MODELS 438M

DIRECT THERMAL PRINTER

USER'S GUIDE

PART NUMBER 880044-0000

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Product Enhancements
Microcom Corporation is committed to the continual improvement of performance and quality in our products. For this reason, specifications are subject to change without notice.

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This equipment is 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 contained in this manual, may cause harmful interference to radio communications.

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Introduction

The Model 438M is a high performance, Direct Thermal open frame printer specifically designed for kiosk, OEM, and specialty applications. With an Industrial quality design and steel construction, the printer provides continuous reliable printing at high volume. Economically priced and loaded with features, the Model 438M provides true throughput capabilities. Maintenance downtime is minimized with the use of a high lift, easy to clean, or replace print head.

This manual provides information needed to operate and maintain the 438M on a daily basis. The resident Label Design Software II is a powerful and easy-to-use control language that allows the creation of custom label formats. The software is a text based and can be interfaced to PC's, mini-computers, main frames, and other special purpose machines. The 438M language uses inches as the default unit of measure. All commands and parameters, unless noted otherwise, should be entered using the selected unit of measure. The conversion values for the printer, using the standard 300 dpi print head, are 11.8 dots per millimeter, 300 dots per inch, or 0.0033" per dot.

Among many other features, 438M supports downloadable graphics and fonts, flexible character spacing, reverse video, resident fonts, and many of the most popular bar code symbologies. Bitmapped fonts and bar codes may be multiplied in size in both the X and Y directions while being printed in 0, 90, 180, and 270 degree rotations. Graphic images and custom designed label formats may also be stored in the printer's flash memory for high-speed access to achieve greater throughput performance.

The printers are capable of printing on most types of labels, pre-printed tickets, fax papers, and tag stocks or varying thickness. The 438M is also capable of detecting registration marks that enable it to print on media that contains die-cut, blow-hole, black-line sense marks, and continuous media. The printer supports a rotary cutter. This cutter provides a means of cutting media of varying thickness to handle even the most demanding applications.

Many printer applications use the same label format, but change the data on every label. This is not a problem for the 438M printer, data may be changed without downloading the same fixed format or fixed data field. This, along with the available serial communication speeds, increases data access time and productivity. Providing the user with high performance desired for a low cost.
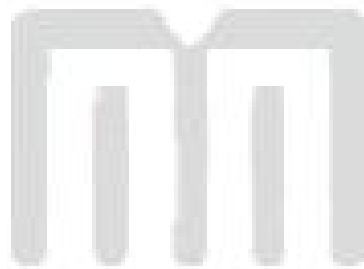
Chapter 1: Printer Specifications

1.1 General Specifications

Width *	9.25" (235mm)
Height *	4.25" (108mm)
Depth *	4" (102mm)
Weight *	4.18 lbs. (1.9 kg)
Electrical	Auto-sensing 90-264 VAC ; 50-60 Hz
Minimum Current	4.2 Amps
Temperature	40° F – 104° F (5° C – 40° C) Operating
Humidity	10% – 85%, non-condensing
Memory	16 MB
Flash Memory	16 MB Data 4 MB Application
Agency Approvals	Designed to meet CUL, CE, and to comply with FCC Class A.
Interface Communications:	
RS-232 Serial	
RS-232, 9 pin D-Sub connector (DCE)	
Flow Control: XON, XOFF, and CTS	
Parity: Odd, Even, and None	
Data Bits: 7 or 8	
USB (Universal Serial Bus)	
Version 1.1 supported	

Table 1   General Specifications

1.2 Printing Specifications

Print Type	Direct Thermal
Print Resolution	203 DPI (8 dots/mm) 300 DPI (11.808 dots/mm) - optional
Maximum Print Speed	6"/sec. (152mm/sec.) 4"/sec. (102mm/sec.) with 300 DPI option
Maximum Print Width	4.094 inches (104mm) 203dpi 4.252 inches (108mm) 300dpi
Print Length	50" (1270mm) using standard memory 24" (609mm) with 300 DPI option

Table 2   Printing Specifications

* NOTE: Listed specifications are based on a standard print mechanism and may vary based on final configuration.

1.3   Media Specifications

Media Types	Continuous, die-cut, preprinted and tag stock either rolled (up to 8" in diameter) or fanfold.
Maximum Media Thickness	.010" (.25mm) ** see note below.*
Maximum Media Width	4.5" (115mm) *** see note below.*

Table 3   Media Specifications

The printers may be optimally configured with a fixed media guides to assist in the installation of media.

*NOTE: The printers may print on thicker media types depending on the pliability of the material; however, this requires testing and evaluation. Contact your authorized Microcom Corporation representative for additional information regarding testing and evaluation of thicker or rigid media types.

**NOTE: The printer's media path has a maximum width of 4.5" while the actual printable width is 4.094" for the 203 DPI and 4.252" for the 300 DPI print head.

Chapter 2: Features and Options

2.1   Fonts

- 19 smooth bitmapped alphanumeric fonts from 6pt to 28pt including OCR-A and OCR-B.

- Downloadable font support.

- Bitmapped fonts expandable in height and width.

- Reverse image printing.

- Rotated: 0 º, 90 º, 180 º, and 270 º.

2.2   Graphics

- Lines and boxes.

- Direct Monochrome BMP image support.

- Store fonts, scripts and/or graphics.

- Rotated: 0 º, 90 º, 180 º, and 270 º.

2.3   Bar codes

- *One-dimensional:* Code 39, Interleaved 2 of 5, Code 128 (A, B, C and Auto), Code 93, Codabar, Modified Plessey, UPC-A, UPC-E, EAN 8, EAN 13, UCC/EAN 128, and Postnet.

- *Two-dimensional:* PDF-417 and Data Matrix

- Rotated: 0 º, 90 º, 180 º, and 270 º.

2.4   Special Features

- Durable steel chassis that protects your investment, even in harsh environments.

- Rotating head mechanism for easy print head cleaning.

- Adjustable media guides for easy label centering or fixed media bracket.

- Software controlled contrast adjustment.

- Downloadable monochrome BMP image support.

- Remote printer interrogation.

- Label Present Sensor (LPS).

- Standard USB version 1.1 capability.

- Detects label gap, blackline, and blowhole using reflective and transmissive sensors.

- Powerful Label Design Software (438M) that is easy to master.

- User storable Flash memory.

- On-site Flash memory updates.

2.5   Options

- Rotary cutter available in 3" or 4" versions.

- Configurable sensor (Input 1) that may be customized for different functions including a Low Stock indicator.

- 300 DPI (11.808 dots/mm) resolution print head.

- Custom Media Handling

- +24VDC 100 W Power Supply

- Cleaning kit.

