



Boca Systems
LEMUR -C TICKET PRINTERS
Operator's Manual



RevA: 04.05.22

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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 the user's 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 ensure compliance.

WARRANTY INFORMATION

BOCA warrants the equipment manufactured and sold by it to be free from defects in material and workmanship under normal use and service for a specified period of time. Parts damaged by negligence or misuse (bad ticket stock, improper operating conditions, etc.) are excluded from this warranty. Warranties for printers are 1 year from date of shipment. (NOTE: The print head is a consumable part and is warranted for 90 days.) Spare parts carry a 90-day warranty. Tickets are warranted, under proper storage conditions, for a period of 3 years. All warranty work is to be performed either by BOCA or by an [authorized BOCA service center](#). Shipping charges to the repair center are the customer's responsibility. BOCA will pay for the equipment's return via ground service.

Please go to the link below if you have any reported issues with your new BOCA printer.
www.bocasystems.com/onlinesupportform.html

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 its 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.

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1.0 Introduction

The Lemur-C printer is a direct thermal ticket printer that may be purchased with optional integrated cutting mechanism. This manual will provide the user with general information regarding printer set-up, configuration and troubleshooting. Please read the important safety information section before installation is conducted. Review the [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 and accessories from the box and inspect for obvious damage. If damage is noticed, please report it immediately to BOCA.

Email: cathy@bocasystems.com Tel: (561) 998-9600 Fax: (561) 998-9609

The following items should be in the box:

- a) Ticket Printer
- b) 24VDC power supply
- c) AC cord
- b) Hopper (if applicable)
- d) Interface cable (optional)
- e) Mounting Plate (optional)



**Shown with
optional hopper**

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3.0 Important Safety Information



WARNING: The appearance of this symbol indicates the proximity of an exposed high voltage area. Please follow all directions carefully for your personal safety. You must read the following safety information carefully before working on the printer.

As a safety precaution, all service to the printer should be done by **qualified persons** with power off and the AC cord unplugged from the printer. Following any procedure requiring the removal of covers and/or doors, please verify that they have been properly attached and fastened prior to operating the printer.

WARNING: "Provide an earthing connection before the mains plug is connected to the mains. And, when disconnecting the earthing connection, be sure to disconnect after pulling out the mains plug from the mains."

WARNING: Power Cord Set: This must be approved for the country where it is used:

U.S.A. and Canada

- The cord set must be UL-approved and CSA certified.
- The minimum specification for the flexible cord is:
 - No. 18 AWG
 - Type SV or SJ
 - 3-conductor
- The cord set must have a rated current capacity of at least 10A.
- The attachment plug must be an earth-grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.

United Kingdom only

- The supply plug must comply with BS1363 (3-pin 13 amp) and be fitted with a 5A fuse which complies with BS1362.
- The mains cord must be <HAR> or <BASEC> marked and be of type H03VVF3GO.75 (minimum).

Europe only:

- The supply plug must comply with CEE 7/7 ("SCHUKO").
- The mains cord must be <HAR> or <BASEC> marked and be of type H03VVF3GO.75 (minimum).

Denmark: The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.

Switzerland: The supply plug must comply with SEV/ASE 1011.

WARNING: The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN60320/IEC320 appliance inlet.

WARNING: The socket outlet must be near to the unit and easily accessible.

WARNING: France and Peru only:

This unit cannot be powered from IT† supplies. If your supplies are of IT type, this unit must be powered by 230V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled Neutral, connected directly to earth (ground).

WARNING: RJ-45 Ports. These are shielded RJ-45 data sockets. They cannot be used as standard traditional telephone sockets, or to connect the unit to a traditional PBX or public telephone network. Only connect RJ-45 data connectors. Either shielded or unshielded data cables with shielded or unshielded jacks can be connected to these data sockets.

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4.0 Installation

The [Lemur series printer](#) was designed to be mounted either on a desktop or shelf (horizontal model) or vertically in a counter top (see [Appendix A](#) for installation of vertical printers).

Prior to site preparation and installation, the printer should be powered up and run in the self-test mode.

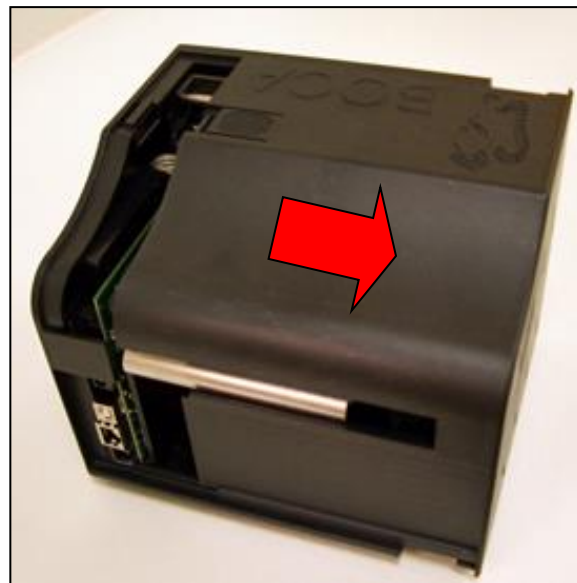
- Lay the printer flat on a counter top.
- Attach the AC cord into the 24VDC power supply and plug the other end into the round DC in port of the printer.
- Install ticket hopper (if applicable) to catch the tickets. Lemur printer without a cutter won't have a ticket hopper.
- IF YOU HAVE A LEMUR-C CONFIGURED FOR RECEIPT MODE THEN SEE [APPENDIX I](#).
- Turn power on. If the printer has an optional cutter, then you will hear the cutter motor cycle.
- Wait six seconds after power up. Begin loading tickets through the entrance slot with a smooth motion until the printer automatically positions the ticket. See section [5.0 Ticket Load Procedure](#).

NOTE: You want to make sure that the black timing mark is in the correct location before loading the tickets into the paper path. See www.bocasystems.com/tickets_specs9.html for black mark layout specs.

- After the ticket is automatically positioned (the green READY led will be illuminated), press the center TEST button located on the control panel to print a test ticket. The next page shows sample self-test ticket printouts.
- Verify that the printer properly works with your system by issuing a ticket through your computer system. You may also use out customer-based program to test the printer independently of your ticketing system (see [Appendix C](#))

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

Lemur cover removal – The cover may be removed by depressing the cover lock tab that is located on top of the cover. Slide the cover off.





Above sample was printed on a 2" x 5.5" concert size ticket.



Above sample was printed on a 3.25" x 2" cinema size ticket.

Your printout may vary depending on printer configuration and ticket stock used.

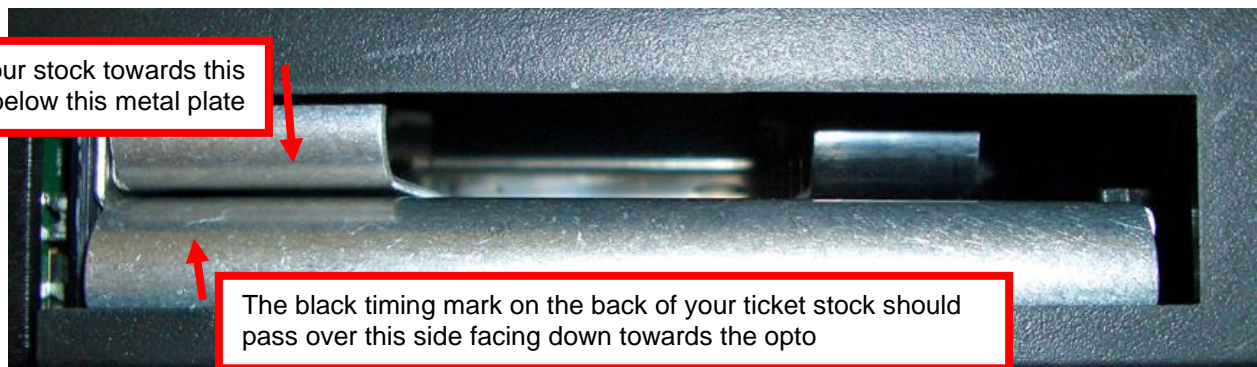
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5.0 Ticket Load Procedure

In June of 2021, Printer serial number 459433 and higher, are equipped with Universal Paper Guides (UPG), except for receipt models. Please go to [page 8](#) for Ticket Load Procedure for this paper path.

1. Turn the printer on and wait five seconds. The red CHECK PAPER led will be illuminated. If your printer has a cutter, they you will hear it cycle during this time.
2. Begin loading the tickets through the entrance slot with a smooth motion until the ticket stock comes to a stop (at this point the stock is between the thermal head and platen). Keep pressure against the stock and the printer will automatically feed the ticket stock.

If you have any ticket load issues then make sure the paper guild slider bar is properly adjusted (see [8.1.4 Ticket Width Adjustment](#)).



Adjustable (ADJW)

Two typical ticket formats and feed directions are shown below. The black timing mark on the back of the ticket stock must be facing down towards the floor or the [opto sensor](#).



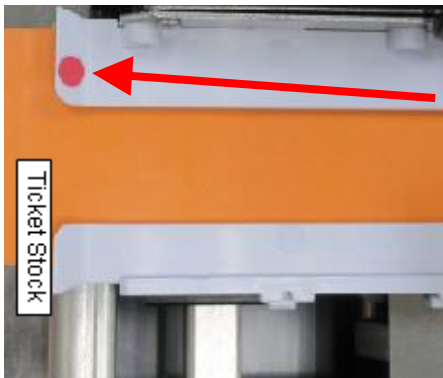
When loading 5.50" long ticket stock the black timing mark should be towards the rear of the ticket (the last part that goes into the printer). When loading 2.0" long cinema ticket stock the black timing mark should be furthest away from to the leading edge of the ticket (the first part that goes into the printer).

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Universal Paper Guide (UPG) Ticket Load Procedure

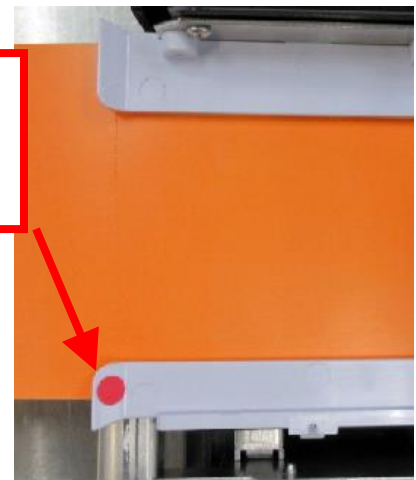
1. Turn the printer on and wait five seconds. The red CHECK PAPER led will be illuminated. If your printer has a cutter, they you will hear it cycle during this time.
2. Begin loading the tickets through the entrance slot with a smooth motion until the ticket stock comes to a stop (at this point the stock is between the thermal head and platen). Keep pressure against the stock and the printer will automatically feed the ticket stock.

If you have any ticket load issues then make sure the paper guild slider bar is properly adjusted (see [8.1.4 Ticket Width Adjustment](#)).



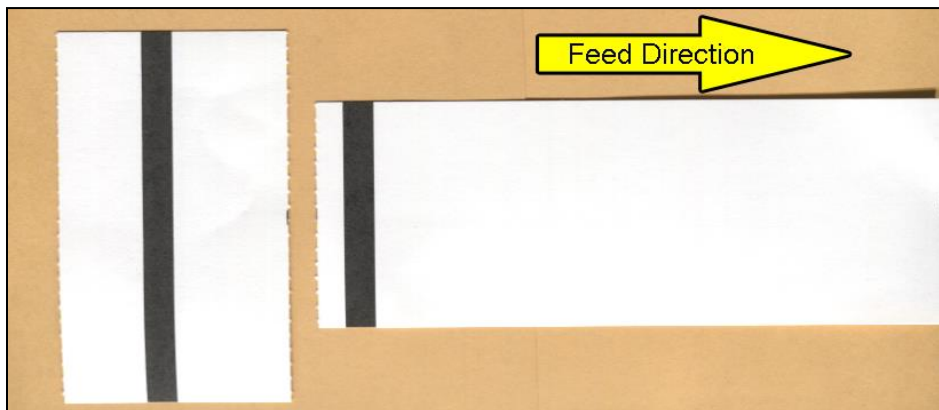
Above shows ADJ2 or ADJW path

The black timing mark on the back of your ticket stock should pass under the rail side with the red dot and is facing down towards the floor.



Above shows RADJW path

Two typical ticket formats and feed directions are shown below. The black timing mark on the back of the ticket stock must be facing down towards the floor or the [opto sensor](#).

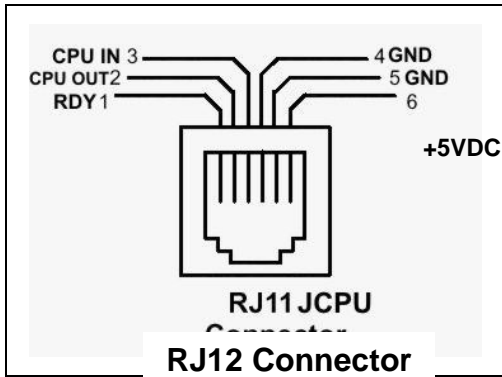


When loading 5.50" long ticket stock the black timing mark should be towards the rear of the ticket (the last part that goes into the printer). When loading 2.0" long cinema ticket stock the black timing mark should be furthest away from to the leading edge of the ticket (the first part that goes into the printer).

