

Mag Mini 41 Ticket Printer

Users Manual



Boca Systems

BOCA SYSTEMS, INC.

© 1997 Boca Systems, Inc. All rights reserved.

Under the copyright laws, this manual may not be copied, in whole or in part, without the written consent of BOCA.

Every effort has been made to ensure that the information in this manual is accurate. BOCA is not responsible for printing or clerical errors and reserves the right to change specifications without notice.

Table of Contents

Page

1.0	Introduction	1
2.0	Unpacking the Printer	2
3.0	A tour of your printer	3-5
4.0	Installation	6
5.0	Configuration	7
6.0.	Standard Interface Pinouts	8
7.0	Thermal Paper - Theory and Specification	9
8.0	Maintenance and Adjustments	10-15
9.0	Magnetic Encoding - Theory and Specifications	16-19
10.0	Spare Parts List	20
11.0	Troubleshooting Guide	21-22

Table of Figures and Appendices

Page

Figure 1	Packaging	2
Figure 2	Mag Mini Ticket Printer	3
Figure 3a	Mag Mini side view	4
Figure 3b	Mag Mini side view - Electronics Cover Removed	4
Figure 4	Rear view	5
Figure 5	Ticket loading	6
Figure 6	Optical Devices	11
Figure 7	Print head removal	13
Appendix A	Operator Menu options through control panel	

FCC NOTICE

NOTE: The 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 instruction manual, 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.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

IMPORTANT NOTICE

THE PRINTER MUST BE OPERATED WITH THE COVER ON AND ALL SCREWS ATTACHED. THE DATA CABLE MUST BE SHIELDED.

FAILURE TO OPERATE IN THIS MODE MAY CAUSE THE PRINTER TO EMIT EMISSIONS IN EXCESS OF EITHER FCC OR CE REGULATIONS. ADDITIONALLY, THE PRINTER MAY BECOME SUBJECT TO DAMAGE BY EXCESSIVE ELECTROSTATIC DISCHARGES IF NOT OPERATED IN THIS MANNER.

WARRANTY INFORMATION

PRINTERS - BOCA warrants each printer to be free of defects for a period of one year from the date of shipment when subject to normal use and service. This warranty covers all parts and labor except for the print head which is warranted for 90 days. All warranty labor is to be performed at the BOCA facility. Equipment damaged by misuse or negligence including damage to print heads caused by defective ticket stock is excluded from this warranty.

Any defective equipment meeting these conditions should be returned to BOCA for repair (freight prepaid) in its original box and packing material. A short note describing the failure should be enclosed with the printer.

Equipment damaged in shipping should be reported immediately both to BOCA and to the shipper.

EXTENDED WARRANTY PLAN - BOCA offers extended warranty plans for all printer models. These plans cover all parts and labor. All labor is to be performed at the BOCA facility. Equipment damaged by misuse or negligence including damage to print heads caused by defective ticket stock is excluded from this extended warranty. The customer, at his option, may request BOCA to ship individual parts to expedite simple repair procedures. In certain cases where the customer is unable to wait for the normal repair cycle, BOCA will ship an exchange printer within one business day after notification by the customer. All freight charges are the responsibility of the customer.

1.0 Introduction

The BOCA Mag Mini 41 is a direct thermal ticket printer with read-write magnetic capability and integrated bursting mechanism designed for ticketing environments which require encoding and verification of data on a magnetic stripe. The printer is available in a credit card (ISO 3 track) and airline ticket (ATB 4 track) versions. The standard versions imprint on the thermal face of the ticket and encode on the rear. Optional models imprint and encode on the face of the ticket. This manual will provide the user with general information regarding printer set-up, configuration and troubleshooting. Please review your programming guide for additional details.

2.0 Unpacking the Printer

The printer is shipped in a ruggedized container. Please save packing material for future use. Remove the printer (**see figure 1**) and accessories from the box and inspect for obvious damage. If damage is noticed, please report it immediately to **BOCA**.

Tel: (561) 998-9600 Fax: (561) 998-9609 E-mail: bocatix@bocasystems.com

The following items should be in the box:

- a) Ticket Printer
- b) Hopper and infeed guide
- c) AC power cord
- d) Interface cable (optional)
- e) Programming guide
- f) This manual

