

Meto mn-4

Label and Tag Printer

Programming Manual



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Part Number: 88-2256-11
Revision: A

Agency Compliance and Approvals:



UL1950 Information Technology Equipment
C22.2 No. 950-M93



EN60950

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

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.

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



The manufacturer declares under sole responsibility that this product conforms to the following standards or other normative documents:

EMC: EN 55022 (1993) Class A
EN 50024 (1998)

Safety: This product complies with the requirements of EN 60950 (1992), A1 (1993), A2 (1993), & A3 (1995)



Gost-R

FCC: This device complies with FCC CFR 47 Part 15 Class A.

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

Important Safety Instructions

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

- Carefully read the installation and operating instructions provided with your printer.
- Read and follow all warning instruction labels on the printer.
- Place the printer on a flat, firm, solid surface.
- To protect your printer from overheating, make sure all openings on the printer are not blocked.
- Do not place the printer on or near a heat source.
- Do not use your printer near water, or spill liquid into it.
- Be certain that your power source matches the rating listed on your printer. If you are unsure, check with your dealer or with your local power company.
- Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.
- Do not insert anything into the ventilation slots or openings on the printer.
- Only qualified, trained service technicians should attempt to repair your printer.

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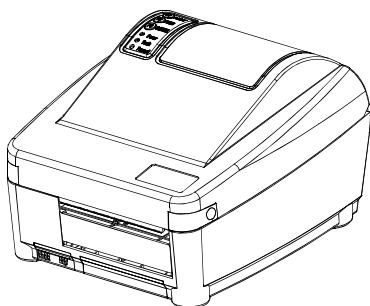
Appendix C

Limitation of Liability.....	C-1
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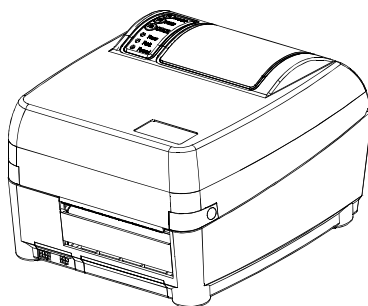
1 *Printer Overview*

1.0 Introduction

The ***mn-4203*** hereafter referred to as ‘the printer’, is a user-friendly printer that blends quality and durability at an affordable price. The front panel was designed to make operation of the printer a simple task. The printer offers direct thermal and optional thermal transfer printing as well as RS232 serial and parallel interfaces for ease of connection to your host system.



Direct Thermal Model



Thermal Transfer Model

This manual provides all the information necessary to operate the printer.

To print labels or tags simply refer to the instructions included with the software you have chosen to create the labels. A Windows™ printer driver can be found on our website or on the Accessories CD.

If you wish to write a custom program, a copy of the ***mn-4 Series Programmer's Manual (88-2265-11)*** is included on the Accessories CD.

1.1 About this Printer

This printer offers the following standard and optional features:

1.1.1 Standard Features

Printing

- Direct Thermal Printing
- On Demand and Batch Printing
- 203 DPI Printhead
- AGFA Scalable Font Engine

Memory

- 1 MB FLASH memory
- 2 MB DRAM Memory

Interfaces

- This printer is equipped with an RS-232 serial interface and a Centronics parallel interface.

Operational

- Simple Media Loading
- Media Tearbar
- Fan-fold media compatible from rear of printer
- 1" (25mm) internal media supply core

1.1.2 Optional Features

Thermal Transfer

Thermal transfer printing requires the use of a ribbon. The ink/wax from the ribbon transfers to the media by the printer to create an image. Thermal transfer printing provides exceptional clarity and scanability.

External Cutter

The external cutter provides ease of automatic cutting for tags and labels after a label is printed. This feature attaches to the front of the printer.

Present Sensor

The present sensor allows the printer to be configured for "one up" printing. With the sensor installed, the printer will not print the next label until the previous printed label has been removed from the printer.

FLASH Memory Expansion

FLASH Expansion cartridges are used for permanent storage of custom fonts, formats and graphics. The FLASH memory cartridges cannot be used in conjunction with the ILPC option

External Media Supply Stand

The external media supply option allows the use of large media supply rolls, up to 8-inches in diameter, on 1–3" cores.

ILPC

International Print Capability consisting of one of the following:

- CG-Times (western European) Scalable font
- Kanji Gothic B Scalable font
- Simplified Chinese GB Scalable font

2 *Getting Started*

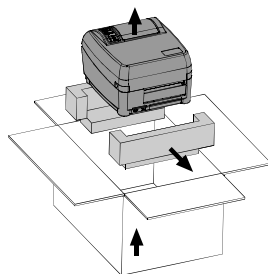
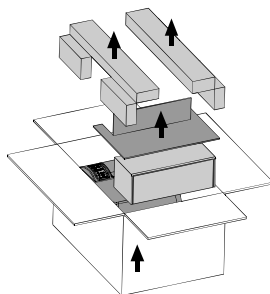
2.0 Before using the Printer

Removing the Packaging

Inspect the shipping container(s) for damage, if damage is evident notify the shipping company to report the nature and extent of the damage.

The printer is carefully packaged to avoid any damage during transit. In order to operate the printer you will need to remove the packaging materials, (i.e., tape and foam) that were placed in the printer for shipment. Complete the following steps prior to connecting power or attempting to load media.

- Open the box, (make sure the arrow on the box is pointing up).
- Remove packing foam, cardboard divider, and power supply box.
- Lift the printer from its box and remove the packing foam.
- Remove the plastic bag from the printer.

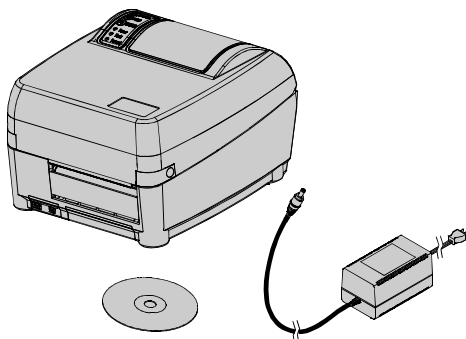


<p><input checked="" type="checkbox"/> Note: It is a good idea to save the carton and packaging materials in the event shipping the printer is ever required.</p>
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Inspecting the Printer

After removing the printer from the packaging material, check the contents of the package. The following items should be included:

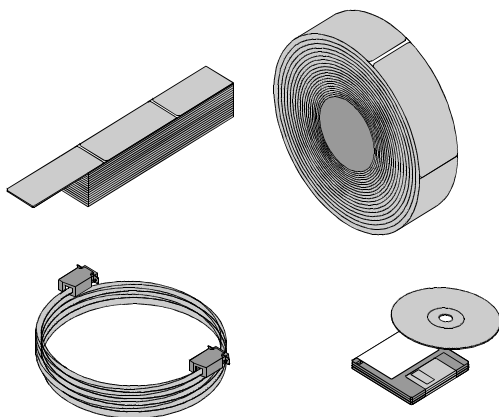
- Printer
- External power supply
- Accessories CD
- Special or additional items purchased.



Additional Requirements

The following items are necessary for generating labels from your printer. Contact your customer support representative for advice on which media and software is best suited for your needs.

- Serial or parallel cable
- Applicable media
- Applicable software



3 *Setting up the Printer*

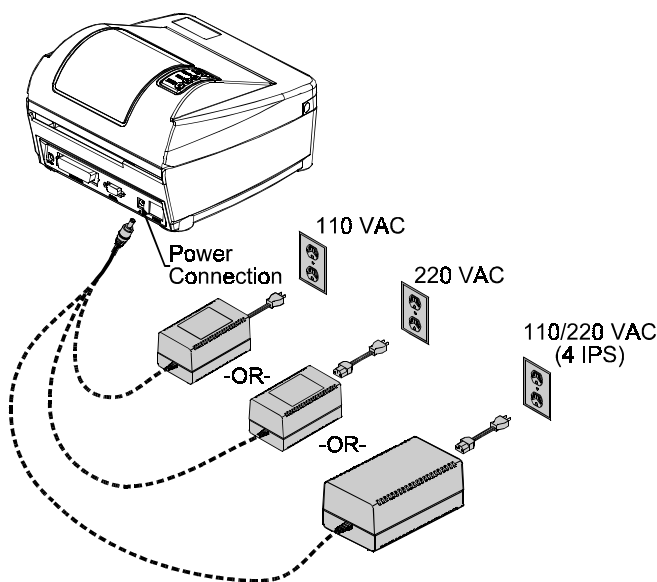
3.0 Introduction

This chapter explains how to connect your printer, load media and ribbon (optional), and print a configuration label.

