

# Technical Manual

10/2/98



**Boca Systems/MILTOPE**

# 4550 A/U MOD 1 Thermal Ticket Printer

## **BOCA SYSTEMS / MILTOPE**

© 1998 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
4.0	Installation	6
5.0	Control Panel Functions	8
6.0.	Standard Interface Pinouts	10
7.0	Thermal Paper - Theory and Specification	11
8.0	Maintenance and Adjustments	12
9.0	Parts Replacement Procedures	21
10.0	Spare Parts List	37

# **Table of Figures and Attachments**

# **Page**

<b>Figure 1</b>	Packaging	2
<b>Figure 2</b>	4550 A/U MOD 1	3
<b>Figure 3a</b>	Right side view	4
<b>Figure 3b</b>	Top view	4
<b>Figure 4</b>	Rear view	5
<b>Figure 5</b>	Left side view	5
<b>Figure 6</b>	Ticket Stock Loading	7
<b>Figure 8-1</b>	Infeed Solenoid Adjustment	13
<b>Figure 8-2</b>	Infeed Pressure Roller Adjustment	14
<b>Figure 8-3</b>	Platen Solenoid Adjustment	16
<b>Figure 8-4</b>	Cutter Adjustment	17
<b>Figure 8-5</b>	Infeed Switch Adjustment	18

# 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.

# 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.

# 1.0 Introduction

The 4550 A/U MOD 1 is a direct thermal ticket printer with an integrated cutting mechanism designed for printing boarding passes and baggage tags. This manual will provide the user with general information regarding printer set-up, configuration and troubleshooting. Please review your programming guide for additional details.

