 1026 bytes are left in the buffer. Characters are transmitted with no parity from the Printer.

Electrical

<i>Power Source:</i>	115/230 VAC 50/60Hz Auto-ranging power supply
<i>Circuit Protection:</i>	(2) 8 amp, 250V slo-blo fuses
<i>Grounding:</i>	Unit must be connected to a properly grounded outlet

Environmental

<i>Operating Temperature:</i>	40°F to 100°F (4°C to 38°C)
<i>Storage Temperature:</i>	32°F to 120°F (0°C to 49°C)
<i>Humidity:</i>	10% to 95% non-condensing
<i>Ventilation:</i>	Forced air movement
<i>Dust:</i>	Non-conducting, non-corrosive

Physical

<i>Dimensions:</i>	6" Printer: 13.5"H x 12.5"W x 18"D (343mmH x 317.5mmW x 457mmD) 8" Printer: 15"H x 15"W x 18"D (379.2mmH x 379.25mmW x 457mmD)
<i>Weight:</i>	6" Printer: Approximately 55 lbs. (24.8 kg) 8" Printer: Approximately 65 lbs. (29.5 kg)

1.2.1 Label/Tag Media Specifications

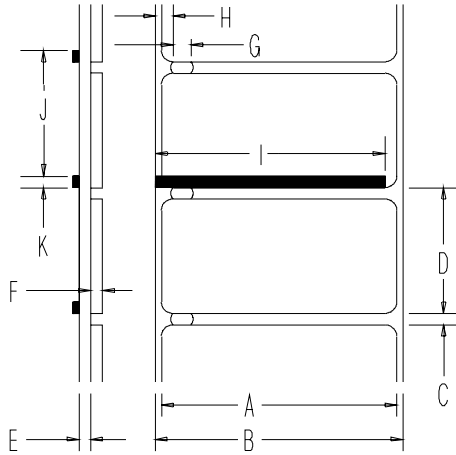


Figure 1-2 Media Dimensions

	Description	6" Printer		8" Printer	
		MAX in.	MIN in.	MAX in.	MIN in.
A	Label width	6.700	2.000	9.000	3.000
B	Backing width	6.700	2.000	9.000	3.000
C	Gap between labels	99.99	0.100	99.99	0.100
D	Label length	99.99	0.500	99.99	0.500
E	Backing thickness	0.005	0.0023	0.005	0.0023
F	Label thickness	0.005	0.0023	0.005	0.0023
G	Width of sensor opening	0.500	0.200	0.500	0.200
H	Distance from edge of media to edge of sensor opening	3.250	0.200	3.250	0.200
I	Reflective sensor mark width	4.00	1.000	4.00	1.000
J	Distance between reflective mark	99.99	0.250	99.99	0.250
K	Reflective sensor mark length	99.99	0.100	99.99	0.100

Table 1-1 Media Specifications

Lists of Approved Media:

For a current list of approved standard media for use in thermal and thermal transfer printers, please contact your product representative.

1.3 Unpacking and Inspection

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

1.4 Connecting Power

The AC Power Cord must be connected from the AC wall outlet to the back of the Printer. Ensure the Printer is 'OFF' when connecting power.

Note: When turning the Printer off and then back on it may take several seconds for the Printer to power up.

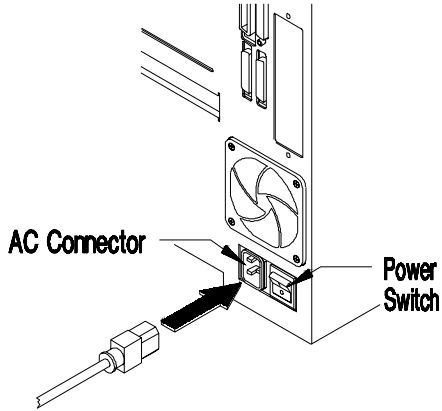


Figure 1-3 Power Connection

1.5 Interfacing to the Printer

The Printer can be connected to the host via **serial** or **parallel**.

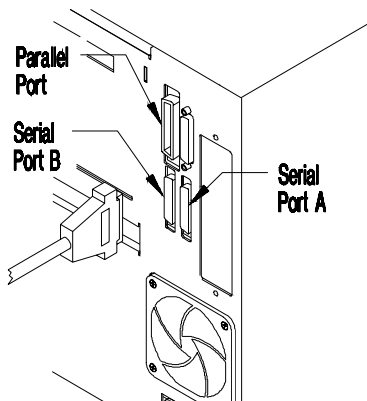


Figure 1-4 Interface Connections

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).

<p>Null Modem or Straight Cable (MXM)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">HOST (DTE)</th> <th style="text-align: center;">SHIELD</th> <th style="text-align: right;">PRINTER (DTE)</th> </tr> </thead> <tbody> <tr> <td>1 _____</td> <td></td> <td>1 _____</td> </tr> <tr> <td>TXD 2 _____</td> <td></td> <td>3 RxD _____</td> </tr> <tr> <td>RxD 3 _____</td> <td></td> <td>2 TXD _____</td> </tr> <tr> <td>7 _____</td> <td style="text-align: center;">GROUND</td> <td>7 _____</td> </tr> <tr> <td>RTS 4 <input type="checkbox"/></td> <td></td> <td>4 RTS <input type="checkbox"/></td> </tr> <tr> <td>CTS 5 <input type="checkbox"/></td> <td></td> <td>5 CTS <input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">DB25P</td> <td></td> <td style="text-align: center;">DB25P</td> </tr> </tbody> </table>	HOST (DTE)	SHIELD	PRINTER (DTE)	1 _____		1 _____	TXD 2 _____		3 RxD _____	RxD 3 _____		2 TXD _____	7 _____	GROUND	7 _____	RTS 4 <input type="checkbox"/>		4 RTS <input type="checkbox"/>	CTS 5 <input type="checkbox"/>		5 CTS <input type="checkbox"/>	DB25P		DB25P	<p>“PC” (DB25P) to Printer</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">PC (DTE)</th> <th style="text-align: center;">SHIELD</th> <th style="text-align: right;">PRINTER (DTE)</th> </tr> </thead> <tbody> <tr> <td>1 _____</td> <td></td> <td>1 _____</td> </tr> <tr> <td>TXD 2 _____</td> <td></td> <td>3 RxD _____</td> </tr> <tr> <td>RxD 3 _____</td> <td></td> <td>2 TXD _____</td> </tr> <tr> <td>CTS 5 _____</td> <td></td> <td>20 BUSY _____</td> </tr> <tr> <td>7 _____</td> <td style="text-align: center;">GROUND</td> <td>7 _____</td> </tr> <tr> <td>6 _____</td> <td></td> <td></td> </tr> <tr> <td>8 _____</td> <td></td> <td>4 RTS <input type="checkbox"/></td> </tr> <tr> <td>20 _____</td> <td></td> <td>5 CTS <input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">DB25P</td> <td></td> <td style="text-align: center;">DB25P</td> </tr> </tbody> </table>	PC (DTE)	SHIELD	PRINTER (DTE)	1 _____		1 _____	TXD 2 _____		3 RxD _____	RxD 3 _____		2 TXD _____	CTS 5 _____		20 BUSY _____	7 _____	GROUND	7 _____	6 _____			8 _____		4 RTS <input type="checkbox"/>	20 _____		5 CTS <input type="checkbox"/>	DB25P		DB25P
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Table 1-2 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.

1.6 Loading Media

The Printer accepts a wide range of media. It can be loaded with Roll, Fan Folded, Die Cut, or Continuous Media of either Thermal Transfer or Direct Thermal type.

Loading Media

1. Open the Stock Door.
2. Slide a roll of the chosen media onto the Media Hub, ensure the media is slid against the Inner Guide. If using Fan-Fold media, slide an empty media core onto the Media Hub, this allows the media to ride smoothly over the Media Hub Fins.
3. Raise the Printhead Latch Wing and rotate it counterclockwise one half turn to unlock the Printhead. Disengage the latch and swing the Printhead to the raised position.
4. Route the media under the Bouncer Assembly and up through the front slot of the Printer.

<p>NOTE: If the Printer is equipped with the Ribbon Saver Option leave the Printhead latched and feed the media in as far as it will go. Then press the FEED button repeatedly until the media feeds up and through the Printhead Assembly.</p>
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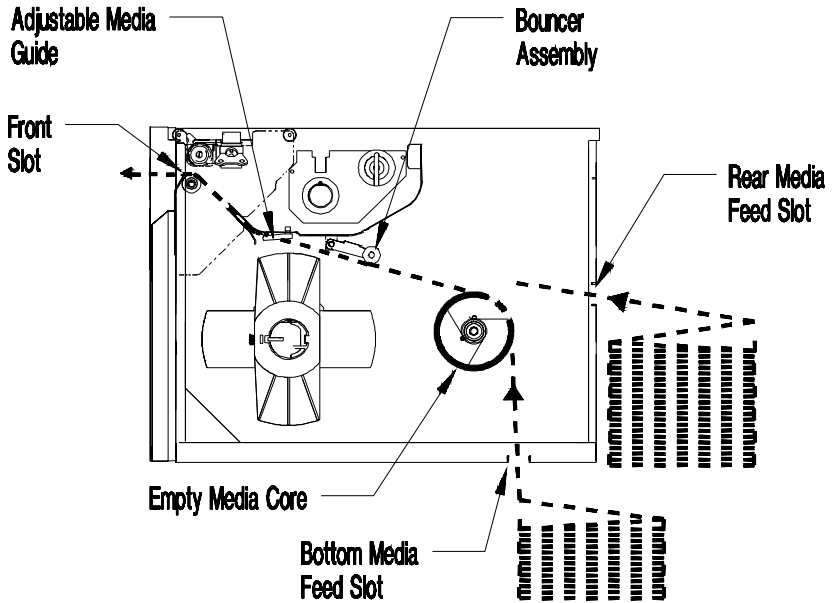
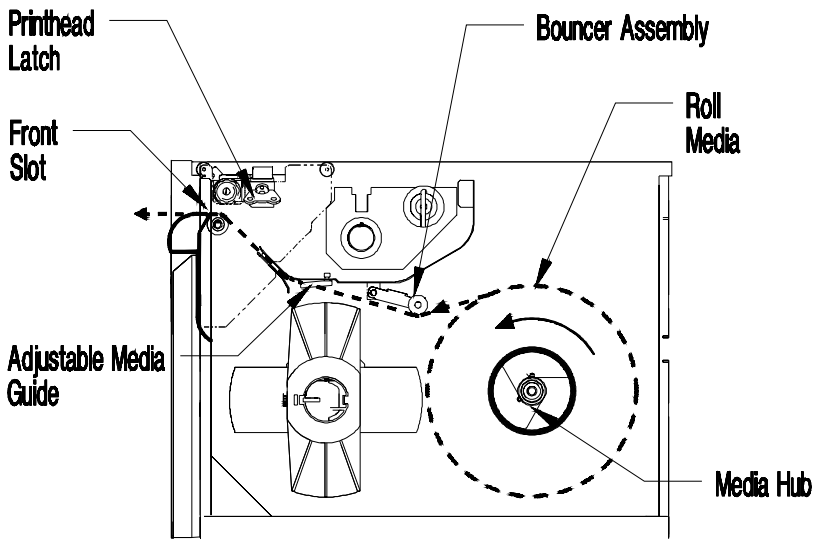


Figure 1-5 Loading Roll and Fan Fold Media

1.6.1 Loading Media (Peel & Present Option)

1. Using the two Release Tabs on the Peel & Present Mechanism pull the Peel Roller Bracket back away from the Fixed Bracket.

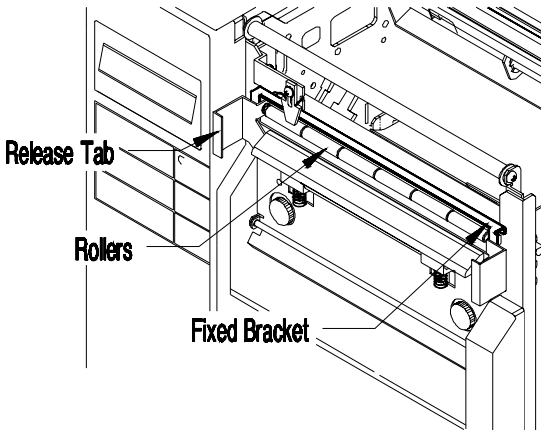


Figure 1-6 Peel & Present Mechanism

2. Thread the media over the top of the Fixed Bracket and under the Peel Rollers of the Roller Bracket.

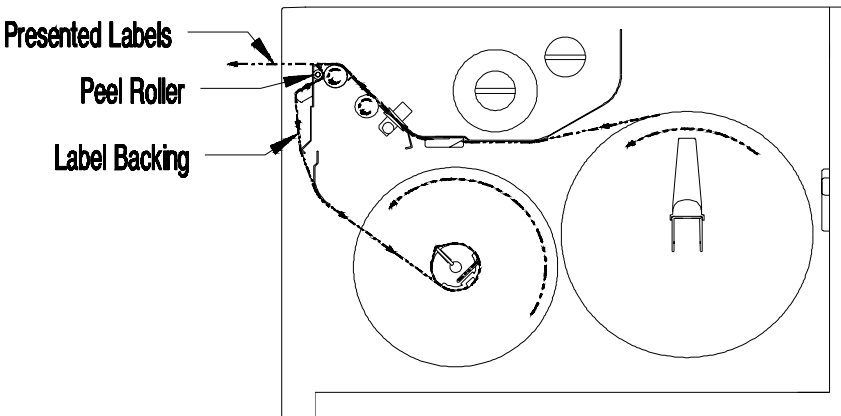


Figure 1-7 Loading Media (Peel & Present Option)

3. Push the Roller Bracket forward to its closed position.
4. Route the remaining media to the Internal Rewind Hub, (see Section 1.11).