3.1 Connecting the Printer

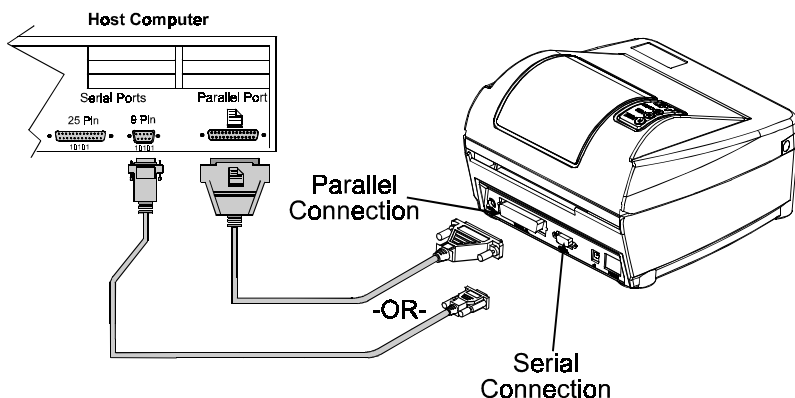
3.1.1 Power Connection

The printer is powered from an external power supply that connects to the printer as shown below. Power supplies are available in both 110 and 220 AC voltages as well as an auto-ranging (110V/220V) power supply for the printer's 4 IPS (inches per second) print speed option. Ensure that the power supply shipped with your printer matches your electrical service.



3.1.2 Interface Connection

The printer can be connected to the host via a **serial** or **parallel** cable.



3.1.3 Interface Cables

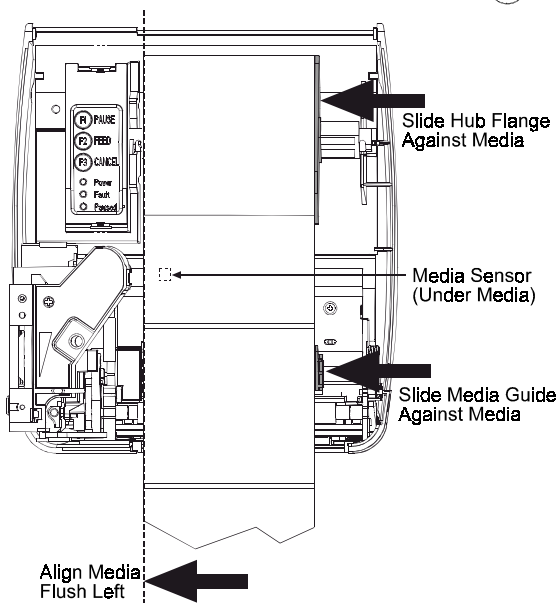
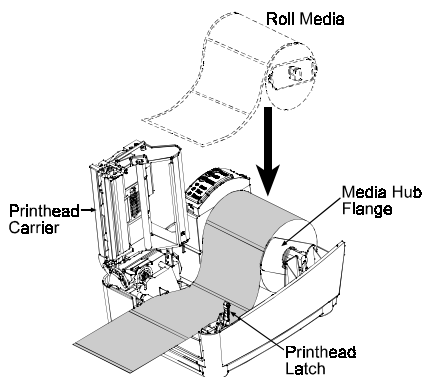
An interface cable is necessary to connect the printer to the host. The interface between the printer and the host will be either a serial RS-232C or parallel cable. Cable configurations for serial (RS-232C) interfaces are shown below, (contact your reseller for part numbers and ordering information).

Host DB-9S	Printer DB-9P	Host DB-25S	Printer DB-9P
TX 3	2 RX	TX 2	2 RX
RX 2	3 TX	RX 3	3 TX
	7 RTS		7 RTS
CTS 8	4 DTR	CTS 5	4 DTR
DSR 6	8 CTS	DSR 6	8 CTS
GND 5	5 GND	GND 7	5 GND
DTR 4		DTR 20	
Shield	Shield	Shield	Shield
Part# 425 063		Part# 425 064	

The printer can also be connected to the host with a parallel connection. In addition, the printer has a unique feature where if you connect both the serial and parallel cables to the printer at the same time, the printer will automatically interface to the first connection, (serial or parallel) that transmits valid data. After a connection has been made, the printer must be turned off and then back on again to change the interface connection.

3.2 Loading Media

1. Open the cover.
2. Push the Printhead Latch toward the back of the printer and raise the Printhead Carrier Assembly.
3. Place a roll of media (labels facing up) on the media hub and insert them into the printer. Slide the Media Hub Flange against the roll of media.
4. Route the media as shown below.

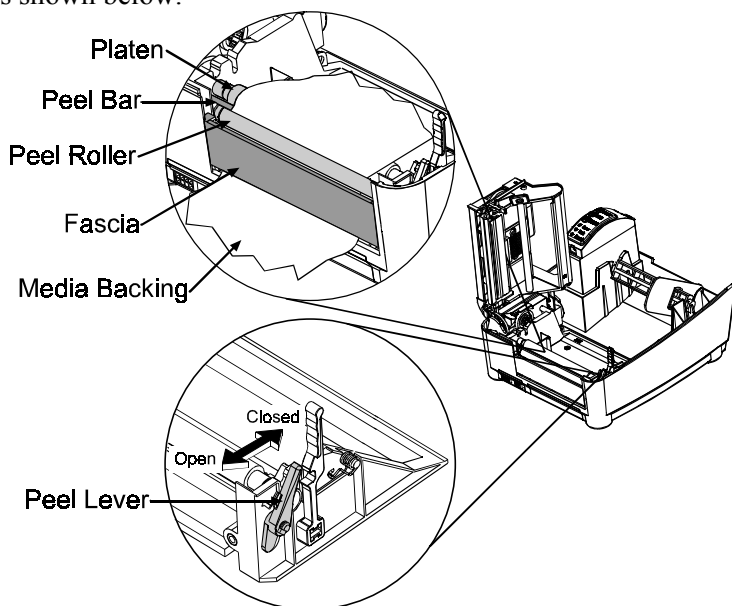


5. Slide the Media Guide to the edge of the media.
6. Close the Printhead Carrier Assembly and press down until it locks into place.
7. Close the cover and press the 'Feed' button several times to feed the media and ensure proper tracking. If the printer does not correctly sense the top of each label it may be necessary to perform the Calibration Procedure, Section 4.5.

Note: The printer is factory set for 4-inch media and ribbon, when using different width media/ribbon please refer to Chapter 5.

3.2.1 Loading Media for Peel Configuration

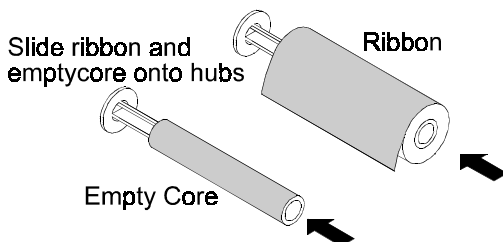
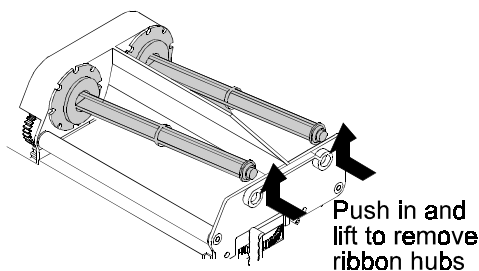
1. Open the cover.
2. Push the Printhead Latch toward the back of the printer and raise the Printhead Carrier Assembly.
3. Place a roll of media (labels facing up) on the media hub and insert them into the printer. Slide the Media Hub Flange against the roll of media.
4. Pull the Peel Lever forward to the 'Open' position.
5. Remove 6" (152 mm) of labels from the backing. Route the backing over the Platen and Peel Bar and behind the Peel Roller and Fascia as shown below.



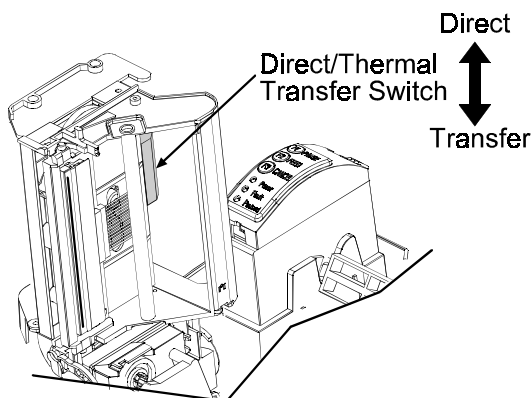
6. Push the Peel Lever back to the 'Closed' position
7. Close the printhead carrier assembly and press down until it locks into place.
8. Close the cover and press the 'Feed' button several times to feed the media and ensure proper tracking. The labels will separate automatically as it feed through the printer. If the printer does not correctly sense the top of each label it may be necessary to perform the Calibration Procedure, Section 4.5.