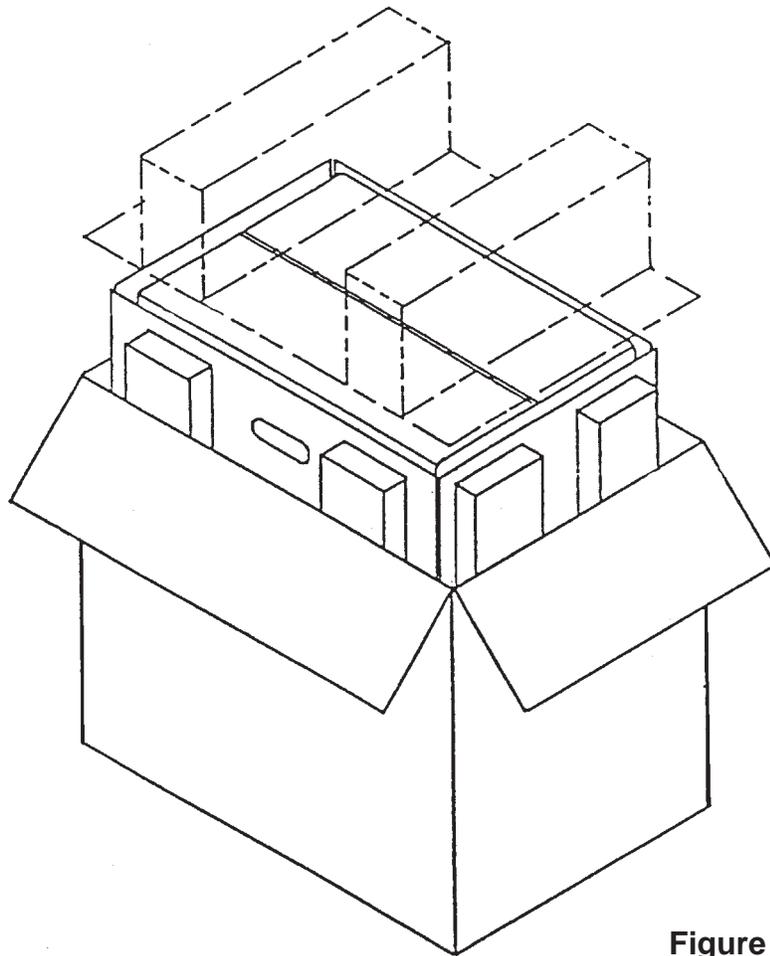


Figure 1 - Packaging

3.0 A Tour of Your Printer



Figure 2 - Mag Mini 41 ticket printer

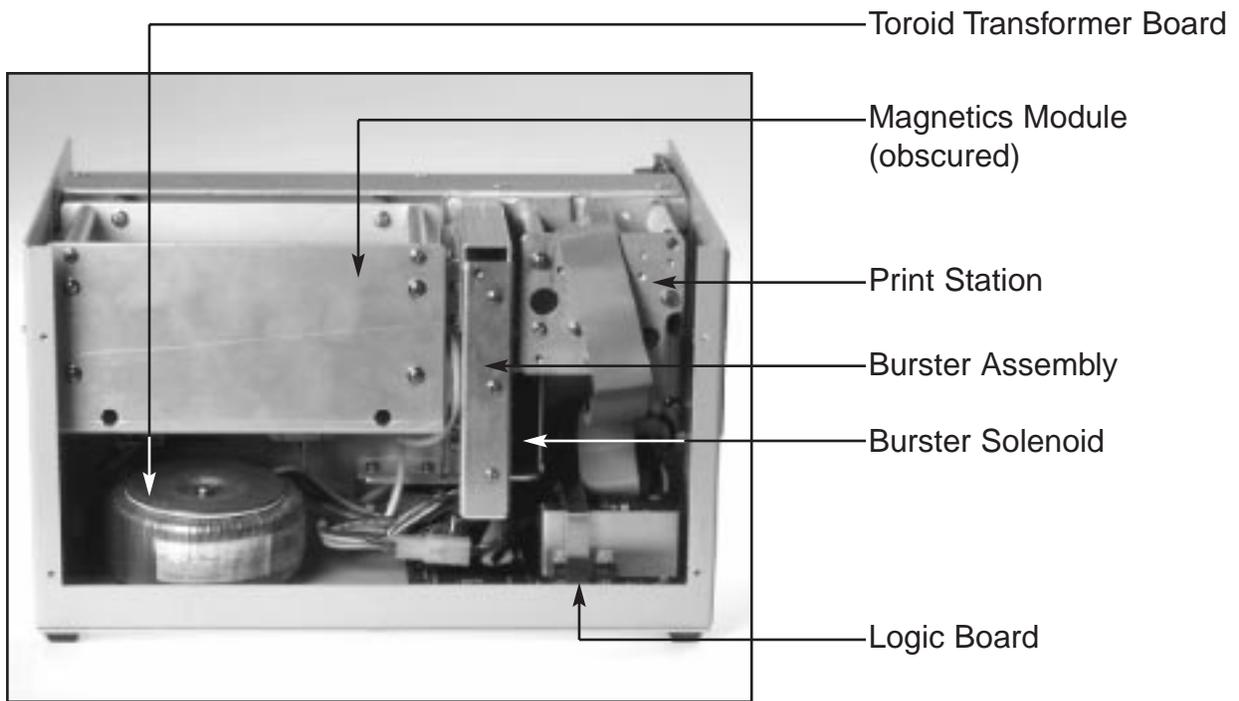


Figure 3a - Mag Mini 41 side view

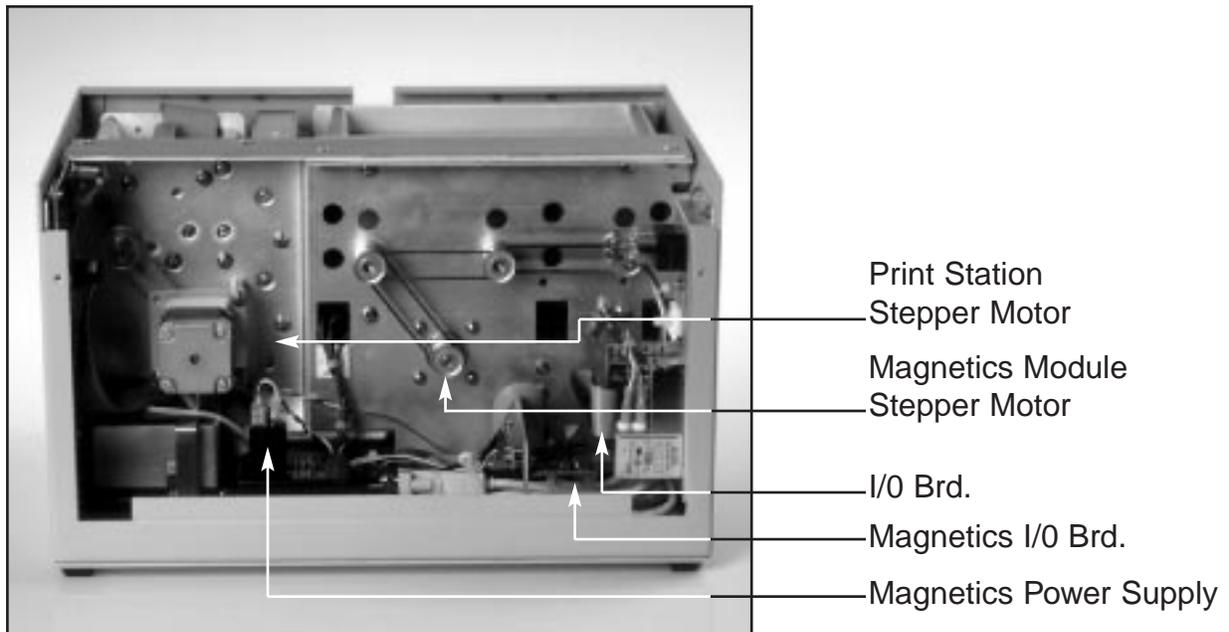


Figure 3b - Mag Mini 41 side view
Electronics Cover Removed

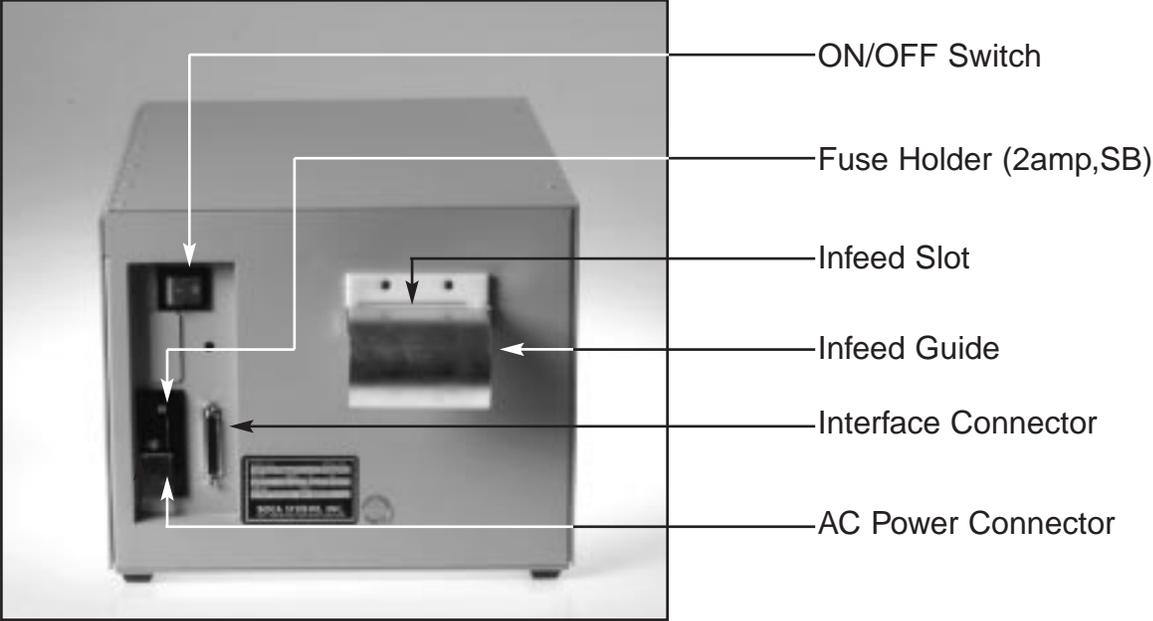
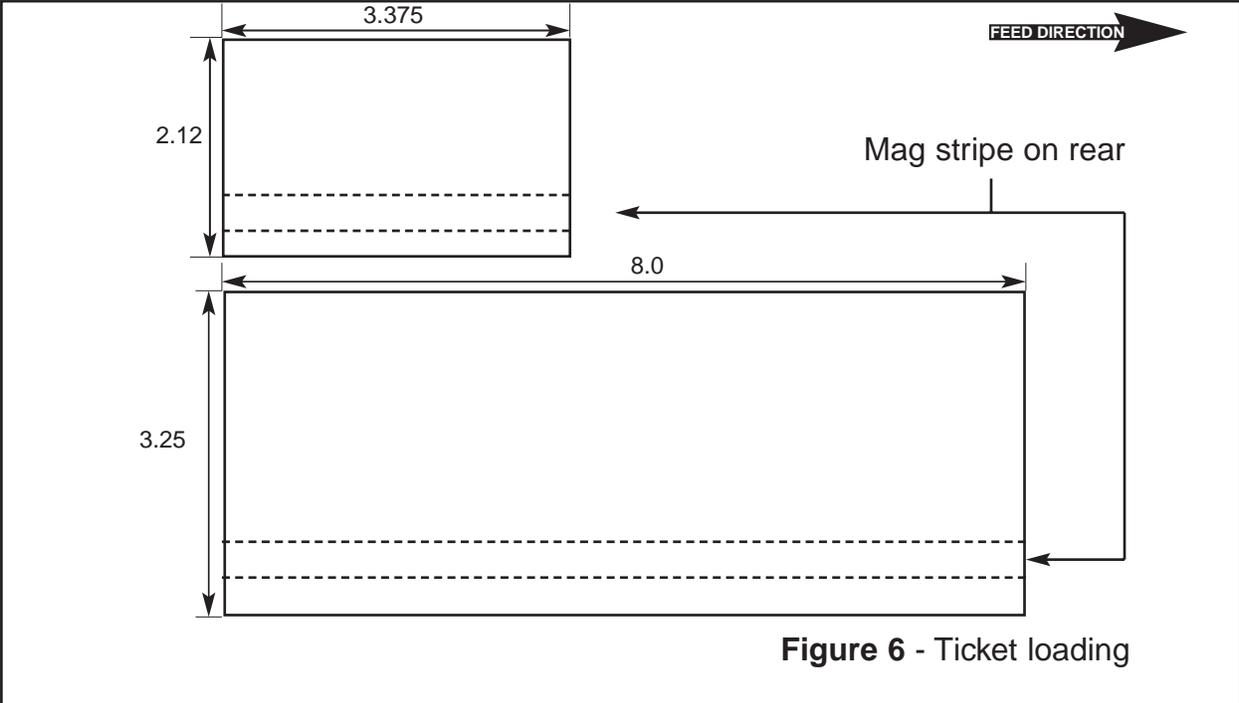


Figure 4 - Mag Mini 41 rear view

4.0 Installation

The Mag Mini 41 ticket printer is designed to be mounted on a counter top or shelf. However, prior to site preparation and installation, the printer should be powered up and run in the self test mode. Attach the AC cord and interface cable into the proper connectors as shown in **figure 4**. Turn Power on. The LCD will display **PAPER OUT**. Begin loading tickets through the input roller assembly (**figure 4**) with a smooth motion until the printer automatically positions the ticket. Two typical ticket formats and feed directions are shown below (**figure 6**).