1.7 Printing Modes

Thermal Transfer and Direct Thermal

The Printer is capable of printing in two modes, Direct Thermal and Thermal Transfer. These two modes have in common the use of heat to produce the printed image, and differ in the way that the heat is applied.

In Thermal Transfer printing, the individual dot elements of the Printhead apply heat to a ribbon. The ink on the ribbon is a specially-formulated material that is melted into the print media, bonding with the media to produce an image. The PRINT METHOD function within the Printer's menu, (*see Section 3.2*), must be set to TRANSFER to utilize this printing method.

Direct Thermal printing dispenses with a ribbon and applies heat directly to the print media, which is formulated to react to the heat by turning black. This mode requires the use of a special Direct Thermal print media. It also requires that the ribbon, (if already installed) must be removed. The PRINT METHOD function within the Printer's menu must be set to DIRECT to use this printing method.

<p>NOTE: Using Direct Thermal print media with a ribbon will produce unacceptable print quality.</p>

1.8 Ribbon Installation

To install a new ribbon, use the following procedure:

1. Open the Stock Door.
2. Raise the Printhead Latch Wing and rotate it counterclockwise one half turn to unlock the Printhead. Disengage the latch and swing the Printhead to the raised position.
3. Slide the ribbon roll onto the Ribbon Supply Hub, making sure that the ribbon roll is pushed back against the flange at the base of the Ribbon Supply Hub.
4. Route the ribbon through the Printer as shown below.

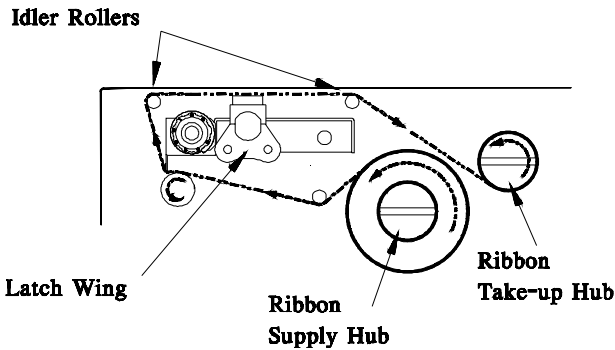


Figure 1-8 Ribbon Loading

5. Remove the J-Hook from the Ribbon Rewind Hub.

6. While holding the ribbon Take-Up Hub, rotate the J-Hook clockwise to un-latch it.
7. Raise the J-Hook upward and place the end of the ribbon over the Take-Up Hub.
8. Slide the J-Hook back into place as shown below. While holding the ribbon Take-Up Hub, rotate the J-Hook counterclockwise to latch.

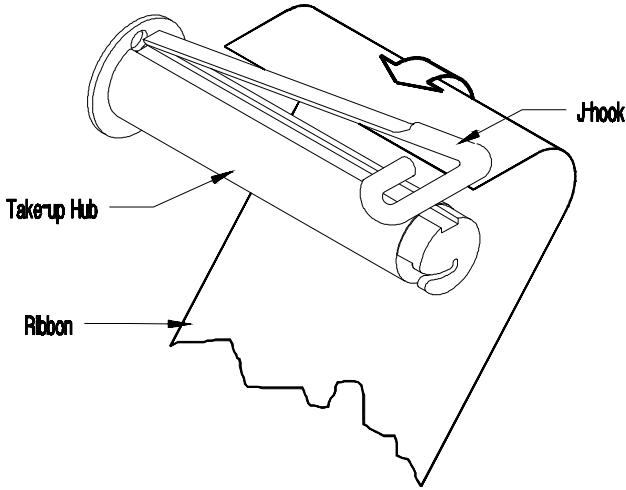


Figure 1-9 J-Hook

7. Lower the Printhead, engage the Printhead Latch, rotate the Printhead Latch Wing one half turn clockwise and lower the Printhead Latch Wing.
8. Close the Stock Door.

1.9 Ribbon Removal

As previously noted, when printing in the Direct Thermal mode, the Printer does not use a ribbon. Generally ribbons are used to completion and then replaced. Removal of the old ribbon is simply a matter of pulling it straight off the Take-Up Hub and discarding it.

There may, however, be applications in which the use of a Direct Thermal media is required, but the installed ribbon has not been completely used. In these cases ribbon removal is as follows:

1. Cut the ribbon between the top two Idler Rollers, (*see Section 1.8*).
2. Unlatch the Printhead. Turn the Ribbon Supply Hub clockwise to draw the unused portion of the ribbon back until it is clear of the Printhead.
3. Turn the Ribbon Take-Up Hub counterclockwise to roll up the used portion of the ribbon, and slide the used ribbon off the Hub.

The unused portion of the ribbon may be left in place until the next Thermal Transfer print job, at which time it may be re-installed following the ribbon installation procedure, (*see Section 1.8*).

1.10 Tear Bar Installation

The Tear Bar is already fastened to the Printer. To utilize the Tear Bar remove the Rewind Bracket and replace the Thumbscrews.

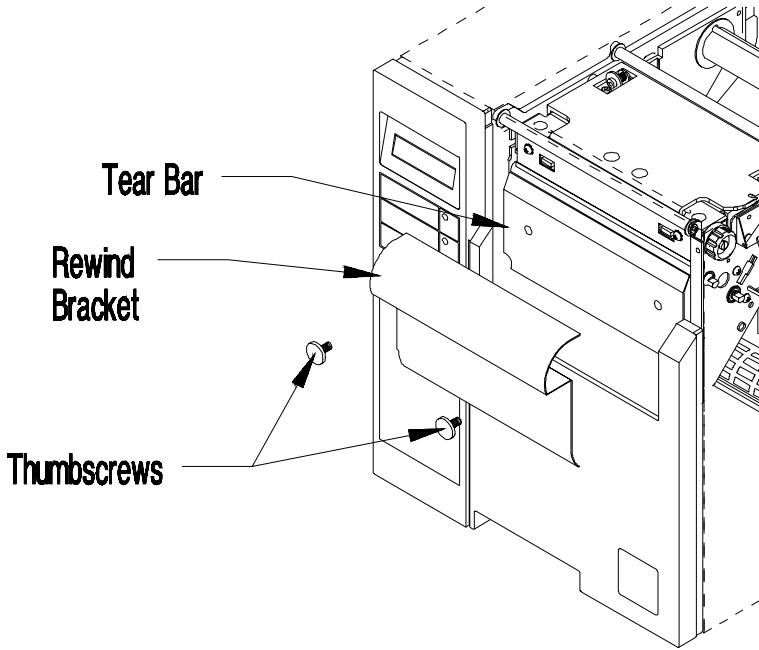


Figure 1-10 Tear Bar Installation

1.11 Using the Internal Rewind Option

When large quantities of labels must be printed as single batches or for later use, the Printer may be equipped with a Internal Rewind Hub that will automatically roll up the label media for convenient handling. The Internal Rewind Hub is also used in conjunction with the Peel and Present Option to roll up the used media backing after labels have been peeled off.

To use the Media Rewind Hub:

1. Open the Stock Door.
2. Install a roll of the desired label media, (*see Section 1.6*) and pull the media through the Printer until approximately 18 inches is free in front of the unit.
3. Loosen the Thumbscrew and remove the Media Retainer from the Rewind Shaft.

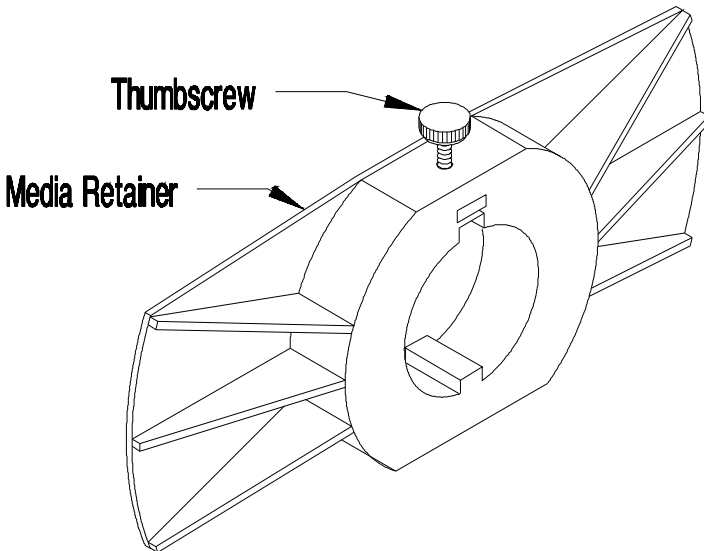


Figure 1-11 Media Retainer

4. Insert the free end of the media through the Media Take-Up slot in the front of the Printer. Place the lead edge of the media into the slot on the Internal Rewind Hub.

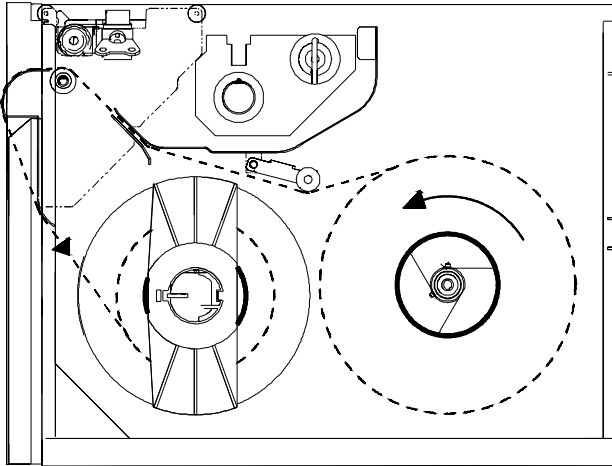


Figure 1-12 Internal Rewind Media Loading

5. Rotate the Internal Rewind Hub counterclockwise to take up any slack. Next slide the Media Retainer onto the Internal Rewind Hub so it is just touching the media.
6. Tighten the Thumbscrew and close the Stock Door.

1.12 Available Options

Cutter

The Printer may be ordered with an optional cutter mechanism installed (for cutting tags and labels), or the option can be installed by the user at a later date. The Cutter Option attaches to the Printer using the same method as the Tear-Off Assembly installation. When properly installed, and the CUTTER function within the Printer's menu is set to ENABLE, the cutter is automatically activated by the Printer.

Peel and Present Mechanism

The Printer can be ordered with an optional Peel and Present Mechanism Kit, or the option can be purchased and installed at a later date. The Peel and Present Mechanism option must be used in conjunction with the Internal Rewind Option. The mechanism can be used with or without the Present Sensor. With the Present Sensor installed and enabled, the Printer will not print the next label in its internal buffer until the last label printed has been removed from the Printer.

For use without the Present Sensor, quantities of labels, (printed one at a time), can be performed by selecting the PAUSE MODE from the menu tree, (*see Section 3.2.2*), or by using the STX J command, (*see Section 4.2*). After removing the printed label, hit the pause button on the Front Control Panel in order to print the next label. To clear the STX J command the Printer must be reset.

Ribbon Saver

The Ribbon Saver, (a factory installed option), raises the Printhead off the Output Platen when the Printer is feeding white space and stops the ribbon movement. Since the ribbon does not move while the Printhead is raised, previous wasted ribbon is now saved.

DRAM Expansion

The DRAM memory on the Main PCB of the Printer can be expanded to 5 or 17 MB using optionally purchased SIMMs. Additional memory allows for larger label formats to be loaded into the Printer's memory, thereby making it possible to print longer labels. With a full 17MB of DRAM installed longer labels can be produced.

Internal Memory Expansion

4 Meg EPROM Expansion

This option is available to Firmware Development Kit users who require additional code, font, or graphic capabilities.

2 Meg FLASH EPROM Expansion

This option is available to Firmware Development Kit users who require firmware to be downloaded from a controller directly to the Printer.

Using Your Printer

2.0 Introduction

Printer operation should be verified before setting it up for ON-LINE operation. This is accomplished using the Printer's internal self-test diagnostics. Before beginning the self-test, load the Printer with full width media, and ribbon (if using thermal transfer media) as explained in Chapter 1. If Direct Thermal media is being used, be sure to place the Printer's PRINT METHOD function in the DIRECT mode. This is done via the Operators Panel.

2.1 Printing Self-Test and Configuration Labels

The Printer's built in Self-Test diagnostics can determine the Printer's status and help isolate problems with the Printer. The Self -Test will:

- Produce Configuration Test-Labels
- Check the operation of host to Printer communication lines (Character Dump Mode)
- Test the transmit/receive data lines, and Data Terminal Ready (DTR)/Clear To Send (CTS) control signal operation.

The Printer's Self-Test can be enabled in one of four ways:

1. Power On Self-Test
2. System Reset Self-Test
3. Host Control
4. The Main Menu Maintenance function accessed using the Operators Panel. (*Refer to Chapter 3 for instructions on using the Operators Panel*).

2.1.1 Power On Self-Test

If power to the Printer is off, begin the Self-Test by using the Power-Up Method.

Press and hold in the FEED button and turn the Printer ON.
Release the FEED button when the Printer displays 'DYNAMIC RAM DIAGNOSTICS'.

After a brief hesitation the Configuration Labels will begin to print.

2.1.2 System Reset Self-Test

If main power to the Printer is already on, begin the Self-Test by using the System Reset method.