3.3 Loading Ribbon (Thermal Transfer)

1. Open the cover.
2. Remove the two ribbon hubs.
3. Slide a roll of Ribbon onto one of the Ribbon Hubs and an Empty Core onto the other hub.

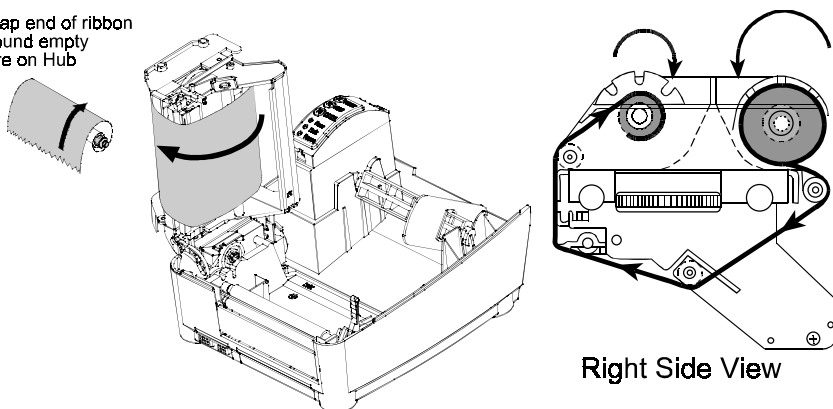


4. Push the Printhead Latch toward the back of the printer and raise the Printhead Carrier Assembly.
5. Slide the Direct/Thermal Transfer switch to the 'Transfer' position.



6. Place the Ribbon Hubs back into the printer and route the ribbon through the printhead carrier assembly as shown below.

Wrap end of ribbon
around empty
core on Hub



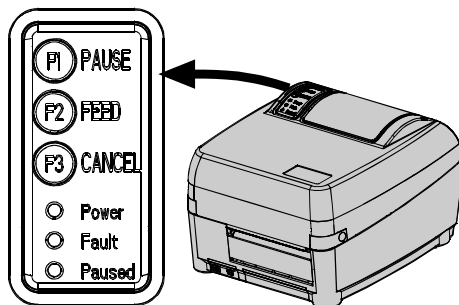
Note: The above 'Right Side View' shows proper ribbon routing for "ink side wound-in" ribbons. For "ink side wound-out" ribbons the ribbon supply hub will rotate in the opposite direction from that shown above. In either case always make sure the ink side of the ribbon faces the media and NOT the printhead.

7. The 'Media Type' setting within the printer's setup must be set to 'Thermal Transfer' to print using a ribbon. See Section 4.4.

4 *Using the Front Panel*

4.0 Front Panel Operation

The Front Panel consists of three lights and three dual-function buttons. The functions of these lights and controls are listed below.



4.1 Lights

(Normal power-up)

Normal Mode

○ Power

Indicates the printer is on

○ Fault

Indicates a top of form or mechanical error has occurred

○ Paused

Solid On: Indicates the printer is in the 'Paused' state

Blinking: Indicates the printer is receiving data from the host

- Both the POWER and PAUSED lights will be on during power-up initialization, or "warm reset".

4.2 Buttons

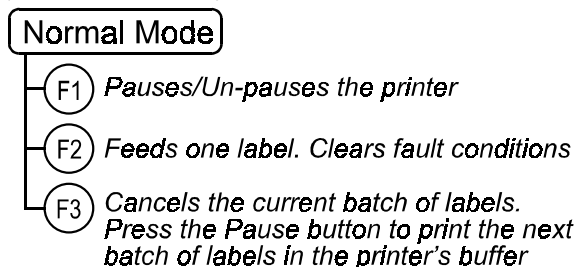
Three buttons perform different functions based on the mode the printer is in. The printer operates in one of the following modes:

- Normal:** Normal printer functions (i.e. Pause, Feed, and Cancel). See Section 4.3
- Printer Setup:** Allows setting of the printer's operating menu items (i.e. Media Settings, Communications, and Options. See Section 4.4
- Calibration:** Allows the printer to 'calibrate' the media for sensing of the Top of Form. See Section 4.5

4.3 Normal Mode - Button Functions

In 'Normal Mode' the printer's buttons control normal operations such as Pause, Feed, and Cancel as well as test and reset functions by using button combinations.

(Normal power-up)



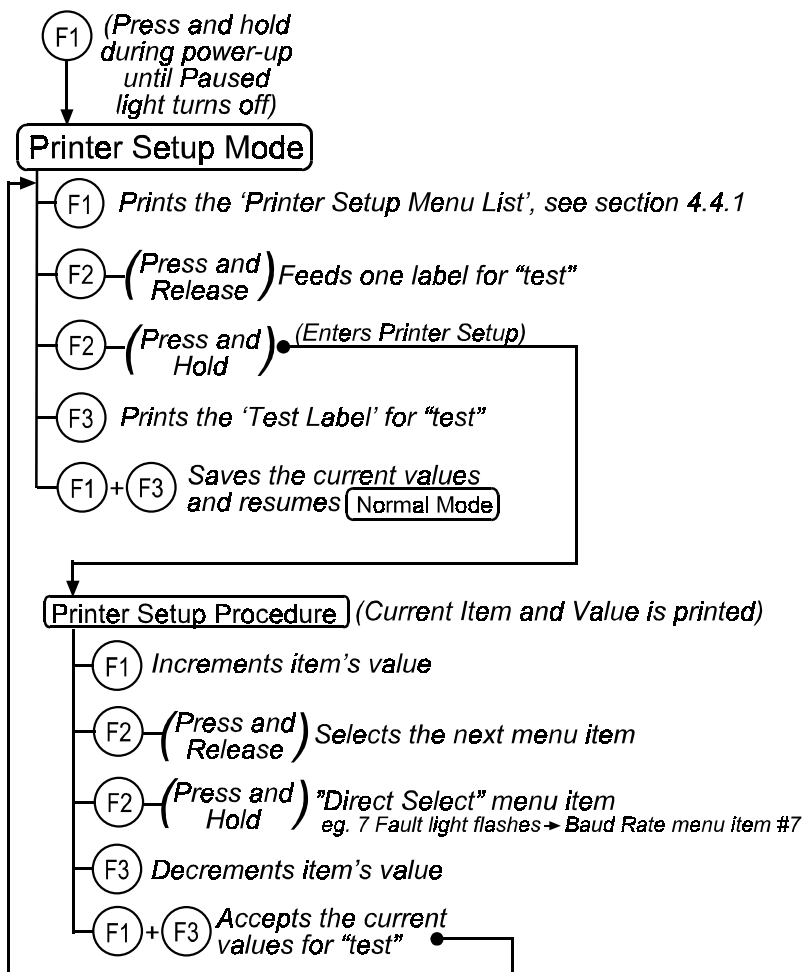
Button Combinations *(push buttons simultaneously)*

(F1)	+	(F2)	Prints the Test Label, see section 4.6.2.
(F1)	+	(F3)	Performs a warm reset and return to the Normal Mode of operation.
(F2)	+	(F3)	Will cause the printer to print the Database Configuration and Dot Pattern Labels.

4.4 Printer Setup Mode - Button Functions

In 'Printer Setup Mode' the printer's buttons control the setting of the printer's operating menu items such as Media Settings, Communications, and Options.

Note: If at any time you wish to discard your changes and revert back to the previous values simply turn off the printer.



Note: Printer and cutter faults are disabled during **Printer Setup Procedure**, but can still occur while printing "test" labels.

Note: Factory Defaults can be restored, see section 5.7

4.4.1 Printer Setup Menu List

The sample label below is the Printer Setup Menu List. This label shows all of the printer's current values for each menu item that can be modified using the front panel. The number far left of the Menu Item corresponds to its position in the Menu List, for selection by pressing $\textcircled{F2}$.

For example to "Direct Select" the BAUD RATE Menu Item press and hold the $\textcircled{F2}$ button for 7 flashes of the Fault light; for the TOF GAIN item hold $\textcircled{F2}$ for 12 flashes, etc.