Chapter 3: Getting Started

3.1   Unpacking and Inspection

The printers have been packaged in protective foam to help reduce the damage that may occur during the shipment of product.

Inspect the shipping container(s) for signs of damage. If damage is evident, contact the shipping company immediately to file a damage claim.

After the printer is removed from the container(s), verify that all the components ordered are present and in good condition (see Figure 3 for an example). Additional items ordered may be included in the foam accessory tray.

The protective foam and shipping container(s) should be kept and used if the printer is to be shipped. Additional shipping materials may be ordered by contacting the Microcom Corporation Service Department.

Figure 3   Printer Accessories

3.2   Connecting the Printer

Refer to Figure 4 and 5 for information regarding the proper printer connections.

3.2.1   Printer Power

Microcom Corporation offers a "desk type" universal power adapter as an option for the printer. The printer requires a universal +24VDC 100 Watt power supply that operates in the 90-264 VAC; 50-60 Hertz range; 4.2 Amps at a minimum. The power supply should operate in an "output foldback mode" during an overload situation rather than a shutdown and restart attempt (sometimes referred to as "Hiccup" mode). Contact your Microcom Corporation representative for any questions regarding power adapter requirements and/or specifications.

AC Input:	90-264 VAC, 50/60HZ
DC Output:	+24Vdc, 4.2 Amps
Power Rating:	100 Watts Continuous, 325W for 1 second
Overload Mode:	Output Foldback Mode
Printer Power Connector:	4 Pin Power mini-DIN Connector

Table 4   Minimum Power Supply Specifications

Note: Verify that the power supply jack is plugged into the printer before plugging the power cord into an electrical outlet

4-Pin Power Mini Din Connector
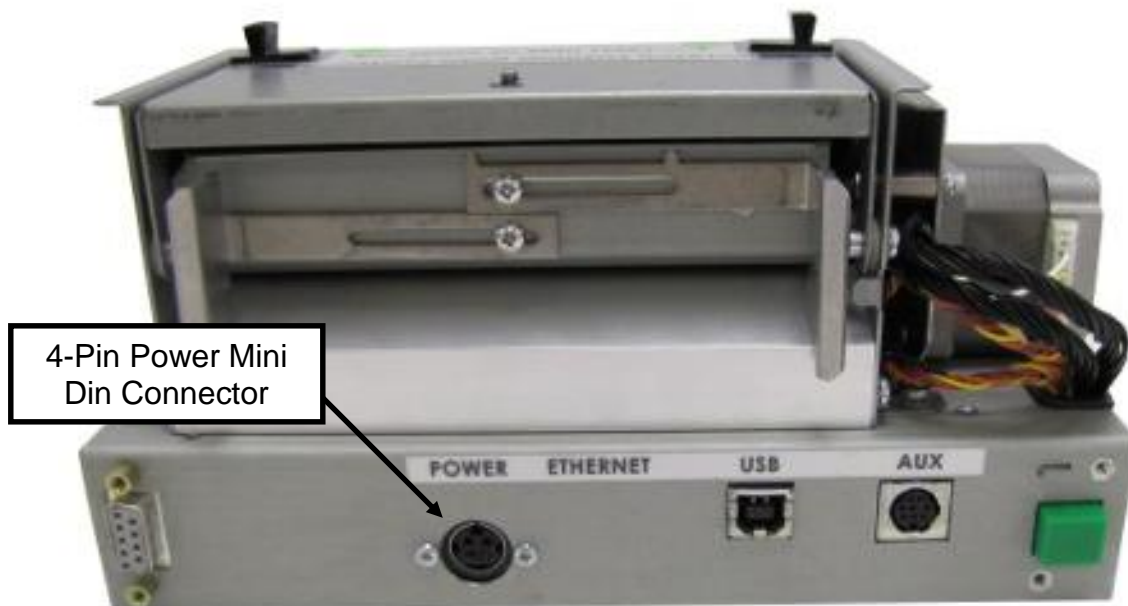
Figure 4   Connecting the Power Adapter

3.2.2   Communication Interface

The printers may be interfaced to PC's, mini-computers, main frames, and special purpose machines. The printer offers a standard RS-232 serial port, and a USB (version 1.1) as standard communication interfaces.

RS-232
Serial Port

USB
Port
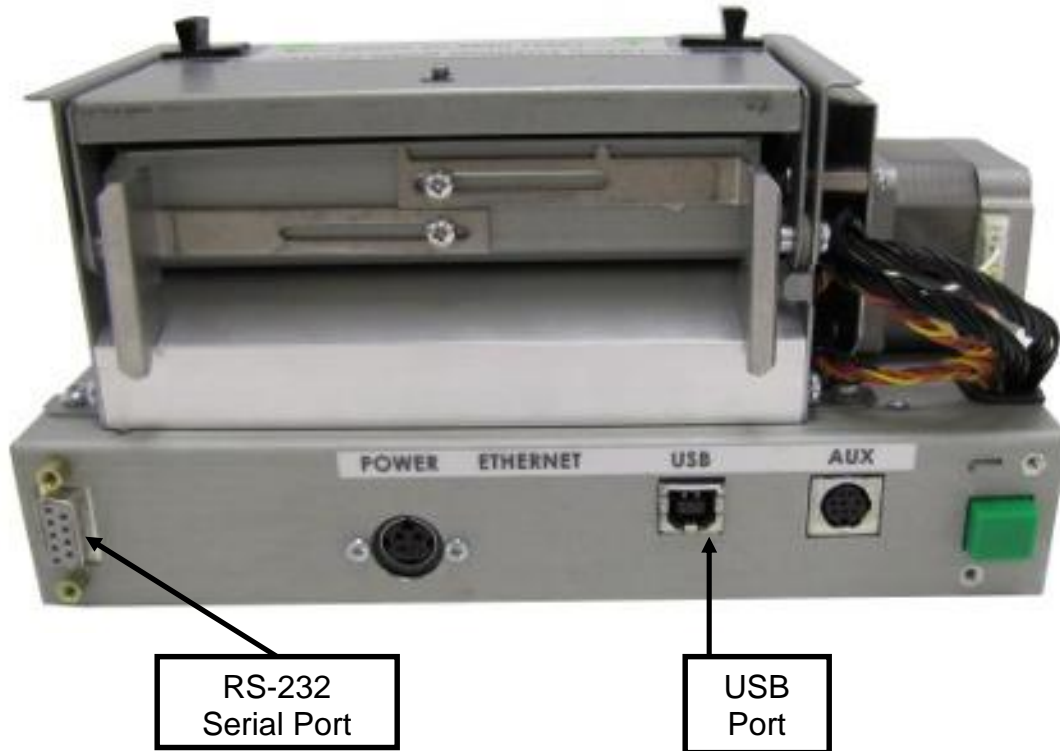
Figure 5   Communication Connections