Press and release the PAUSE and CANCEL buttons at the same time.
Next press and hold the FEED button until the Printer displays 'READY'.

After a brief hesitation the Configuration Labels will begin to print.

2.1.3 Host Control Self-Test

The following procedures describe how to start and end each test by using software commands.

The following command will print a Configuration Test Label:

<STX> Z

Translation: Simultaneously send the data sequence, "<STX>", followed by the (upper case) letter "Z".

2.2 Configuration Test Labels

The Self-Test will perform a complete diagnosis of the Printer. The Printer will print out two test labels and will then enter the character dump mode. If an RS-232 test plug is installed, the Printer will also test the transmit/receive data lines, and DTR/CTS control signal operation. If a test plug is not installed the Printer will perform the normal Self-Test routine, ignoring the serial port status. Figure 2-1 demonstrates how to fabricate a test plug if one is not available.

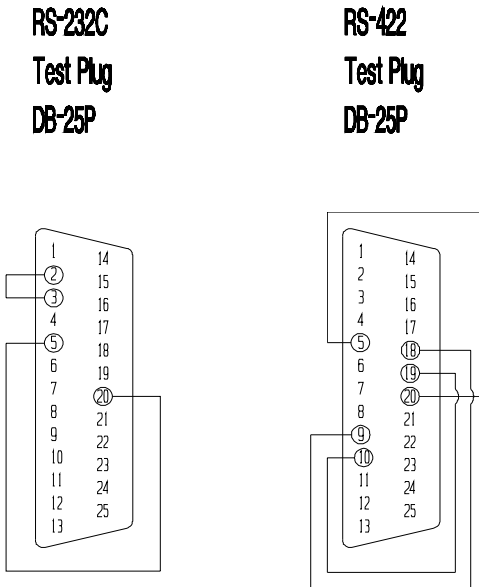


Figure 2-1 Self-Test Plugs

2.3 Sample Configuration Label

The Printer will print two labels when a Self-Test is performed. The first label printed is the Configuration Label which lists the Printer's configuration and status.

TUE JANUARY 02, 1995 17:14 002	LABEL OPTIONS	COMMUNICATION OPTIONS
DATABASE INFORMATION	HEAT SETTING__10	INPUT PORT____PORT_A
SERIAL NUMBER____00000000	PRINT SPEED____5.0 IPS	BAUDRATE____9600
SECURITY____NONE	SLEW SPEED____5.0 IPS	PARITY____NONE
VERSION: EC - 02.05 09/8/95	BACKFEED SPEED__2.0 IPS	WORD LENGTH____8 BIT
ROM CHECKSUMS	HORIZONTAL RES__300 DPI	STOP BITS____1
U28 47-2045-01G	VERTICAL RES____300 DPI	PROTOCOL____BOTH
U29 47-2046-01G	ATTRIBUTES____XOR	CONTROL CODES__STANDARD
U30 47-2047-01G	ROW ADJUST____0in	
U31 47-2048-01G	COLUMN ADJUST__0in	OPERATION
SYSTEM RAM CHECKS____GOOD	CUT AMOUNT____1	PAUSE MODE____DISABLE
SYSTEM RAM SIZE____1 MEG	LABEL WIDTH____400in	FEEDBACK MODE__DISABLE
	CONT. LABEL LEN__0in	TEST MODE____DISABLE
	MAX LABEL LEN__0600in	
	TOF DISTANCE____220in	
	PRESENT DIST____220in	
COUNTER INFORMATION	HARDWARE	BASIC FUNCTIONS
ABSOLUTE VALUES 10- 7-1995	BATTERY LEVEL____GOOD	PRINT METHOD____TRANSFER
LENGTH____4 INCHES	THERMISTOR ADC__64	SELECT TOF____GAP
TIME____0 HOURS	REFLECTIVE ADC__0	DARKNESS____33
RESETABLE VALUES 10- 7-1995	TRANSMISSIVE ADC 170	LABEL PRESENT__DISABLE
LENGTH____4 INCHES	PAPEROUT ADC____0	CUTTER____DISABLE
TIME____0 HOURS		RIBBON SAVER__DISABLE
MEMORY CONFIGURATION	INSTALLED OPTIONS	INTERNAL BATCH__DISABLE
INTERNAL MODULE____0	RIBBON SAVER____NO	CONVERSION____DECIMAL
SCABLE FONTS____15	CUTTER____NO	TOF ADJUST____64
SYMBOL SET__PC-850 MODIFIED		

Figure 2-2 Human Readable Self-Test Label

2.3.1 Explanation of the Configuration Label

Database Information - Includes unit serial number, security setting, firmware version I.D. number, the checksums from ROMs U28 to U31, (if bad), the result of the RAM memory test (**Good**), and the amount of RAM installed (**1MB**).

Counter Information - Includes the Absolute and Resettable Counter Values. Resettable Values can be reset at any time by the user. The Absolute Values cannot be reset. Both the Absolute and Resettable Counters measure length, (total length of stock that has passed through the Printer in inches), and time (total number of hours that the Printer has been in operation).

Memory Configuration - Lists the Printer's current memory that is allocated to the scalable fonts and internal module. The values represent the number of 4K blocks (e.g., 15 = 60K).

Label Options - Lists all of the settings related to the printing of labels, including the current heat setting, the Printer speed settings (print, slew and backup speeds), the horizontal and vertical resolution, Attributes, the row and column adjust, and other important instructions.

Hardware - Lists the current readings of the Printer's various sensors.

Installed Options - Lists the options that have been installed.

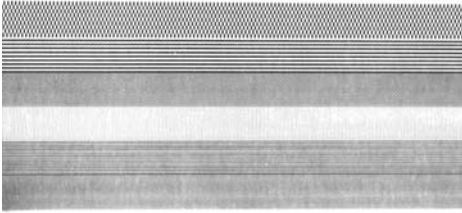
Communication Options - Describes the current communication settings and options which include; Input Port, Baud Rate, Parity, Word Length, Stop Bits, Protocol, Control Codes.

Operation - Indicates the operational elements that are available and whether or not they are enabled.

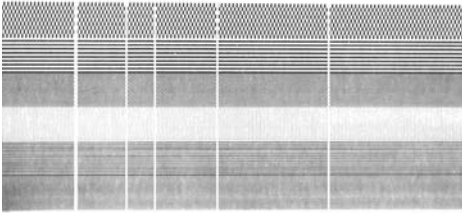
Basic Functions - Lists the current settings of the Basic Function Menu.

2.4 Configuration Dot Test Pattern Label

The second of the two labels is the Test Pattern Label. This label is used to determine whether the Printhead is in need of replacement. Examples of 'Good' and 'Bad' Test Pattern labels are shown below:



A 'Good' test label indicates the Printhead is operating normally.



Streaks in the test label indicate a dirty or faulty Printhead.

(See Ch. 5 for cleaning, call Service for replacement).

Figure 2-3 Printhead Test Label

2.5 Character Dump Mode

After printing a System Reset Self-Test 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. The test label shown below has been designed to make troubleshooting in the dump mode easy. Repeatedly sending this label to the Printer will uncover a buffer overflow problem (if one exists). Overflow problems are identified by large gaps of data in the character string.

```

0000 02 10 02 18 06 0C 0C 07 F8 03 F0 1B 2A 63 32 32 ..... *c22
0010 35 45 1B 2B 73 33 30 57 04 00 0E 01 01 00 FF F5 SE(=30U)
0020 00 07 00 0C 00 07 00 24 03 C0 77 E0 FC 30 88 10 ..... $ u 0
0030 88 10 FF F0 7F F0 1B 2A 63 32 32 36 45 1B 2B 73 ..... *c22E(=
0040 34 30 57 04 00 0E 01 01 00 FF F2 00 0C 00 0F 00 40U)
0050 0C 00 34 03 F0 07 F8 0C 0C 1B 06 50 02 90 02 90 ..... P 8 P
0060 02 50 02 36 06 0C 0C 07 F8 03 F0 1B 2A 63 32 32 ..... *c22
0070 37 45 1B 2B 73 34 30 57 04 00 0E 01 01 00 FF F2 7E(=40U)
0080 00 0C 00 0F 00 0C 0C 00 34 03 F0 07 F8 0C 0C 1B 06 ..... 4
0090 10 02 50 02 00 02 50 02 18 06 0C 0C 07 F8 03 F0 ..... P
00A0 1B 2A 63 32 32 38 45 1B 2B 73 33 34 57 04 00 0E *c22BE(=34U)
00B0 01 01 00 FF F5 00 0B 00 0C 00 09 00 24 07 C0 0F ..... $
00C0 E0 58 30 50 10 90 10 90 10 58 30 0F E0 07 C0 1B X0P X0
00D0 2A 63 32 32 39 45 1B 2B 73 34 30 57 04 00 0E 01 *c229E(=40U)
00E0 01 00 FF F2 00 0C 00 0F 00 0C 00 34 03 F0 07 F8 ..... 4
00F0 0C 0C 9B 06 50 02 50 02 90 02 90 02 58 06 0C 0C ..... P P X
0100 07 F8 03 F0 1B 2A 63 32 33 30 45 1B 2B 73 33 36 *c230E(=36
0110 57 04 00 0E 01 01 00 FF F9 00 08 00 08 00 0A 00 U
0120 24 C0 00 F8 00 1F 00 02 00 01 00 C1 00 FF 00 0F $
0130 80 01 E0 00 20 1B 2A 63 32 33 31 45 1B 2B 73 33 ..... *c231E(=3
0140 32 57 04 00 0E 01 01 00 FF F5 00 09 00 0C 00 09 08 ..... 2U)
0150 00 2B 07 C0 0F E0 1B 30 10 10 10 08 20 FF FE ( 0
0160 FF FE 1B 2A 63 32 33 32 45 1B 2B 73 33 34 57 04 ..... *c232E(=34U)
0170 00 0E 01 01 00 FF F5 00 09 00 0C 00 09 00 2C 0E ..... l
0180 00 1F 00 31 80 20 80 20 80 20 80 20 80 FF F0 FF ..... *c233E(=36U)
0190 F0 1B 2A 63 32 33 33 45 1B 2B 73 33 36 57 04 00 ..... 0
01A0 0E 01 01 00 FF F2 00 0A 00 0F 00 0A 00 30 1F FB ..... e
01B0 1F FC 00 04 80 02 C0 02 40 02 00 02 00 04 1F FC ..... *c234E(=36U)
01C0 1F F8 1B 2A 63 32 33 34 45 1B 2B 73 33 36 57 04 ..... 0
01D0 00 0E 01 01 00 FF F2 00 0A 00 0F 00 0A 00 30 1F ..... e
01E0 FB 1F FC 00 04 40 02 80 02 80 02 40 02 20 04 1F ..... e
01F0 FC 1F FB 1B 2A 63 32 33 35 45 1B 2B 73 33 36 57 ..... *c235E(=36U)
0200 04 00 0E 01 01 00 FF F2 00 0A 00 0F 00 0A 00 30 .....

```

Figure 2-4 ASCII Character Dump Label

To exit the character dump mode, simultaneously press and release the front panel PAUSE and CANCEL buttons to perform a 'Soft Boot' (reset), or turn the Printer's main power OFF and then ON.

2.6 Printing Test Labels

The Printer has a built in function that prints 14 test labels. This function is useful in determining Printer faults. To print the test labels:

Press and Release the PAUSE and the FEED buttons simultaneously.

<p>NOTE: Labels will NOT print if the Printer is in the Character Dump Mode. To escape from this mode press and release the PAUSE and CANCEL buttons simultaneously. This will cause a System Reset and return the Printer to Normal Mode</p>
--

2.7 Printer Configuration Switch Settings

DIP switch S1 is a Dual In-line Package 4-position switch located on the main PCB. It is used to release the operator panel lock-out and allow access to the maintenance levels of the front panel menu. It also provides termination when operating in a multidrop RS-422 communications mode

<p>NOTE: The DIP switch setting information is discussed in the Maintenance Manual and should only be changed by qualified service personnel.</p>
--

2.8 NV RAM

An additional 128K of Non-Volatile (NV) RAM is located internally in the Printer. The NV RAM can be used to store label formats, fonts, and images in the same manner as the external Memory Cartridges. This is an internal module and is accessed as Memory Cartridge (Module) D.

2.9 Memory Cartridges (Modules)

The Printer has 2 standard 32 bit external memory cartridge slots. These slots are located towards the rear of the Printer and may be accessed by raising the Stock Door.

The memory cartridges used in the Printer look like PCMCIA type II cards. However, the cartridges supplied for use with the Printer are not the same architecture as normal PCMCIA cards, and will not work in regular PCMCIA slots nor will actual PCMCIA cards work in the Printer due to their 32 Bit construction, (PCMCIA uses 8 or 16 Bit construction).

The external memory cartridges are available in three different types:

O.T.P (One Time Programmable)

SRAM (1 and 2 Megabytes)

FLASH (1 and 4 Megabytes).

The memory cartridges are specially designed so they can be plugged into the Printer when the power is **ON**. Therefore it is not necessary to turn the Printer off when installing or removing a cartridge.

To install a cartridge:

1. Open the Printer's Stock door.
2. With the Cartridge label facing up, carefully seat the Cartridge into one of the Cartridge slots, taking care as not to bend the pins in the connector.

The upper Cartridge Slot is **A** and the lower is **B**. Slot A, B, or both may be used.