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6.0 Standard Interface Pinouts

RJ12 Serial Connection



TYPICAL DB9 to RJ12 PIN CONNECTIONS

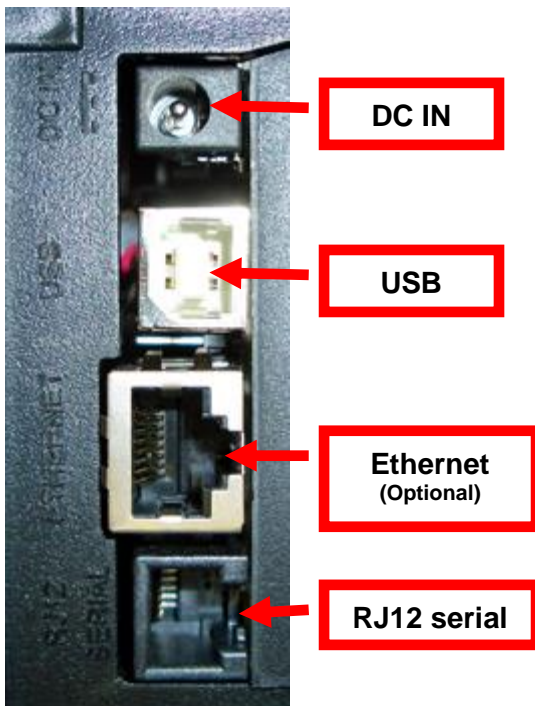
9 pin host	BOCA RJ12	
2	2	Transmit
3	3	Receive
5	4	GND
6	1	RDY
8	6	CTS

USB USB 2.0 compliant devices.

ETHERNET (Optional) is a standard RJ45 Ethernet cable connection.

WI-FI (Optional) is compatible with 802.11b/g Wi-Fi router and supports security settings WEP/WPA/WPA-2.

BLUETOOTH (Optional) Low Energy (LE).



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7.0 Thermal Paper - Theory & Specification

Refer to the BOCA Systems website at www.bocasystems.com, [THERMAL TICKETS](#) section for the most current [paper specifications](#).

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 ink 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 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 T4, T5, T7, LCS and SKI10

200 and 300 dpi usage

BOCA HS7, M7, HS5, M10, SKI14

Please note that the 300 dpi papers may be used on 200 dpi printers. In fact, doing so will allow the user to decrease the head energy thereby increasing the electrical life of the head. DO NOT use 300 dpi heads with 200 dpi paper.

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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.



WARNING: The appearance of this symbol indicates the proximity of an exposed high voltage area. Please follow all directions carefully for your personal safety. You must read the following safety information carefully before working on the printer.

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

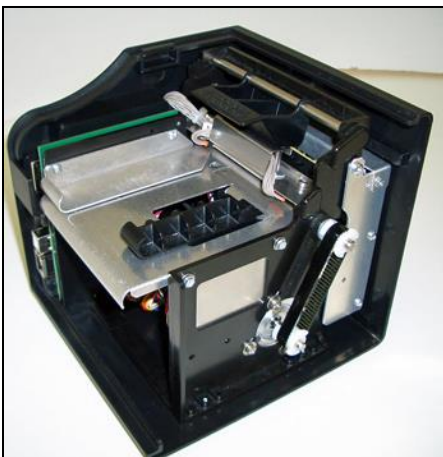
For discussion purposes, the printer consists of three major modules or assemblies:

- Paper guide and print head assembly
- Cutter assembly
- Logic board assembly

As a safety precaution, all service to the printer should be done by [qualified persons](#) with power off and the AC cord unplugged from the printer. Following any procedure requiring the removal of covers and/or doors, please verify that they have been properly attached and fastened prior to operating 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 platen and ticket positioning sensors. If necessary, the total assembly may be removed from the unit. All replacements and adjustments of the components on this assembly may be done without removing the total assembly. The most common adjustments and replacements regarding this assembly follow:



Lemur-C non-UPG paper guide



Lemur-C UPG paper guide

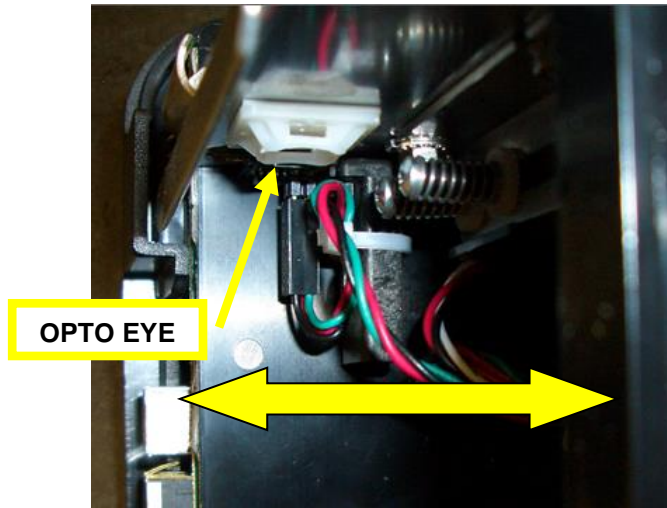


Lemur-C with receipt paper holder
See [Appendix I](#).

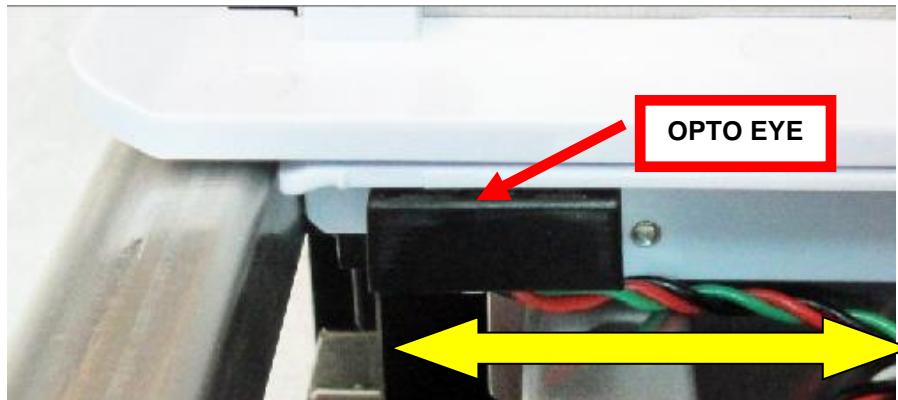
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8.1.1 Cut or Tear Opto Sensor

There is one optical sensor (opto) mounted on an adjustable plastic bracket. The opto controls the cut or tear position. **Removal or adjustment of the opto should be done without removing the bracket from the paper guide.** The opto position is factory set and adjustment should normally not be necessary.



Below image shows a Universal Paper Guide (UPG)



Note: Before making any opto adjustments make sure your ticket stock was manufactured to proper [ticket specifications](#).

To adjust the cut or tear position, physically adjust the opto mounting bracket forward or backwards to achieve the desired cut or tear location. On a Lemur with auto cut the cut position should be a 1/16"-1/8" away from the ticket perforation. On a Lemur without auto cut the ticket perforation should line up with the edge of the cabinet or top plate.

For a printer with a Universal Paper Guide (UPG) you may need to remove the ticket stock in order to physically adjust the black timing mark sensor (opto).

If you are not able to get the desired cut position, make sure your ticket stock was manufactured to proper specifications.

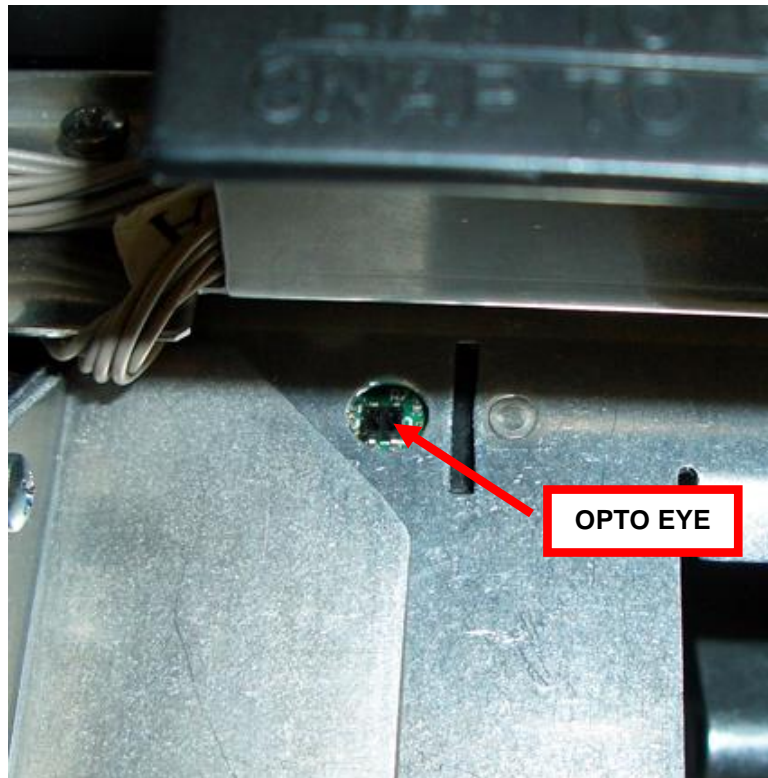
Once a year the opto eye should be blown off with air. This interval will vary depending upon the environment and the quality of the ticket stock.

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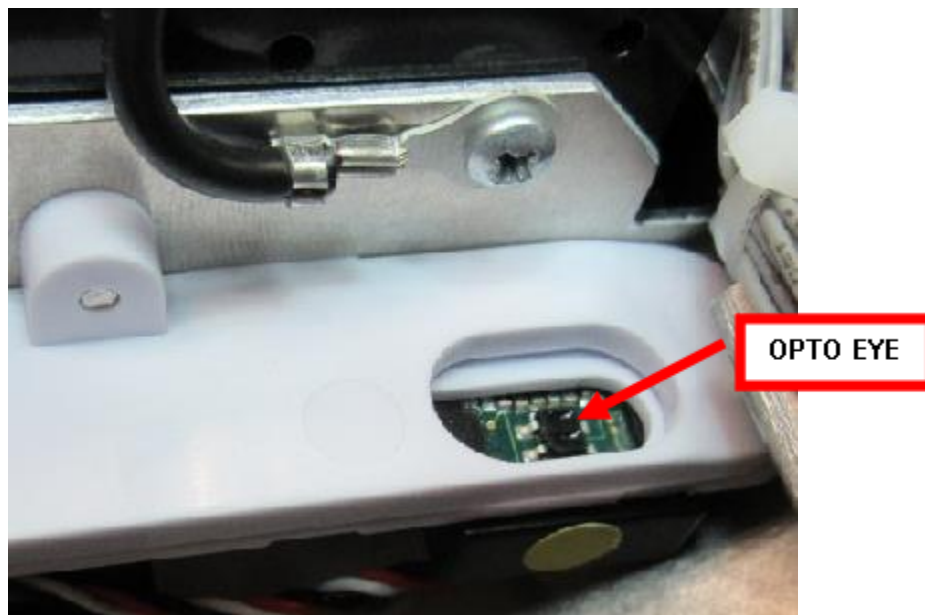
8.1.2 Load Opto Sensor

The load opto is responsible for letting the printer know when it has paper stock loaded in the printer.

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



Below image shows Universal Paper Guide (UPG)

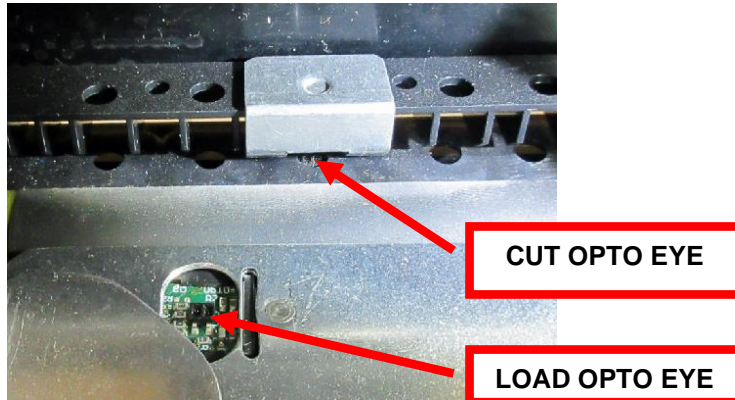


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8.1.3 CUT-3 Opto Sensor

Your printer may have an optional CUT-3 configuration that will place the cut opto onto the cutter or tear assembly. On the printer's serial number tag the opto field will show CUT-3. The opto sensors are responsible for letting the printer know when it has paper stock loaded in the printer (load opto) and detecting the black timing mark on the back of the ticket stock (cut/tear opto).

1. Remove the print head (see [8.1.4 Thermal Print Head](#))
2. Using inert dusting gas (canned air) or equivalent blow air over the opto eyes (see below photo).



3. Once the opto eyes are cleaned, install the print head back into the printer
4. Restore pressure to the head by closing the cam lock lever so it locks in place.

The printer is now ready to be put back in service.