Values		
1)	DIRECT	MEDIA TYPE
2)	EDGE	SENSOR TYPE
3)	NO	PRESENT SENSOR
4)	NO	CUTTER EQUIPPED
5)	128	SOP ADJUST, 0.005 in.
6)	128	PRESENT ADJUST, 0.005 in.
7)	9600	BAUD RATE, bps
8)	8,N	DATA, PARITY
9)	STD	CONTROL CODES
10)	100	CONT FORM LENGTH, 0.01 in.
11)	2	OOS MAXVOLT, 0.1 Volts
12)	10	TOF GAIN
13)	10	TOF DELTA, 0.1 Volts
14)	0	TOF LOW, 0.1 Volts
15)	410	LABEL WIDTH, 0.01 in.
16)	64	SCALABLE FONT, 4KB
17)	128	INTERNAL MODULE, 4KB

Note: When using narrow media the 'Menu Items' column will be truncated.

4.4.2 Menu Items and Values

The table below lists all the menu items and their possible values in the ‘Printer Setup Procedure’.

Item# (Flashes)	Item Name	Description	Possible Values
1	Media Type	Sets printing for either direct thermal or thermal transfer stock.	*DIRECT THERMAL THERMAL TRANSFER
2	Sensor Type	Select the sensor type that matches your label stock.	*EDGE: (Gaps in media) (REFL) REFLECTIVE: (Black stripes) (CONT) CONTINUOUS: (No sensing)
3	Present Sensor	Enables/Disables optional Present Sensor	*NO or YES
4	Cutter Equipped	Enables/Disables optional Cutter	*NO or YES
5	SOP Adjust	Allows fine-tuning of the starting print position on each label.	0 – 255; default = *128 0 = close to edge 255 = furthest from edge
6	Present Adjust	Adjusts the present distance.	0 – 255; default = *128 0 = close to edge 255 = furthest from edge
7	Baud Rate	Serial port baud rate.	600 to 38.4k; default = *9600
8	Data, Parity	Data word length and parity.	*8,N or 7,E
9	Control Codes	Allows code selection listed in Programmer’s manual.	(STD) *STANDARD CODES (ALT) ALTERNATE CODES
10	CONT. Form Length	Sets label length for continuous media.	0 – 9999; default = *100
11	OOS MAXVOLT	Sets the sensor reading that can indicate OOS, (out of stock condition).	0 – 16; default = *2 Units: 0.1 volt
12	TOF Gain	Sets TOF Gain value.	0 – 15; default = *10
13	TOF Delta	Sets minimum change in the sensor reading required to recognize a “Gap” or Mark”.	0 – 50; default = *10 Units: 0.1 volt
14	TOF Low	Sets the minimum sensor reading for paper (EDGE) or mark (Reflective).	0 – 50; default = *0 Units: 0.1 volt
15	Label Width	Sets the label width.	75 – 410; default = *410
16	Scalable Font Cache	Sets the number of 1K blocks allocated for scaleable fonts.	0 – 128; default = *64
17	Internal Module	Sets the number of 1K blocks allocated for the internal RAM module.	0 – 128; default = *128

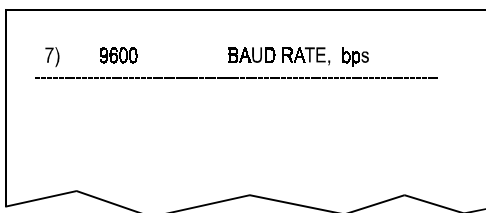
* = Default Setting

All of the menu items listed in the previous table are stored in non-volatile memory.

4.4.3 Example of Changing Baud Rate

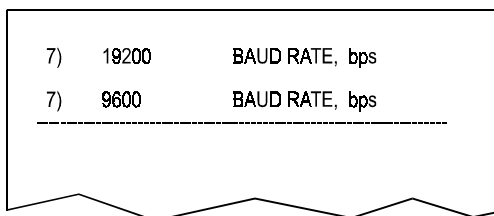
The following is a step by step example for modifying the Printer Setup. Although this example will show how to modify only the Baud Rate value from a default of 9600 bps to 19200 bps the same procedure can be used to change any of the printer's menu items.

1. With printer off and properly loaded with media press and hold the $\textcircled{\text{F1}}$ button while powering up the printer. Continue to hold the button until the PAUSED light turns off then release.
2. Press and hold the $\textcircled{\text{F2}}$ button and count 7 flashes of the Fault light then release. The following printout should be showing:



7) 9600 BAUD RATE, bps

3. Press the $\textcircled{\text{F1}}$ button once to increment to the 19200 bps value. The following printout should be showing:



7) 19200 BAUD RATE, bps

7) 9600 BAUD RATE, bps

4. At this point you will accept the current values for “test” and exit the Printer Setup Procedure by pressing the $\textcircled{\text{F1}}+\textcircled{\text{F3}}$ buttons simultaneously.

Note: If you wish to discard your changes and revert back to the previous values simply turn off the printer before Step 5.

5. Now you can save your changes and resume **Normal Mode** by again pressing the $\textcircled{\text{F1}}+\textcircled{\text{F3}}$ buttons simultaneously. Wait about 15 seconds for **Normal Mode** to begin.

Continued...

6. To confirm that your changes have been made press the $\text{F2} + \text{F3}$ buttons simultaneously, this will print the Database Configuration Label. The label should show the new Baud Rate value of 19200.

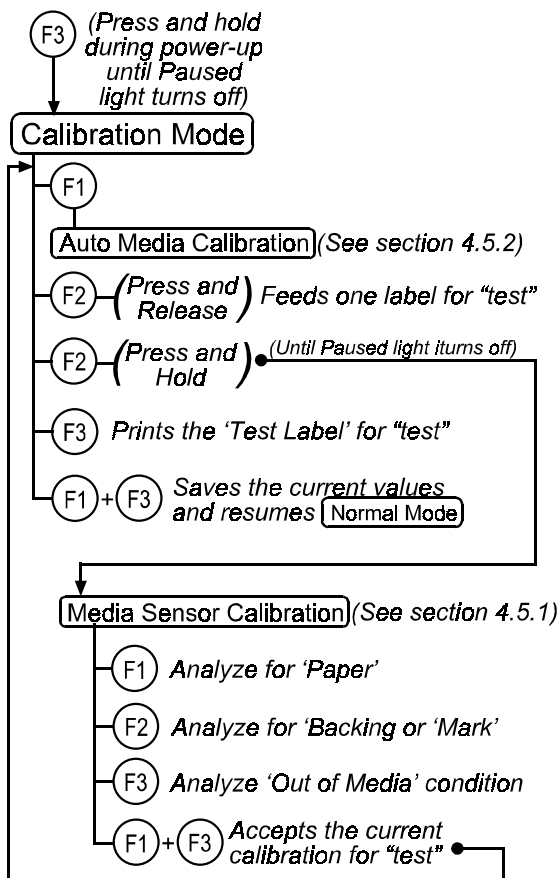
FRI SEPTEMBER 026, 1997 19:29	CONFIGURATION	
244	DIRECT THERMAL	
VER: mn-4203 - 01.01 09/30/99	COMMUNICATIONS NOT DETECTED	
BOOT 83-2279-01A	19.2,8,N	New '19.2' Value
CODE 83-2280-01A	EDGE	
FONT 83-2281-01A	SOP ADJUST	128
EXPN	PRESENT ADJUST	128
SYSTEM RAM CHECKS GOOD	TOF LOW	0
SYSTEM RAM SIZE 2016 KBYTES	TOF DELTA	10
SYSTEM RAM AVAIL 1264 KBYTES	TOF GAIN	10
REG POWER SUPPLY NO	OOS MAXVOLT	2
INPUT VALUES	COUNTER INFORMATION	
PAPER 255	ABSOLUTE VALUES 9-18-1999	
DARKNESS 131	LENGTH 773 INCHES	
TRAN 255	TIME 20 HOURS	
REFL 149	RESETTABLE VALUES 9-22-	
RIBM 87	1999	
THR 48	LENGTH 576 INCHES	
24V 223	TIME 10 HOURS	
	MEMORY CONFIGURATION	
	INTERNAL MODULE 128	
	SCALABLE FONTS 64	
	LABEL SIZE 0410:02218	
	IN	

4.5 Calibration Mode

In 'Calibration Mode' the printer's buttons allows the printer to 'calibrate' the media for sensing of the Top of Form either automatically or manually.

Note: If at any time you wish to discard your changes and revert back to the previous calibration simply turn off the printer.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.



Note: Printer and cutter faults are disabled during **Auto Media Calibration** and **Media Sensor Calibration**, but can still occur while printing "test" labels.