3.2.3   Optional INPUT 1 Sensor

The AUX port on the printer's rear panel provides an input signal to the printer that may be used in conjunction with an optional sensor. This sensor is configured using the "^D509)" command to set the desired polarity of the sensor. Once the sensor is blocked or activated, the printer issues the ">INPUT 1<" enquiry response that may be defined by the host application to identify custom meanings.
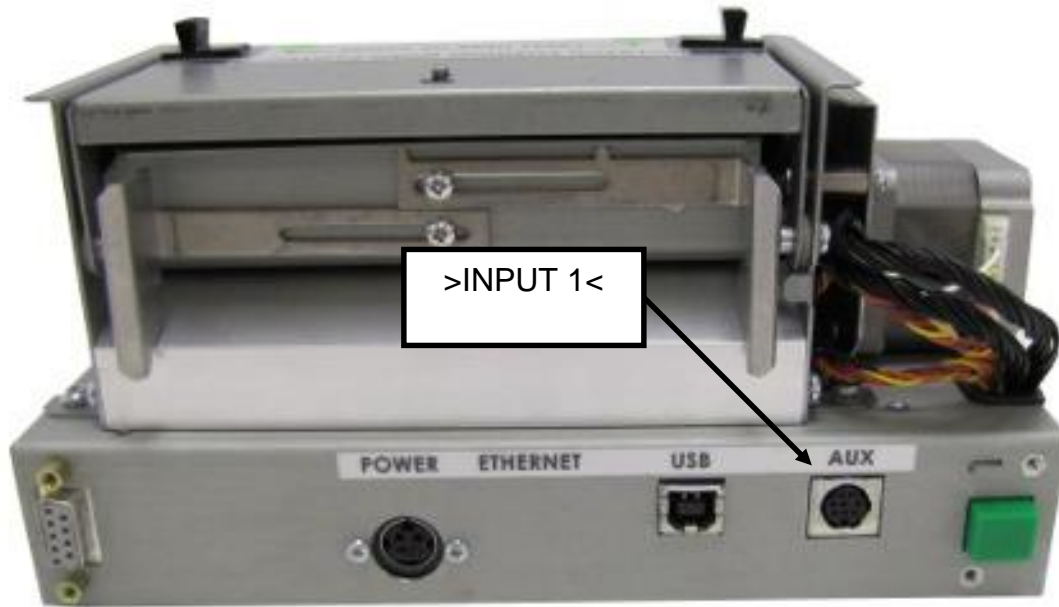
>INPUT 1<

Figure 6 >INPUT 1< Sensor Connection

3.3 Button and Indicator Light

The button and the indicator light are used to identify and perform many functions

Status Light
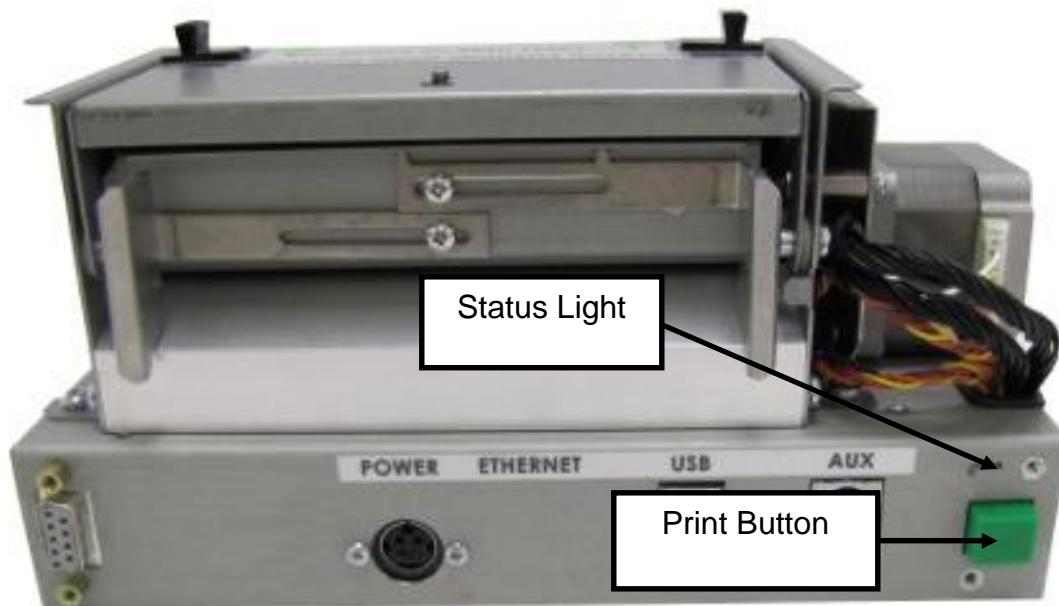
Print Button

Figure 7 Button and Indicator Light

3.4   Loading Media

The open frame printers have been designed to make loading media a simple process. No adjustments are required when installing media once the media guides are set, thus reducing down time. Contact your Microcom Corporation Representative about the availability of custom size media guides. Follow the instructions below to properly load the media.

1. Tear off a clean edge on the media before loading into the printer.
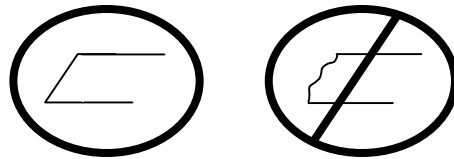
2. Insert the media into the media path (see Figure 6), located on the back of the printer, until you feel resistance.