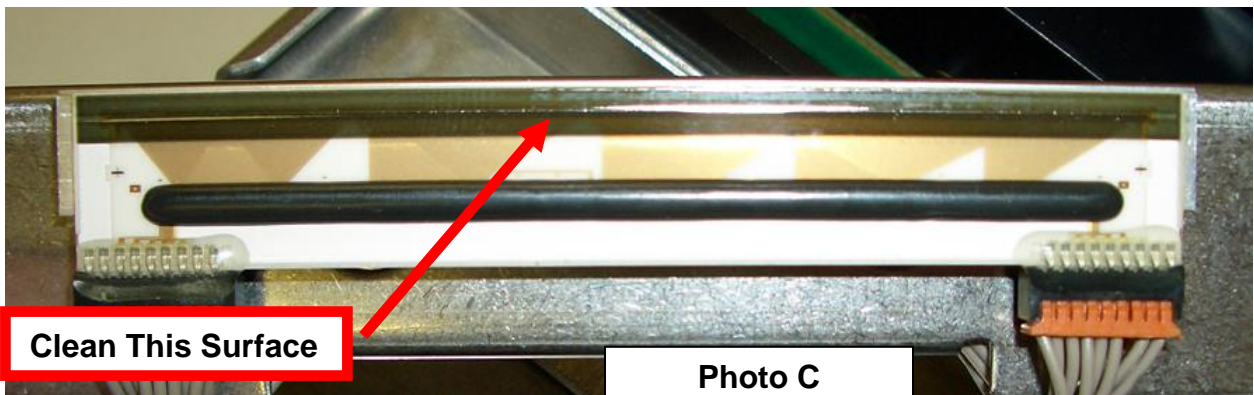
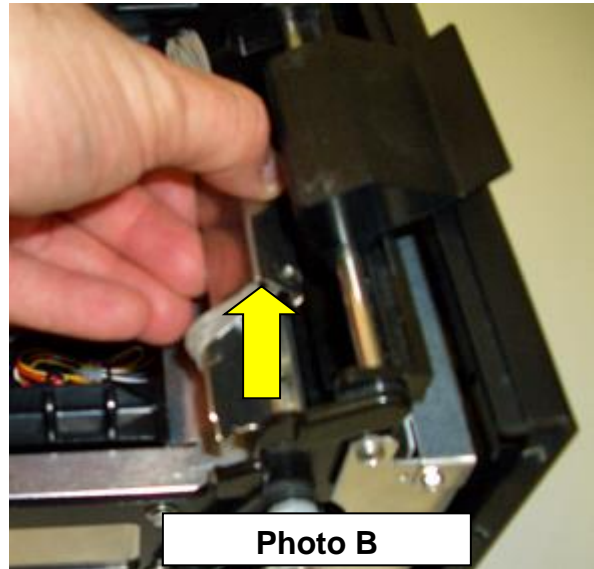
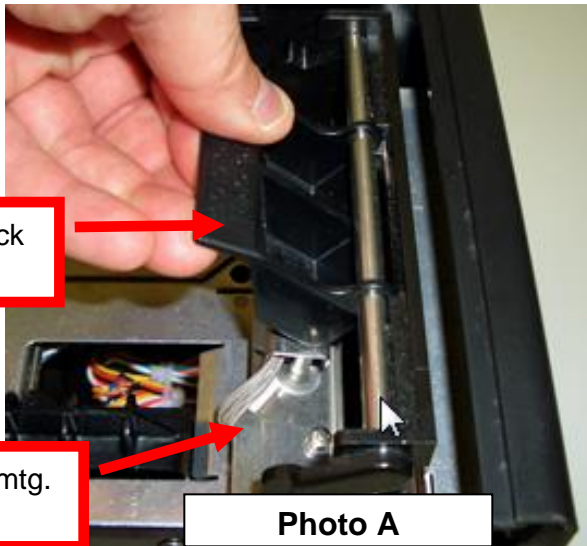
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8.1.4 THERMAL PRINT HEAD

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 builds 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:

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 or plate) to remove pressure from the thermal head. **Photo A**
4. Lift up on the head mounting plate/thermal head to remove. **Photo B**
5. Clean the thermal print head surface (the side that makes contact with the paper) with isopropyl alcohol. **Photo C**
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 plate by removing two Philip head screws.

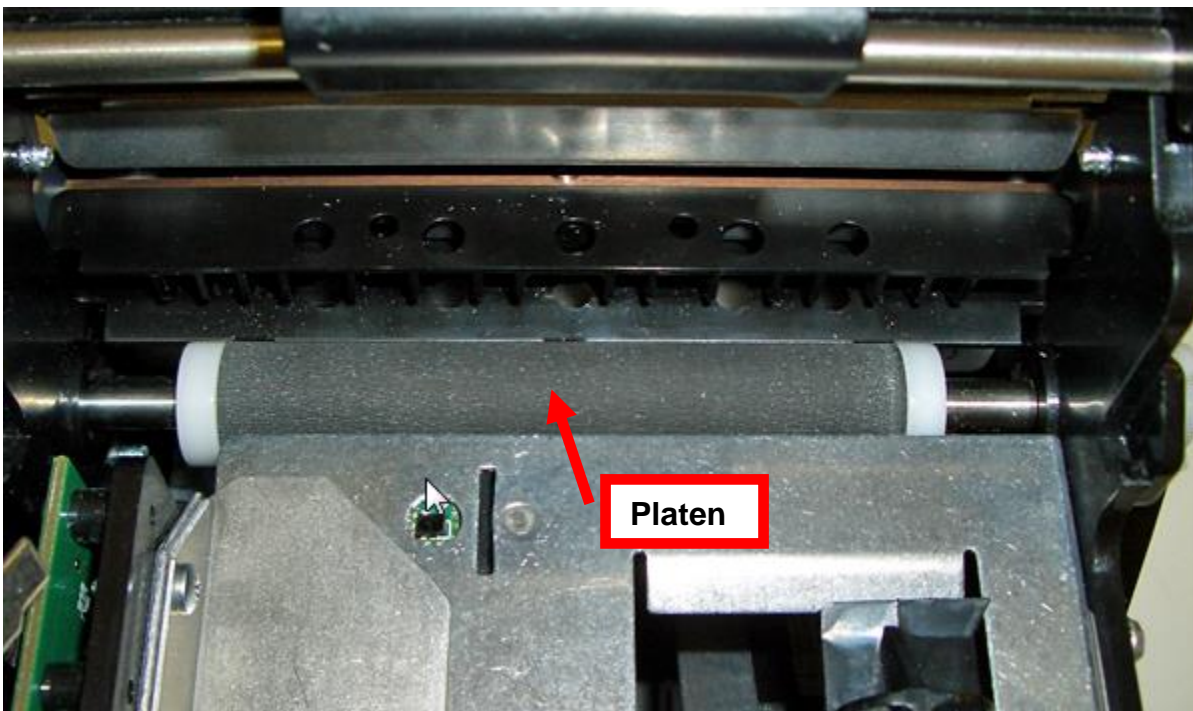


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8.1.5 Platen (Rubber Driver Roller)

The Platen (rubber drive roller) should be cleaned once a year to prevent paper dust from building up on the roller. (NOTE: The platen may require more frequent cleaning in dusty environments or under high usage)

1. Make sure power is off and the AC cord is disconnected from the printer
2. Unlock the cam lock lever and remove head mounting block/ plate. (Refer to section [8.1.3 Thermal Print Head](#)).
3. Apply a small amount of Isopropyl alcohol onto a paper towel to clean the rubber roller.
4. Clean only the part of the rubber roller where the ticket stock makes contact with.
5. Rotate the rubber roller clockwise a little and repeat step 4; continue in the same manner for one full revolution of the rubber roller.
6. Install the head mounting block/ plate and lock the cam lock lever back in place. Printer is now ready for normal operation.

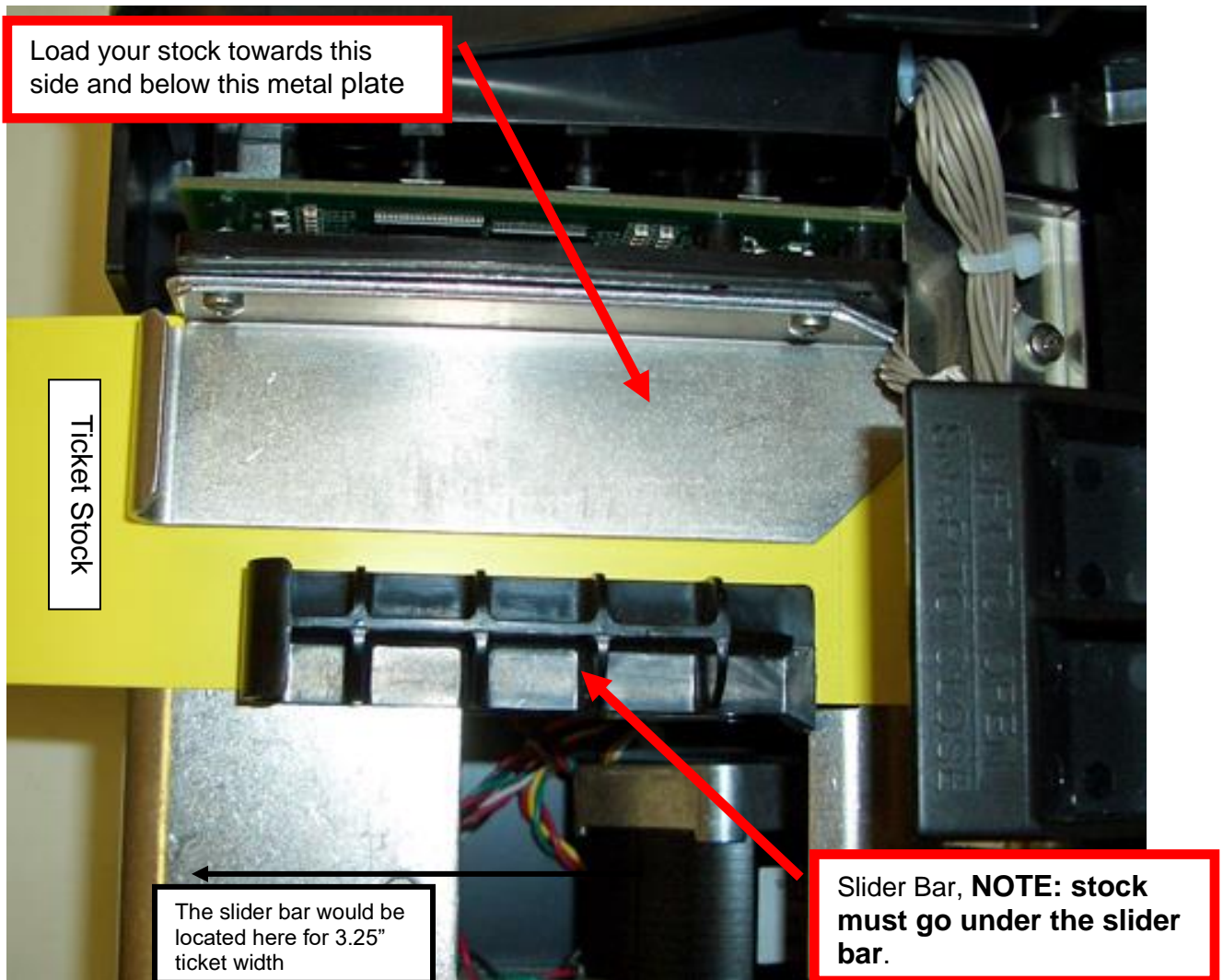


Platen color and shoulder configuration may vary

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8.1.6 Ticket Width Adjustment

To adjust the paper path for use with a different ticket width, adjust the slider bar to the fully open position. Insert your ticket stock into the paper guide. Adjust the slider bar down to the proper ticket width, making sure the bar is not too tight against the ticket. The ticket should move freely in the paper guide.

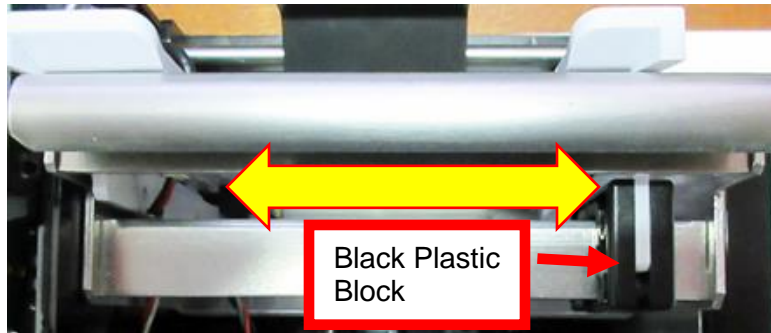
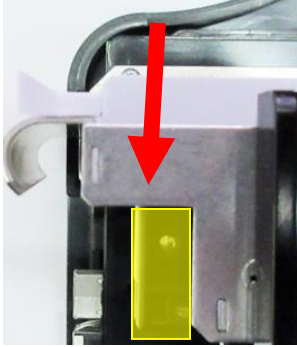


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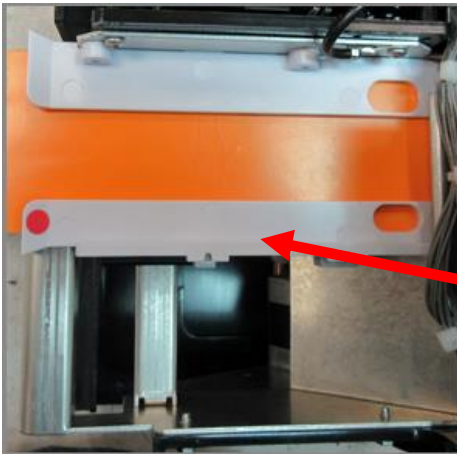
8.1.7 Ticket Width Adjustment (UPG)

The below reviews how to adjust paper path of a Universal Paper Guide (UPG) printer for use with a different ticket width. Adjust the slider bar down to the proper ticket width, making sure the bar is not too tight against the ticket. The ticket should move freely in the paper guide path

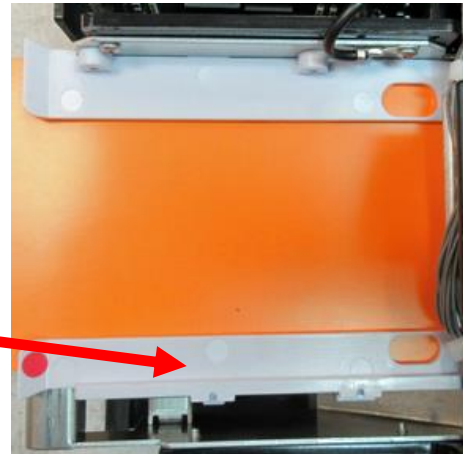
The adjustable rail may be closed by gently pushing on the black plastic block shown in the area below (highlighted in yellow).