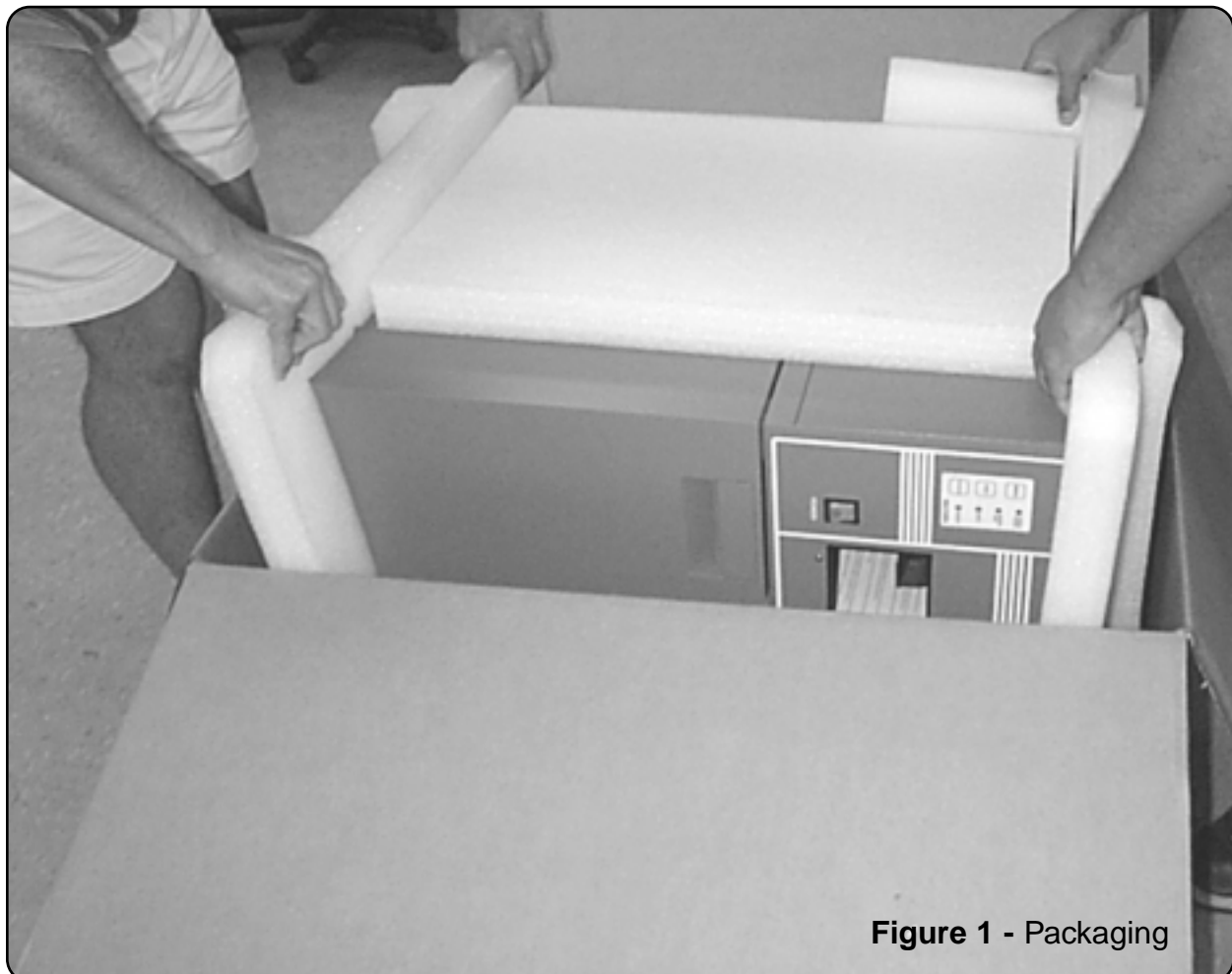
## 2.0 Unpacking the Printer

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

The following items should be in the box:

- a) Ticket Printer
- b) Printer Base (If applicable)
- c) AC power cord
- d) Interface cable (optional)
- e) Programming guide on disk
- f) This manual on disk