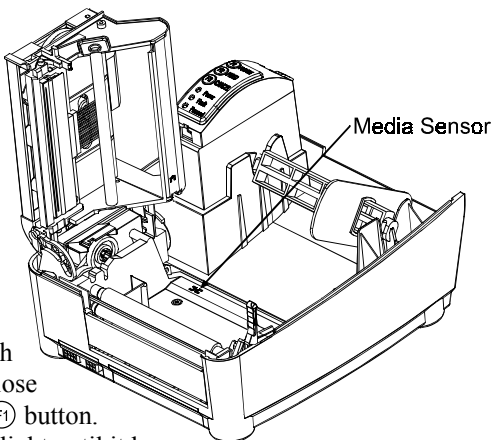
Note: Factory Defaults can be restored, see section 5.7

4.5.1 Media Sensor Calibration Procedure

The 'Media Sensor Calibration Procedure' allows the operator to recalibrate the selected media sensor (reflective or gap) for a selected media. Follow the steps below to calibrate your sensor.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.

1. Hold the (F3) button while powering up the printer, continue to hold the button until the PAUSED light turns off then release. Next press and hold the (F2) button, continue to hold the button until the PAUSED light turns off then release.
2. Place a sample of your media (with backing) over the media sensor, close the printhead, and then press the (F1) button. The printer will flash the FAULT light until it has finished analyzing the material.
3. Place a sample of your media backing or position the reflective mark of your continuous media over the media sensor, close the printhead, and then press the (F2) button. The printer will flash the FAULT light until it has finished analyzing the material.
4. Remove all media from the media sensor, close the printhead, and then press the (F3) button. The printer will flash the FAULT light until it has finished analyzing the media sensor for no media.
5. Once the calibration is complete (all three operations performed) press the (F1)+(F3) buttons simultaneously to accept the current calibration for "test" and exit the **Media Sensor Calibration**.
6. Use the (F2) button, (feeds blank label) and the (F3) button, (prints test label) to test the current calibration.



Note: If you wish to discard your changes and revert back to the previous calibration simply turn off the printer before Step 7.

7. Now you can save your changes and resume **Normal Mode** by again pressing the (F1)+(F3) buttons simultaneously.

4.5.2 Auto Media Calibration Procedure

The 'Auto Media Calibration Procedure' allows the operator to automatically obtain the optimum (TOF Low and TOF Delta) values for a particular media. These values are useful for media that continues to have troubles after Media Sensor has been manually calibrated (usually preprinted media). This operation feeds 10 inches of media using the current Media Sensor Calibration setting and calculates the TOF Delta and TOF Low values to be used. Upon completion the printer will exit back to 'Calibration Mode' flashing the PAUSED light if successful or the FAULT light if not successful.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.

To perform the Auto Media Calibration complete the following steps:

1. Load the desired media.
2. Hold the $\textcircled{F3}$ button while powering up the printer. Continue to hold the button until the PAUSED light turns off then release.
3. Next press the $\textcircled{F1}$ button, (the printer will now calibrate to the media)
4. The PAUSED light will flash 5 times to indicate a successful calibration. The FAULT light will flash 3 times to indicate an unsuccessful calibration.

Note: If you wish to discard your changes and revert back to the previous calibration simply turn off the printer before Step 5.

5. Now you can save your changes and resume **Normal Mode** by again pressing the $\textcircled{F1}+\textcircled{F3}$ buttons simultaneously.

4.6 Internal Labels

The following sections explain each of the printer's internally generated test and configuration labels.

4.6.1 Database Configuration and Dot Check Label

To print the Database Configuration and Dot Check Labels:

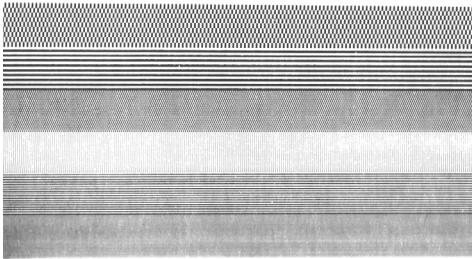
With the printer on, loaded with media (at least 4 inches wide), and ribbon (if printing in thermal-transfer). Press the (F2)+(F3) buttons simultaneously to print the Database Configuration and Dot Check Label

Alternately, press and hold the (F2) button and turning the printer on, continue holding the F2 button until the Paused light turns off. Using this method will initiate the 'Character Dump Mode'. Turn the printer off to terminate the 'Character Dump Mode'.

The first label printed will be the Database Configuration Label, which lists the printer's configuration and status.

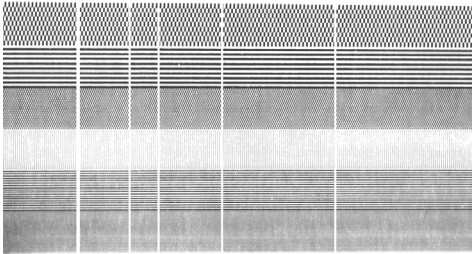
FRI SEPTEMBER 026, 1997 19:29	CONFIGURATION
244	DIRECT THERMAL
VER: mn-4203 - 01.01 09/30/99	COMMUNICATIONS NOT DETECTED
BOOT 83-2279-01A	9600,8,N
CODE 83-2280-01A	EDGE
FONT 83-2281-01A	SOP ADJUST_____ 128
EXPN	PRESENT ADJUST_____ 128
SYSTEM RAM CHECKS_____ GOOD	TOF LOW_____ 0
SYSTEM RAM SIZE_____ 2016 KBYTES	TOF DELTA_____ 10
SYSTEM RAM AVAIL_____ 1264 KBYTES	TOF GAIN_____ 10
REG POWER SUPPLY_____ NO	OOS MAXVOLT_____ 2
INPUT VALUES	COUNTER INFORMATION
PAPER_____ 255	ABSOLUTE VALUES 9-18-1999
DARKNESS_____ 131	LENGTH_____ 773 INCHES
TRAN_____ 255	TIME_____ 20 HOURS
REFL_____ 149	RESETTABLE VALUES 9-22-1999
RIBM_____ 87	LENGTH_____ 576 INCHES
THR_____ 48	TIME_____ 10 HOURS
24V_____ 223	
	MEMORY CONFIGURATION
	INTERNAL MODULE_____ 128
	SCALABLE FONTS_____ 64
	LABEL SIZE 0410:02218 IN

The second label printed is the Dot Check Label. This label is used to determine whether the printhead is in need of replacement. 'Good' and 'Faulty' Dot Check Labels are shown below:



Good Test Label:

Indicates that the printhead is operating normally.



Faulty Test Label:

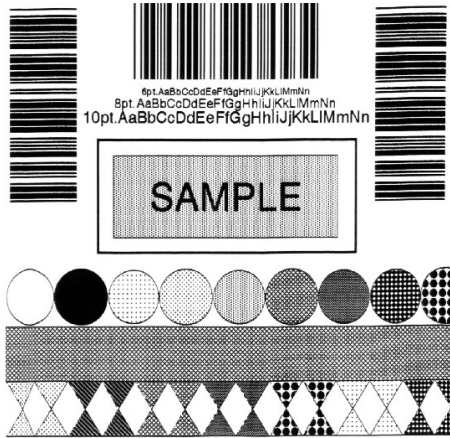
Streaks in test label indicate a dirty or faulty printhead. (See Chapter 5 for cleaning and replacement.)

4.6.2 Test Label

This label is intended to be used to evaluate the current printer setup for print quality and label tracking and positioning.

To print the Test Label:

With the printer loaded with media (at least 4 inches wide), and ribbon (if printing in thermal-transfer), press the (F1) + (F2) buttons simultaneously to print the Internal Test Label.



5

Maintenance and Adjustments

5.0 Introduction

This chapter covers the cleaning, adjusting, and some troubleshooting tips involved with your printer. In addition, the following table provides a recommended cleaning schedule for the various parts of your printer.

Area	Method	Interval
Printhead	Turn off the printer before cleaning the printhead. Use solvent* on a cotton swab to clean the printhead from end to end.	After every roll of media.
Platen Roller	Turn the power off. Rotate the platen roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Peel-Off Roller	Rotate the peel-off roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Media Path	Solvent*	After every roll of media.
Peel/Tear Bar	Solvent*	As needed
Media Sensor	Air blow	Monthly
Exterior	Mild detergent or desktop cleaner.	As needed
Interior	Brush or vacuum cleaner	As needed.