3. The printer will then Autoload and align the paper.
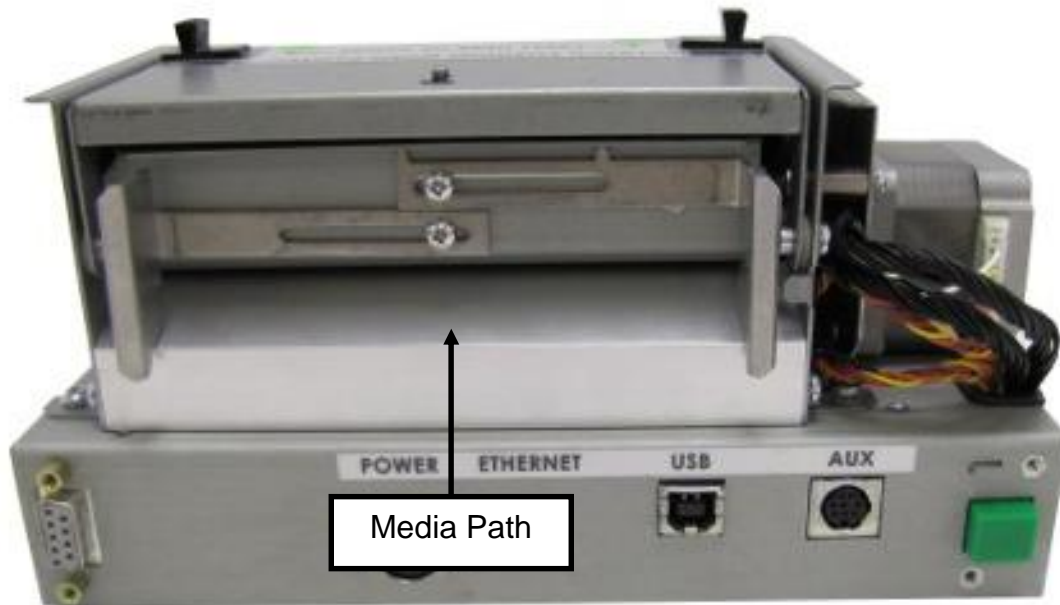
Figure 8   Loading Media

3.5   Clearing Media Jams

Occasionally, media may jam inside the printer and require the print head mechanism to be opened to clear the media jam. This section provides the proper procedure to remove and clear media jams.

1. Release and lift the Print Head mechanism to the open position.

2. Remove the installed media from the media path.

3. Verify that all of the media is removed from the media path and drive roller areas.

4. Rotate and latch the print head mechanism in the down or normal position.

5. Tear off a clean edge on the media before loading into the printer.
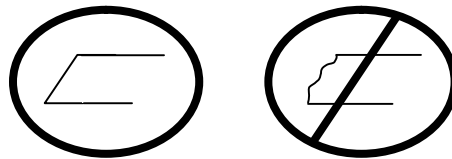
6. Insert the media into the media path (Figure 6), located on the back of the printer, until you feel resistance.

7. The printer will then Autoload and align the paper.
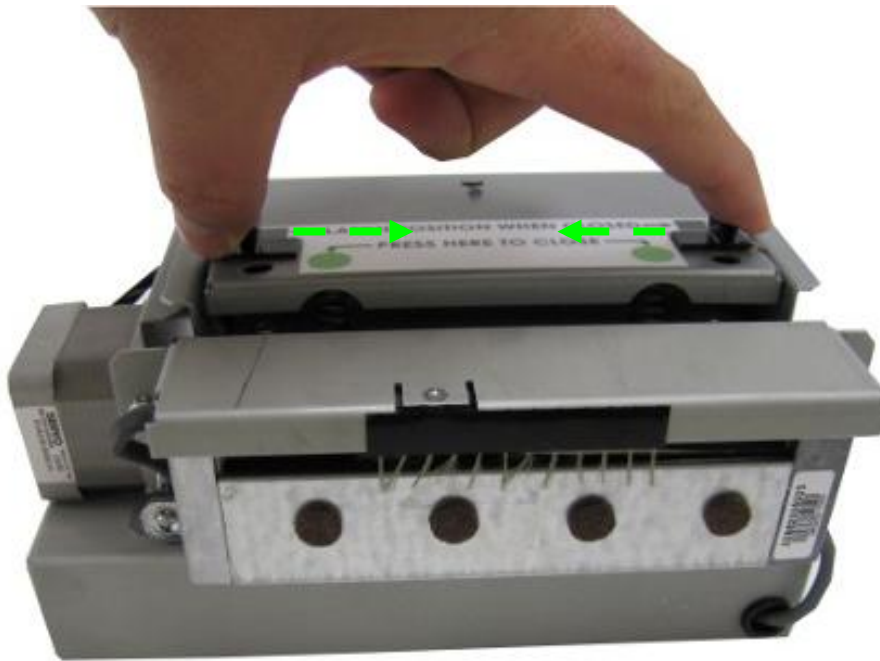
Figure 9   Releasing the Print Head

Chapter 4: Printer Modes

4.1   Idle Mode

Idle Mode is when the printer is not printing and has no pending activity. The indicator light is green, which indicates that the printer is ready to receive label scripts and/or commands.

4.2   Halted Mode

Halted Mode is when the printer has stopped due to an error condition that needs to be corrected before the printer. The indicator light flashes red when the printer enters the *Halted Mode*.

4.2.1   Status Responses

Status responses provide a method of determining the current status of the printer as well as identifying the different error conditions. This is possible by sending either the "Ctrl+E" combination or by issuing the "^D327)" command. Immediate error responses are sent from the printer to the host automatically when they occur.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
0x01	>STOCK OUT<	Out of Media
0x03	>STOCK JAMMED<	Media is jammed.
0x06	>OK<	ACK message used with the ^D726)1 command.
0x10	>CUTTER JAMMED<	The cutter has jammed.
0x11	>CUTTER INOPERATIVE<	The cutter is not detected
0x21	>INPUT 1<	The Input 1 sensor has been actuated.
0x30	>SCRIPT ERROR<	An error with the script has been detected.
0x31	>INVALID PARAMETER<	The printer has detected an invalid parameter.
0x32	>PARSER ERROR<	An error with the printer's parser has occurred.
0x40	>COMM ERROR<	A Communication error has been detected.
0x51	>FLASH ERROR<	The flash memory has encountered an error.

Byte Mode Responses (ASCII Hex)	Text and Verbose Mode Responses	Definition
0x80	>RESTARTED<	The printer has been powered on or the power has been reset.
0x81	>READY<	The printer is in ready to receive data.
0x87	>STOCK ADVANCED<	The media has been advanced.
0x8F	>STOCK NOT LOADED<	The printer was powered up with out media installed.
0xD1	>NONEXISTENT COMMAND<	The received command does not exist.
0xD2	>INCOMPLETE COMMAND<	The received command is not complete.
0xD3	>ZIP FILE ERROR<	The received Zipped file has an error.
0xD4	>FILE CONVERSION ERROR<	The file was not converted properly.
0xD5	>UNSUPPORTED FILE TYPE<	The received file is not recognized.
0xD6	>FILE NOT FOUND<	The requested file does not exist or cannot be found.
0xD9	>FILE IS READ ONLY<	File is read only and cannot be deleted.
0xDA	>INADEQUATE FLASH SPACE<	Cannot save an item to the flash memory due to lack of space.
0xDB	>I/O FAILURE<	The Input/Output circuitry has failed.
0xDC	>FONT/GRAPHIC NOT FOUND<	The requested file does not exist or cannot be found.

Table 5   Enquiry Responses

4.2.2   Fatal Error Responses

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

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

4.2.2.1   >STOCK OUT< (01)

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

4.2.2.2   >STOCK JAMMED< (03)

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

4.2.2.3   >CUTTER JAMMED< (10)

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

4.2.2.4   >CUTTER INOPERATIVE< (11)

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

4.2.2.5   >SCRIPT ERROR< (30)

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

4.2.2.6 >INVALID PARAMETER< (31)

This error response indicates that a received command contains an invalid parameter or illegal structure while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x31 will be issued from the printer in response to an enquiry command.