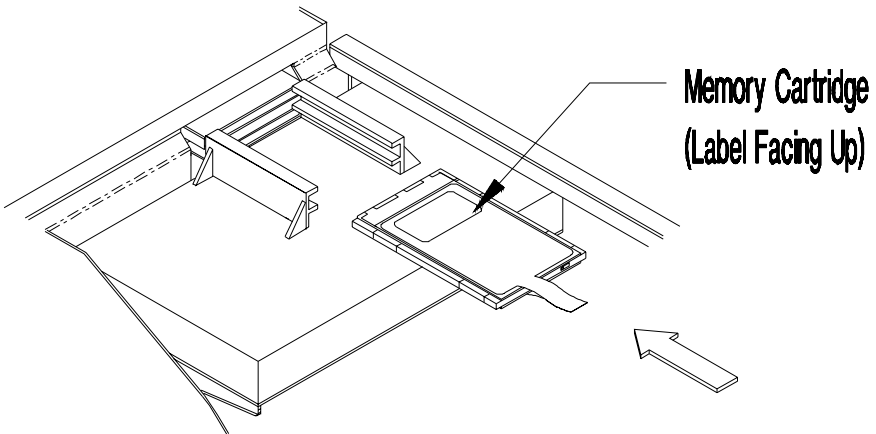


Figure 2-5 Installing Memory Cartridge

Front Panel Operation

3.0 Introduction

This chapter will explain the Front Panel operation and the various functions that reside within the Printer's Menu.

3.1 LCD/Keypad Front Panel

The Printer is equipped with an LCD/Keypad front panel. The Front Panel is equipped with a 2 row x 16 character LCD display and a 6 key Operator's Keypad.

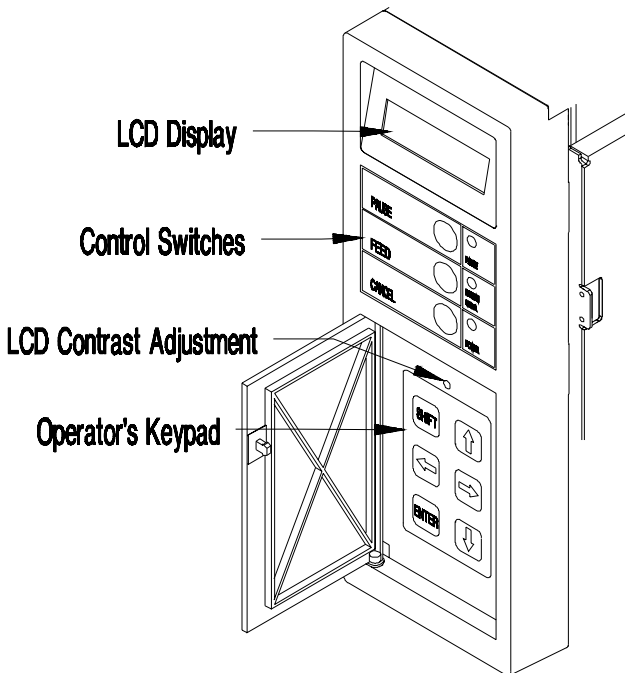


Figure 3-1 LCD/Keypad Front Panel

The Operator's Keypad consists of 6 pressure sensitive switches. The functionality of each keypad switch is described as follows:

KEY	Function
SHIFT	Moves to the next available field.
↔ ↔	Scrolls through the current menu selections. Increments and decrements number values.
↑	Returns to the previous menu level.
↓	Move to the next menu level.
ENTER	Selects a function or value. Used to respond yes to an operator query.
CONTRAST	Used to adjust the LCD display brightness.

Table 3-1 Key Functions

3.2 Using the LCD/Keypad Front Panel

The menu structure is divided into two primary menus, BASIC FUNCTION and ADVANCED SETUP. Use the ↓ arrow key to scroll to the BASIC FUNCTION menu, then use the ↔ ↔ arrow keys to scroll to the desired sub menu. Once the desired sub menu is selected, use the ↓ arrow key to scroll down to the sub-level of the desired function. 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 the selection has been made. The asterisk (*) also indicates the current default setting.

One of the selections at the BASIC FUNCTION sub-menu is ADVANCED SETUP. ADVANCED SETUP allows access to the Printer's counters, date & time, various label and system options, and communications options. Upon exiting the ADVANCED SETUP menu the Printer prompts 'CHANGES DEFAULT'. Pressing the **ENTER** key saves the changes as defaults, pressing the ↑ arrow key exits without saving the changes, (except under DATE/TIME and areas where there is no asterisk (*) used for default). Exiting without saving will cause all changes to return to the default values when the Printer is turned off.

3.2.1 Basic Function

BASIC FUNCTION PRINT METHOD

DIRECT

*TRANSFER

- Selects the type of printing desired
- Selects direct thermal printing (no ribbon)
- Selects thermal transfer printing (ribbon installed)

BASIC FUNCTION SELECT TOF

*GAP

REFLECTIVE

CONTINUOUS

- Top Of Form
- Default - looks for gap between labels
- Senses black stripe of back side on media
- No Top Of Form sensing

BASIC FUNCTION DARKNESS

Values 1-64 *Default =33

- Used to balance a new Printhead level of darkness
- 1 indicates the lightest and 64 indicates darkest setting

BASIC FUNCTION COMM SETUP

*PORTA 9600

8 N 1 BOTH

PORTB 9600

8 N 1 BOTH

PARALLEL

- Set parameters for the communication port
 - Communications port and Baud rate
 - Word length, Parity, Stop Bits, Protocol
- Word length = 7, 8 Stop Bits = 1, 2
Parity = None, Even, Odd.
Protocols = BOTH, DTR, XON/XOFF
Baud rates = 300, 600, 1200, 2400, 4800,9600, 19200

BASIC FUNCTION LABEL PRESET

ENABLE

*DISABLE

- Selects the Peel and Present option
- Use to select present sensor
- No Present option selected

BASIC FUNCTION CUTTER

ENABLE

*DISABLE

- Controls Cutter option, if installed
- Cutter option installed or selected
- No Cutter option installed or used

BASIC FUNCTION RIBBON SAVER

ENABLE

*DISABLE

- Controls Ribbon Saver option, if installed
- Ribbon Saver selected (stops ribbon from advancing)
- Ribbon Saver not installed or selected.

BASIC FUNCTION INTERNAL BATCH

- Enables or disables the Internal Batch labeling program

BASIC FUNCTION CONVERSION

METRIC
*DECIMAL

- Used to set the Printer's system of measurement
- Printer to make all measurements in metric values
- Printer to make all measurements in inches

BASIC FUNCTION TOF ADJUST

0 TO 128
*DEFAULT= 064

- Selects the point where the label edge is detected by the sensor
- Set start of print from the label edge.
128 sets the start of print approximately .3 inches from the label edge

3.2.2 Advanced Setup

ADVANCED SETUP COUNTERS

ABSOLUTE VALUES
RESETABLE VALUES
RESET COUNTERS

- Allows access to Printer Counters
- Non-resetable counter (view only by this function)
- User resetable counter (can keep track of labels)
- Resets the Printer's Resetable Counters to 0

ADVANCED SETUP DATE/TIME

SET DAY NAME day
hh:mm a dd mon yy

- Allows current date and time to be set

ADVANCED SETUP LABEL OPTIONS

HEAT SETTING

PRINT SPEED

SLEW SPEED

BACKFEED SPEED

HORIZONTAL RES

VERTICAL RES

ATTRIBUTES

ROW ADJUST

- Allows access to various label options
- Values: 00 to 20 *10 default (0 = lightest, 20 =darkest)
- Values:
6" Printer: 2ips to 8ips (Print speed/ inches per sec.)
8" Printer: 2ips to 5ips (Print speed/ inches per sec.)
- Values:
6" Printer: 2ips to 8ips (Print speed/ inches per sec.)
8" Printer: 2ips to 5ips (Print speed/ inches per sec.)
- Values 2ips to 5ips (rate the printer backs up label)
- Values 150dpi and 300dpi (dot print width resolution)
- Values 75dpi, 150dpi, 300dpi (dot print height resolution)
- *XOR, TRANSPARENT, OPAQUE
- Vertical position where printing begins (shifts up)

COLUMN ADJUST • Values 0 t o 600

CUT BY AMOUNT

- Values: 0001 to 9999 (number of labels printed before a cut)

LABEL WIDTH

- Values:
6" Printer: 200 to 640 (2.0" to 6.4") print width
8" Printer: 300 to 850 (3.0" to 8.5") print width

CONT. LABEL LEN

- Values: 0000 to 9999 (00.00" to 99.99") (Label/page length)

MAX LABEL LEN

- Amount of labels when the sensor does not sense a gap

TOF DISTANCE

- Distance from the TOF sensor to the Printhead

PRESENT DIST

- Distance from the Printhead to where the label stops

**ADVANCED SETUP
SYSTEM OPTIONS**

FACTORY SETTING
SECURITY CHECK

- Allows access to Printer's system options
- Returns the Printer to its original factory settings.
- Selects security features to protect Advanced Setup
PASSWORD
DIP SWITCH #1
NONE * Default

MODIFY PASSWORD
SERIAL NUMBER
INTERNAL MODULE
0 - 1000

- Allows the user to change the entry password
- Used to assign an 8-digit numeric serial number
- Internal Module (ID-A). Memory size - 4K blocks

SCALABLE FONT
0, 15 - 1000

- Scalable font set selection. See Programmers manual

SYMBOL SET
28 SELECTIONS

- Scalable font symbol set selection. See Programmers manual

**ADVANCED SETUP
OPERATION**

PAUSE MODE
ENABLE
DISABLE

- Allows access to various operational modes

FEEDBACK MODE
ENABLE
DISABLE

- Suspends printing between each label (until pause button is pressed)
- Returns ASCII charac. 30 after each label and charac. 31 after each batch of labels are printed

TEST MODE
ENABLE
DISABLE

- Sends debug characters to Host while printing

ADVANCED SETUP COMMUNICATIONS

SERIAL PORT A
CONTROL CODES
SERIAL PORT B
CONTROL CODES
PARALLEL PORT
CONTROL CODES
PORT DIRECTION

- Allows access to communication variables

ADVANCED SETUP MAINTENANCE

TEST PRINT

CURRENT CONFIG
DATABASE CONFIG
TEST RIBBON
TEST PATTERN
PRINthead TEST

- Standard and Alternate control codes
- Standard and Alternate control codes
- Standard and Alternate control codes
- Allows access to various test modes and configurations
- Prints a configuration test label of all current values
- Prints a configuration label of default values
- Test reflects the status of the ribbon type
- Prints label with a test pattern (to check dot elements)
- Prints Printhead Dot Element Test Label

FRONT PANEL

LED TEST
KEYPAD TEST
DISPLAY TEST

- Exercises the front panel indicator LEDs
- Checks the operation of the front panel keypad
- Exercises the front panel LCD display

TEST I/O

MONITOR GP INPUT
TEST GP OUTPUT
SENSOR READINGS
DIGITAL SENSORS

- Allows monitoring of the General Purpose input
- Allows testing of the General Purpose output
- Displays the status of the digital and analog sensors
- Displays digital sensors with active values below them

Sample Display

```
HD CT LP RS RM
8
D U N D 0
```

- H = HEAD
- CT =CUTTER
- LP =PRESENT LABEL
- RS =RIBBON SAVER
- RM =RIBBON MOTION
- D=Down
- D=Down
- Y=Blocked
- D=Down
- I=Blocked
- U=Up
- U=Up
- N=Not Blocked
- U=Up
- 0=Not Blocked

ANALOG SENSORS

- Displays 4 analog sensors with sensor values below each

Sample Display

```
THR REF TRAN PO
8
62 0 208 0
```

- THR=THERMAL
- REF=REFLECTIVE
- TRAN=TRANSMISSIVE
- P= PAPEROUT

SERIAL LOOPBACK
SERIAL PORT A
SERIAL PORT B

- Serial loopback connector must be in installed for test

INSTALLED OPTION
CUTTER
RIBBON SAVER

- Lists the currently installed options that are enabled
- * = installed

ADVANCED SETUP MODULES

PRINT DIRECTORY
PRINT FILE
COPY MODULE
FORMAT MODULE
TEST MODULE

- The optional modules are available;
Module Slot A - External Flash, RAM, or Font Cartridge
Module Slot B - External Flash, RAM, or Font Cartridge
Module D - Internal Non-Volatile RAM
- Prints contents of selected memory modules
- Prints *Label*, *Font*, or *Image* from selected module
- Copies data from one module to another
- Formats the selected memory modules
- Tests Read/Write operation of selected modules

Printing Labels

4.0 Introduction

The Printer can be used in any one of three different operating modes:

A LINK MC2 or compatible CRT with Internal Batch Software, a stand-alone label creation package developed especially for the Printer

A PC with a compatible software package

RS-232 to a host computer.

This chapter describes all three operating modes. The Printer's internal labeling software program works much like the PC-Batch software package, but uses Internal Batch modules instead of a hard or floppy disk drive to store and retrieve label formats. The program is easy to learn and operate. Only two screens are used to create or modify and print labels. A system maintenance screen is included for printing test labels, copying and formatting memory modules, and performing several other functions. You can purchase as many Internal Batch modules as you need for your applications. They essentially provide you with unlimited memory capacity.

4.1 Printer Used With a Link CRT

Four steps are required before label formatting and printing can begin. The following pages explain these steps.

Connect Cables

Verify that the LINK CRT and the Printer main power switches are OFF. Connect the LINK CRT terminal to the Printer with the supplied cable. Plug in the supplied power cords for the Printer and the LINK CRT terminal.

NOTE: The Printer connects to the LINK MAIN port, not the LINK parallel port.