After the ticket is automatically positioned (the **READY** LED will be illuminated), press the **TEST** button located on the control panel (**figure 2**) to print a test ticket and mag-netics feature A printed test pattern indicates that printer is operational. Verify that the printer properly works with your system by issuing a ticket through your computer system.

You may now install the printer in its permanent location. Adequate room should be provided behind the printer for the smooth feeding of stock. Please do not prevent the ticket hopper from operating by touching tickets during the printing cycle.

5.0 Configuration

The Mag Mini 41 is factory configured for 200 or 300 dpi (optional). An optional Windows compatible (HP emulation) is also available. The printer is factory configured for either serial or parallel interface (see pinouts in **section 6.0**).

A number of other features including baud rate, burst count and print speed are also factory set but can be modified (Operator Menu) through the touch panel as described in Appendix A. Most users will never have reason to change the options in the Operator Menu.

6.0 Standard Interface Pinouts

6.1 Serial Pinouts

RS232 (Standard)

Pin	Function
2	Printer Transmit
3	Printer Receive
7	Ground
5,20	DTR (Printer Ready)
4,22	RTS (+5Vdc)

RS232 (PC type)

Pin	Function
2	Printer Receive
3	Printer Transmit
5	RTS (+5Vdc)
6	DTR (Printer Ready)
7	Ground
8	CD (+5Vdc)

6.2 Typical RS232 Pin Connections

(Standard) 25 PIN PC		(Standard) 9 PIN PC		(PC Type) 25 PIN PC		(PC Type) 9 PIN PC	
BOCA	CPU	BOCA	CPU	BOCA	CPU	BOCA	CPU
2	3 RXD	2	2 RXD	2	2 TXD	2	3 TXD
3	3 TXD	3	3 TXD	3	3 RXD	3	2 RXD
7	7 GND	7	5 GND	5	5 CTS*	5	8 CTS*
20	6 DSR	20	6 DSR	6	6 DSR	6	6 DSR
20	5 CTS*	20	1 CD*	7	7 GND	7	5 GND
20	8 CD*	20	8 CTS*	8	8 CD*	8	1 CD*

* Optional Connection

6.3 Parallel Pinout

Pin	Function
1	Strobe (negative)
2-9	Data (DB0-BD7)
10	ACK (negative)
11	BUSY
12	PAPER OUT
15	ERROR (negative)
18	Ground

NOTE: The above pinouts may vary on certain printers due to special customer request.

7.0 Thermal Paper - Theory & Specification

The print head's life expectancy is composed of both a mechanical and an electrical component. Both of these factors are strongly influenced by the quality of the thermal paper used.

MECHANICAL

The print head has a theoretical rating of 60 kilometers. This number is based upon the assumption that the head will be used with a good quality, top coated thermal paper. Uncoated and poorly top coated thermal papers are abrasive to the print head and have been found to wear through the head after less than one kilometer.

Other factors which may contribute to premature mechanical wear are the use of non-thermal inks and stray metallic particles stuck in ticket perforations. Certain inks colors such as opaque white (which contains titanium dioxide) are also highly abrasive.

Unfortunately, there are no available devices for quantitatively measuring the abrasiveness of a given ticket. Fortunately, we have developed a slightly subjective, but effective method of weeding out overly abrasive ticket stock.

ELECTRICAL

Each heat element, dot, on the print head has a theoretical life expectancy of 100 million activations. This is based on the assumption that each activation will cause the dot temperature to approach the dot's maximum recommended temperature. Running at lower temperatures will increase the theoretical life expectancy, while slight temperature increases will seriously (exponentially) degrade the head life.

The thermal paper can affect the electrical head life in two ways. Insensitive, slow to image papers, will typically encourage the user to increase the voltage to darken the printed image. This will directly increase the head temperature resulting in reduced head life. Additionally, the higher temperatures will frequently cause the ink to peel off the ticket and deposit onto the print head. The ink debris will disrupt the normal transfer of heat from the head to the paper. This further increases the head temperature above the desired level. The use of non-thermal inks and/or non-top coated papers also will cause the ink to release and deposit on the print head.

SPECIFICATION

Based upon the above technical information, BOCA has always tried to encourage our customers to use the proper thermal papers to maximize the life of their print heads. BOCA provides an extensive series of papers which meet the above criteria for low abrasion and high sensitivity. We have also tested and approved a number of Ricoh thermal papers which meet our criteria. While we have not had the opportunity to test other manufacturers' thermal papers, we feel confident that other papers manufactured with the above goals in mind should be acceptable for use in our printers. The following list of papers have been approved by BOCA.

200 dpi usage

BOCA	TLD7
Ricoh	120TLD

300 dpi usage

BOCA	HS7, HS11SG
Ricoh	150TLD

Please note that the 300 dpi papers may be used on 200 dpi printers. In fact, doing so will increase the electrical life of the head as this will allow the head to operate at a lower temperature. DO NOT use 300 dpi heads with 200 dpi paper.

8.0 Maintenance and Adjustments

Your ticket printer is solidly constructed and has been designed for high volume use. It requires minimal care to provide maximum service.

This section provides an overview of printer maintenance, including part alignments, adjustment and replacement.

For discussion purposes, the printer consists of four major modules or assemblies:

- Paper guide and print head assembly
- Burster assembly
- Logic board assembly
- Magnetics Module

As a safety precaution, all service to the printer should be done with power off and the AC cord unplugged from the printer.

8.1 Paper Guide and Print Head Assembly

The principal function of this assembly is to guide the ticket stock to the thermal print head where thermal printing takes place. Additionally, this assembly houses the drive plates and one optical detector. If necessary, the total assembly can be removed from the unit. However, all replacements and adjustments of the components of this assembly can be done without removing the total assembly. The most common adjustments and replacements regarding this assembly follows:

8.1.5 Optical Devices (see figure 8)

There are four opto devices located in the Mag Mini 41 printer.