- Open up the adjustable rail so it is a little wider than the width of the stock you intend to use.
- Insert your ticket stock into the paper guide.
- Adjust the rail down to the proper ticket width, making sure the rail is not too tight against the ticket. The ticket should move freely in the paper guide path



Above shows UPG adjusted for 2" wide media



Above shows UPG adjusted for 3.25" wide media

CAUTION:

If the slider bar is adjusted too tightly against the ticket stock, then it will cause the stock to buckle (see photos below). This will lead to feed or ticket jam issues. Ensure the adjustable rail is properly adjusted.



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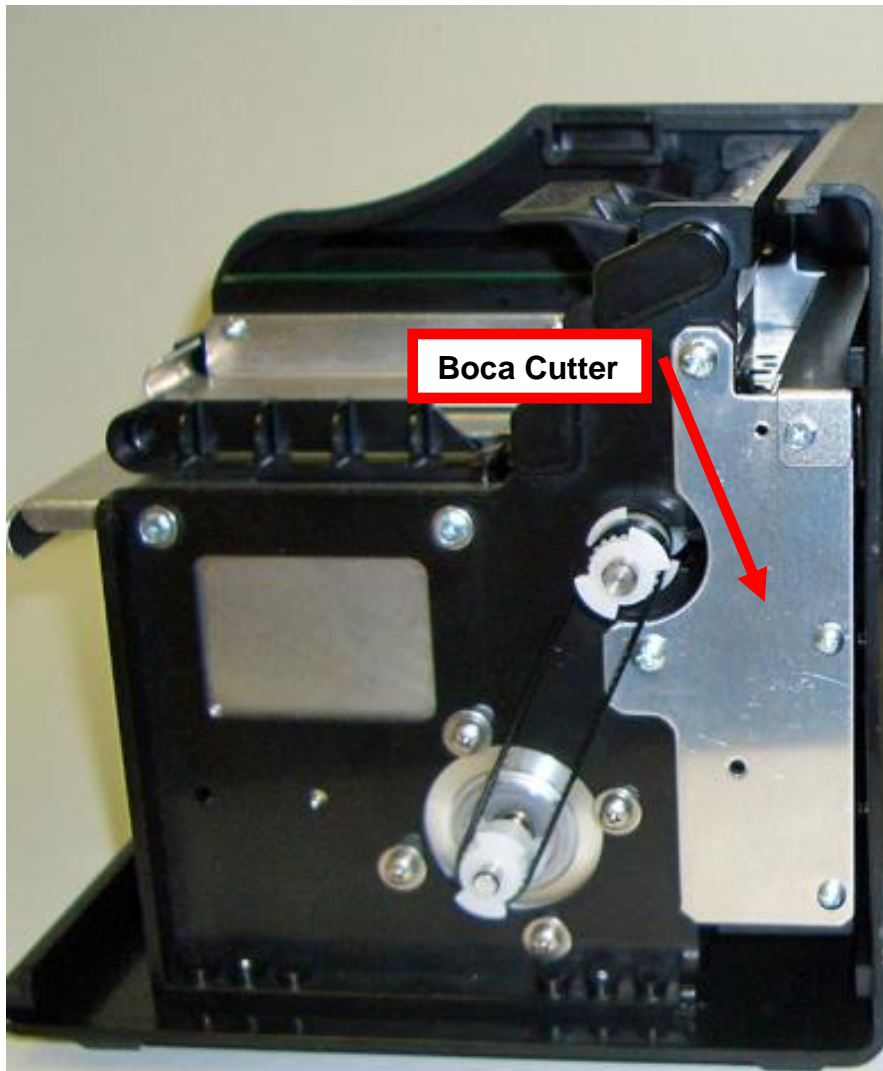
8.2 Cutter Assembly

The optional BOCA cutter system is a fully integrated cutter knife mechanism powered by a stepper motor. The cutter requires no adjustments and is rated for approximately 750,000 cuts. Please be aware of the following:

Wait five seconds before feeding ticket stock into the printer after power up. During this time the cutter knife will move up and down. If ticket stock is fed into the printer before five seconds, a ticket jam could occur.

The cutter area 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 cutter area.

If the printer will be used with ticket stock that has a thickness greater than .008" then the cutter speed needs to be changed to SLOW. Please contact [BOCA](#) for documentation to make this change. If the cutter speed is not changed to SLOW, then the printer will not work reliably with said stock.



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9.0 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.

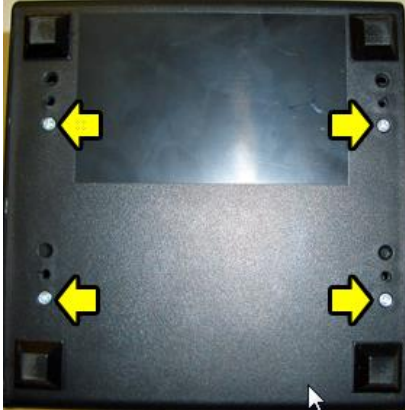
10.0 Logic Board

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.

Warning: ALL SERVICE SHOULD BE DONE WITH POWER OFF AND THE DC POWER SUPPLY UNPLUGGED FROM THE PRINTER.

10.1.1 Logic Board (Removal)

1. Gain access to the logic board. This is normally done by removing the electronics cover or rear access panel.
 - a. Remove 4 Philip head screws that are located on the bottom of the printer.



2. Slide the print module assembly out.
3. Denote where all the cables are plugged into the logic board.
4. Unplug connectors connected to the main logic board.
5. Remove the three Philip head screws that secure the logic board onto the print module.
6. Remove board.

10.1.2 Logic Board (Installation)

1. Install the logic board into the printer.
2. Install the three Philip head screws that hold the logic board onto the print module and tighten.
3. Attach connectors going to the main logic board.
4. Install the print module back into the enclosure. Take care to make sure the wires are not being pinched.

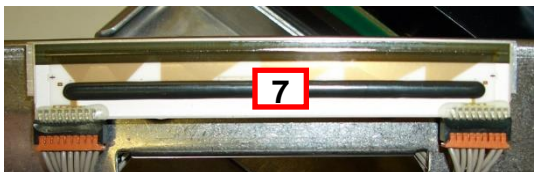
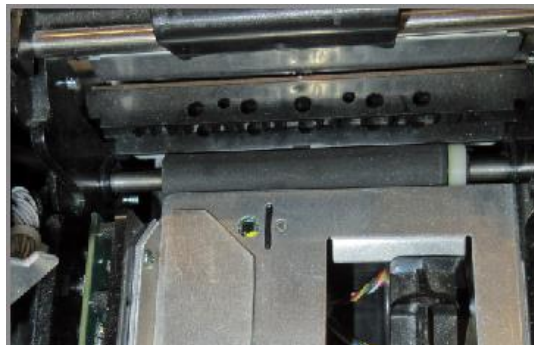
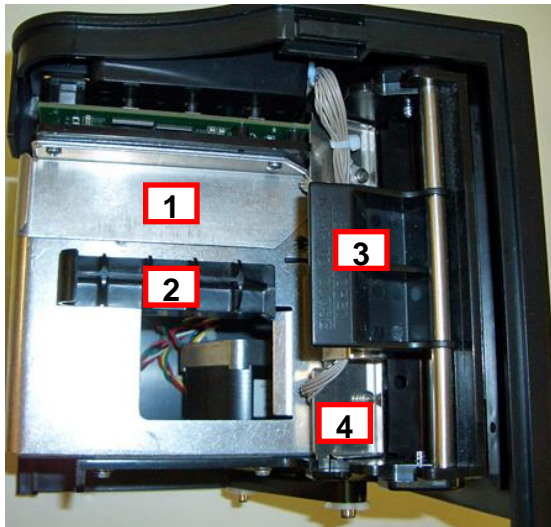
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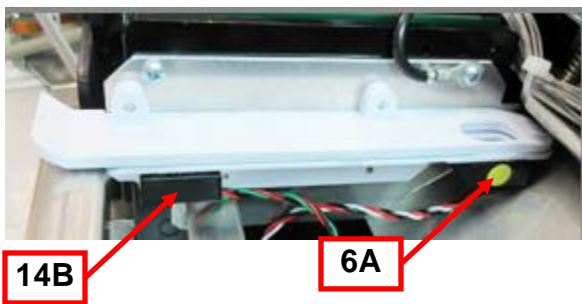
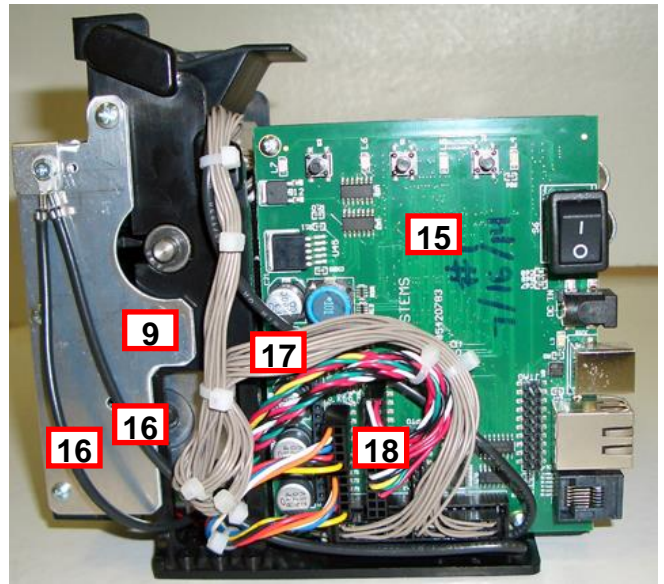
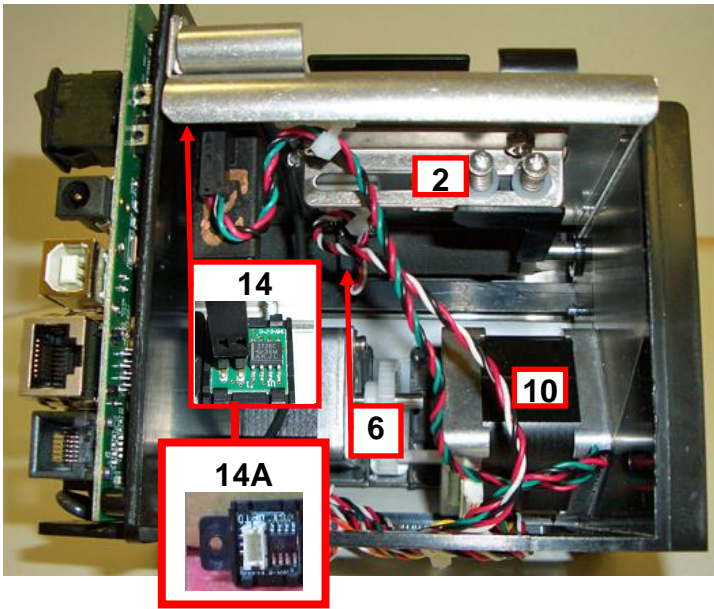
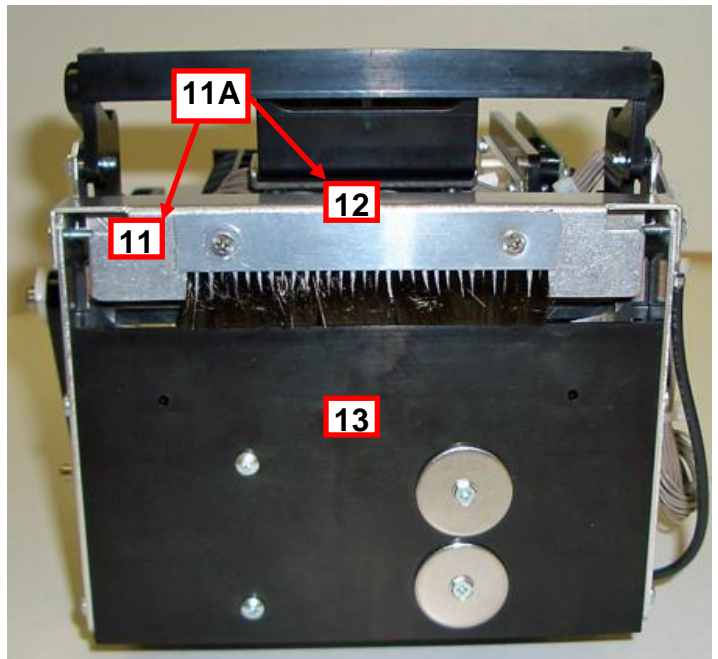
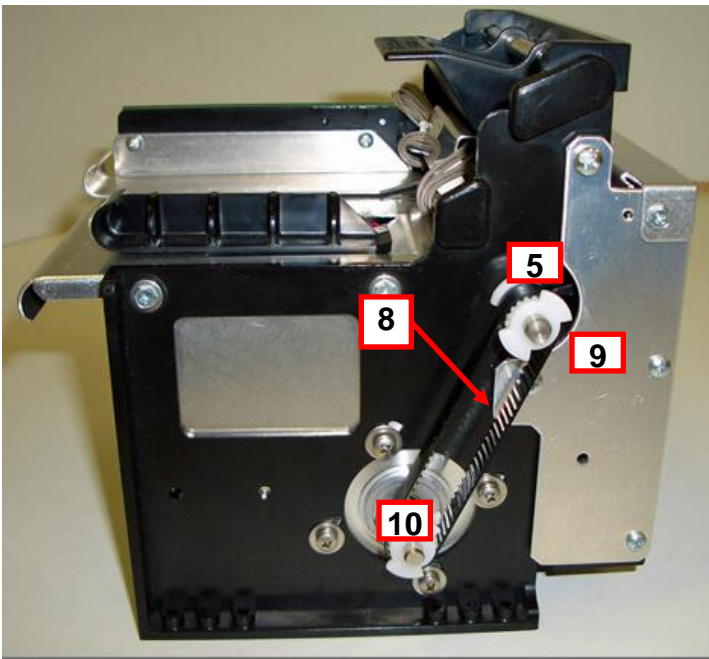
11.0 Spare Parts List