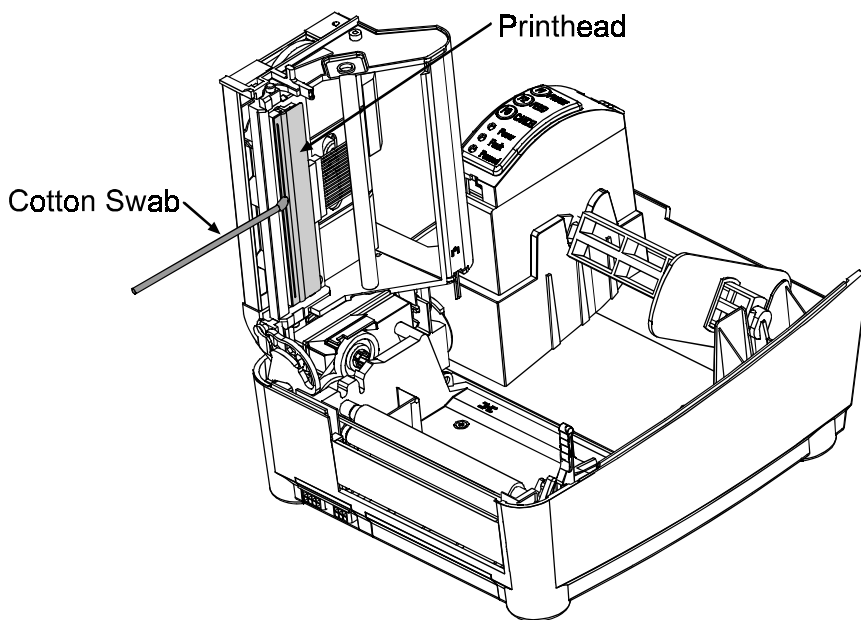
* Recommend using a solvent that contains isopropyl alcohol.

Warning: Isopropyl alcohol is a flammable solvent, always take the proper precautions when using this solvent.

5.1 Cleaning the Printhead

Warning: Turn 'off' the printer and unplug the unit from the outlet before cleaning the printhead.

1. Turn 'off' the printer and open the cover.
2. Push the printhead latch back toward the back of the printer and raise the printhead carrier assembly.
3. Using a Cotton Swab dipped in isopropyl alcohol, rub the Cotton Swab along the Printhead.

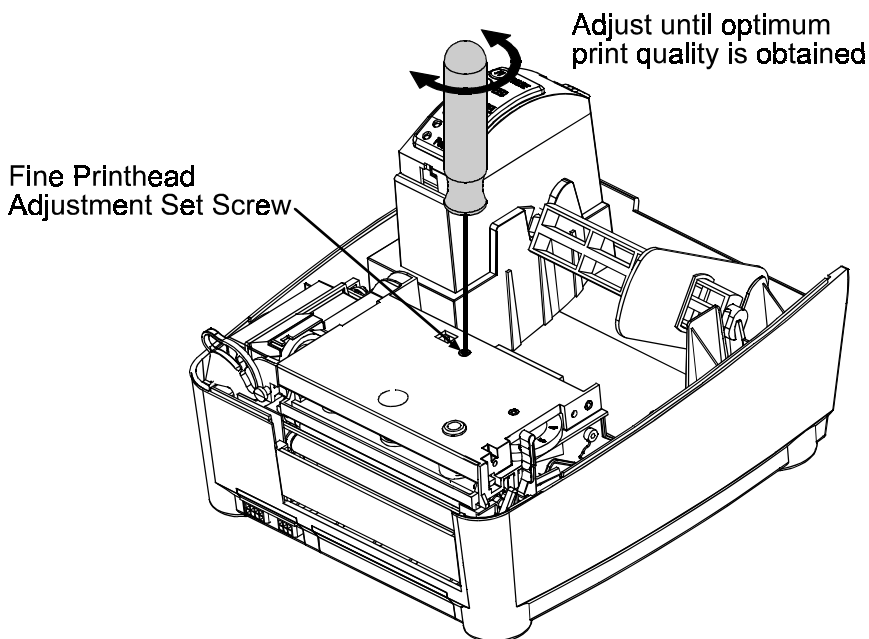


5.2 Fine Printhead Adjustment

A fine printhead adjustment set screw is located on top of the printhead carrier assembly that can be used for adjusting print quality. This adjustment is set at the factory and should not need further adjusting; however, with different types and thickness of media some adjustment may be necessary.

To adjust the printhead, turn the Set Screw until optimum print quality is obtained, (some trial and error may be necessary). Do not over tighten the Set Screw.

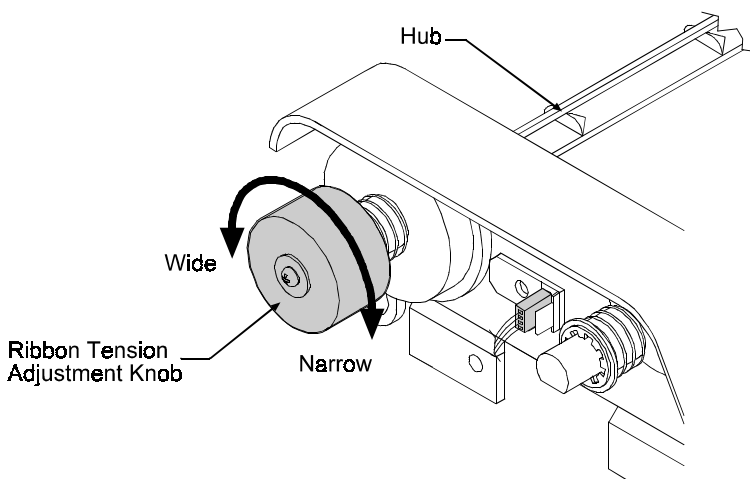
Note: It is not necessary to remove the Ribbon Handler Assembly, (if equipped). An access hole in the assembly is provided adjustments.



5.3 Ribbon Width Adjustment

The adjustable ribbon handler feature allows adjustment to the ribbon supply hub that provides optimum tension when using different widths of media or ribbon.

1. Turn 'off' the printer.
2. Hold the Hub and rotate the Ribbon Tension Adjustment Knob to meet your media/ribbon widths based on the table below. Ensure that the Ribbon Tension Adjustment Knob is turned fully to the clockwise or counter-clockwise position, the knob will no longer turn once it is in the proper position, do not force or over turn.

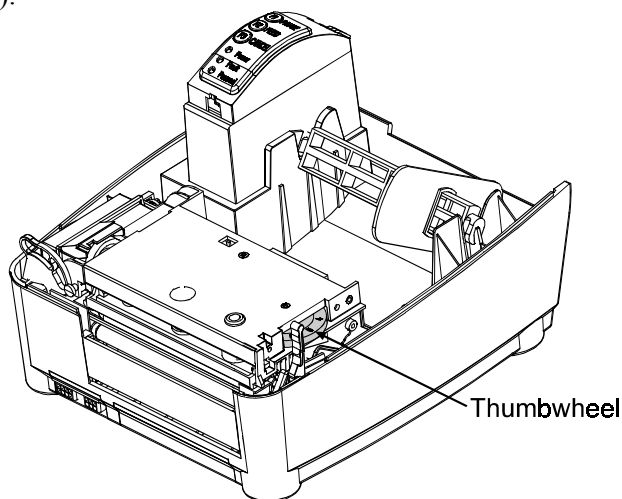


Ribbon Size	Ribbon Width	Direction of Rotation
Narrow	1-2 inches wide	Clockwise*
Wide	2-4 inches wide	Counter-Clockwise*

* Continue turning the ribbon tension adjustment knob until it will not turn any further in either the clockwise or counter-clockwise position.

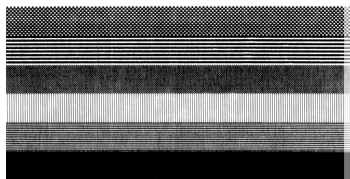
5.4 Media Width Adjustment

The thumbwheel on the side of the printhead carrier assembly allows the printhead to be adjusted for various sizes of media. The numbers on the thumbwheel serve only as a reference point and do not correspond with a particular media width. To adjust for narrow media move the Thumbwheel to the left (frontward), for wide media move it to the right (rearward).



1. Load media into the printer.
2. Print a label, if it is light on the right-hand side then move the Thumbwheel to the right (rearward), (see example below).

Light print on the right side of the test label indicates that the Thumbwheel should be adjusted to the right (rearward).