The opto position is factory set and adjustment should not be necessary.

Caution: Before making any opto adjustments make sure your ticket stock was manufactured to proper specifications.

The printer should burst the ticket at the perforation. The position of the burst can be controlled by changing the burst count setting in the **FACTORY MENU**. If you are not able get the desired burst position, then make sure your ticket stock was manufactured to proper specifications.

Once a year the optos eyes should be blown off with air. This interval will vary depending upon the environment and the quality of the ticket stock.

8.1.6 THERMAL PRINT HEAD

The print head should be cleaned periodically to prevent debris from building up on the print element. The required cleaning interval varies greatly depending on the quality of the ticket stock and the amount of dust entering the print area. Excessive dirt build up on the print head will result in reduced quality. Continuing to run the print head in a dirty condition will reduce its life expectancy as it is unable to diffuse its heat properly.

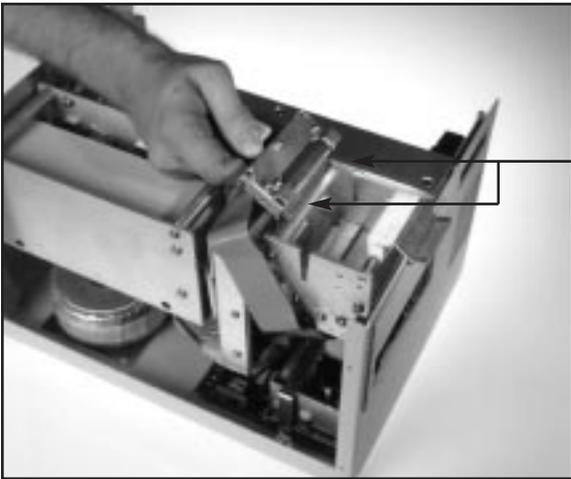
The thermal print head can be removed for cleaning or replacement, as follows:

(Please refer to **figures 9a - c**)

1. Make sure power is off and the AC cord is disconnected from the printer.
2. **DO NOT UNPLUG CABLE FROM PRINT HEAD.**
3. Lift up on the cam lock assembly (located above the head mounting block) to remove pressure from the thermal head. (see **figure 9a**)
4. Lift up on the head mounting block/thermal head to remove. (see **figure 9b**)
5. Clean the thermal print head surface (the side that makes contact with the paper) with isopropyl alcohol. (see **figure 9c**)
6. Install the head by reversing the above procedures.
7. Restore pressure to the head by pushing down on the cam lock assembly.
8. The printer is now ready for operation. If the print quality is still poor then the thermal head needs to be replaced.
9. To replace print head remove ribbon connector from print head and then remove print head from mounting block by removing two unmarked screws. (see **figure 9b**)

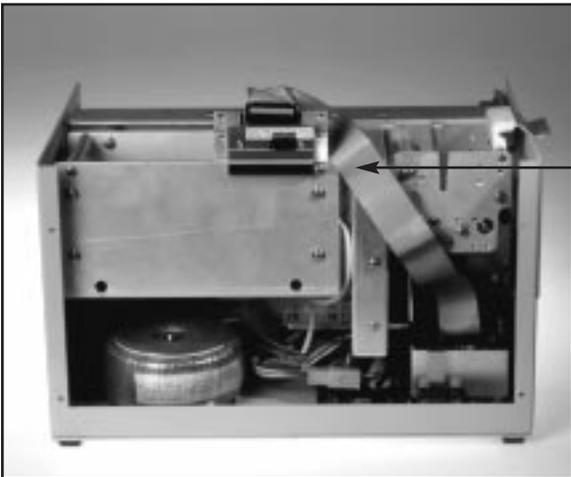


Figure 9A - Print Head removal



Remove these two unmarked screws to replace print head.

Figure 9B - Print Head removal



Clean this surface.

Figure 9C - Print Head removal

8.1.7 Rubber Drive Roller (Platen)

The rubber drive roller should be cleaned once a year to prevent paper dust from building up on the roller. Clean drive roller with a paper towel and alcohol.

1. Unlock the thermal head and tilt back to gain access to platen.
2. Clean the full length of the platen.
3. Rotate the platen clockwise and repeat step 2, continue in the same manner for one full revolution of the platen.
4. Close or lock the thermal head. Printer is now ready for normal operation.
(NOTE: The platen may require more frequent cleaning in dusty environments or when using inferior ticket stock.)

8.2 Burster Assembly

The Burster is a solenoid activated mechanism designed to separate ticket at the perforation. The Burster requires no adjustments and is rated for approximately 750,000 cuts. Please be aware of the following:

The Burster should be blown out with air periodically to prevent debris from building up inside the cutter area. The required cleaning interval varies greatly depending on the quality of the ticket stock and the amount of paper dust entering the burst area.

8.3 Logic Board and Power Supply Board

The printed circuit boards used in this product have been manufactured using surface mount technology. These printed circuit boards cannot be effectively repaired in the field and should be returned to the manufacturer if repair is required.

Your printer has one large printed circuit board, the Main Logic Board. This section describes board removal and proper installation. **ALL SERVICE SHOULD BE DONE WITH POWER OFF AND THE AC CORD UNPLUGGED FROM THE PRINTER.**

8.3a Logic Board (Removal)

1. Gain access to the Logic Board Assembly by turning printer over and unscrewing electronics mounting plate.
2. Remove nuts attaching heat sink brackets to the electronics mounting plate.
3. Unplug connectors going to the main logic board.
4. Use a screwdriver to gently wedge logic the board from the fasteners.
5. Lift board and remove.

8.3b Logic Board (Installation)

1. Align Main Logic Board so that the four mounting holes are above the four fasteners.
2. Press logic board straight down onto the brass fasteners.
3. Attach connectors going to the main logic board.
4. Install nuts attaching heat sink brackets to the electronics mounting plate.