Check LINK CRT Settings

The LINK CRT is shipped ready for use with the Printer. The settings are pre-set and should be changed only when necessary. If the terminal's settings have been changed since shipment from the factory, follow the terminal's set-up procedure to reset all default values. For reference, the default values are listed in Table 4-1. The Printer will set all remaining parameters; however, these settings are not saved in the CRT's RAM. To save them, follow the CRT's "save changes" routine after normal operation is established.

Function	Settings	Function	Settings
Handshake:	NONE	F1	CTRL W
Mode:	FDX	F2	CTRL X
Data Bits:	8	F3	CTRL Y
Stop Bits:	1	F4	CTRL Z
Parity:	NONE	F5	ALT S
Baud Rate:	9600	F6	ALT P
Keys:	US	F7	ALT I
Blk End:	US/CR	F8	ALT X
Auto NL:	ON	F9	ALT F
CR:	CR		
Compatible:	LINK MC 2		

Table 4-1 LINK CRT Settings

Select a Stand-Alone Labeling Software Mode

The Printer is shipped in the RS-232 mode for use with PCs. To use the CRT; set the INTERNAL BATCH function (located within the operators menu tree) to 'ENABLE' and insert a memory cartridge into the Printer's slot A or B before turning the power on, or the internal 128K NVRAM can be used in place of the module. Verify that 9600 baud is selected by accessing the Printers Communication menu as described in *Chapter 3*.

When the Printer is turned on it will recognize that the module has been formatted and run the Internal Batch program. The following screen will appear:

```
BATCH SYSTEM INITIALIZATION

ENTER:  START BATCH
F1:    TEST & FORMAT MEMORY MODULE.
ESC:   EXIT TO RS-232 MODE.

ENTER CHOICE:
```

Press the 'ENTER' key to start Internal Batch Mode, or 'F1' to format a module. In either case a menu of available modules will appear. A valid module (A - L) must be selected before continuing. Pressing the 'ESC' key will exit Internal Batch Mode and start the Printer software.

If the 'ENTER' option was selected the PRINT LABEL screen will appear.

If the 'F1' option was selected, the program will verify if the module has been formatted. If it has, the message "THIS MODULE IS ALREADY FORMATTED, ARE YOU SURE? N" will appear. To abort the format press 'ENTER', to proceed press 'Y'. The program will then test and format the selected module. If an error is encountered a message will appear.

NOTE: Be sure to turn the module's Write Protect Switch to the OFF position. Label formats cannot be sent to the module if the switch is in the ON position. To prevent accidental changes or modifications to formats, turn the Write Protect Switch to the ON position.

Verify Setup, Power Up, and Load Media

Check that all connections are made and that the INTERNAL BATCH function is set to ENABLE. Turn on the CRT and Printer power switches. Press the F1 key on the CRT several times. The CREATE/MODIFY LABEL and PRINT LABEL screens should toggle back and forth. If they don't, re-check the CRT settings, the interface cable, and verify that power is applied to both the Printer and CRT. If the screens still do not appear, contact your Printer sales representative. Remember, if the module has not been formatted for Internal Batch, the set up screen will appear until you select the TEST & FORMAT MEMORY MODULE option. If steps 1-4 have been successfully completed, load the Printer with media.

Formatting labels is designed to be a simple process and requires no special operator training. The procedure involves three steps:

- (1) Selecting an operating screen
- (2) Specifying where on the label you want to place text and/or bar codes
- (3) Printing the actual labels.

4.1.1 Formatting and Printing Labels

Available Fonts and Bar Codes

Available character font sizes and bar codes are illustrated and explained in *Appendix B*. Each font and bar code has a name associated with it for use in the CREATE/MODIFY LABEL screen. Alphanumeric fonts are **0** through **9**. Human readable bar codes are uppercase **A** through **T**, except **p** (Postnet). Bar codes without human readable interpretation lines are lowercase **a** through **u**, and "z" is PDF 417. All fonts and bar codes can be magnified in height and width. Multiplication parameters and resulting character sizes are listed in *Appendix B*.

Menu Screens

Three menu screens are available in the Printer's internal labeling software program. The three screens are as follows:

1. CREATE/MODIFY LABEL
2. PRINT LABEL
3. SYSTEM MAINTENANCE

Function Keys

Nine function keys labeled **F1** to **F9** are used extensively in the label formatting process. Some functions can also be controlled by the ALT keys. To use the ALT functions, press and hold the ALT key at the same time as you press another key. The ALT functions and the function keys include the following functions:

F1 or ESC (SWITCH) - Toggles between the PRINT and CREATE/MODIFY LABEL screens. F1 can be used only in the LABEL NAME: position of the CREATE/MODIFY or PRINT screens.

F2 (LIST) - Displays a library listing of every label format and/or graphic image loaded in the current memory module. F2 can be used only when the prompt is in the LABEL NAME: position of the CREATE/MODIFY or PRINT screens.

The first screen displays batch label files. When the screen is filled, press the 'ENTER' key to display the directory of Image files or press 'ESC' to go back to the CREATE/MODIFY screen.

```
BATCH FILES: MODULE: A MEMORY AVAILABLE: 99%  
  
FILE1 FILE2 FILE3  
  
PRESS <CR> TO CONTINUE.....  
  
IMAGE FILES: MODULE: A MEMORY AVAILABLE: 99%  
  
FILE1 FILE2 FILE3  
  
PRESS <CR> TO CONTINUE.....
```

The top of each screen shows which file type, (batch or image), is being displayed, the currently selected module, and the amount of available memory.

F3 (COPY) - Used in the CREATE/MODIFY LABEL screen only. Enter a new label name, then press the F3 key.

The message "COPY LABEL (Y/N) N" will appear. Press Y to continue or 'ENTER' to abort. If 'Y' was pressed, the program will ask for the name of the file to be copied.

Enter the name of an existing label already in memory and press the ENTER key. A new label is then created with the same data as the source label, which allows immediate editing of the new label format. The F3 COPY feature, (if used during an edit session), will copy the current field record to a new field record.

F4 (KILL) - Used in the CREATE/MODIFY LABEL screen only. Enter an existing label name, followed by the F4 key. The message "REMOVE LABEL? (Y/N)" will appear. Answer yes or no with the Y or N key. If Y, and the WRITE PROTECT SWITCH is OFF, the label is permanently removed from the memory module. When creating or modifying a label format use the F4 kill feature to delete the currently selected format line one at a time.

F5 and ALT-S - Calls up the SYSTEM MAINTENANCE screen.

F6 and ALT-P - While in the SAMPLE print request position of the CREATE/MODIFY LABEL screen or the PRINT LABEL screen, press ALT-P to bring up the PRINT PARAMETERS windows. *Refer to Figure 4-1.*

PRINT ADJUSTMENT	
HEAT FACTOR:	10
PRINT SPEED:	I
SLEW SPEED:	I
DOT PATTERN (5 mil):	1 X 1
LABEL ADVANCE:	02.20
FORM EDGE OFFSET:	02.20
ROW OFFSET:	00.00
COLUMN OFFSET:	00.00
COUNT BY:	01
MAX. LABEL WIDTH:	06.40
MAX. LABEL LENGTH:	12.00
CONTINUOUS FORM:	NO
CUT BY (# PER CUT):	0001
SENSOR TYPE:	EDGE

Figure 4-1 ALT-P Screen

Print parameters include row and column offsets, label edge offset, label backfeed position, pixel (dot) size, heat setting, etc.(*see Table 4-2*). Use the arrow keys to move from one position to the next. Key in any values that need to be changed. Press the ESC key to exit the window.

Description	Default	Range
Heat Factor	10	0 to 20
Print Speed	I	6" Printer: C to O 8" Printer: C to I
Slew Speed	I	6" Printer: C to O 8" Printer: C to I
Dot Pattern Wide	1	1 or 2
Dot Pattern High	1	1 to 3
Label Advance (Back Feed)	220	Form Edge Offset to Form Edge Offset + 200
Form Edge Offset	220	050 to 999
Row Offset	000	000 to 999
Column Offset	000	000 to 640
Update Count On	01	01 to 99
Max. Label Width	640	050 to 640
Max. Label Length	1200	0500 to 9999
Cut By Amount	0001	0001 to 9999

Table 4-2 Print Parameters

If ALT-P parameters are changed while in the CREATE/MODIFY LABEL screen, the changes are saved with the label format. If they are changed in the PRINT LABEL screen, they are not saved and will affect only the current print job. Changing parameters in the PRINT LABEL screen is useful when testing a new label to determine optimum print parameter settings for that particular format.

F7 and ALT-I - This function is used in the CREATE/MODIFY LABEL screen to insert a new field description line between existing field description lines on the screen. It is especially useful when the REPEAT function is used and other lines on the screen are already below the field to be repeated.

F8 and ALT-X - May be pressed while the cursor is located on a line item entry field of the CREATE screen. It will go to the PRINT/LABEL screen using a pre-set quantity of 1 for the purpose of printing a test label.

F9 and ALT-F - Feeds one label at a time. It operates the same way as the front panel FEED switch. This function is useful when loading new media to register the photoelectric sensor.

Other Important Keys

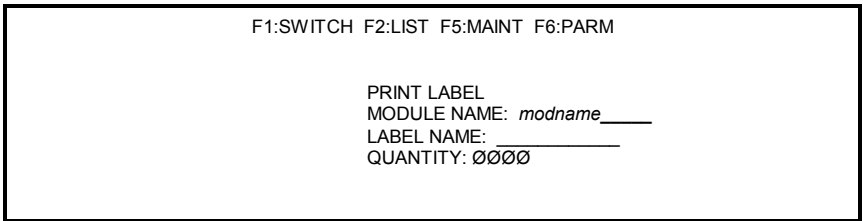
Several other keys are used in the editing and printing steps. These keys have the following functions:

1. **RETURN:** Enters an answer for the prompt and moves the cursor to the next position if the answer is acceptable.
2. **ARROW KEYS:** Used to move the cursor left, right, up, and down in the CREATE/MODIFY and PRINT screens.
3. **ESC:** Ends the formatting for a particular label and returns the cursor to the top of the screen. The ESC key allows the F1 key to be used to switch screens and to exit ALT-S and ALT-P screens.
4. **BACKSPACE:** Erases one character at a time.
5. **HOME or F4:** Deletes the current line on the CREATE/MODIFY screen and moves the cursor to the beginning of the next field.

4.1.2 Create/Modify Label Screen

This section describes how to create a new label. Before beginning, a good tool to have on hand is a ruler marked in tenths of an inch because all label format print positions are specified in tenths and hundredths of an inch. The procedure for creating a new label follows:

1. Power up the CRT terminal with the switch on the front of the unit. Turn the Printer on with the POWER switch located in the back of the Printer. If a good BATCH module is present the CRT screen will look like this:



```
F1:SWITCH F2:LIST F5:MAINT F6:PARAM

PRINT LABEL
MODULE NAME: modname_____
LABEL NAME: _____
QUANTITY: 0000
```

Figure 4-2 Print Label Screen Header

Press the F1 key, and the screen will look like this:

```
F1:SWITCH F2:LIST F3:COPY F4:KILL F5:MAINT F6:PARM F7:INS F8:SAMPL F9:FEED

FIELD # 000                                MODULE: A

                CREATE/MODIFY LABEL
                MODULE NAME: modname
                LABEL NAME: -----

    ROT  FNT  XW   XH   BH   ROW  COL   TYPE   DATA/PROMPT
    ---  ---  --   --   ---  ---  ---   ----   -----
```

Figure 4-3 Create/Modify Label Screen Header

2. The software has only two operating screens, **CREATE/MODIFY LABEL** and **PRINT LABEL**. Both have already appeared on your CRT. All data is entered into the fields, (a field is a set of information such as a product name, address, bar code, consecutive number, and so on, that is specified on individual lines on the CRT screen). Because fields are independent of each other, it is possible, and sometimes desirable, to place two or more fields on the same horizontal or vertical measurement. Be careful not to print one field over another.

The upper-right hand corner of the screen displays the current selected module. The upper left-hand corner of the screen displays the current FIELD NUMBER. This program can accommodate up to 200 fields per format. Use the RETURN key, or arrow keys, to move the cursor around within the 200 fields, one field at a time. A sample label format is illustrated in Figure 4. To CREATE a label, press the F1 key to return to the CREATE/MODIFY LABEL screen. The cursor will be in the LABEL NAME position.

F1:SWITCH F2:LIST F3:COPY F4:KILL F5:MAINT F6:PARM F7:INS F8:SAMPL F9:FEED

FIELD # 001

CREATE/MODIFY LABEL
MODULE NAME: **MY MODULE**
LABEL NAME: -----

ROT	FNT	XW	XH	BH	ROW	COL	TYPE	DATA/PROMPT
1	2	2	2	0.00	03.70	00.20	D	NYLON INSULATED TOGGLE SWITCH
1	X	1	1	0.00	03.60	00.10	D	B370040003003
1	6	2	2	0.00	00.30	00.20	D	DA100-PB-B
1	X	1	1	0.00	00.20	00.15	D	L400080
1	Y	1	1	0.00	01.50	02.85	D	SW5
1	a	6	2	0.40	01.35	00.15	D	DA100 PB B
1	1	2	2	0.00	01.20	00.65	D	DA100 PB B
1	3	1	1	0.00	03.20	00.20	D	SWITCH ACTION
1	1	2	2	0.00	03.00	00.20	D	SPST ON-NONE-OFF
1	3	1	1	0.00	02.70	00.20	D	TERMINALS
1	1	2	2	0.00	02.50	00.20	D	SOLDER/SPADE
1	3	1	1	0.00	02.20	00.20	D	RATING
1	1	2	2	0.00	02.00	00.20	D	@ 10 AMPS, 125VAC
1	X	1	1	0.00	01.90	00.10	D	B200160003003
1	X	1	1	0.00	02.40	00.13	D	L194003
1	X	1	1	0.00	02.90	00.13	D	L194003
1	0	1	1	0.00	00.00	00.15	D	LABEL PRINTER

Figure 4-4 Sample Label Format

3. Enter an alphanumeric name of up to 16 characters for this label, followed by the RETURN key. If the name entered does not already exist on the module the message "NEW LABEL FORMAT?" appears. Answer Y for yes if you wish to create a label by this name, or answer N for no. If yes, the cursor moves to the ROT position.