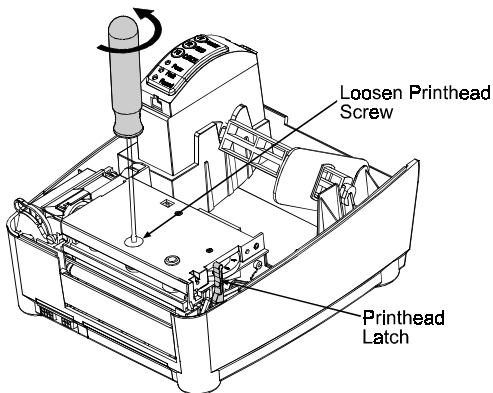
Note: If the media begins tracking to the right while printing the Thumbwheel should be adjusted to the left (forward)

5.5 Printhead Replacement

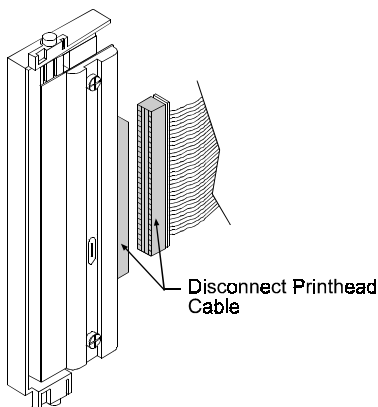
Removal:

Note: It is not necessary to remove the Ribbon Handler Assembly, (if equipped). An access hole in the assembly is provided for access.

1. Turn off the printer.
2. Loosen the Printhead Screw until it is free from the printhead. Carefully unlatch the printhead carrier assembly and remove the printhead.



3. Remove the printhead cables from the back of the printhead.



Replacement:

1. Connect the printhead cable to the new printhead.
2. Position the printhead on the printhead carrier assembly and tighten the printhead screw.
3. Ensure that the printhead cable is not pinched and that the Printhead is clean.

5.6 Darkness Adjustment

The Darkness Adjustment (located on the rear of the printer), allows the operator to adjust the 'print darkness' on the printed ticket. Turning the Darkness Adjustment clockwise will make the print darker, turning it counterclockwise will lighten the print.

Note: Large increases the 'Darkness Adjustment' can shorten printhead life. If you need to increase the 'Darkness' level large amounts, try instead increasing the Heat value and/or slowing the Print Speed through your software or DPL commands first.

5.7 Resetting to the Factory Defaults

With the printer off, press and hold the F1, F2, and F3 buttons while turning the printer on. Continue to hold the buttons down until the PAUSED light turns off. The printer will now be set to the 'Factory Defaults'. See Section 4.4.1 for a listing of the factory defaults.

5.8 Downloading Firmware and Fonts

The Printer stores the printer's Boot Loader, Operating Program, and Font firmware in flash memory located on the main PCB. This allows an operator to update the printer's firmware through the printer's parallel port. These updates will include bug fixes and/or new features. The following procedure can be used to update the Boot Loader, Operating Program, and Font firmware by substituting the correct filenames.

Updating Instructions:

1. **Identifying the New Firmware** - Firmware program updates and new features are available from our web site. Simply download the desired version on to your computer's hard drive or a floppy disk.
2. **Placing Printer into Download Mode** – Press and hold the Pause and Cancel buttons simultaneously while powering up the printer. All three indicators on the printer should be on.
3. **Downloading** – The printer is now ready to accept new printer firmware. Using the DOS copy command enter:

```
copy filename.dlf lpt1/b
```

After the download starts the Paused and Fault lights will turn off. Once the download is complete the printer will turn on the Paused light (indicating a successful download) or the Fault light (indicating an unsuccessful download). If the download fails (i.e. Fault light on) simply send the file again, if the download continues to fail here are some possible causes:

1. **Invalid or corrupted file being downloaded.**
Make sure the file you are downloading to the printer is correct and applicable for your printer model.
2. **Communications errors.**
Check the cable connections on the host computer and the printer. Be sure to use a quality-shielded cable.
3. **The Printer could not successfully write to or erase the flash memory.**
Flash chips or main PCB defective. Try again and if problem persists call for service.

6 *Troubleshooting*

6.0 Introduction

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

Problem Situation	Page
Unacceptable print quality	36
The Printer does not print or prints several labels at once	36
The ribbon does not advance	36
Skips every other label	37
Unable to print in rotation 4	37
Prints light on the right side of the label	37
Printer fails to turn on	37
Label advances 1-2 inches before a fault indication	38
Label advances 16 inches before a fault indication	38
Tracking Problems	38

Unacceptable print quality:

- Dirty printhead. Clean the printhead, (see Chapter 5).
- The printhead temperature is too high. Use the software control to adjust the Heat Setting, Print Speed, or adjust the darkness adjustment located on the back of the printer.
- The incorrect ribbon/paper combination is being used, check the ribbon type being used.
- Faulty Printhead, replace, (see Chapter 5) or call for service.

The Printer does not print or prints several labels at once:

- The labels are incorrectly loaded, see the loading instructions on the inside cover of the printer, or Chapter 3.
- The media is not calibrated, (see Chapter 4)
- The media sensor or media sensor circuitry may be defective, call for service.

The ribbon does not advance

(The printer advances paper but ribbon does not advance).

- The ribbon is installed incorrectly. Open the printhead and make sure that the ink side faces the paper. With most ribbon this can be verified by rubbing paper against the ribbon, the ink should smudge the paper. With label stock use the sticky side of a label, the ink will stick to the label.
- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Skips every other label

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

- The label is formatted too close to the top edge of the form. Leave white space equal to 8-dot rows at the top of the label, approximately .02" (.5mm).
- The media is not calibrated, (see Chapter 4)
- The media sensor or media sensor circuitry may be defective, call for service.

Unable to print in rotation 4

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

Prints light on the right side of the label

- The media width adjustment thumbwheel is set for a narrower media width than the actual media being used, (see Chapter 5).
- The printhead is not properly aligned, call for service.
- The printhead is not locked down.

Printer fails to turn on

- A fuse may be blown, call for service.
- Faulty AC cord, replace
- A bad power switch may exist on the printer, call for service.
- A faulty AC wall outlet.

Label advances 1-2 inches before a fault indication

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

Label advances 16 inches before a fault indication

- The media is not loaded properly, see Chapter 5. When loading media be certain that the media hub and media guide is against the media and that gaps or marks in the labels are in line with the media sensor.
- The media sensor or media sensor circuitry may be defective, call for service.

Tracking Problems

- The media is not loaded properly, see Chapter 5. When loading media be certain that the media hub and media guide is against the media.
- The media width adjustment thumbwheel is not set properly, (see Chapter 5).

7 *Specifications*

7.0 Printer Specifications

Mechanical

Width	8.5" (21.6 cm)
Depth	9.5" (24.1 cm)
Height	6.25" (15.9 cm)
Weight	4 lbs. (1.8 kg)
Operating Temperature	40° F to 95° F (4° C to 35° C)
AC INPUT POWER	115VAC Power Brick: 105 to 125, 60 Hz 220VAC Power Brick: 210 to 250 VAC, 50 Hz 4IPS Auto Ranging Power Brick: 105 to 250 at 50 – 60 HZ

Printer Specifications

Print Type	Direct Thermal
Print Speed	1-4 IPS (25.4-101.6 mm/s); <i>4IPS requires optional power supply.</i>
Resolution	203 dpi (8 dots/mm)
Tear Bar	Tear up
DRAM Memory	2MB
FLASH Memory	1MB

Media/Ribbon

Media Types	Roll-Fed, Die-Cut, Continuous, Fan-Fold
Max. Media Width	4.3" (109.2 mm)
Min. Media Width	1" (25.4 mm)
Max. Print Width	4.09" (104 mm)
Print Length Range	.375-24" (9.52-609.6 mm)
Media Thickness Range	.0025-.01" (.064 mm - .254 mm); <i>up to .007" (.117 mm) with optional cutter</i>
Supply Roll Capacity	4" (101.6 mm) O.D. on 1" (25.4 mm) core
Ribbon Width Range	1.0-4.3" (25-110 mm)
Optional Ribbon	Matched to media; approx. 361' (110m) long 1.5" O.D. on .5" core

Communications

Interface	RS-232 (DB-9), and Centronics Parallel
Baud Speed	600 to 38,400 bps
Handshaking	Xon/Xoff, CTS, DTR
Parity	Even, Odd, or None
Stop Bits	1 or 2
Data Bits	7 or 8

Fonts

9 Bit Map fonts
Rotated 0, 90, 180, 270 degrees

Imbedded Bar Codes

Code 39, Interleaved 2 of 5, Code 128 A, B & C, Codabar, LOGMARS, UPC-A, UPC-E, UPC 2&5, EAN-8, EAN-13, EAN 2&5, UPC Random Weight, Code 93, Plessey, USCS, Code 128 MOD 43, Postnet, Uss/EAN-128 Random Weight, Telepen, UPS Maxicode, PDF417, and Datamatrix

Approved Media

To achieve optimum print quality and maximum printhead life, we recommends the use of our brand media and ribbons. These supplies are specially formulated for use in our printers; use of other supplies may affect the print quality, performance, and life of the printer or its components.