4.2.2.7 >PARSER ERROR< (32)

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

4.2.2.8 >COMM ERROR< (40)

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

4.2.2.9 >FLASH ERROR< (51)

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

4.2.3   Basic Status Responses

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

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

4.2.3.1 >OK< (06)

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

4.2.3.2 >INPUT 1< (21)

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

4.2.3.3 >RESTARTED< (80)
The ">RESTARTED<" response is issued the first time the printer's status is queried after a power up or reset condition while in verbose and/or semi byte responses. If the printer is configured for byte responses, the code ASCII 0x80 will be issued from the printer in response to an enquiry command.

4.2.3.4 >READY< (81)
The ">READY<" response indicates that the printer is in the normal operating state and that it is ready to accept data while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x81 will be issued from the printer in response to an enquiry command.

4.2.3.5 >STOCK ADVANCED< (87)
The ">STOCK ADVANCED<" response indicates that the media has been advanced after printing when a Dispense Mode (^D597) command) is being used while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x87 will be issued from the printer in response to an enquiry command.

4.2.3.6 >STOCK NOT LOADED< (8F)
The ">STOCK NOT LOADED<" response indicates that media is not being detected in the printer on power up while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0x8F is issued from the printer in response to an enquiry command. This message persists until media is detected at the registration mark sensors but does not prevent commands from being processed.

4.2.3.7 >NONEXISTENT COMMAND< (D1)
The ">NONEXISTENT COMMAND<" response indicates that the printer has received data in the 438M command structure that does not exist or is yet to be implemented while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD1 will be issued from the printer in response to an enquiry command.

4.2.3.8 >INCOMPLETE COMMAND< (D2)
The ">INCOMPLETE COMMAND<" response indicates that the printer has received a command that does not contain all of the required parameters for proper operation while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD2 will be issued from the printer in response to an enquiry command.

4.2.3.9 >ZIP FILE ERROR< (D3)
The ">ZIP FILE ERROR<" response indicates that the printer has received a zip file that is either not complete or that the file contains errors while in text and verbose response sets. If the printer is configured for byte responses, the code ASCII 0xD3 will be issued from the printer in response to an enquiry command.

4.2.3.10 >FILE CONVERSION ERROR< (D4)
This enquiry response indicates that the printer encountered an error while performing an internal conversion of the received file while in text and verbose modes. If the printer is configured for byte responses, the code ASCII 0xD4 will be issued from the printer in response to an enquiry command.

4.2.3.11   >UNSUPPORTED FILE TYPE< (D5)

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

4.2.3.12   >FILE NOT FOUND< (D6)

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

4.2.3.13   >FILE IS READ ONLY< (D9)

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

4.2.3.14   >INADEQUATE FLASH SPACE< (DA)

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

4.2.3.15   >I/O FAILURE< (DB)

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

4.2.3.16   >FONT/GRAPHIC NOT FOUND< (DC)

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

4.2.3.17   >GRAPHIC TOO LARGE< (F2)

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

Chapter 5: Communications

5.1   RS-232 Serial

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

The factory settings, unless otherwise requested, are set at 115200 baud, 8 data bits, 1 stop bit, and no parity with both hardware and software handshaking. The baud rate is user selectable from 1200 to 115,200 and uses hardware CTS handshaking.

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

Table 6   RS-232 Cable Configurations

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

5.1.1   RS-232 Printer Cables

The 438M printers use standard cables that may be purchased through Microcom Corporation or a local computer supply company. A NULL-modem cable is not required because the printer is configured as DCE.

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

5.2   USB Port

The printer provides the capability of a Universal Serial Bus (USB) port that supports version 1.1. The USB Type 1 port is a virtual serial communications port and requires the installation of the Microcom Corporation supplied virtual serial communication USB driver to be installed to properly function.

Chapter 6: Maintenance and Adjustments

6.1   Maintenance Schedule

It is important to note that optimum print quality and print head life is achieved by maintaining a clean printer and print head. A Microcom Corporation approved cleaning kit (*part # 040005-0000*) is available. Contact your Microcom Corporation sales representative for purchasing information.

AREA	METHOD	INTERVAL
Print head	Foam tipped swab, cotton tipped swab, or thermal printer cleaning card dampened with Isopropyl Alcohol. *See section 6.4*	After every roll of media or every 512 feet of tag stock or fanfold media.
Drive Roller	Foam tipped swab, cotton tipped swab, thermal printer cleaning card, or lint-free cloth dampened with Isopropyl Alcohol *See Section 6.5*	After every roll of media or every 512 feet of tag stock or fanfold media.
Peel Edge	Foam tipped swab, cotton tipped swab, thermal printer cleaning card, or lint-free cloth dampened with Isopropyl Alcohol *See section 6.3*	*As Needed.*
Interior Cleaning	Compressed air, soft-bristle brush, and/or lint-free cloth dampened with Isopropyl Alcohol. *See section 6.3*	*As Needed.*
Exterior Cleaning	Lint-free cloth dampened with a mild, non-abrasive general purpose cleaner. *See section 6.6*	*As Needed.*

Table 7   Recommended Maintenance Schedule

⚠ *CAUTION: Microcom Corporation will not be held responsible for damage caused by any non-approved solvent, cleaning material and/or method and the use of such non-approved materials and/or methods may void appropriate expressed or implied warranties.*

6.2   Thermal Printer Card

Decline in print quality, voids or drop out areas in bar codes and/or graphics may indicate that the print head is dirty and needs to be cleaned. The necessary cleaning materials can be purchased through Microcom Corporation by contacting your sales representative and ordering the *Cleaning Kit, part # 040005-0000.* The print head should be cleaned after every roll of media or after every 512 feet (a typical stack of tag or fanfold media is about 3200 tags).

A thermal printer card is the quickest and easiest way to clean the print head, drive roller, and peel edge all at the same time. Follow the steps below for the proper cleaning procedure.

1. Remove any installed media.

2. Dampen both sides on one end of the cleaning card with isopropyl alcohol.

3. Release the print head by pushing the *Head Release Levers* towards the center of the printer and insert the thermal card into the front of the printer between the print head and the drive roller.

4. Continue inserting the card into the media path until you feel resistance, now latch the print head making sure the *Head Release Levers* lock into place.

5. Using both hands, slowly pull the card out of the printer at a 45º down angle.

6. Repeat as necessary

7. Reinstall media.

Thermal cleaning cards should not be used more than three times each. Extremely dirty cards should be disposed of immediately.