8.4 General Cleaning

The interior of the printer should be cleaned whenever there is a visible accumulation of dust. Use a small vacuum for cleaning. Be careful not to jar any of the printer's parts loose.

9.0 Magnetic Encoding

Theory and Specifications

Initialization Sequence

- Ticket feeds forward through magnetics module to register ticket
- Ticket reverses to encode position

Normal Operation

- CPU sends magnetics data, followed by ticket data
- Printer starts encode process
- Burster separates ticket
- Ticket moves through print station, while the next ticket is reversed through magnetics to the pre-encode location
- Ticket ejected after printing
- Next ticket starts encoding
(NOTE: The “next ticket starts encoding” function will eventually be performed while the ticket is being printed)

Command Formats and Communications

- All printing related commands will be handled in accordance with BOCA's FGL IV programming guide.
- Any error in writing to the magnetic strip will cause the printer to automatically print a “void” ticket.
- To print a ticket without magnetics, just send a valid ticket with a print command. The printer will automatically bypass the encoding operation.
- All transmissions to and from magnetics will be as defined below. These functions will follow normal FGL formats.

CPU COMMANDS

COMMAND	Definition	Printer Response
<T1>	write track 1 magnetics	ACK or NAK after completion of encode
<T2>	write track 2 magnetics	
<T3>	write track 3 magnetics	
<T4>	write track 4 magnetics	
<WM>	start writing magnetics	
<bc#>	burst length	

Burst Count

The burst length is preset at the factory and should not require adjustment by the customer. In the event that the ticket is not bursting at the proper location, the burst length # should be adjusted to a value slightly greater than or less than the actual ticket length. The ticket length is defined as the number of dot columns in the ticket. (For example, a 8", 203.1 dpi ticket is approximately 1624 dots long; at 305 dpi, the ticket is 2440 dots long.)

In addition to the burst length command, the burst count can also be adjusted from the front panel by entering the factory menu. The procedure for doing this is given below.

- 1) Press and hold all three control panel keys, (MENU, TEST & CHOICES) to enter the factory menu.
- 2) Scroll to the "INC BURST COUNT" or "DEC BURST COUNT" topic, depending on the direction of adjustment, by repeatedly pressing the MENU key.
- 3) Press the CHOICES key to select the topic's numeric value.
- 4) Repeatedly press the CHOICES key to increment or decrement the value as necessary. Please note it is usually best to move in increments no larger than 10 counts at a time to prevent over compensation of the burst position.
- 5) Press the TEST key once to enter your choice and a second time to save the new value permanently and re-initialize the printer.

Magnetic Format

The magnetics section of the printer is shipped from the factory in either the ATB or ISO (1 thru 3 track) configuration. Please address the magnetics in the format appropriate to your configuration type:

ATB Format

The data for each track must be terminated with an EOT (04H). All data must be sent in accordance with the ATB specification.

Typical ATB data stream

```
<T1> block1 ; block2 ; block3 EOT  
<T2> block1 ; block2 ; block3 EOT  
<T3> block1 ; block2 ; block3 EOT  
<T4> block1 ; block2 ; block3 EOT  
<WM>
```

NOTES:

1. Do not insert spaces in data stream. Spaces are for readability only.
2. All 4 tracks support alphanumeric data.
3. The “;” (block separator character) must be sent between blocks whether or not there is any data in a given block.
4. Maximum number of characters per block: Block 1 = 60; block 2 = 60; block 3 = 40.

ISO Format

The data for each track must be terminated with an EOT. All data must be sent in accordance with the ISO specification.

Typical ISO data stream

```
<T1> block1 EOT  
<T2> block1 EOT  
<T3> block1 EOT  
<WM>
```

NOTES:

1. Do not insert spaces in data stream. Spaces are for readability only.
2. ISO data contains only one block of data and no block separator characters.
3. A start, stop and LRC byte are automatically inserted into each track of data. These three characters are counted among the maximum characters allowed per track.
4. Tracks 1 supports alphanumeric data. Tracks 2 & 3 are numeric only.
5. Maximum number of characters per track: Track 1 = 79; track 2 = 40; track 3 = 107

Automatic Re-print

Automatic Re-print is a user selected feature that provides for automatically reproducing a ticket, including the magnetics data, that has fail the verification process. The printer will make up to three attempts to produce a good ticket from the original information before it returns an error message and halts any further ticket processing. This feature was designed specifically for those customers using parallel interfaces who can not receive status messages from the printer and would otherwise not know when a void ticket has been printed.

Automatic Re-print can be selected from the factory menu using the following procedure.

- 1) Press and hold all three control panel keys, (MENU, TEST & CHOICES) to enter the factory menu.
- 2) Scroll to the “Auto Reprint” topic by repeatedly pressing the MENU key.
- 3) Press the CHOICES key to select the topic’s options.
- 4) Repeatedly press the CHOICES key to scroll through the option list. Please note, the flashing black cursor indicates the current selection.
- 5) Select Yes to enable automatic re-print or No to disable it.
- 6) Press the TEST key to enter your choice and re-initialize the printer.