For a current list of approved media and ribbons for use in direct thermal and thermal-transfer applications, please contact a Media Representative.

A *Appendix A*

ASCII Control Code Chart

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

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	Ö	227	E3
ä	132	84	ñ	164	A4		196	C4	ø	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
ã	134	86	ª	166	A6	ä	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	þ	232	E8
è	137	89	®	169	A9		201	C9	Û	233	E9
è	138	8A		170	AA		202	CA	Ü	234	EA
ï	139	8B	1/2	171	AB		203	CB	Ý	235	EB
î	140	8C	1/4	172	AC		204	CC	ÿ	236	EC
ì	141	8D	ì	173	AD		205	CD	Ÿ	237	ED
Á	142	8E		174	AE		206	CE		238	EE
Â	143	8F	–	175	AF		207	CF		239	EF
Ê	144	90		176	B0	Ö	208	D0		240	F0
Æ	145	91		177	B1	Ð	209	D1	±	241	F1
Æ	146	92	²	178	B2	Ë	210	D2		242	F2
ô	147	93	³	179	B3	Ë	211	D3	¾	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	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	Ã	183	B7	Î	215	D7	,	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	°	248	F8
Õ	153	99	¡	185	B9		217	D9	“	249	F9
Ů	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

Notes: For the hardware handshake XON/XOFF commands:

XON = Ctrl Q (DC1)

XOFF = Ctrl S (DC3)

The Euro € character has been added to the table above at 255 (FF) as a standard for resident bit-mapped fonts 0,1,2,3,4,5,6, and 9 (CG Triumvirate).

B *Appendix B*

Embedded Fonts and Barcodes

All character fonts and barcodes available with the printer are described in this section. Each font and barcode has a name associated with it for use in programming. Human-readable fonts have numeric names while barcode fonts have alpha names.

Fonts

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the alphabetic O. The slash can be removed with the label-formatting command Z. These fonts are non-proportional (monospaced); all of the characters take up the same amount of space when printed.

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

Font	Valid ASCII Characters (decimal)	Use with Record Structure Type
0	32-127,255	Internal Bit-Mapped Fonts
1	32-168, 171, 172, 225,255	
2	32-168, 171, 172, 225,255	
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
7	32-126	
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90	Smooth Font
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224-237, 241, 243, 246-250,255	
9	Dependent upon selected symbol set; see Appendix H in the Programmers Manual.	Downloadable Scalable Font

The table below lists the font sizes. The numbers indicate the number of dots.

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

Font 0 96-character alphanumeric, upper and lower case.

Font 0
!"#\$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã

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

Font 1:
!"#\$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã

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

Font 2:
!"#\$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã

Font 3 62-character alphanumeric, uppercase.

Font 3:
!"#\$%&'()*+,-./0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ ß à á â ã

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 Ä Å Æ Ö Ù £ Ø Ñ ¿ ß

Font 5 62-character
alphanumeric, uppercase.

FONT 5:
\$ % & () * + . - / 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 Ä Å Æ 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 Ä Å Æ Ö Ù £ Ø Ñ ¿ ß

Font 7 OCR-A, size I.

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 OCR-B, size III.

Font 8:

0123456789
<>CENSTXZ|

Font 9 Internal Triumvirate font.

Point sizes are selected by the number in the barcode height.

Larger point sizes can be obtained by increasing the height and width multipliers, 48pt and 72pt fonts are generated by doubling the 24pt and 36pt fonts respectively (see the *Programmer's Manual* for more information).

6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789

8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabc

14 pt ABCDEFGHIJKLMNOPQRSTUVWXYZ

18 pt ABCDEFGHIJKLMNOPQR

24 pt ABCDEFGHIJKLM

30 pt ABCDEFGHIJ

36 pt ABCDEFG

48 pt ABCD

Barcodes

Uppercase alpha names will print barcodes with human readable interpretations. Lowercase alpha names will print barcodes only.

Font	Bar Code	Length	Cksum	Valid Characters
A	3 of 9	Varies	No	0-9, A-Z, -, *\$/% and space char.
B	UPC-A	11 digits	Yes	0-9
C	UPC-E	6 digits	Yes	0-9
D	Interleaved 2 of 5	Varies	No	0-9
E	Code 128 (A,B,C)	Varies	M-103	entire 128 ASCII character set.
F	EAN-13	12 digits	Yes	0-9
G	EAN-8	7 digits	Yes	0-9
H	Health Industry Bar Code (HIBC)	Varies	M-43	0-9, A-Z, -\$/ . The Host must supply leading "+"s
I	Codabar	Varies (Min. 3)	No	0-9, -, ., \$, :, /, +, and the start/stop codes: a, b, c, and d.
J	Interleaved 2 of 5 without Bars	Varies	M-10	0-9
K	MSI Plessey	Varies	M-10	0-9. If + is last character, additional MSI checksum will be added to the bar code in place of the + character.
L	Interleaved 2 of 5 (UPC CASE)	13	M-10	0-9
M	UPC 2 digit add.	2 digits	Yes	0-9
N	UPC 5 digit add.	5 digits	Yes	0-9
O	Code 93	Varies	No	All 128 ASCII characters
p	Postnet	Varies	Yes	0-9
Q	UCC/EAN Code 128	19 digits	Yes	0-9
R	UCC/EAN Code 128 K-MART NON EDI	18 digits	Yes	0-9
S	UCC/EAN Code 128 Random Weight	Varies. At least 34 digits	Yes	0-9
T	Telepen	Varies	Yes	All 128 ASCII characters
u	UPS MaxiCode	84	Yes	0-9, A-Z
v	FIM	1 char.	No	A, B, C, or D
z	PDF-417	Varies	Yes	All ASCII characters
W1c	DataMatrix*	Varies	Yes	Any 8-bit data

* Optional

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 (HIBC)



Barcode I Codabar



Barcode J Interleaved 2 of 5
w/module 10 checksum



Barcode K Plessey



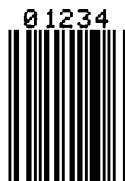
Barcode L Interleaved 2 of 5
w/module 10 checksum and
shipping bearer bars



Barcode M 2 Digit UPC
addendum



Barcode N 5 Digit UPC
addendum



Barcode O Code 93



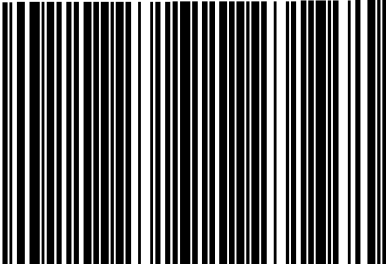
Barcode p Postnet



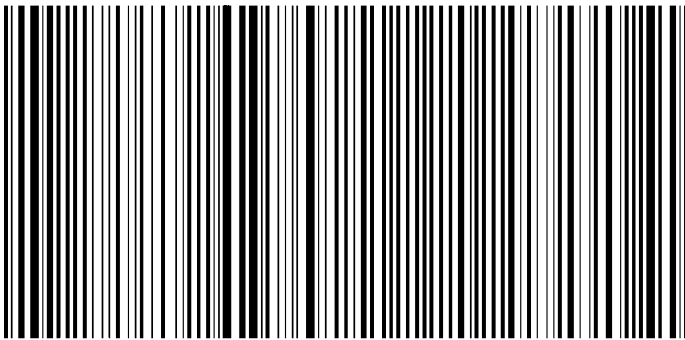
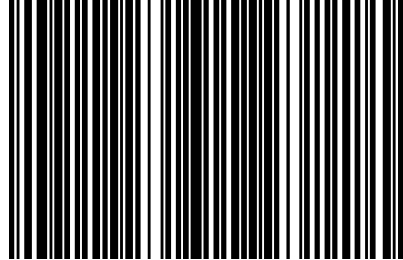
Barcode Q UCC/EAN Code 128

Barcode R UCC/EAN Code 128
KMART NON EDI

(01) 2 3456789 012345678 9



34 567890 123 4567

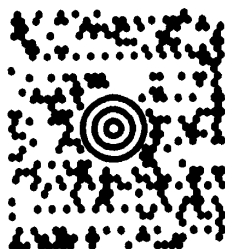


01 10073675029260 11 930420 3202 001800 21 10123456

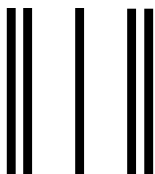
Barcode S UCC/EAN Code 128 Random Weight



Barcode T Telepen



Barcode u UPS MaxiCode



Barcode v FIM



Barcode z PDF 417



Barcode W DataMatrix
(Optional)

C

Appendix C

Limitation of Liability

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