⚠️ **CAUTION: Never touch or clean the print head with any abrasive solvents and/or with any metal or sharp object.**
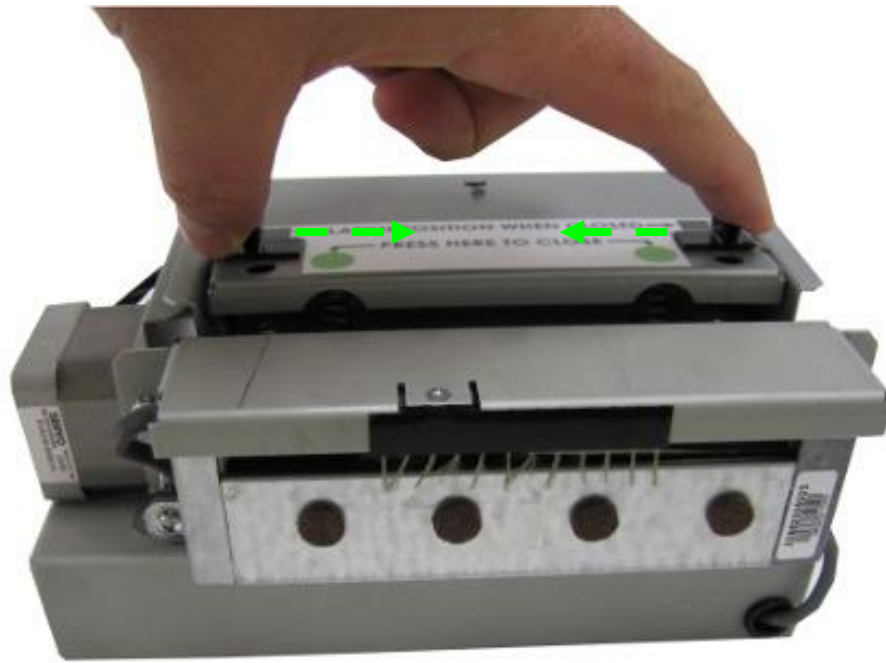
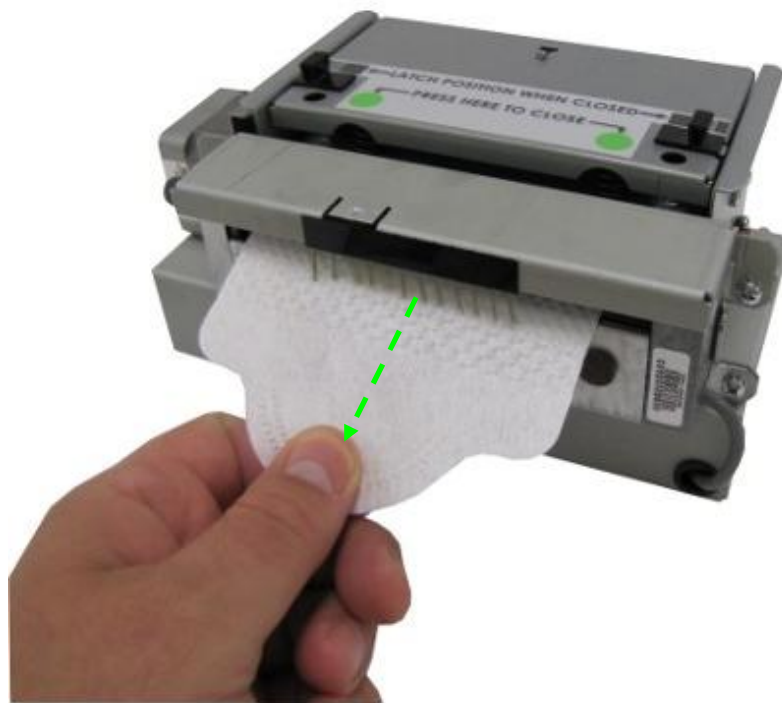**Figure 10   Unlatching of the Print head**

Figure 11   Removal of Thermal Card

6.3   Internal Cleaning

The overall internal cleaning of the printer is important to help reduce the dust and other contaminates residing in the printer. Contaminates may attach to the print head or drive roller and affect the printer's performance. Refer to the below for common areas needing cleaned.

1. Remove installed media.

2. Turn the printer power OFF.

3. Using the two *Head Release Levers*, unlatch and raise the print head.

4. Basic internal cleaning can be done using a combination of compressed air, soft-bristle brushes, foam/cotton tipped swabs, and/or lint-free cloths dampened in alcohol. Using any combination of these materials, remove dust or other contaminants from the printer.

5. When finished, latch the print head completely.

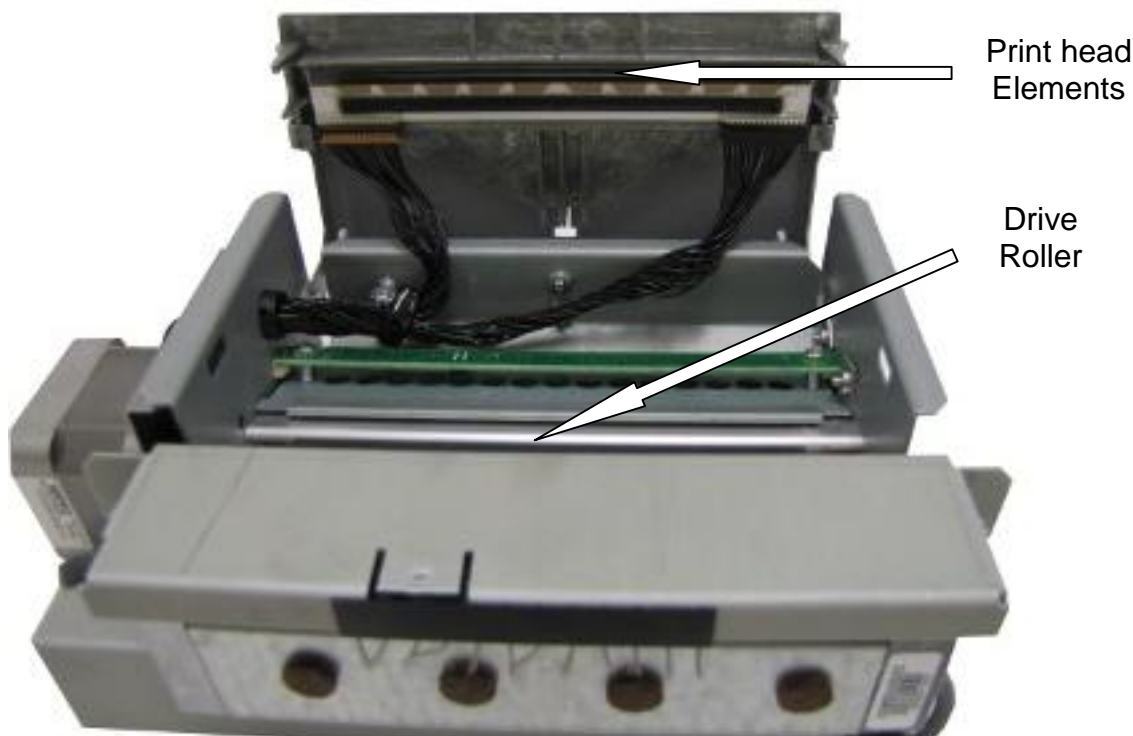6. Turn the printer power ON and reinsert the media.