#	Part Number	Description
1	423524C-1	Upper Rail Only (cutter)
1*	423524-C-NC	Upper Rail Only (non-cutter)
2	423802-W	Slider bar assembly for ADJW
3	423236P	Take Out Head Cam Lock
4	423496-6	Head Mounting Plate 2C
5	423760-LC-200	Platen complete for 200dpi
6	SQ OPTO-L	Opto Detector Ticket load
6**	SQ OPTO-L-JST	Opto Detector Ticket load (for printer with CJ46 type logic board)
6A	SQ OPTO-L-U	Opto Detector Ticket load (for UPG path printer)
7	200C3	Print Head for Lemur-R & 2C printers only
8	P50-1017	Drive Belt, 98T (for 200dpi)
9	423473C	Mounting plate, BC5 cutter
10	424011	Stepper Motor with 20T pulley
11	423480C	Upper exit deflector only (Lemur-C)
11A	423480C-C	Upper exit deflector with brush (Lemur-C)
12	422718W	Anti-Static Brush
13	424008-LC	Cutter Assembly (BC5) No mounting plates
13**	424008-LC-U	Cutter Assembly (BC5) No mounting plates (for printer with CJ46 type logic board)
14	SQ OPTO	Opto Detector cut or tear
14A	SQ OPTO-JST	Opto Detector cut or tear (for printer with CJ46 type logic board)
14B	SQ OPTO-U	Opto Detector cut or tear (for UPG path printer)
15	LC46-E	Main Logic Board (Ethernet option)
15**	CJ46-E	Main Logic Board (Ethernet option) for printer with CJ46 type logic board
15*	LC46	Main Logic Board (Standard)
15*	LC46-cd	Main Logic Board with optional RJ12 cash drawer mode
15*	LC46-ecd	Main Logic Board (Ethernet option) with RJ12 cash drawer option
15**	CJ46	Main Logic Board (Standard) for printer with CJ46 type logic board
15**	CJ46-cd	Main Logic Board with optional RJ12 cash drawer mode (for printer with CJ46 type logic board)
15**	CJ46-ecd	Main Logic Board (Ethernet option) with RJ12 cash drawer mode (for printer with CJ46 type logic board)
16	423192	Ground Strap
17	424010	Cable, Print Head 2C
18	423938	DC Harness, cutter
18*	423938-JST	DC Harness, cut (for printer with CJ46 type logic board)
19	420880C	Base
20	420881C	Cover
21	424009	Power Supply 24VDC
22	423825-4x6	Hopper, (4" x 6") Plastic
*	P19-1000	Cable, AC cord 110VAC (US)
*	423855	Cable, AC cord 220VAC (European)
*	423856	Cable, AC cord 220VAC (UK)
*	423863	Cable, AC cord 220VAC (Australia)
*	423855	Cable, AC cord 220VAC (European)
*	423765	Cable External, serial DB9 TO RJ12
*	423947	Cable External, serial DB25 to RJ12
*	423846	Cable External, USB
*	423825-4x6	Hopper, (4" x 6") Plastic
*	423829	Mylar only, Vlemur
*	423635	Rubber Feet
*		Top Plate, vertical Lemur (8.70" x 9.64") Plastic cabinet Lemur

* Customer dependent and not shown in photos

** for printers that has a software ID CJ## on the serial number tag.





12.0 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. **As a safety precaution, all service to the printer should be done by qualified persons with power off and the AC cord unplugged from the printer. Following any procedure requiring the removal of covers and/or doors, please verify that they have been properly attached and fastened prior to operating the printer.** If you need additional help, please visit the link below www.bocasystems.com/onlinesupportform.html

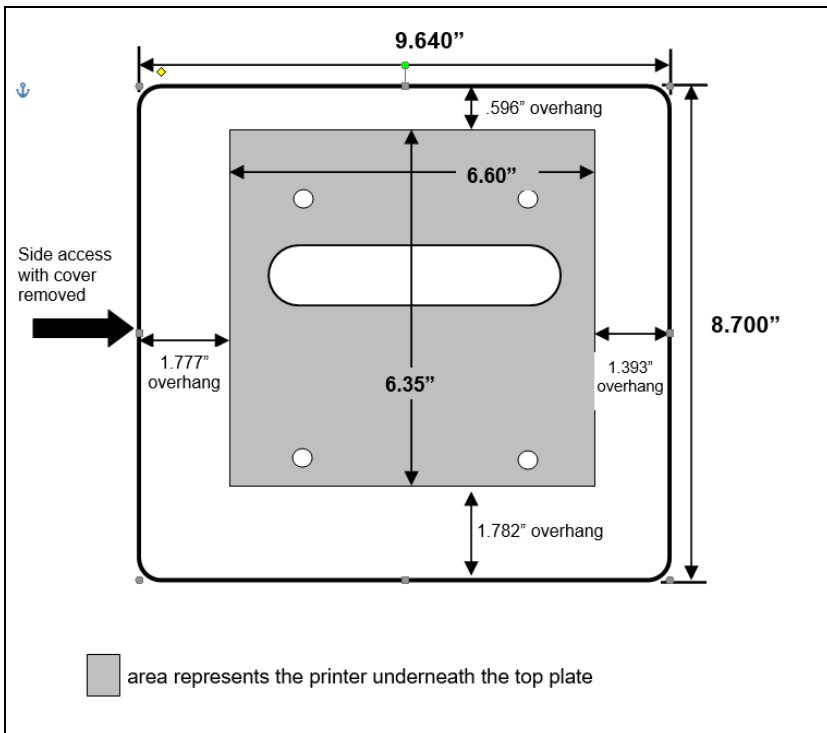
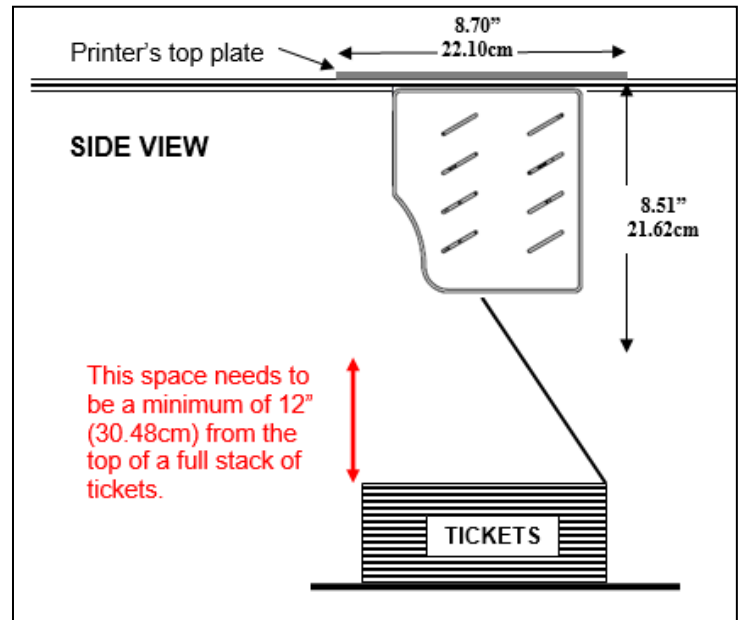
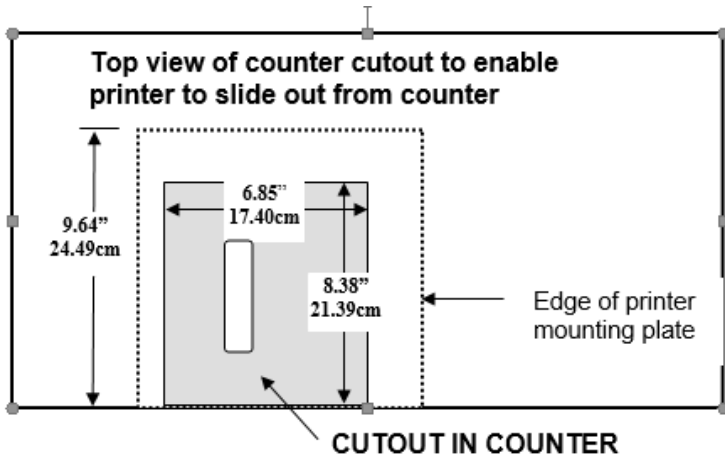
1. NO OPERATION, LED'S DON'T LIGHT UP UPON POWER UP
 - a. Power the printer off and wait 30 seconds then power it back on.
 - b. Check the power cord for proper installation at both ends.
 - c. Check that there is power at the AC outlet.
 - d. Contact your system provider or [BOCA](#) for further assistance.
2. POWER IS ON BUT NO OPERATION
 - a. Make sure the stock is being loaded properly into the printer. Consult section [5.0 Ticket Load Procedure](#).
 - b. Clean the SQ load opto. Consult section [8.1.2 Load Opto Sensor](#)
 - b. If cutter knife (if so equipped) does not go up and down after power up, See # 6.
 - c. With the printer powered off, unplug the thermal head and turn on the printer. If printer works then replace the thermal head.
 - d. Contact your system provider or [BOCA](#) for further assistance.
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](#)" section. For Lemur-R see "[Thermal Print Head](#)"
 - c. Check that the ticket stock is being loaded correctly. Consult "[Installation](#)" section.
 - d. Contact your system provider or [BOCA](#) for further assistance.
4. ERRATIC CUT POSITION
 - a. Check for defective ticket stock. Is the black mark unevenly spaced apart or light in color? Is the ticket too wide for the paper path?
 - b. Make sure the paper guild slider bar is properly adjusted (see [9.1.4 Ticket Width Adjustment](#)).
 - c. Clean off opto eyes (see [8.1.1 Cut or Tear Opto Sensor](#)) with air.
 - d. Check that the platen is clean. Consult "[Platen \(Rubber Drive Roller\)](#)" section.
 - e. Replace ticket cut opto.
 - f. Contact your system provider or [BOCA](#) for further assistance.
5. ERRACTIC PRINT POSITION
 - a. See # 4
6. CUTTER KNIFE DOES NOT MOVE (if equipped)
 - a. Check for blockage in the cutter area.
 - c. Default printer settings. With the printer powered off hold down the TEST button and then power up the printer. Keep the TEST button held down for ten seconds and release.
 - c. Contact your system provider or [BOCA](#) for further assistance.
7. POOR PRINT OUT (light print out)
 - a. Try a different stack of ticket stock.
 - b. Make sure the print head/cam lock assembly if fully locked in the closed position.
 - c. Clean print head. Consult "[Thermal Print Head](#)" section. For Lemur-R see "[Thermal Print Head](#)"
 - d. Adjust print intensity setting via software command. (see [Appendix D](#))
 - e. Replace thermal head.
 - f. Contact your system provider or [BOCA](#) for further assistance.
8. POOR PRINT OUT (white voids in print out)
 - a. Clean print head. Consult "[Thermal Print Head](#)" section. For Lemur-R see "[Thermal Print Head](#)"

- b. Replace thermal head.
 - c. Contact your system provider or [BOCA](#) for further assistance.
9. NO PRINT OUT
- a. Try a different stack of ticket stock.
 - b. Check head cable for electrical connection at both ends
 - c. Check to make sure head cable is plugged in properly into the thermal head.
 - d. Replace the thermal head.
 - e. Contact your system provider or [BOCA](#) for further assistance.
10. PRINTER SKIPS TICKETS WHILE PRINTING
- a. Check position and quality of black mark on the ticket stock.
 - b. Make sure the paper guild slider bar is properly adjusted (see [8.1.6 Ticket Width Adjustment](#)).
 - c. Clean off opto eye (see [8.1.1 Cut or Tear Opto Sensor](#)) with air.
 - d. Check that the platen is clean. Consult “[Platen \(Rubber Drive Roller\)](#)” section.
 - e. Replace ticket cut opto.
 - f. Contact your system provider or [BOCA](#) for further assistance.
11. PRINTER SKIPS TICKETS AND DIES
- a. See # 10.
12. TICKET JAM ENTERING THE CUTTER AREA
- a. Make sure the entrance to the cutter area is not blocked.
 - b. Make sure the paper guild slider bar is properly adjusted (see [8.1.6 Ticket Width Adjustment](#)).
 - b. Contact your system provider or [BOCA](#) for further assistance.
13. WI-FI WILL NOT CONNECT
- a. Make sure you are connecting to Wi-Fi router that supports 802.11b devices. The router also needs to support 1 and 2 MBps data rates.
 - b. On initial setup have the printer as close as possible to the Wi-Fi router.
 - c. Check to make sure you have the correct security values for the Wi-Fi router you are trying to connect to.
 - d. If you have multiple routers change the channel setting to 1, 6 or 11. Multiple routers using the same channel will cause connection and drop single issues.