**Figure 1 - Packaging**



# 3.0 A Tour of Your Printer

USE THIS SECTION WITH THE PARTS LIST IN SECTION 10.0

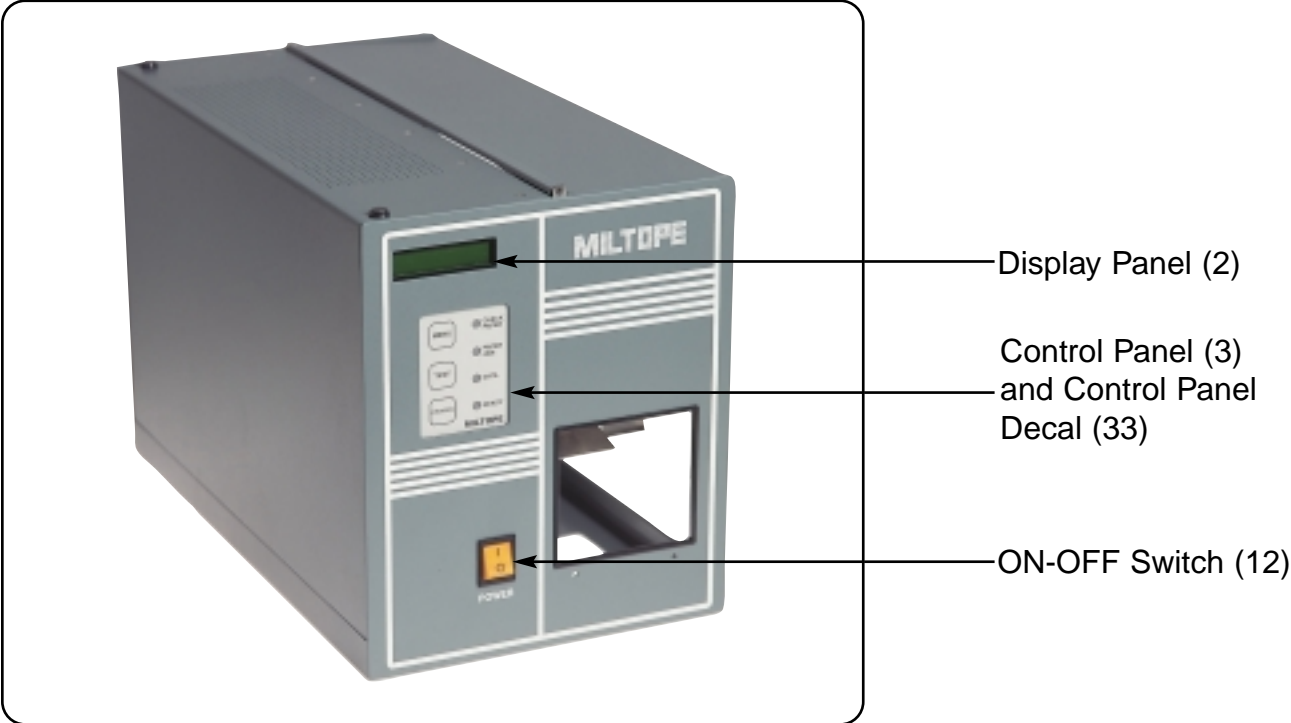
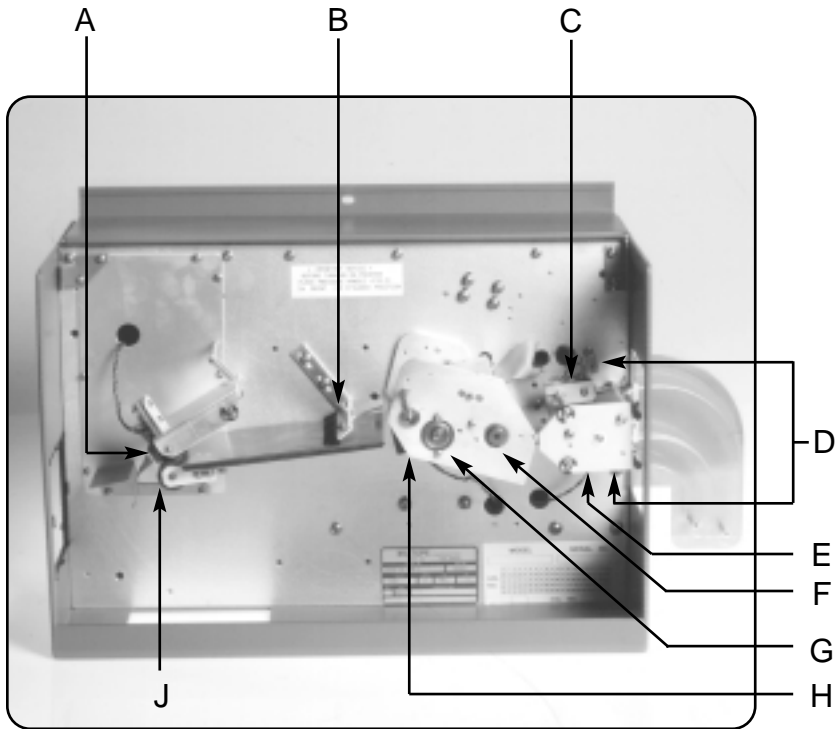