Figure 12   Internal Cleaning

6.4   Print head Maintenance

If print quality has not improved after cleaning using a thermal cleaning card or if one is not available, foam or cotton tipped swabs dampened in isopropyl alcohol may be used. Refer to Figure and steps below for the proper cleaning procedure.

1. Remove any installed media.

2. Turn the power to the printer OFF.

3. Using the two *Head Release Levers* , unlatch and raise the print head.

4. With a foam or cotton tipped swab dampened in isopropyl alcohol, clean the thermal elements by gently rubbing the swab down the length of the print head. Allow for the alcohol to evaporate then repeat if necessary.

5. The Drive Roller, Peel Edge, and other basic internal cleaning may also be performed at this time.

6. When finished, latch the print head completely.

7. Turn the printer power ON and reinsert the media.

Print head Elements

Figure 13   Print head Thermal Elements

⚠ ***CAUTION: When performing maintenance inside the printer, always make sure that the print head is latched completely before installing the top cover. Failure to do so may result in damage to the print head.***

6.5   Cleaning the Drive Roller

Maintaining a clean drive roller not only helps extend the life of the roller but also reduces print quality issues and media slips that may occur due to dust, label adhesive and other forms of contamination. The drive roller should be cleaned after every roll of media or after every 512 feet (a typical stack of tag or fanfold media is about 3200 tags). See the previous section *Thermal Printer Card* for a quick and easy way to clean the drive roller or follow the steps below.

1. Remove any installed media.

2. Turn the printer power OFF.

3. Using the two *Head Release Levers*, unlatch and raise the print head.

4. With a lint-free cloth dampened in alcohol, clean the drive roller. Manually rotate the drive roller by the drive gear located to the left (from the front of the printer) or by manually rotating the drive roller itself to clean the entire drive roller surface.

5. Print head, Peel Edge, and Internal cleaning may also be performed at this time, see the appropriate sections for more information.

6. When finished, latch the print head completely.

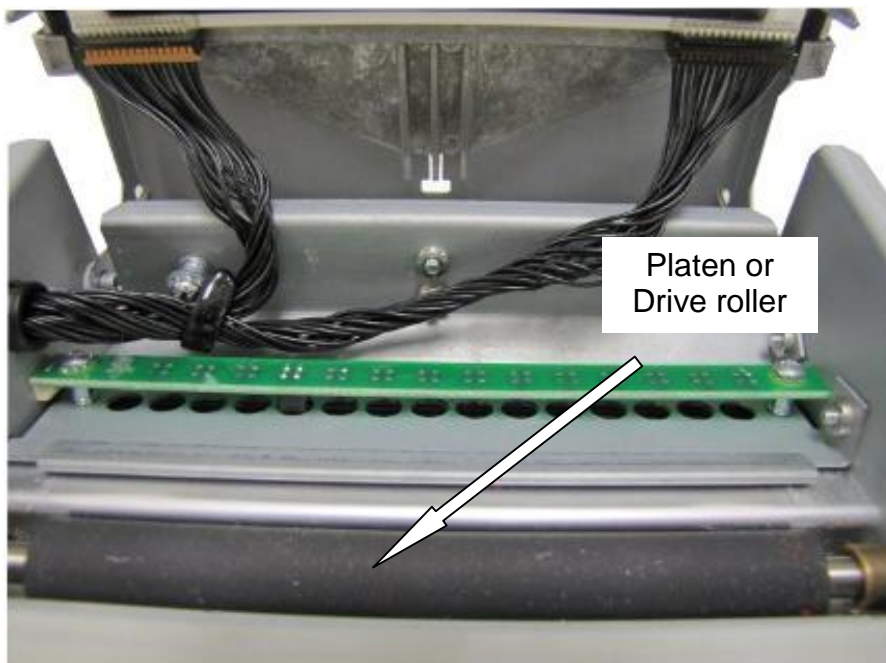7. Turn the printer power ON and reinsert the media.

Platen or Drive roller

Figure 14   Platen or Drive Roller

⚠ *CAUTION: Isopropyl Alcohol should be used to clean the drive roller. The use of other cleaning solvents or materials is not recommended and may degrade the performance of the drive roller.*

6.6   Exterior Cleaning

Although cleaning the exterior surfaces does not affect printer performance, it will help the overall appearance of the printer. The use of any mild, non-abrasive general purpose cleaner with a lint-free cloth may be used to clean the exterior surfaces. This cleaning should be performed on an as needed basis.

6.7   Gap Detector Adjustment

The Gap detectors may be custom configured and placed in a different position upon request. The printers contain fixed gap detection locations every half inch to provide flexibility for custom applications.
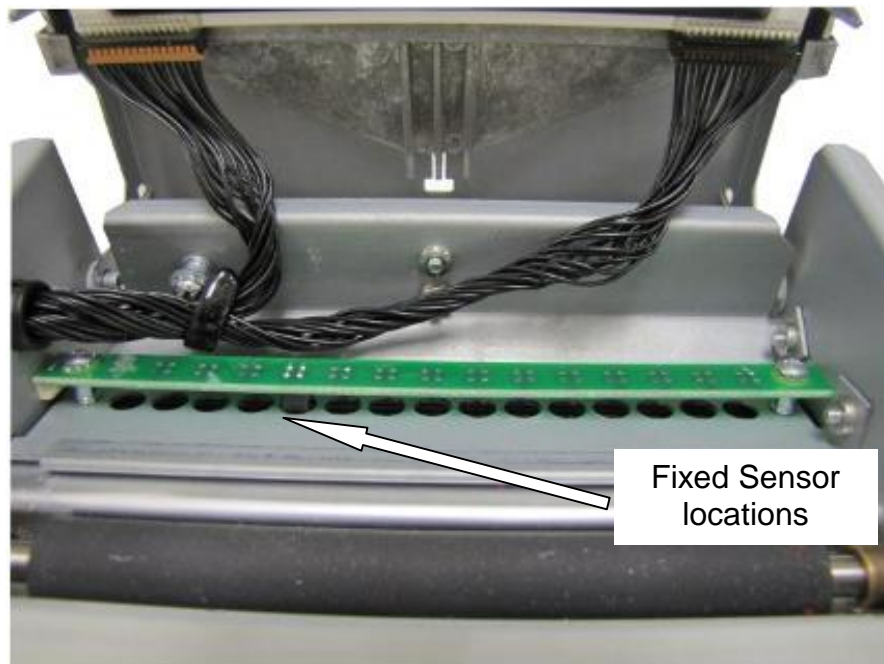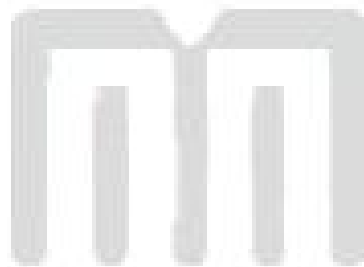