10.0 Mag Mini Spare Parts

PART #	DESCRIPTION
P31-1000	AC FILTER
P28-1012	AC SWITCH
P50-1002	BELT, TIMING 89T
P50-1013	BELT, TIMING 94T
	BURSTER ASSEMBLY
421671	CONTROL PANEL ASSEMBLY
422559	CONTROL PANEL CABLE
P19-1002	CORD, POWER
422558	DATA CABLE
422773	DC HARNESS
P29-1001	FUSE 2A SB, 250V
422558	HEAD CABLE
421359-5M3	HEAD MOUNTING BLOCK
422190-2	INTERFACE BOARD
P38-1003A	LCD DISPLAY PANEL
422754	LCD WIRE HARNESS
	MAGNETIC UNIT
422770	MAIN LOGIC BOARD (FGL 41)
422264	OPTO BOARD
P52-1009	O-RING (BAG OF 3)
421508W	PLATEN
P45-1011	PLATEN BEARING
422772	PRINT CAGE ASSEMBLY (NO PRINT HEAD)
	PULLEY SET
422718	STATIC BRUSH
4422590	STEPPER MOTOR
422774	STEPPER MOTOR WIRE HARNESS
422808-115	TRANSFORMER, 115 volt
422808-230	TRANSFORMER, 230 volt
422775	TRANSFORMER WIRE HARNESS
P29-1002	FUSE, 2A SB
421428	OPTO MTG. BRACKET
422264	OPTO DETECTOR ASSY. (surface mtg. IC's)
422007-F	OPTO DETECTOR, ATM FEED
422007-C	OPTO DETECTOR, ATM TEAR OR CUT
	OPTO MTG. HARDWARE (SCREW, FW, LW)
4215085M2	PLATEN 2.00" 200 OR 300 DPI
4215085M3	PLATEN 3.25" 200 OR 300 DPI
421370-5M	PRESSURE BLOCK ASSY.
BS2002	PRINT HEAD, THERMAL (2.00" 200 DPI)
BS3002	PRINT HEAD, THERMAL (2.00" 300 DPI)
BS 2003	PRINT HEAD, THERMAL (3.25" 200 DPI)
BS3003	PRINT HEAD, THERMAL (3.25" 300 DPI)
P44-1011	SPRING, PRESSURE ADJ. BLOCK
P28-1013	SWITCH, POWER (4 tab)
P28-1012	SWITCH, TEST
421724	TAKE OUT HEAD CAM LOCK ASSY. (Complete)

11.0 Troubleshooting Guide

This is a simplified troubleshooting guide listing some of the typical problems. It is not intended to provide technical details or repair methods, but can serve as a guide to fault isolation in the field. If you need additional help, please contact **BOCA** at
Tel: (561) 998-9600 Fax: (561) 998-9609

1. NO OPERATION, POWER INDICATOR IS OUT

- a. Check the power cord for proper installation at both ends.
- b. Check main fuse and replace if blown. (2amp, 250 volt, SB)
- c. Check that there is power at the AC receptacle.
- d. If main fuse keeps blowing then check that the printer's AC voltage board is set for the correct voltage.

2. POWER IS ON BUT NO OPERATION

- a. Check all electrical connections on the printer.
- b. Unplug the thermal head and turn on the printer.
If printer works, replace the thermal head.
- c. Replace the Power Supply board.
- d. Replace the Main logic board.

3. POWER IS ON BUT TICKET WILL NOT LOAD

- a. See # 2
- b. Make sure the print head/cam lock assembly is fully locked in the closed position.
Consult "**Thermal Print Head**" in **Section 8.1.6**.
- c. Check that the ticket stock is being loaded correctly.
- d. Replace ticket load opto.
- e. Replace the Power Supply board.
- f. Replace the Main logic board.

4. ERRATIC CUT POSITION

- a. Check for defective ticket stock Is the ticket too wide for the paper path?
- b. Clean off opto eyes. Consult "**Optical Devices**" in **Section 8.1.5**.
- c. Check that the platen is clean. Consult "**Rubber Drive Roller**" in **Section 8.1.7**.
- d. Replace ticket burst opto.
- e. Replace ticket load opto.
- f. Replace the Power Supply board.
- g. Replace the Main logic board.

5. ERRATIC PRINT POSITION

- a. See # 4

6. **POOR PRINT OUT** (light print out)
 - a. Make sure the print head/cam lock assembly is fully locked in the closed position.
 - b. Consult “**Thermal Print Head**” in **Section 8.1.6**.
 - c. Clean print head. Consult “**Thermal Print Head**” in **Section 8.1.6**.
 - d. Adjust print intensity setting via the control panel (see **Appendix A**)
 - e. Replace thermal head.

7. **POOR PRINT OUT** (white voids in print out)
 - a. Clean print head. Consult “**Thermal Print Head**” in **Section 8.1.6**.
 - b. Replace thermal head.

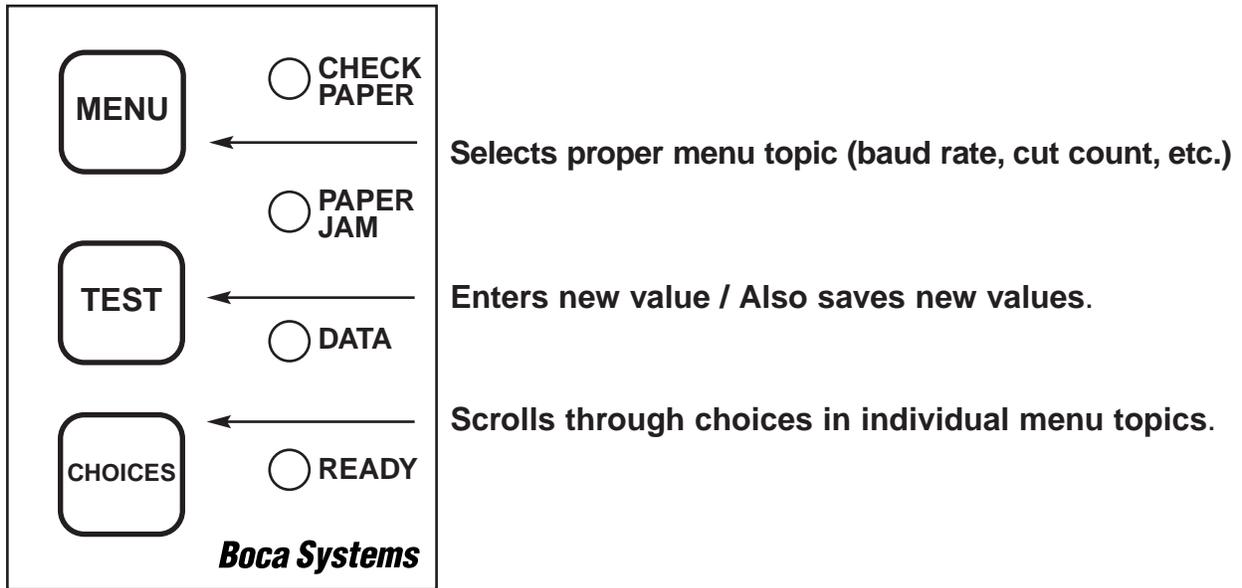
8. **NO PRINT OUT**
 - a. Check head cable for electrical connection at both ends
 - b. Check to make sure head cable is plugged in properly into the thermal head.
 - c. Replace the thermal head.
 - d. Replace the Power Supply board.
 - e. Replace the Main logic board.