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APPENDIX A - VERTICAL PRINTER INSTALLATION

Prepare the counter top by cutting a rectangular hole in accordance with the dimensions specified for your printer model. **NOTE: The table or counter top must be able to support at least four times the weight of the printer.**



Top view of standard 421421C-P top plate

If you are looking to make the cutout just big enough to fit the printer then we recommend making the cutout 0.50" larger than the height and width of the printer.

- Attach the top plate to the printer using only the supplied mounting hardware.
- Insert the printer with the top plate attached into the countertop cutout.
- Attach the power cord and the interface cable to the printer.
- Turn the power switch to the ON position.
- The printer is now ready for ticket stock to be loaded.

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APPENDIX B –ETHERNET PARAMETERS

General

Each Boca Ethernet Printer is assigned a unique MAC address based in part on the printer's serial number. All Boca printers are factory configured in DHCP enabled mode. (Exceptions may be made by special request.) If the printer is unable to get a dynamic IP address from the customer's network in the allotted time period (about one minute), it will default to the 10.0.0.192 address. You can select a different fixed IP address either via a Web Browser (see below) or the printer's control panel if your printer has an optional LCD display.

ETHERNET – Quick Installation Guide

- Connect the printer to your network (the IP address will be automatically assigned by your DHCP server)
- Load tickets into the printer
- Wait one minute to allow assignment of IP address
- Print a test ticket to identify the printer's IP address
- Ping the printer
- Open your web browser and type the printer's IP address to review its configuration page (see below image).
- If you are going to set a static IP address then you will need to change the ETHERNET setting to YES.
- If you experience any problems, please refer to the Ethernet section of our [FGL Programming Guide](#).

Boca Systems' Printer Configuration Page

Firmware :	FGL-26F13 / COM-26F13 / SB02
Serial number :	208377
On Time :	000:00:02:25 d/h/m/s
MAC ID :	00.0D.71.03.2D.F9

FACTORY MENU : items with an * should not be changed or selected without first consulting Boca Systems.

BAUD RATE=	9600,N,8,1	MINI/MICRO=	MICRO	PRINT SPEED=	3	DIAGNOSTIC MODE=	NO
TICKET TYPE=	SPECIAL TICKE	STATUS ENABLED=	USB/SER	TRANSPARENT MODE=	NO	PAPER MODE=	NO
*HEAD DPI=	200	SPECIAL HEAD=	NO	PATH TYPE=	PATH1	BUFFER MODE=	MULTIPLE MOD
CLEAR DOWNLOAD=	NO	DEFAULT SETTINGS=	YES	CUT1 COUNT=	16 (1-200)	CUT2 COUNT=	16 (1-200)
*2-SIDED PRINTER=	NO	PARK TICKET=	NO	TICKET MODE=	MULTIPLE	PRINT MODE=	THERMAL
PRINT INTENSITY=	NORMAL	SKI MODE=	NO	FLASH ACK MODE=	NO	SOFTWARE BUSY=	NO
BI-DIRECTIONAL=	NO	TEST TICKET=	STANDARD	BASEBALL MODE=	NO	USB=	YES
FONT ENCODING=	NONE	ACKNOWLEDGE=	NORMAL	*HIGH SPEED MODE=	NO	BUZZER=	DISABLE
*SHUFFLE MODE=	NO	*CUTTER TYPE=	SILENT	*CUTTER SPEED=	NORMAL	ORIENTATION=	NORMAL
ETHERNET=	YES	IP ADDRESS=	010.000.000.192 (Enter 12 digits)	SUBNET MASK=	0.0.0.0	DEFAULT GATEWAY=	010.000.000.192 (Enter 12 digits)
SPEED/DUPLEX=	AUTO-NEGOTIATE	RFID=	NO	USB DEVICE TYPE=	PRINTEF	BLUETOOTH=	NO
MAGNETICS=	NO						

SAVECHANGES
(Press Save button to store)

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APPENDIX C – TESTING A LEMUR

Boca Systems, Inc. has developed various program that allows customers to communicate from a host computer or mobile device to the printer. Below are the various configure and test programs we offer:

WINDOWS: (Allow connection via Ethernet/ Wi-Fi, Parallel, Serial, USB-HID interfaces and print driver connection)

<https://www.bocasystems.com/documents/Testing%20a%20BOCA.pdf>

MAC: (Allows Ethernet/Wi-Fi, USB-HID interfaces or print driver connection)

<https://www.bocasystems.com/documents/Testing%20a%20BOCAmac.pdf>

iPad: (Allows Bluetooth and Ethernet/Wi-Fi interfaces connection)

<https://apps.apple.com/us/app/bocaprinter/id951179236>

Android: (Allows Bluetooth, Ethernet/Wi-Fi and USB interface connection)

<https://play.google.com/store/apps/details?id=com.bocasystems.BocaPrinter&hl=en>

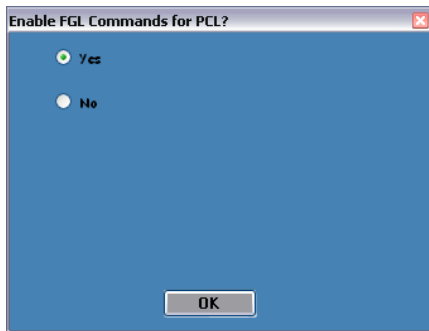
Click here to return to > [Table of Contents](#)

APPENDIX D – DOWNLOADING SOFTWARE COMMANDS

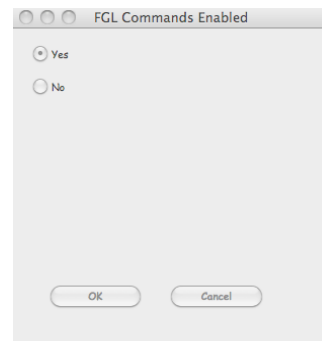
For those Lemurs model printers without LCD display the menu setting changes may be done by utilizing the software commands listed below. This is best done using our configure and test program (see [Appendix C](#))

If needed, the printer may be defaulted back to its originally factory settings as follows. With the printer powered off hold down the TEST button and then power up the printer. Keep the TEST button held down for 10 seconds and release (the printer will reset at this time).

Once you have your interface or driver selected then clicks on the “Enable FGL for PCL” button. *For the MAC customer program under the Select Printer Operation choose “Enable FGL Commands (HP)”*. Click on the Yes button. Click the Yes button and then the OK button.

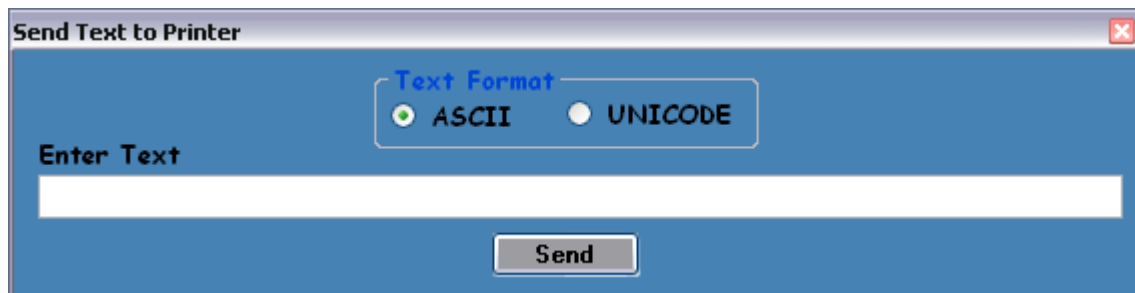


Window



MAC

Click on the “Send Text” button. *For the MAC customer program under the Select Printer Operation choose “Send Text Commands”*. Once the Text Data box comes up you type the text command in the Data input box. Then click on the OK button and the text data will be sent to the printer.



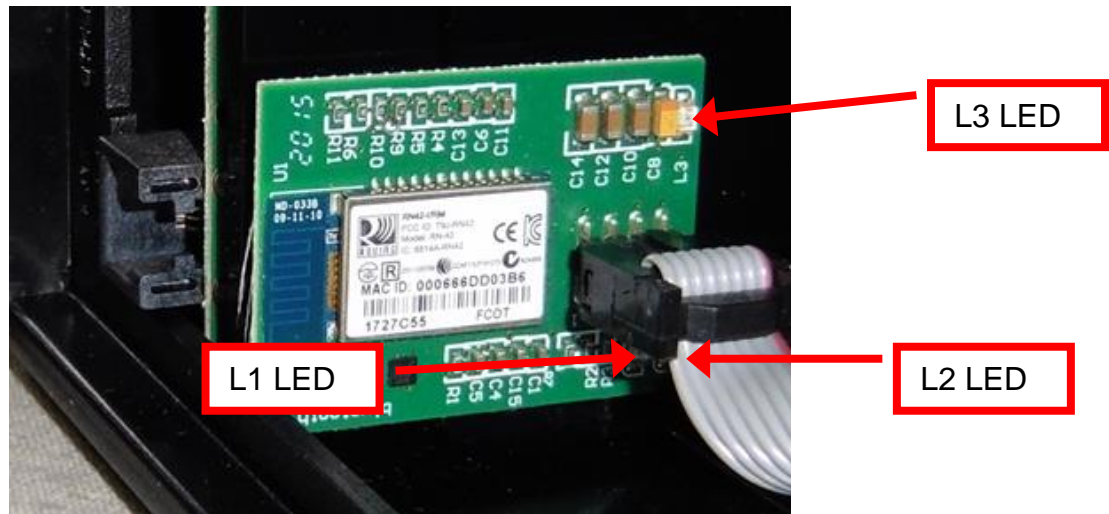
You may click on the HELP button at any time to open up the help window.

The CONFIGURATION TEST TICKET SUPPLEMENT section of the [FGL programming guide](#) shows all of the commands necessary to access the operator control panel functions.

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APPENDIX E- BLUETOOTH CONNECTION


If your printer is equipped with an optional Bluetooth interface port then you will see **BT LE** in the Interface 2 or Interface 3 field of the serial number tag. The printer will also have the Bluetooth interface board mount onto one of the paper guides rails (see below photo).



When a printer is turned ON with stock loaded or when stock is loaded into a printer after it has power up, the printer will try to connect to a Bluetooth device (OS or Android). The *L3 LED* will be flashing rapidly at this time. During this time (about a minute) the printer will be busy thus not being able to print a ticket.

Once the printer has connected to a Bluetooth device, *L1 LED* and *L3 LED* will go solid. If the printer does not connect to a Bluetooth device it will go into BT discovery mode (only *L3 LED* will be flashing). In BT discovery mode the printer will be waiting for a Bluetooth device to try to connect to it.

The below provides an overview of an iPad connecting to a BOCA printer with optional Bluetooth interface.

- Click on the setting icon. 
- When setting menu comes up click on Bluetooth.
- Turn Bluetooth ON if it was OFF.
- Under DEVICES you should see the serial number of the printer you are trying to pair to (Boca#####) For example if your printer was serial number 123456 then you would see Boca123456
- Click on this serial number to enable the iPad to pair to it.
- The iPad should show that it is connected when successfully paired.
- The *L1 LED* and *L3 LED* on the Bluetooth will be solid red.
- At this point, the iPad is paired to the BOCA printer.
- You may use our iPad test program that is on the Apple store to test the printer. The search will need to be done via the iPad and search name would be *BocaPrinter* (<https://itunes.apple.com/us/developer/boca-systems/id951179235>). When the BOCA test program is being used the *L2 LED* will be solid red.
- When the printer is powered off the iPad will disconnect from the printer.
- When the printer is powered on the iPad will automatically reconnect to the printer.

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APPENDIX F– CONFIGURE WI-FI CONNECTION

To use the wireless capabilities of a printer equipped with the optional 802.11b wireless interface (Wi-Fi), it will first be necessary to setup the printer with information and security settings that match the settings of the IEEE 802.11b compatible wireless server/router you are connecting to. Printer purchased after April-2014 is able to support IEEE 802.11g compatible wireless server/router.

Our Wi-Fi printer is designed to work with a wireless router.



To initially configure the wireless settings, it will be necessary to connect to the printer via the Parallel, RJ12, USB or Ethernet (if so equipped) interface using a Windows or MAC based system.

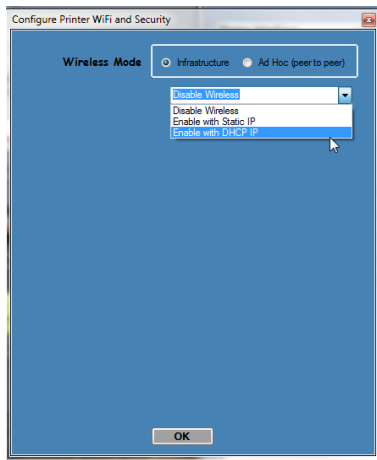
This may be done using our Configure and Test program for Windows or Customer program for MAC (see [Appendix F](#)). The printing of a ticket via this program will confirm it is communicating with the printer.

To use the wireless capabilities in FGL and PCL 26/46 model printers equipped with a wireless interface, it will first be necessary to setup the printer with information and security settings that match the wireless settings of the local wireless server/router. To configure the printer with the correct security settings, it is necessary to acquire these settings directly from the wireless server/router or see your network administrator. Also to initially configure the wireless settings it will be required to temporarily connect a cable between the printer and the host computer.