4. The Printer can print fonts and bar codes at **0, 90, 180, or 270** degrees rotation. Valid responses to the ROT prompt include:

1 =	0 degrees
2 =	90 degrees
3 =	180 degrees
4 =	270 degrees

5. In the FNT position, enter the type of font you want to print. This can be an alphanumeric font or a bar code. Enter one of the following:
- An alphanumeric font type, followed by the RETURN key. Choices are **0** through **8**. See *Appendix B* for examples of each available font type and for the actual printed size of the various fonts using different multiplication factors.
 - An **alphanumeric** CG Triumvirate font type, followed by the RETURN key. The only choice is **9**. See *Appendix B* for examples of each available font type and for the actual printed size of the font using different multiplication factors. The point size is selected in the bar code height field.
 - A bar code followed by the RETURN key. For bar codes that include the human-readable interpretation line choices use uppercase **A** through **T**, except for **p** (Postnet). For bar codes without human readable lines, choices are lowercase **a** through **u**, and **z** (PDF 417). See *Appendix B* for examples of each available bar code.
 - X** selects a special option for drawing lines, boxes, circles, and polygons. More information is necessary for drawing these shapes and must be entered into the DATA/PROMPT field.

- e. **Y** selects a graphic image that has already been loaded into the memory module. The name of the graphic image must be entered in the DATA/PROMPT field. (Note: The graphic image name is **case sensitive** for upper and lower case characters (i.e., the name “LOGO” is not the same as the name “logo”).

NOTE: If any letter or number is entered in the FNT position other than those specified above, the entry will not be accepted.

After entering the desired font, the cursor will move to the **XW** position.

6. The **XW** and **XH** positions are used to magnify widths and heights of fonts and to change the X/Y ratio of bar codes.
 - a. To magnify the width of a font, enter 1 through 9, or A through O (A=10, B=11, etc.). The default value for fonts is 1.
 - b. To magnify the width of a bar code, enter 1 through 9, or A through O. The default is 3 for ratio-based bar codes, 2 for fonts Q & R, and 1 for all other bar code fields. For bar codes, each number is equal to 5mm. (If the pixel width is set to 1, the result will be a 5 mm. wide bar. If set to 2, the result will be a 10-mm. wide bar. Pixel sizes are entered in the PRINT PARAMETERS screen.
 - c. Enter the desired XW (width) dimension and press the RETURN key. The cursor will move to the **XH** position.

7. Enter the desired **XH** (height) dimension and press the RETURN key. All values and limits are the same as for the XW dimension. The cursor will move to the **BH** (bar height) position.
 - a. If you wish to magnify the width of a font, valid responses are **1** through **9** and **A** through **O**. The default value is 1 for fonts.
 - b. If you wish to magnify the width of a bar code, valid responses are **1** through **9** and **A** through **O**. The default is 3 for ratio-based bar codes, 2 for fonts Q & R, and 1 for all other bar code fields. If the pixel width is 1, the result will be a 3 mil narrow bar. If the pixel width is 2, the result will be a 6 mil narrow bar. Pixel sizes by label format are specified in the PRINT PARAMETERS screen.
 - c. Enter the desired XH dimension and press the RETURN key. The cursor will move to the bar height (BH) position.

8. In the **BH** position, a **3**-digit number defines the printed bar height for the field or defines a smooth font.
 - a. For **UPC/EAN** bar codes the default value is 080 (0.80 in. or 20mm). For all other bar code fields, the default value is 040 (0.40 in. or 10mm). For all alphanumeric fonts, the BH value is set at 000.
 - b. A **9** entered in the **FNT** position selects a **smooth font**. The actual size (in points) is set by entering a value in the BH position. Enter the desired bar height and press the RETURN key. The cursor will move to the **ROW** position.

9. The 4-digit **ROW** field tells the Printer how far up on the label to print the data. The default value is 00.00 and the maximum number cannot exceed the maximum label length set in the PRINT PARAMETERS window. Use the bottom left corner as the starting point for ROW and COLUMN.
 - a. To select a height, enter a number (no more than four digits) followed by the RETURN key. If the measurement entered is acceptable, the cursor will move to the **COL** position.
 - b. When specifying measurements, always measure to the bottom of the field. For example, if using font 6 the measurement will be to the bottom of the alphanumeric letters. If using a bar code, the measurement will be to the bottom of the bar code's human readable line. If the bar code being printed does not have a human readable line, measure to the bottom of the bars.
 - c. When rotating a bar code or alphanumeric field, the ROW measurement is specified as the amount of space from the starting point of the label to the top of the field.
10. The 4-digit COLUMN number tells the Printer "how far over" from the left edge of the label that the data is to be printed. Enter a number no longer than four digits in this field, then press the RETURN key. The cursor will move to the TYPE position.

11. The TYPE position tells the Printer how the DATA/PROMPT area is to be used. There are six options.

- a.** The most common TYPE is D for data, this tells the Printer that fixed data will be entered in this field. In other words, any alpha and/or numeric characters entered in the DATA/PROMPT position will be printed on the label exactly as entered. After pressing the D key, the cursor will move to the DATA/PROMPT position. Enter the data to be printed on the label and press the RETURN key. Type '**D**' is specified when using special font X for lines, boxes, and illustrations. It is also specified when using special font Y for graphics. The graphic name must be entered with up to 16 upper case characters.
- b.** Press the '**P**' key to signify that "this is a prompt." Any data typed in the DATA/PROMPT position will reappear prompting an entry on the PRINT LABEL screen. This allows a label format to be set up ahead of time, but with the ability to change variable information every time that format is printed.

For example, if printing inventory labels that contain the same information (e.g. company name, date) and are located in the same position on every label, but the stock number for the part may change approximately every 100 labels. The stock number field could be set up as a prompt by entering in the phrase "ENTER STOCK NUMBER" in the DATA/PROMPT position. Every time that format is selected in the PRINT LABEL screen, the phrase "ENTER STOCK NUMBER" appears. The desired stock number can be entered for that label run and the new information will be printed on every label.

- c.** Enter one of the following symbols to signify a consecutive number or alpha character:

- + for numeric increment**
- for numeric decrement**
- > for alpha increment**
- < for alpha decrement**

If any of these symbols are entered in the TYPE position, you will be printing either incrementing or decrementing numbers or letters in the label position you specified earlier in this field. Information entered in the DATA/PROMPT field in the next step will tell the Printer the increment value that you want to use. When viewing the PRINT LABEL screen, it will ask "INITIAL INCREMENT?" or "INITIAL DECREMENT?" The number you enter at this time will be incremented or decremented every time a label is printed.

The number of labels to be printed with the same number before an increment or decrement occurs can be set with the ALT-P command as described earlier. The default value is 1.

- d. Press the **C** key to signify a comment. Any data entered in the DATA/PROMPT position will appear on the PRINT LABEL screen as a comment. This function is useful in giving the operator special instructions, (i.e., how to load a particular type of media for the labels to be printed). Comment fields do not affect the printing of the label.
- e. Press the **R** key to request a repeat of the previous field's data.
- f. Press the **T** key to print the time and date.

After entering any one of the above choices, the cursor will move to the DATA/PROMPT position.

12. In the DATA/PROMPT position, there are six options:

- a. If **D** was selected in the preceding step, enter the desired data or label length settings.

Special Font X: Drawing Font for Line, Box, Circle and Polygon. The required information is entered in the following formats:

NOTE: Reverse printing is accomplished by printing a very high, or wide, solid line. Text placed at the same coordinates (inside the line) is reversed with white letters on a black background.

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

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

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

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

CIRCLES: 1pppprrrrccccC1111111rrrr

Where, 1 must be entered at the places indicated.

ppp = a fill pattern type

rrrr = row number for the circle center point

cccc = column number for center point

C = circle's ID number

RRRR = Radius

POLYGONS 1pppprrrrccccP1111111rrrrcccc.....

Where, 1 must be entered where indicated.

ppp = a fill pattern type

rrrr = row number for the first point

cccc = column number for first point

P = Polygon ID

rrrr = row number for the second point

cccc = column number for second point

.... - Continue until all points are entered

<p>NOTE: The points must be specified in the order that they are to be drawn. The last point specified is automatically connected to the first point specified, thereby closing the polygon. If only 2 points are specified, a single line is drawn.</p>

Special Font Y: Enter the name of the graphic image you want to call from the memory module for printing at this field position. You can enter up to 16 uppercase characters.

b. Enter the desired PROMPT information. The field allows up to 44 characters to be entered.

c. Enter the desired consecutive number fill character and increment value. This field has the format 'xnn' with the following parameters:

x = fill character. It can be any character, including a space. For example, if * is entered, all insignificant characters will be filled with "*" If 0 is entered, the field will fill with 0's.

nn = increment value desired. If 01 is entered, it will increment by ones (i.e. 1, 2, 3 etc.). If 02 is entered, it will increment by two's (i.e. 1, 3, 5, 7 etc.). nn can be any value up to 99.

An entry of 02 will print like this:

02
04
06
08
10

Once in the PRINT LABEL screen, the operator is prompted for an initial increment or decrement value. The value entered is the starting value for that particular run of labels. As a separate function, an increment every "x" number of labels can be set in the PRINT PARAMETERS screen (ALT-P).

d. For comment fields, enter the data you wish to have appear on the PRINT screen in the DATA/PROMPT field.

e. For repeat fields, enter the data in the DATA/PROMPT field just as if the field were a type D field. Place a ^ character in the data string at the place you wish to insert the data from the previous field into this field.

- f. For the time and date to be printed on the label enter the data as shown in the following example: Time and date string data are selected by using characters A through Z and a through f as shown in Table 3 in order to retrieve data from Printer's internal clock.

w	W	W	W	m	m	M	M	M	M	M	M	M	M	M	d
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
d	y	y	y	y	h	h	H	H	n	n	a	a	j	j	j
Q	R	S	T	U	V	W	X	Y	Z	a	b	c	d	e	f

w	Day of the week (1 = MON)	hh	2 digit hour (24 hour format)
W	Day of week name	H H	2 digit hour (12 hour format)
mm	2 digit month	nn	2 digit minutes
M	Month name	aa	AM or PM (12 hour format)
dd	2 digit day	jjj	3 digit Julian date
yyyy	4 digit year		

Table 4-3 Time and Date Information Format

In the following example the proper matching characters are sent to Printer that request the day of week and date to be printed. This command causes the Printer to enter the date formatting mode. Spaces and punctuation appear as shown in the example.

Sample: BCD GHI PQ , RSTU <CR>

Prints: TUE DEC 27 , 1993

After entering the desired data, prompt, comment, or consecutive number information, press the RETURN key. The cursor will move to the next line on the screen for another field of information.

13. Enter additional fields of information as desired. To print a sample label, press the ALT-X key and the PRINT screen will appear. Press ENTER again and a sample label will be printed. Then the CREATE/MODIFY LABEL screen will return.

After all fields are completed, press the 'ESC' key from any field in the ROT column. This brings the cursor back to the LABEL NAME position.

14. To print a quantity of the label you defined, press the F1 key (SWITCH). The PRINT LABEL screen will appear.

4.1.3 Print Label Screen

The PRINT LABEL screen is used to print labels that have been formatted and/or modified in the CREATE/MODIFY LABEL screen. From the CREATE/MODIFY LABEL screen, press the F1 key to toggle to the PRINT LABEL screen. The screen should look like this:

```
                PRINT LABEL
MODULE NAME:   MY MODULE
LABEL NAME:   _____
                QUANTITY: 0000
```

Figure 4-5 Print Label Screen

When viewing the PRINT LABEL screen, the procedure for printing a label is as follows:

1. Enter the **LABEL NAME** you want to print and press the RETURN key. The cursor will move to the **QUANTITY** position. If the Printer does not find the label name you entered, you will receive an error message and the label name will need to be re-entered. When in the LABEL NAME position, you can use the F2 key (LIST) to list all of the names currently available in the memory module.
2. Enter the quantity of labels to print, (not more than four digits long), and press the RETURN key. The maximum number of labels per run is 9999.
3. Depending on how the label is set up, the cursor may move to the INITIAL INCREMENT or INITIAL DECREMENT position if a consecutive number or letter was specified as a data type. Or, the cursor may move to a prompting position if a P was specified as a data type. Enter the starting number or the prompt information, followed by the RETURN key, for each consecutive number or prompt. After this information is entered, the cursor will move to the SAMPLE? position.
4. In the **SAMPLE?** position, there are the following choices:
 - a. Print a sample label to check data placement by pressing the Y key for yes. A sample label will print and the cursor will return to the SAMPLE? position. At this point, you can proceed to step b or stop the run by pressing the up arrow key to move the cursor back to the LABEL NAME position. Press the F1 key to re-edit your format in the CREATE/MODIFY LABEL screen.
 - b. If you do not need a sample, press the N key or the RETURN key for no. The number of labels you requested will be printed. After the print job request is sent to the Printer, the cursor will move back to the LABEL NAME position. Additional print jobs can now be sent to the Printer, or you can return to the CREATE/MODIFY LABEL screen.