Fixed Sensor locations

Figure 15   Gap Detector Locations
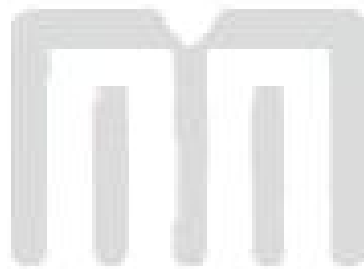
Appendix A

Limited Warranty

Microcom Corporation printers, excluding thermal print heads, which are warranted separately below, are warranted against defects in material and workmanship for twelve (12) months from the date of original shipment by Microcom Corporation. This warranty does not cover normal wear and tear and shall be null and void if the printer is modified, improperly installed or used, damaged by accident or neglect, or in the event any parts are improperly installed or replaced by the user.

The thermal print head is covered by a limited warranty of three (3) months or 500,000 linear inches to be free from defects in material and workmanship. The length of media run through the printer may be verified using the printer's internal statistical counter. Although the user is not required to purchase Microcom Corporation brand supplies, to the extent it is determined that the use of other supplies (such as non-approved label stock, ribbons, and cleaning solutions) shall have caused any defects in the thermal print head for which the warranty claim is made, the user shall be responsible for Microcom Corporation's customary charges for labor and materials to repair such defects.

MICROCOM CORPORATION'S SOLE OBLIGATION UNDER THIS WARRANTY SHALL BE TO FURNISH PARTS AND LABOR FOR THE REPAIR OR REPLACEMENT OF PRODUCTS FOUND TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP DURING THE WARRANTY PERIOD.

Except for the express warranties stated, Microcom Corporation disclaims all warranties on products, including all implied warranties of merchantability and fitness for a particular purpose. The stated warranties and remedies are in lieu of all other warranties, obligations or liabilities on the part of Microcom Corporation for any damages, including, but not limited to, special, indirect, or consequential damages arising out of or in conjunction with the sale, use, or performance of these products.

MICROCOM CORPORATION SHALL NOT, UNDER ANY CIRCUMSTANCES WHATSOEVER, BE LIABLE TO THE BUYER OR ANY OTHER PARTY FOR LOST PROFITS, DIMINUTION OF GOODWILL OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER WITH RESPECT TO ANY CLAIM HEREUNDER. IN ADDITION, MICROCOM CORPORATION'S LIABILITY FOR WARRANTY CLAIMS SHALL OT, IN ANY EVENT, EXCEED THE INVOICE PRICE OF THE PRODUCT CLAIMED TO BE DEFECTIVE, NOR SHALL MICROCOM COPRORATION BE LIABLE FOR DELAYS IN THE REPLACEMENT OR REPAIR OF PRODUCTS.

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Appendix B

Return Material Authorization (RMA) Procedure

A Return Material Authorization (RMA) number must be obtained prior to the return of printer's and/or materials to the Microcom Corporation Service Department. The purpose of the RMA number is to provide effective tracking and control of returned printers and/or materials. Microcom Corporation is not responsible or accountable for printers and/or materials returned without proper authorization.
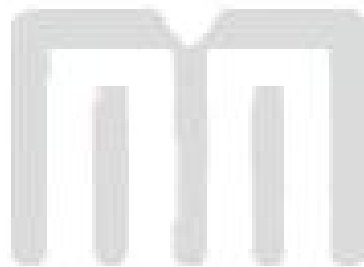
Shipping Charges:

The return of printers and/or materials to Microcom Corporation for repair should be returned freight and insurance prepaid. Microcom Corporation will pay the return shipping charges (standard ground service) on all warranty repairs; an Expedited service is paid at the customer's expense. The return of non-warranty repairs to printers and/or materials is shipped by the customer's choice of shipping carrier and delivery service.

Receiving a Return Material Authorization (RMA) number:

1.   To receive an RMA number, either complete the online RMA request form located on the World Wide Web (www.microcomcorp.com) or contact the Microcom Corporation Service Department and provide the representative with the following information.

        - Company name.
        - Contact name and phone number.
        - Model number.
        - Printer serial number.
        - A detailed description of the problem.
        - Service option requested (1 Day, 3 Day, 5 Day, or Standard turnaround).
        - Purchase Order Number.

2.   The shipping label should contain the following information:

        Microcom Corporation
        Attn: Service Dept. RMA# <place RMA number here>
        8220 Green Meadows Dr. N.
        Lewis Center, Oh 43035 USA

3.   Return the defective item(s) for repair to the address listed above, freight and insurance prepaid.

4.   Upon receipt of an RMA number, the customer contact is notified by a Microcom Corporation representative regarding repair charges, at which time the ship method is determined. Items returned for repair with inadequate packaging material are returned to the customer in Microcom Corporation approved packaging at the customer's expense.

Glossary

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

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

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

Blow-hole - A registration mark, typically a notch or cutout in certain media that is used to identify the starting position of a label.

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

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

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

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

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

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

DPI (Dots Per Inch) - A unit of measure term that identifies the print resolution capability.

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

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

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

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

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

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

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

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

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

Kiosk – A small structure or stand used to dispense items..

438M (Label Design Software II) - This is the resident control software language that is used to develop label formats and controls the full function of the printer.

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

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

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

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

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

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

RXD (Receive Data) - An essential signal that carries data from the DCE to the DTE for 2-way RS-232 serial communication. Also known as RX and RD.
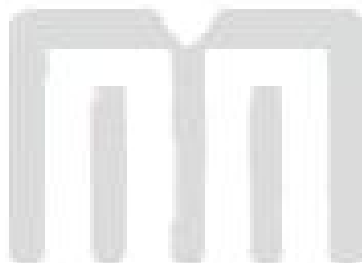
SRAM (Synchronous Random Access Memory) - Memory used to store formats while printing. This is volatile memory; information stored in this memory is not saved when the printer power is turned off.

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

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

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

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

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