We recommend that the Wi-Fi be configured by either your system administrator or IT support staff.

The below steps walk you through the Wi-Fi setup in the Infrastructure mode. **The Wi-Fi router must be configured to support an IEEE 802.11b Wi-Fi device. Printers manufactured after April 2014 are able to support an IEEE 802.11g Wi-Fi device.**

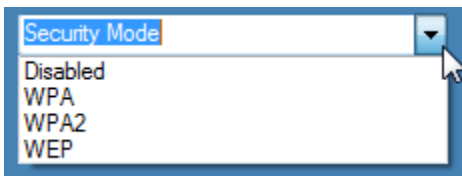
1. The printer will need to be connected to the host computer via a cable (parallel, serial, USB or optional Ethernet if your printer has it. For initial install the printer must be as close as possible to the Wi-Fi router itself. This will ensure maximum signal strength. Once you have confirmed the Wi-Fi is operational, the printer may be moved to its desired location.
 2. You will want to confirm you are able to print a ticket using our Configure and Test program for Windows or Customer program for MAC (see [Appendix C](#)). The printing of a ticket via this program will confirm it is communicating with the printer.
 3. Click on the Setup **Wi-Fi** button.
 4. When the Configure Printer Wi-Fi and Security menu comes up you have a few choices.
 - a. **Wireless Mode** – Infrastructure (using a Wi-Fi network router) or Ad Hoc (peer to peer).
 - b. **Disable Wireless** – You would choose this if you wanted to disable the Wi-Fi
- Enable with Static IP** – This would be for networks that require a static IP address.
Enable with DHCP IP - Automatically attempts to get an IP address from Local Server (this is the most common one and the one we will be using for the rest of the steps).



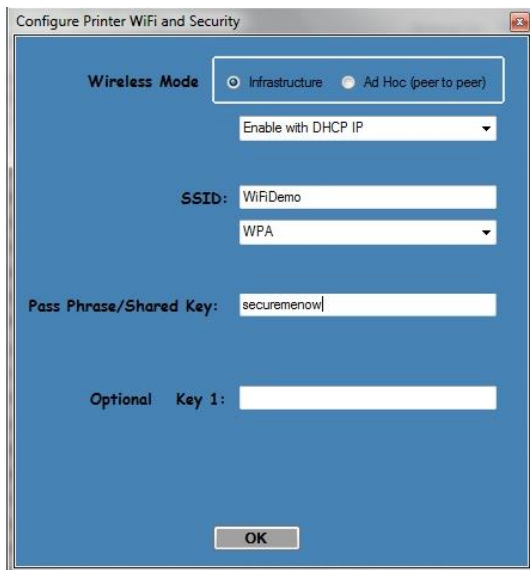
5. You will need to enter the **SSID value**. The Service Set Identifier is a 1 to 32 byte string. This normally would be the name of the Wi-Fi router you are connection to.

SSID:

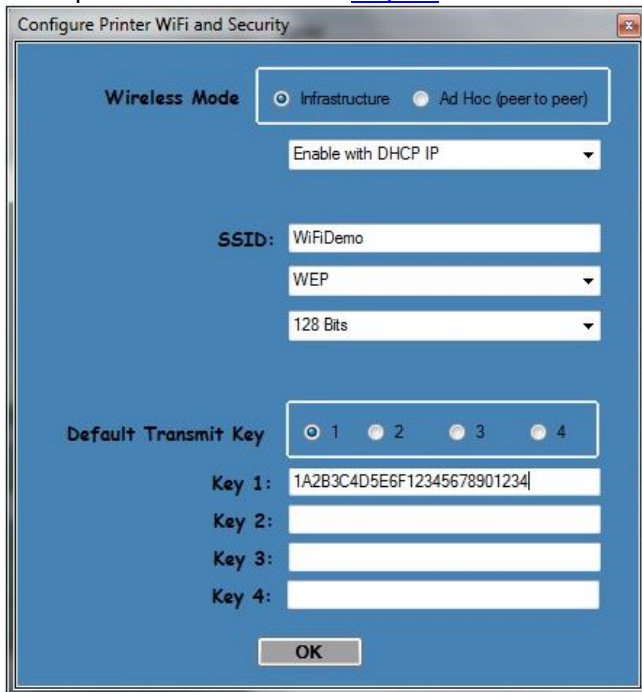
6. Security Mode: you will need to choose the security mode that is appropriate for your WiFi router.
 - Disable** – Allows the user to communicate through the wireless network without any security encryption involved.
 - WPA** – Go to [Step 7](#)
 - WPA2** – Go to [Step 7](#)
 - WEP** – Go to [Step 8](#)



7. **WPA and WPA2 Personal Security Mode** – Allows the user to communicate through the network using WPA or WPA2 Personal wireless encryption. When this security encryption mode is chosen it will be required to enter the “WPA Shared Key” for the local wireless network. Some networks also enforce the use of an optional key value. The optional prompt field is provided for those networks. Finally click on OK to have these values transmitted to the printer (through the cable). The printer will reset and upon re-initialization it will establish wireless communication with the local network. The handshaking involved in establishing wireless communication can take up to 30 seconds. Go to [step #9](#).



8. **WEP Security Mode** – Allows the user to communicate through the network using WEP wireless encryption. With WEP one can select 64 bit or 128 bit encryption. When the security encryption mode is chosen it will be required to enter the “Pass Phrase” for the local wireless network. Some networks also enforce the use of a default transmit key. If needed select one, else leave it set to “1”. Next the four security key values will have to be entered to match those of the local network. Finally click on **OK** to have these values transmitted to the printer (through the cable). The printer will reset and upon re-initialization it will establish wireless communication with the local network. The handshaking involved in establishing wireless communication can take up to 30 seconds. Go to [step #9](#).



9. The printer will reset. Depending on your operating system, this rest may happen less than 60 seconds or as long as 5 minutes. Upon re-initialization it will establish wireless communication with the local network. Depending on your network, a connection can be established in less than 60 seconds or as long as 5 minutes. If it fails then see [item #13](#) on the Troubleshooting Guide.
10. Press the TEST button to print out a self-test ticket. This ticket will show the IP address that was acquired by the printer. You may use the configuration and test program to test this interface connection. You would run the program like you are connecting to an Ethernet printer and enter in the IP address that is shown on the self-test ticket.

Please go to the link below if you need assistance in configuring your Wi-Fi connection.
www.bocasystems.com/online-support-form.html

If your printer has an options Ethernet port then this port will be disable while the printer is in Wi-Fi mode. The printer is not able to run both Ethernet and Wi-Fi at the same time. If you need to go back to using the Ethernet port then the Wi-Fi needs to be disable. This may be done by repeating the above procedure but at step # 4 choosing **Disable Wireless**.

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APPENDIX G – WINDOWS USB DRIVER INSTALLATION GUIDE

Do not connect the printer to your computer's USB port until instructed.

Please contact your software provider to confirm if the use of our driver is required for their ticketing software. We recommend that the print driver is installed by either your system administrator or IT support staff.

These print drivers are intended to be installed on Windows PC platforms X86, AMD64 or IA64. This includes Windows 7, 8.1, 10 and Server 2012 R2.

Below is a link that provides details on how to installed the print driver:

<http://www.bocasystems.com/documents/WindowsDriverInstallGuide.pdf>

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APPENDIX H – MAC DRIVER INSTALLATION GUIDE

Do not connect the printer to your computer's USB port until instructed.

Please contact your software provider to confirm if the use of our driver is required for their ticketing software. We recommend that the print driver is installed by either your system administrator or IT support staff.

Below is a link that provides details on how to installed the print driver:

www.bocasystems.com/documents/MAC_Driver_Install_Guide_2021.pdf

If you were not able to install the BOCA print driver using the above steps, please take a screenshot of the “printers and drivers” dialog and attach it to the support form located at

www.bocasystems.com/online-support-form.html

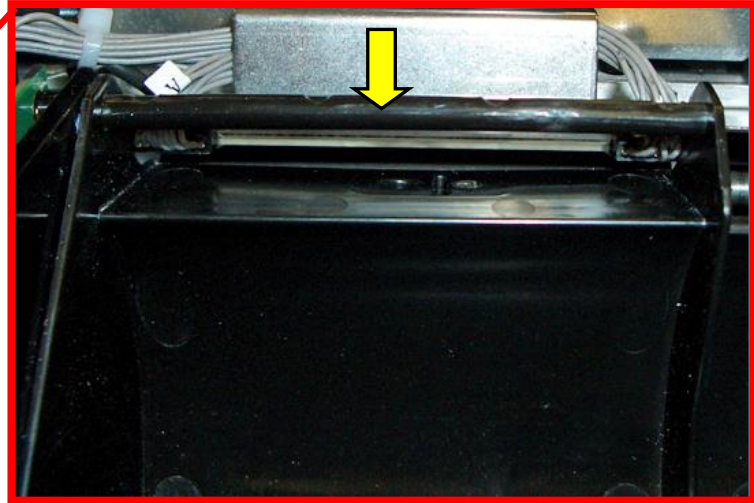
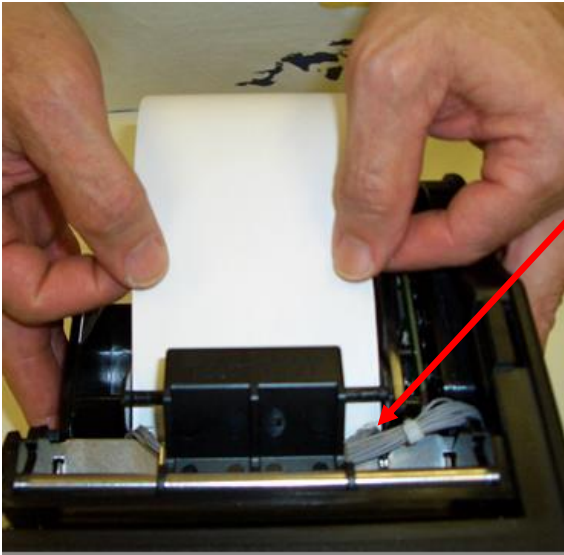
Click here to return to > [Table of Contents](#)



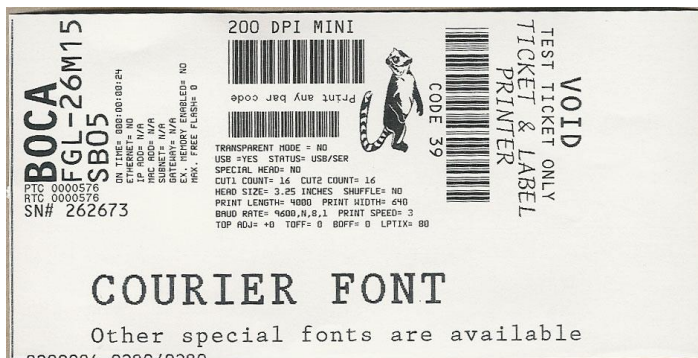
APPENDIX I – RECEIPT MODE

The Lemur-C may be configured from the factory for use with receipt roll stock.

Ticket Load Procedure

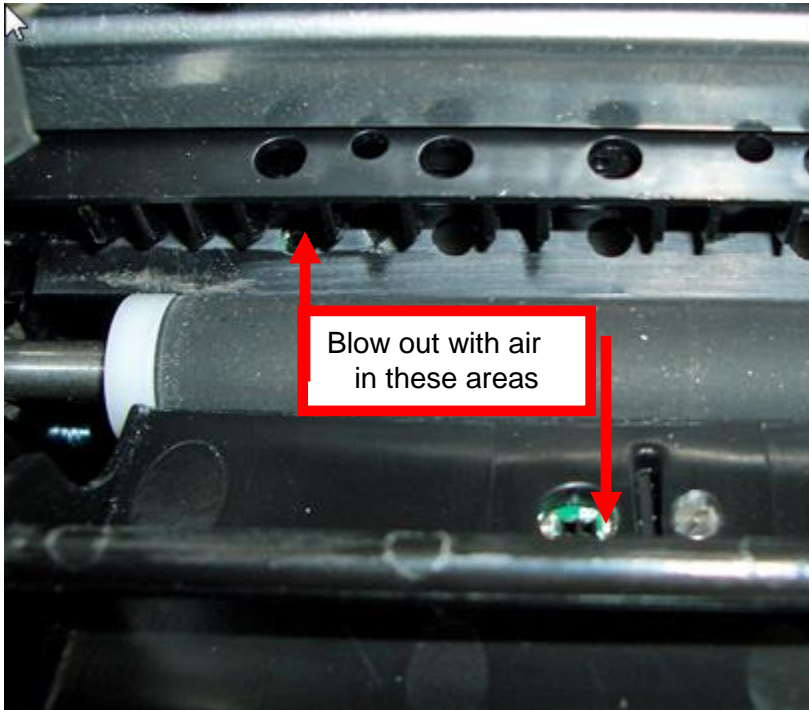


- Turn the printer on and wait five seconds. If your printer has an optional LCD then it will display PAPER OUT (the red CHECK PAPER led will be illuminated).
- You need to make sure the leading edge (first part that is feed into the printer) has a nice clean edge. Not crumpled or tape stuck to it.
- Begin loading the tickets through the entrance slot with a smooth motion until it stops. At this point the printer will automatically grad and positions the receipt paper.
- After the ticket is automatically positioned (the READY LED will be illuminated), press the TEST button located on the control panel to print a test ticket. The printer is configured when it leaves the factory to be particle cut the receipt. Self-test printout should look similar to the image below.
- Printer is now ready for operation.