4.1.4 System Maintenance Screen

The third screen, SYSTEM MAINTENANCE, is used to format and copy memory modules, print test labels, and perform several other maintenance functions.

To access the screen in the LABEL NAME position of the CREATE/MODIFY LABEL or PRINT LABEL screens, use ALT-S. The screen will look like this:

```
SYSTEM MAINTENANCE
1>  MODULE SELECTION & FORMATTING.
2>  COPY MODULE.
3>  METRIC ? NO.
4>  PRINT TEST LABEL.
5>  SYSTEM TEST LABEL.
6>  EDIT MODULE NAME.
7>  RESET PRINTER.
8>  EXIT TO RS-232 SYSTEM.
9>  PACK MODULE DATA.
```

Figure 4-6 System Maintenance Menu

To exit the screen, press the ESC key. All SYSTEM MAINTENANCE screen choices are explained below:

- 1. MODULE SELECTION & FORMATTING:** Used to format or reformat the memory module. Tests the memory module to see if it is functioning and if it is capable of erasing and loading data.

WARNING: This test destroys all the existing memory module data. Follow the prompts to perform the test.

2. **COPY MODULE:** Copies graphic images and/or label formats from one memory module to another. Be certain that the WRITE PROTECT SWITCH is ON for the source module and OFF for the destination module. Follow the screen prompts to perform the copy routine.
3. **METRIC:** Each time the number 3 is pressed, the screen will toggle between METRIC NO and METRIC YES. When in the METRIC mode, all references to dimensions will be in METRIC measure.
4. **PRINT TEST LABEL:** Prints a Printhead Test Label, and is used as a relative gauge of Printhead condition and wear.
5. **SYSTEM TEST LABEL:** Lists all current Printer settings and checks both ROM and RAM. Prints a Printhead Test Label after the system test.
6. **EDIT MODULE NAME:** This will allow you to change the name of the module.
7. **RESET PRINTER:** This is the same as the <SOH #> command in the standard Printer mode.
8. **EXIT TO RS-232 SYSTEM:** This is useful if you are connecting an A/B switch box to the CRT and a PC at the same time for downloading graphic images to memory modules. The <STX> g command can be used to enter the Internal Batch Mode.
9. **PACK MODULE DATA:** All the label formats are stored in a memory module. This means that selective memory erasing is impossible, only the entire module can be cleared. The way to change or erase is by flagging the format and not actually erasing it. For this reason, occasionally the data will need to be packed from time to time when the memory becomes low.

4.1.5 Quick Reference Listing

The following pages list the valid commands for the Printer's internal labeling software program.

CREATE/MODIFY LABEL COMMANDS

Command	Valid Inputs
ROT	1,2,3, and 4
FNT	Fonts 0 through 8 Smooth Font 9 Human Readable Bar Codes Uppercase A through S, Except p (Postnet) Non-Human Readable Bar Codes Lowercase a through u & z (PDF 417) X = Boxes and Lines Y = Graphics
XW	1 through 9, and A through O
XH	1 through 9, and A through O
BH	0.00 to 9.99
ROW	00.00 to 99.99
COL	00.00 to 04.10
TYPE	D = Data, P = Prompt, C = Comment, R = Repeat, T=Time and Date +,-, <,> = Consecutive Numbering and Alpha

PRINT PARAMETERS (ALT-P)

Description	Default	Range
Heat Factor	10	0 to 20
Print Speed	I	6" Printer: C to O 8" Printer: C to I
Slew Speed	I	6" Printer: C to O 8" Printer: C to I
Dot Pattern Wide	1	1 or 2
Dot Pattern High	1	1 to 3
Form Edge Offset	220	050 to 999
Form Advance (Back Feed)	220	Form Edge Offset to Form Edge Offset +
Row Offset	000	000 to 999
Column Offset	000	000 to 640
Update Count On	01	01 to 99
Max. Label Width	640	050 to 640
Max. Label Length	1200	0500 to 9999
Cut By Amount	0001	0001 to 9999
Sensor Type	EDGE	EDGE/REFLECTIVE

SPECIAL KEYS

Key	Function
F1 ESC	Switch
F2	List
F3	Copy
F4	Kill
F5 ALT-S	System Maintenance
F6 ALT-P	Print Parameters Screen
F7 ALT-I	Insert Format Line
F8 ALT-X	Print Sample Label
F9 ALT-F	Feed a Label
ESC	End Key
HOME	Erase Current Line

4.2 Using Basic Programming Commands

In order to prepare 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	Dump	Attention Getter For
SOH	1	01	^A	Immediate Commands
STX	2	02	^B	System Level Commands
ESC	27	1B	^[	Font Loading Commands

Table 4-4 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 the following sequence:

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

CC	P	PR	Command
#	N	Y	Reset
A	N	Y	Send ASCII Status String
B	N	N	Toggle Pause
C	N	N	Set Stop/Cancel
D	N	N	SOH Shutdown
E	N	Y	Send Batch Quantity
F	N	Y	Send Status Byte

CC = Command Character

P = Must Enter Parameters? (Y/N)

PR = Printer Responds ? (Y/N)

Table 4-5 Immediate Commands

The most commonly used commands are the System Level Commands, which are used to create formats, load and store graphic information, and precisely control the Printer.

CC	P	PR	Command
A	Y	N	Set Time and Date
a	N	Y	Enable Feedback Characters
B	N	Y	Get Printer Time and Date Information
c	Y	N	Set Continuous Paper Length
d	N	N	Set Printer to Double Buffer Mode
E	Y	N	Set Quantity for Stored Label
e	N	N	Select Edge Sensor
F	N	N	Form Feed
f	Y	N	Set Form Stop Position
G	N	N	Print Last Label Format
g	N	Y	Internal Batch Software Mode
I	Y	N	Input Graphics Data Block
J	Y	N	Set Pause for Each Label
k	N	Y	Test RS-232 Port, With a Y if OK
L	Y	N	Enter Label Formatting Mode
M	Y	N	Set Maximum Label Length
m	N	N	Set Printer to Metric
n	N	N	Set Printer to Inches
O	Y	N	Set Start of Print Position
o	N	N	Cycle Cutter
P	N	N	Enter Character Dump Mode
p	N	N	Controlled Pause
Q	N	N	Clears all Modules
q	Y	N	Clear Module
r	N	N	Select Reflective Sensor
S	Y	Y	Set Feed Rate
s	N	N	Set Printer to Single Buffer Mode
T	N	N	Printhead Dot Pattern Test Label
t	N	Y	Test RAM Memory Module
U	Y	N	Label Format Field Replacement

Table 4-6 System Level Commands

CC	P	PR	Command
V	Y	N	Software Switch Settings
v	N	Y	Printer's Firmware Version Information
W	Y	Y	Request Memory Module Information
w	N	Y	Test FLASH Memory Module
X	Y	N	Set Default Module (<i>Special Dump Mode</i>)
Y	N	Y	Output Sensor Values
Z	N	Y	Print Internal Information and Dot Pattern

CC = Command Character

P = Must Enter Parameters? (Y/N)

PR = Printer Responds? (Y/N)

Table 4-6 System Level Commands-Continued

An **STX L** command switches the Printer from the **system level** to the **label formatting** command processor. All commands after **STX L** are interpreted as Label Formatting commands.

CC	P	Description
:	Y	Set Cut By Amount (4 Digit)
A	Y	Set Format Attribute
C	Y	Set Column Offset Amount
c	Y	Set Cut by Amount (2 Digit)
D	Y	Set Height and Width Dot Size
E	N	Terminate Label Formatting Mode and Print Label
G	N	Place Data in Global Register
H	Y	Enter Heat Setting
m	N	Set Metric Mode
n	N	Set Inch Mode
P	Y	Set Speed for Print Cycle
p	Y	Set Label Backup Speed
Q	Y	Enter Quantity of Labels to Print
R	Y	Set Row Offset Amount
r	Y	Recall Stored Label Format
S	Y	Set Slew Rate Speed for Feeding Labels
s	Y	Store Label Format in Module
T	Y	Set Field Data Line Terminator
u	N	Make Previous Field a String - Replace Mode Field

Table 4-7 Label Formatting Commands

CC	P	Description
X	N	Terminate Label Formatting Mode
Z	N	Zero (0) Conversion to "O" to Eliminate Slash (/)
+	Y	Make Last Field Entered Increment Numeric
-	Y	Make Last Field Entered Decrement Numeric
>	Y	Make Last Field Entered Increment Alphanumeric
<	Y	Make Last Field Entered Decrement Alphanumeric
^	Y	Set Count by Amount

CC = Command Character

P = Must Enter Parameters? (Y/N)

Table 4-7 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). 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 4-8 Special Label Formatting Commands

The commands used for font loading are usually generated by font creation software. However, the **Assign Font ID Number** command **must** be sent to the Printer **before** the font file.

CC	P	PR	Description
*c###D	N	N	Assign Font ID Number ### = ID Number 100 to 999

CC = Command Character

P = Must Supply Parameters?(Y/N)

PR = Printer Responds? (Y/N)

Table 4-9 Font Loading Commands

4.3 Sample Label

The following sample program is included for reference. This ASCII text file will generate the label shown in Figure 4-7.

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



Figure 4-7 Sample Label

4.4 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 example's fields. Refer to the Figures below for a brief explanation of the data fields.

<STX>L<CR>

D11<CR>

1A93040001501000123456789<CR>

121100000000100Bar Code A<CR>

E



Barcode A

<STX>L Syntax L on line 1 is used to enter the label formatting mode.

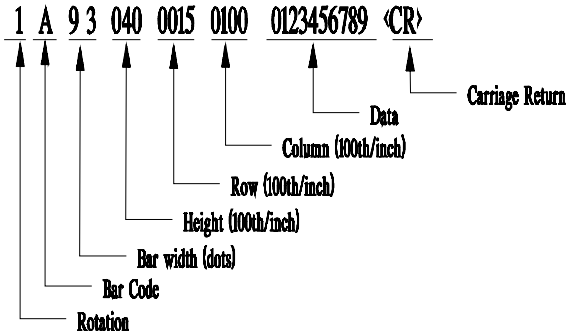


Figure 4-8 Example line 3

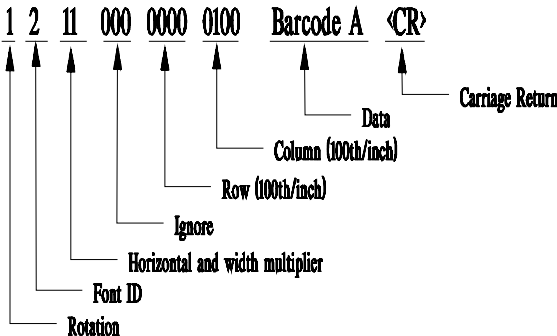


Figure 4-9 Example line 4

Maintenance

5.0 Introduction

This chapter will cover the cleaning, adjusting, and some troubleshooting tips involved with your Printer.

5.1 Cleaning

Very little Printer maintenance is required. Keeping the Printer clean will help ensure trouble free operation. Points of interest include:

5.1.1 Printhead

WARNING: Turn OFF the Printer before cleaning the Printhead.

The Printhead can become dirty from operation; however, regular cleaning of the Printhead will ensure print quality. The Printhead is easily cleaned by using a cotton swab and Isopropyl Alcohol.

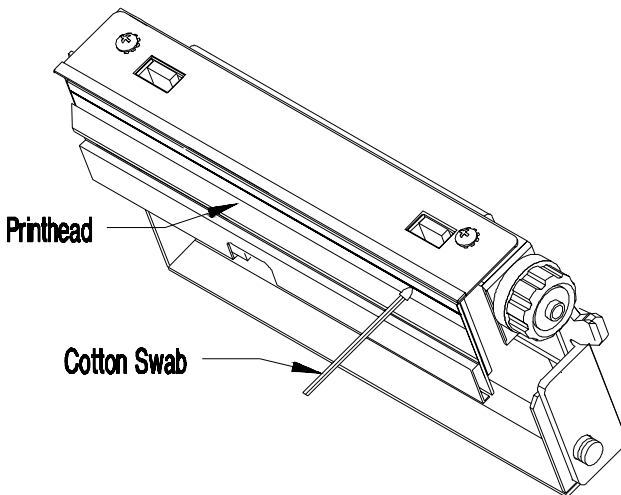


Figure 5-1 Cleaning the Printhead

5.1.2 General Cleaning

WARNING: Turn OFF the Printer and unplug the unit from the outlet before cleaning the Printer.

A periodical cleaning should be done on all Rollers, Guides and Assemblies. Isopropyl Alcohol and a cotton swab can be used to clean these areas. This will ensure all items are free of residue and will not contribute to any Printer malfunctions.

5.1.3 Cutter or Tear Bar

WARNING: Turn OFF the Printer and unplug the unit from the outlet before cleaning the Cutter or Tear Bar.

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

5.2 Media Sensor Adjustment

In order to be able to detect the label edge and/or carbon black stripe for all media sizes, the Media Sensor is adjustable across half of the media path. The position of the Media Sensor may need to be adjusted when changing from a wider to a narrower media stock size, this ensures that the Media Sensor is positioned to detect the label edge.

Rotating the knurled Adjustment Knob clockwise sets the sensor for wider media. In general, if the knob is kept in the full counterclockwise position it will correctly sense media. However, if there is a problem in sensing Top Of Form, try rotating this knob clockwise, one half turn at a time, until the error is eliminated.