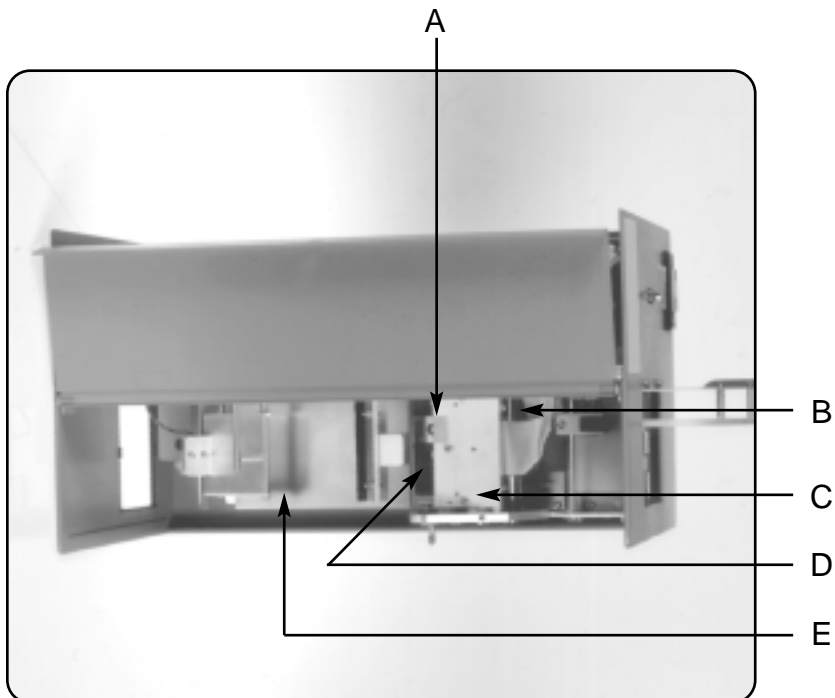
Figure 2 - 4550 A/U MOD 1



**Figure 3a**

- A - Eject Sensor (31)
- B - Anti Static Brush and Bracket (27) (28)
- C - Upper Infeed Roller (21)
- D - Switch, Upper and Lower (5)
- E - Lower Infeed Roller (21)
- F - Cutter, Rotary Shaft (35)
- G - Platen (20)
- H - Sensor, TOF (23)
- J - Eject Roller (32)

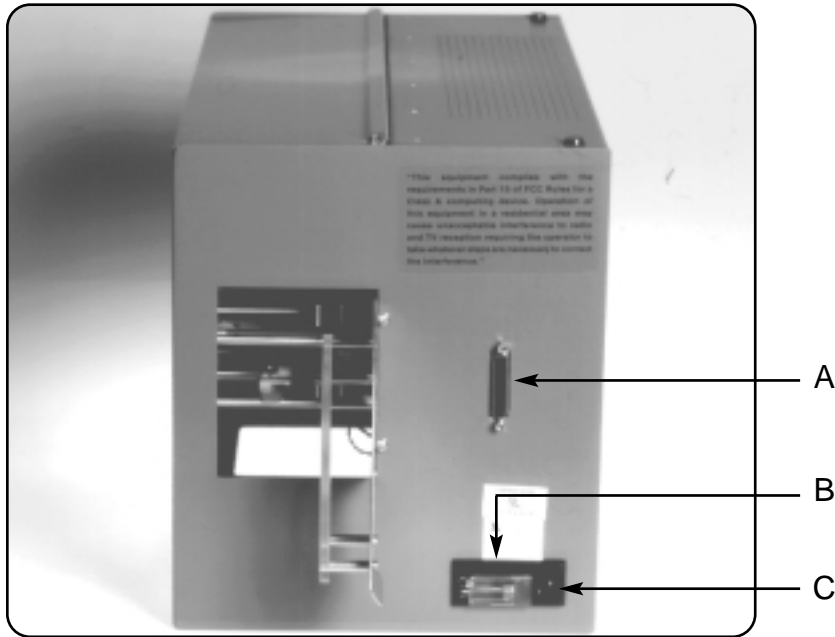
**Figure 3a**  
right side view



**Figure 3b**

- A - Stabilizer, Media (25)
- B - Cutter Blade (34)
- C - Print Head (22)
- D - Window, TOF (24)
- E - Eject Plate (30)