LOAD & CUT OPTO

Once a year the opto eyes should be blown off with air. This interval will vary depending upon the environment and the quality of the ticket stock. The print head will need to be removed to gain access to the optos.



The below items are serviced just like a standard Lemur-C printer.

Thermal head – See [8.1.3 Thermal Print Head](#)

Platen – See [8.1.4 Platen \(Rubber Driver Roller\)](#)

Cutter Assembly – See [8.2 Cutter Assembly](#)

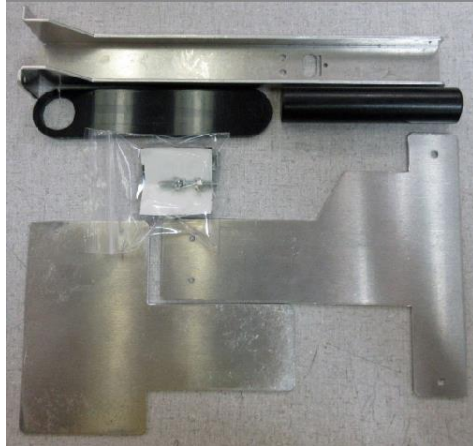
General Cleaning

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.

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APPENDIX J – Optional Roll Holder Adaptor Kit (P/N 424195)

Kit will include floor plate (2pcs), one roll holder arm, one spindle, one adjustable stopper and various mounting screws.

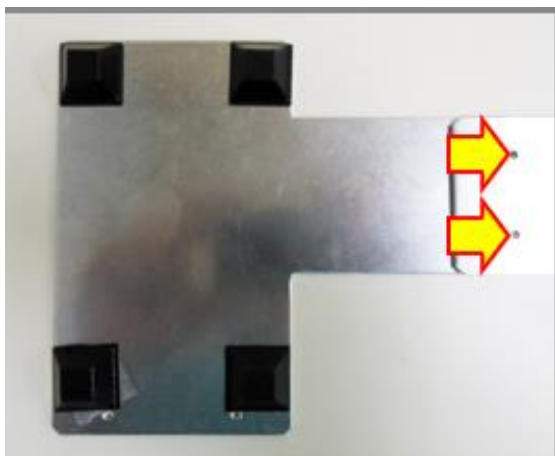


Part may vary from above photo

1. Attach the spindle onto the roll holder arm using the two Philip 1/4" Hex head screws.



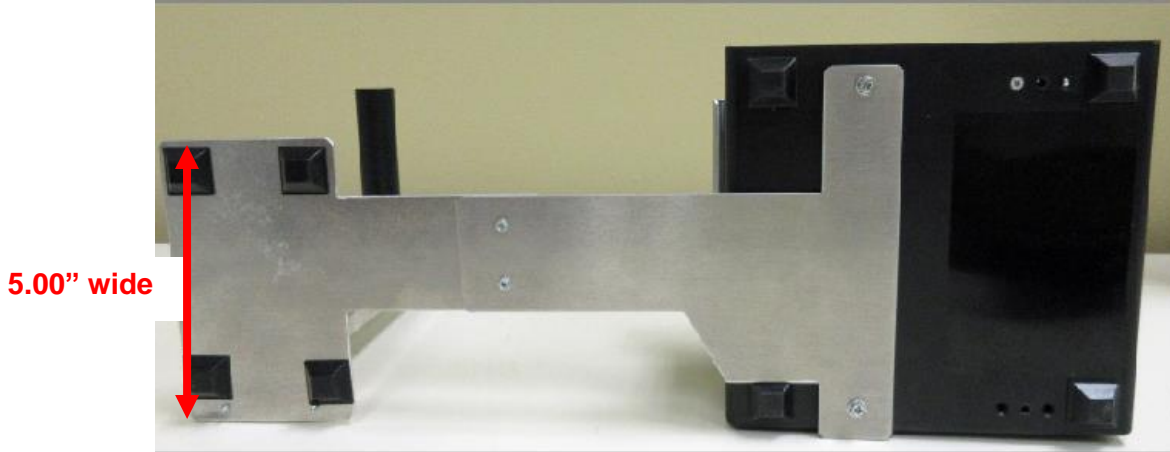
2. Affix the rubber feet to the bottom roll holder arm plate.
Align the two floor plate pieces so that the two screw holes align. Make sure the piece with the rubber feet is on the bottom with rubber feet facing up. Install the two self-tapping 3/16" hex head screw and tighten.



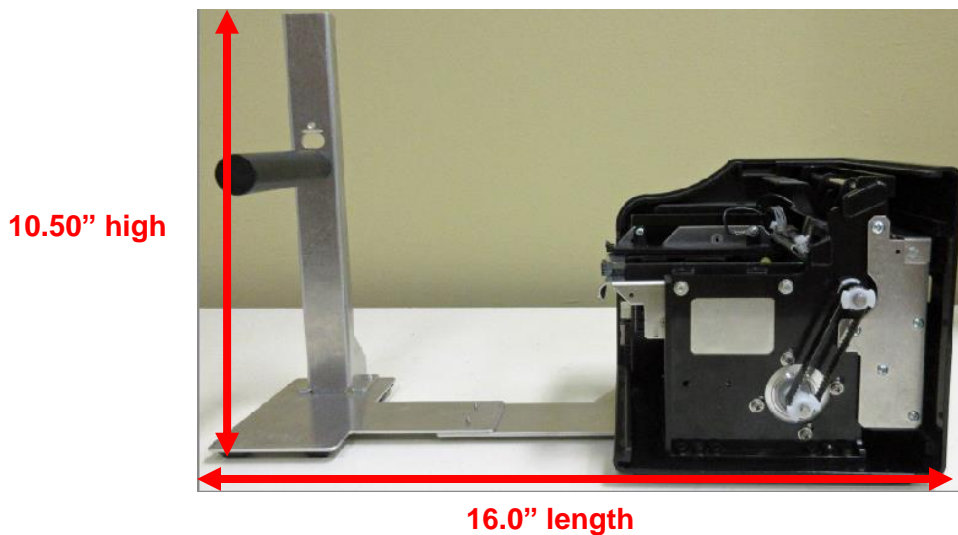
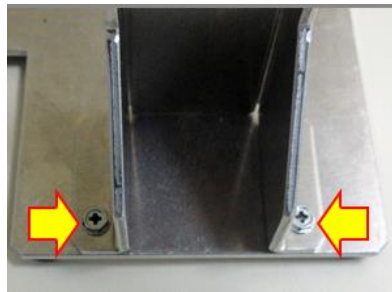
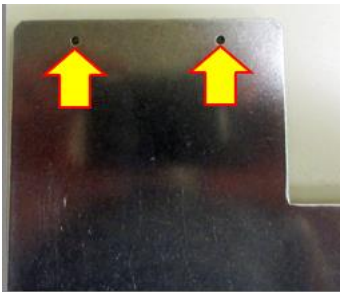
3. Install the floor plate onto the bottom of the Lemur UPG printer. Align the two holes on the floor plate up with the two mounting holes on the printer. Install the two self-tapping 1/4" hex head screws and tighten.



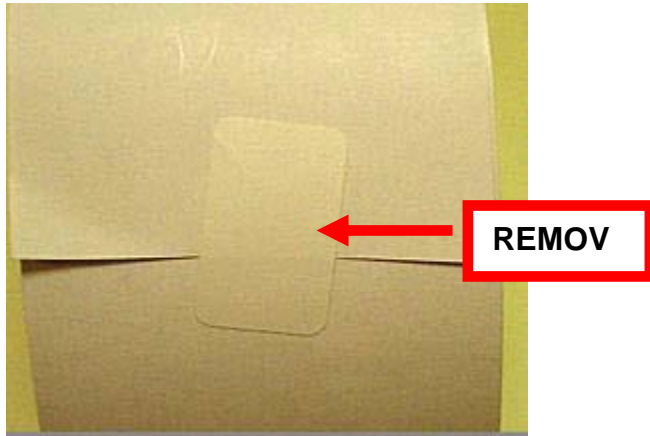
4. Flip both the Lemur and attached floor plate so all rubber feet are facing down.



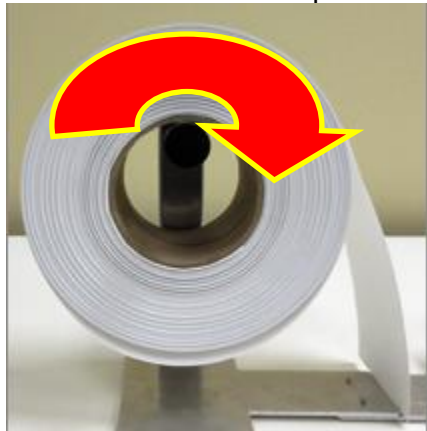
5. Align the two holes on the roll holder up with the two mounting holes on the floor plate. Install the two self-tapping 3/16" hex head screws and tighten.



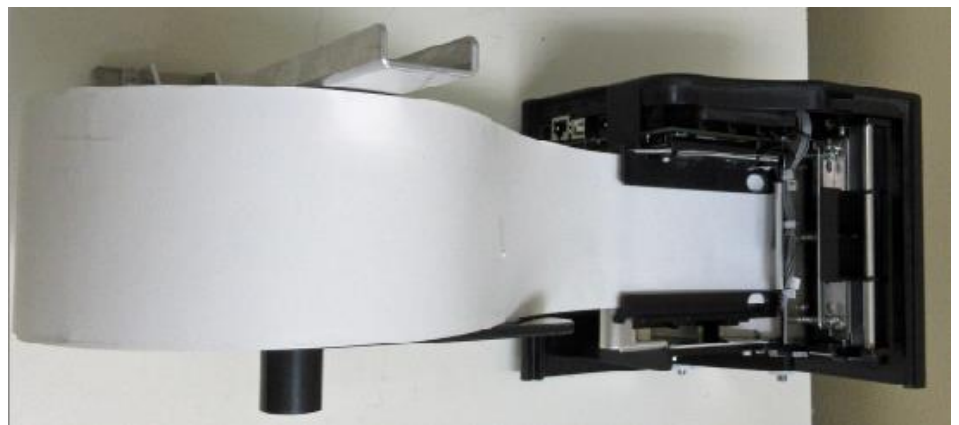
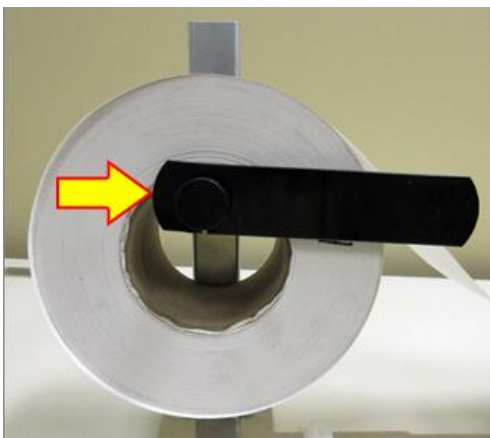
6. Tear off a full turn of the paper or media from the new roll. **Caution:** It is important that the outer end of the media is free of glue or other adhesive substance that may cause a paper jam or damage the print head.



7. Place the roll onto the spindle so the media turns in a clockwise direction.



8. Install the adjustable stopper disc onto the spindle and slide into place. The stopper should not be binding against the roll to prevent it from moving freely.



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APPENDIX K – SERVICE PLANS

For enhanced [warranty](#) coverage or out of warranty printer, we offer two types of service plans.

GOLD SERVICE

- Printer repair at BOCA facility (3 business day turnaround)
- Replace defective parts (ship within one business day) – customer must return defective parts
- Free printer and parts return via UPS ground service (other delivery options to be billed to the customer)

PLATINUM SERVICE

- Printer repair at BOCA facility (3 business day turnaround)
- Replace defective parts (ship within one business day) – customer must return defective parts
- Free printer and parts return via UPS ground service (other delivery options to be billed to the customer)
- Replacement printer provided within one business day, if requested. (This service will become available one week after the platinum plan begins.)

The following items are not covered by the service plans:

- **Preventative Maintenance** – the customer is responsible to provide a reasonable level of preventative maintenance as described in [section 9](#) of this manual.
- **Negligence** – parts damaged by misuse or negligence, including damage due to defective ticket stock, is not covered
- **Pre-existing conditions** - all printers must be in good working order prior to entering the plan. The customer will be invoiced for any parts and repair work needed on printers which were defective prior to the start of the maintenance plan. BOCA reserves the right to make this determination unilaterally.
- **Incoming Shipments** – the customer is responsible for shipping charges to BOCA.

Please visit the link below for the latest pricing on our service plans.

www.bocasystems.com/serviceplans.html

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APPENDIX L – TECHNICAL SUPPORT

Please go to the link below if you require technical support with your BOCA printer. There is no fee for initial email support.

www.bocasystems.com/onlinesupportform.html

PHONE / EMAIL SUPPORT - BOCA provides free technical support via email for all printers under warranty or service contracts. (Phone support may be provided for covered printers at BOCA's sole discretion as needed.) Email support for non-warranty/non-contract printers is billable at \$100.00 per incident. However, BOCA may (at its sole discretion) choose to waive this fee for customers in good standing. Phone support for non-warranty/non-contract printers will be billed at a rate of \$100.00/hour for Level 1 support and \$200.00/hour for Level 2 support. Billing time will be rounded up to the nearest hour. A valid credit card number is required for phone support payments.

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APPENDIX M – REFERENCE DRAWING