CAUTION

Do not force or over tighten this adjustment knob.

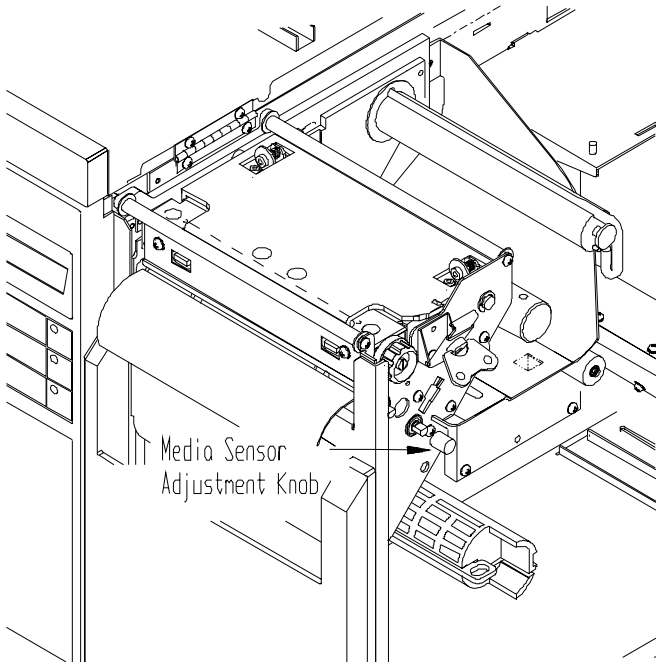


Figure 5-2 Media Sensor Adjustment

5.3 Printhead Cam Adjustment

The Printer can use a variety of media widths and thicknesses. The Printhead has a Leveling Cam adjustment that ensures even print quality. The Cam raises and lowers the right side of the Printhead to keep the Printhead level across the media.

NOTE: Mis-adjustment of the Printhead Leveling Cam has been found to cause "Ribbon Wrinkling". If you are experiencing "Ribbon Wrinkling" problems make sure the Printhead Leveling Cam is properly adjusted.

The knob is numbered for the convenience of the operator. (*The numbers do not relate to specific media sizes*). Turn the knob one click at a time until the desired print quality is achieved.

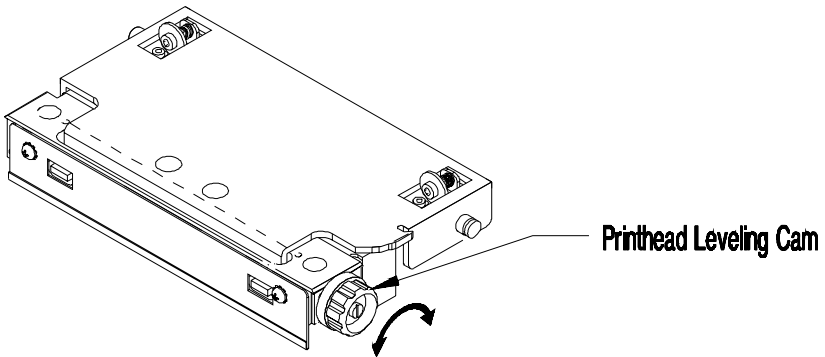


Figure 5-3 Printhead Cam Adjustment

5.4 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 in relation 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 damage the Printhead. For example, low-cost direct thermal stocks have very high reaction temperatures, it takes a great deal of heat to make clear images on this type of paper. The Printer provides three ways to compensate for this:

- (1) Use the H Label formatting command.
- (2) Set the burn time to a higher value. The HEAT command accessed through the main menu will cause more or less heat to be transferred into the media.
- (3) Increase the DARKNESS setting in the main menu for finer adjustments.

5.5 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 here, 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, and/or are not covered in this section.

No Modules Available Message:

- a. No Modules installed.
- b. A Module with corrupt memory. The Printer should be powered off and on again, this should reformat the corrupted Module.
- c. A hardware problem may exist, call for service.

Poor Print Quality:

- a. Dirty Printhead. Clean the Printhead.
- b. Printhead temperature is too high. Use the software control to adjust the burn time, or heat setting or use the HEAT and/or DARKNESS functions within the menu tree.
- c. Incorrect ribbon/paper combination being used. Be sure to use the correct ribbon type.

Printer Does Not Print

(Advances several labels when FEED button is pressed).

- a. Labels are loaded incorrectly. See the loading instructions on the inside cover of the Printer, or Section 1.6.
- b. Media Sensor may be out of adjustment.
- c. Media Sensor or Media Sensor circuitry may be defective, call for service.

Erratic Printing

(Prints strange characters instead of the correct label format).

- a. 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.
- b. Printer is set for 8 data bits but the transmitting device is set up for 7 data bits (or vice versa). Check the current data bits setting from the Operators Panel.

Ribbon Does Not Advance

(Printer advances paper but ribbon does not advance).

- a. Ribbon is installed incorrectly. Make sure the dull side (inked side) of the ribbon is facing the paper.
- b. A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure the correct type of ribbon is being used.

Skips Every Other Label

(Print quality is good but skips every other label).

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

Unable to print in rotation 4

- a. 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.

Print Light lit on the Right Side of Label

- a. Media Width Adjustment Cam is set for a narrower media width than the actual media being used.
- b. Printhead is adjusted for thick media or cardstock.
- c. Printhead misaligned, call for service.

Printer fails to turn on

- a. Blown fuse, call for service.
- b. Faulty AC cord.
- c. Bad Printer power switch, call for service.
- d. Faulty AC wall outlet.

No Display

(Power indicator on but nothing in display).

- a. Contrast is set too low, turn Contrast adjustment clockwise until the display appears.
- b. Faulty Display, call for service.

5.6 Printer Alarms

The Printer has built in alarms that monitor the Printer's status and stock conditions. Alarm messages will be displayed on the Operators Panel LCD display indicating the present status of the Printer, stock levels, or if 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.

The above three alarms are displayed on 'POWER-UP'.

PRINT HEAD FAULT

Thermal Printhead control circuit failed, call for service.

ADC FAULT

Analog to digital converter failed, call for service.

TOF FAULT

Printer failed to find the top of form position.

Possible causes:

1. Defective stock
2. Max Label Length (set from communications or front panel) is smaller than one form.
3. Media sensor out of adjustment.
4. Defective media sensor, call for service.

HEAD UP FAULT

Head is in the UP position, or it is not completely latched down.

OUT OF STOCK

Printer is out of stock or media not loaded correctly.

RIBBON FAULT

The ribbon system detected a fault.

Possible causes:

1. Out of ribbon or not loaded correctly.
2. Ribbon motion was prohibited.
3. Obstructions in the paper movement may cause ribbon faults.

CUTTER FAULT

The cutter operation failed.

**CAUTION**

Turn OFF the Printer and unplug the unit from the outlet before attempting to remove any jam or obstruction from the cutter.

Possible causes:

1. Jam in cutter
2. Defective cutter hardware, call for service.

RIB SAVER FAULT

The Ribbon Saver operation failed.

Possible causes:

1. Obstruction in ribbon area.
2. 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.

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	Œ	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	Œ	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

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

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	Õ	227	E3
ä	132	84	ñ	164	A4		196	C4	ö	228	E4
à	133	85	Ñ	165	A5		197	C5	Ö	229	E5
â	134	86	ª	166	A6	ã	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	ƒ	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	Ü	235	EB
î	140	8C	1/4	172	AC		204	CC	ý	236	EC
ì	141	8D	ì	173	AD		205	CD	Ý	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F	—	175	AF		207	CF		239	EF
É	144	90		176	B0	ð	208	D0		240	F0
æ	145	91		177	B1	Ð	209	D1	±	241	F1
Æ	146	92	²	178	B2	Ê	210	D2		242	F2
ô	147	93	³	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	Ë	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	À	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
Û	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	ï	222	DE		254	FE
f	159	9F		191	BF		223	DF		255	FF

Appendix B

Available Fonts and Bar Codes

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 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. 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.

Human Readable Fonts

Font Matrix Sizes			
Font	Dot H	Dot W	Dot Spacing
0	10	7	1
1	19	10	3
2	27	15	3
3	40	21	3
4	53	27	4
5	77	27	4
6	95	47	6
7	47	22	7
8	41	22	7

Table B-1 Human Readable Font Sizes

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 B-2 Valid Human Readable Font ASCII Characters

Font 0. 96-character alphanumeric Upper and lower case.

Font 1. 145-character upper and lower case alphanumeric w/ descenders and ascenders.

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

```
Font 1:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz
CueaaaaaCeee i i i AAE e E ooo
GüyDUe£Ø×fa iouñÑ@Qç¼qB
```


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

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

Font 3. 62-character alphanumeric uppercase.

FONT 3:
\$ % & () * + . - . / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Å Ä É Ö Ù £ Ø Ñ ¿ ß

Font 4. 62-character alphanumeric uppercase.

FONT 4:
\$ % & () * + . - . / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Å Ä É Ö Ù £ Ø Ñ ¿ ß

Font 5. 62-character alphanumeric uppercase.

FONT 5:
\$ % & () * + . - . / 0 1 2 3 4 5 6 7 6 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Å Ä É Ö Ù £ Ø Ñ ¿ ß

Font 6. 62-character alphanumeric uppercase.

FONT 6:
\$ % & () * + . - . /
0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L
M N O P Q R S T U V W X Y Z
Ç Å Ä É Ö Ù £ Ø Ñ ¿ ß

Font 7. OCR-A, size I.

Font 8. OCR-B, size III.

Font 7:

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

Font 8:

0123456789
<>CENSTXZ|

Font 9. Internal Triumvirate font.

Point sizes are selected by the number in the bar code height field.

4 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
5 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
14 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
18 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
24 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
30 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
36 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
48 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
72 pt AB

Font	Length	Cksum	Valid ASCII Characters
A	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B	11	Yes	48-57 Numeric only. Option V used in the 6th & 7th position
C	6	Yes	48-57 Numeric only
D	Varies	No	48-57 Numeric only
E	Varies	M-103	32-127
F	12	Yes	48-57 Numeric only. Option V used in the 7th & 8th position
G	7	Yes	48-57 Numeric only
H	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I	Varies	No	36, 43, 45-58, 65-68
J	Varies	M-10	48-57 Numeric only
K	Up to 14	M-10	48-57 Numeric only. Option + is Last Character for Second M-11 Checksum
L	13	M-10	48-57 Numeric only
M	2	Yes	48-57 Numeric only
N	5	Yes	48-57 Numeric only
O	Varies	No	35-38, 42-58, 65-90, 97-122
p	Varies	Yes	48-57 Numeric only
Q	19	Yes	48-57 Numeric only
R	18	Yes	48-57 Numeric only
S	34 +	Yes	48-57 Numeric only
T	Varies	Yes	Alpha numeric
U	84	Yes	Alpha numeric
v	1	No	A, B, C, D
z	Varies	Yes	All

Table B-3 Valid Bar Code Font ASCII Characters

Barcode A. Code 3 of 9



Barcode B. UPC-A



Barcode C. UPC-E



Barcode D. Interleaved 2 of 5



Barcode E. Code 128



Barcode F. EAN-13



Barcode G. EAN-8



Barcode H. Health Industry Barcode (HBIC)



Barcode I. Codabar



Barcode J. Interleaved 2 of 5 w/modulo 10 checksum



Barcode K. Plessey



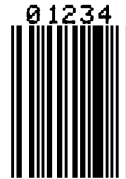
Barcode L. Interleaved 2 of 5 w/modulo 10 checksum and shipping bearer bars



Barcode M. 2 Digit UPC addendum



Barcode N. 5 Digit UPC addendum



Barcode O. Code 93



Barcode p. Postnet



Barcode Q. UCC/EAN Code 128



Barcode R. UCC/EAN Code 128 KMART NON EDI



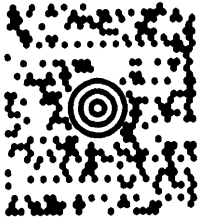
Barcode S. UCC/EAN Code 128
Random Weight



Barcode T. Telepen



Barcode u. UPS MaxiCode



Barcode v. FIM



Barcode z. PDF-417



Font Cartridges

Font cartridges are pre-loaded with 13 sizes of each typeface in both portrait and landscape orientations. To print a particular size, specify a "name" by which that size was stored on the cartridge. The following are the names of each font and size available for all font cartridges:

CG Triumvirate (Internal Font)

Point Size	New Numbering system Portrait and Landscape Font ID	Old Numbering system Portrait and Landscape Font ID
4	A04	
5	A05	
6	A06	001
8	A08	002
10	A10	003
12	A12	004
14	A14	005
18	A18	006
24	A24	007
30	A30	008
36	A36	009
48	A48	010
72	A72	

CG Triumvirate Italic

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

CG Triumvirate Bold

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

CG Triumvirate Bold Condensed

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

CG Times

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

CG Times Bold

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

Futura Extra Bold Condensed

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

Appendix C

Error Codes

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

Lowercase "c"

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

Lowercase "e"

Memory Module won't clear. Retry after a <STX> W command.

Lowercase "v"

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

Uppercase "I"

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

Uppercase "R"

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

Uppercase "T"

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

BELL HEX "07"

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

Appendix D

Warranty Information

DMX 600/800

Printer

Datamax warrants to Purchaser that under normal use and service, the DMX 600/800, (with the exception of the thermal Printhead) 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 DMX 600/800 thermal printhead. This one year (365 days) 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) 578-8007 extension 5550. 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.