9. **PRINTER SKIPS TICKETS WHILE PRINTING**
 - a. Check all electrical connections on the printer.
 - b. Check position and quality of black mark on the ticket stock.
 - c. Clean off opto eyes. Consult “**Optical Devices**” in **Section 8.1.5**.
 - d. Replace ticket burst opto.
 - e. Replace ticket feed opto.

10. **PRINTER SKIPS TICKETS AND DIES**
 - a. See # 9.

11. **TICKET JAM ENTERING THE BURST AREA**
 - a. Check all electrical connections on the printer.
 - b. Verify that path is clear

The FGL 41 printers allow the user to adjust various printer options through the control panel.



To access and use the OPERATOR MENU, follow these steps:

1. Ticket stock should be loaded into the printer. The LCD window displays **FGL41B#** (# - revision number, incremented for minor revisions (**B** - revision letter, incremented for major revisions)
2. Press both **MENU** and **TEST** switches simultaneously for about three seconds. The LCD window displays **OPERATOR MENU!** .
3. To scroll through the menu topic, use **MENU** stopping on the topic you wish to change.
4. Press **CHOICES** to scroll through choices in the selected topic. **NOTE:** The printer displays a blinking cursor for the values presently stored in the printer.
5. Once you have found the new value you want, press **TEST**. The LCD window displays **EXIT AND SAVE?**. If you wish to save the new value, press **TEST** again.
6. If you do not wish to save the new value, press **MENU**. The LCD window displays **JUST EXIT?**. Press **TEST** to exit the **OPERATOR MENU** without saving new values or press **MENU** to enter back into the **OPERATOR MENU**.

The chart below lists the present menu topics. These topics are subject to change.

OPERATOR MENU!
BAUD RATE?
MINI/MICRO?
PRINT SPEED?
DIAGNOSTIC MODE?
TICKET TYPE?
STATUS ENABLED?
TRANSPARENT MODE
PAPER MODE?
INC CUT1 COUNT?
DEC CUT1 COUNT?
INC CUT2 COUNT?
DEC CUT2 COUNT?
PRINT MODE?
PRINT INTENSITY?
EXIT AND SAVE
JUST EXIT

The following is an overview of what each Menu option does:

BAUD RATE? Controls the serial interface baud rate, parity bit, data bits and stop bits.

Here are the following choices:

1200,N,8,1
1200,E,7,1
2400,N,8,1
2400,E,7,1
4800,N,8,1
4800,E,7,1
9600,N,8,1
9600,E,7,1
19200,N,8,1
19200,E,7,1

(factory default)

MINI/MICRO? Defines the type of printer.

MINI Is for a printer with a Silent Cutter Assembly (SC2) (Mini, Mini Plus, Mini MB, Dual Mini)

MICRO Is for a printer without a SC2 (Micro, Micro Plus, Micro MB, Dual Micro)
(factory default)

PRINT SPEED? Controls the speed the ticket travels at. Also effects the print quality.

The numbers range from **0 - FASTEST** to **7 - SLOWEST**. **3 is factory default.**

DIAGNOSTIC MODE? Please consult your Programming Guide

Your choices are **YES** or **NO**. **NO is factory default.**

TICKET TYPE? Defines how the optos are configured on the paper guide assembly.

NORMAL Both optos are inline with each other (usually mounted on a black bracket)
(factory default)

ATM Feed opto is mounted under the thermal head and cut opto is attached to the cutter assembly.

LABEL Same as ATM but the cut opto is a see through type.

SPECIAL TICKET This option is for a Micro MB printer

STATUS ENABLED? Enables or disables the X-ON/X-OFF and status response protocols.

Your choices are **YES** (Enabled) or **NO** (Disabled). **YES is factory default.**

TRANSPARENT MODE? Please consult your Programming Guide

Your choices are **YES** (Enabled) or **NO** (Disabled). **NO is factory default.**

PAPER MODE? Is generally used only for test purposes. It may also be used on roll stock with no black marks on the ticket.

Your choices are **YES** (Enabled) or **NO** (Disabled). **NO is factory default.**

INC CUT1 COUNT? Enables the operator to move the cut or tear position to the left (towards the ticket entrance area). Cut counts are increments of .003" for 300dpi and .002" for 200dpi. The count value is changed by depressing **CHOICES**. **16 is factory default.**

DEC CUT1 COUNT? Enables the operator to move the cut or tear position to the right (towards the ticket exit area). Cut counts are decrements of .003" for 300dpi and .002" for 200dpi. The count value is changed by depressing **CHOICES**. **16 is factory default.**

INC CUT2 COUNT? Same as **INC CUT1 COUNT?** but effects path #2 on a dual path printer.

DEC CUT2 COUNT? Same as **DEC CUT1 COUNT?** but effects path #2 on a dual path printer.

PRINT MODE? Defines the automatic ticket length calculation feature.

THERMAL The printer will feed out and then retract a ticket during this measurement. **(factory default)**

RIBBON The printer will feed out one blank ticket. This mode is used for label stock to prevent peeling.

PRINT INTENSITY? Controls the darkness of ticket print out.

Here are the following choices:

LIGHT
MED LIGHT
NORMAL
MED DARK
SHORT HEAD LIFE

(factory default)

EXIT AND SAVE ! Will save any changes made to the above menu options.

If you wish to save the new value then press **TEST**, if not press **MENU**.

JUST EXIT? Will exit the menu options without saving any changes.

If you wish to exit without saving the new value then press **TEST**, if not press **MENU**.