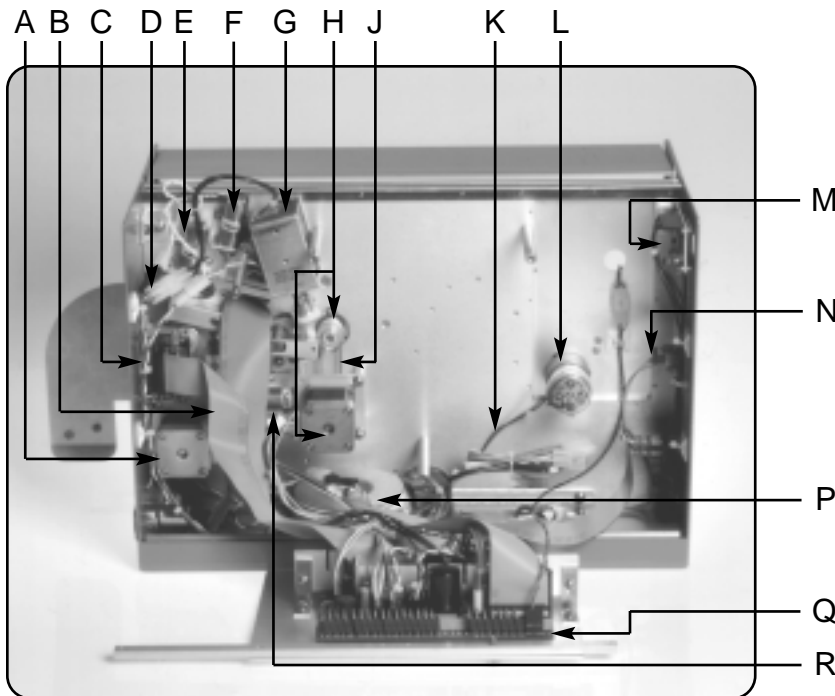
**Figure 3b**  
top view



**Figure 4**

- A - Interface Connector Board (38)
- B - Fuse Holder (2amp,SB)
- C - AC Receptacle and Filter (10)

**Figure 4**  
rear view



**Figure 5**

- A - Stepper Motor Infeed (9)
- B - I/O Cable (19)
- C - Upper and Lower Solenoid Harness (16)
- D - Cutter Solenoid Cable (17)
- E - Solenoid Infeed (37)
- F - Solenoid Platen (37)
- G - Solenoid Cutter (36)
- H - Pulleys (11) (2 places)
- J - Drive Belt (29) (2 places)
- K - Upper Right Solenoid and Eject Motor Harness (18)
- L - Eject Motor (8)
- M - LCD Harness (13)
- N - Control Panel Harness (14)
- P - Transformer (6)(7)
- Q - Main Logic Board (1)
- R - Solenoid, Infeed (37)

**Figure 5**  
left side view (Electronics Removed)

## 4.0 Installation

The 4550 A/U MOD 1 is designed to be mounted on a printer stand. Please confirm that the line voltage agrees with the voltage listed on the label affixed to the rear of the unit (see figure 4). Attach the AC cord and interface cable into the proper connectors as shown in **figure 4**. To turn on the printer, press the amber toggle switch located on the front of the printer to the “I” position. The amber switch light will illuminate. While the printer initializes, all lights will illuminate. When initialization is complete, the amber CHECK PAPER light will illuminate. When the required forms are loaded into both form infeeds, the green READY light will illuminate. The LCD window will display 4550-41# PO2 (#=Revision Letter).

**LOADING STOCK** - To load stock into the printer, first withdraw the cabinet to allow access to the right side of the printer. Unlock and open the doors. There are two form paths to load. Position the ATB stock such that the index hole is away from the operator. Lift the upper stock (printable surface to the rear) and thread it up and through the top plastic guide path until it reaches the metal form guides. Feed the leading edge of the form through these guides until it is automatically “grabbed” and positioned at the load point. Repeat this procedure for the lower stock. When both form paths are properly loaded, all indicators of the front panel will extinguish except the green READY light. Refer to **figure 6** for proper loading and stock orientation.

# 4.1 Loading Ticket Stock

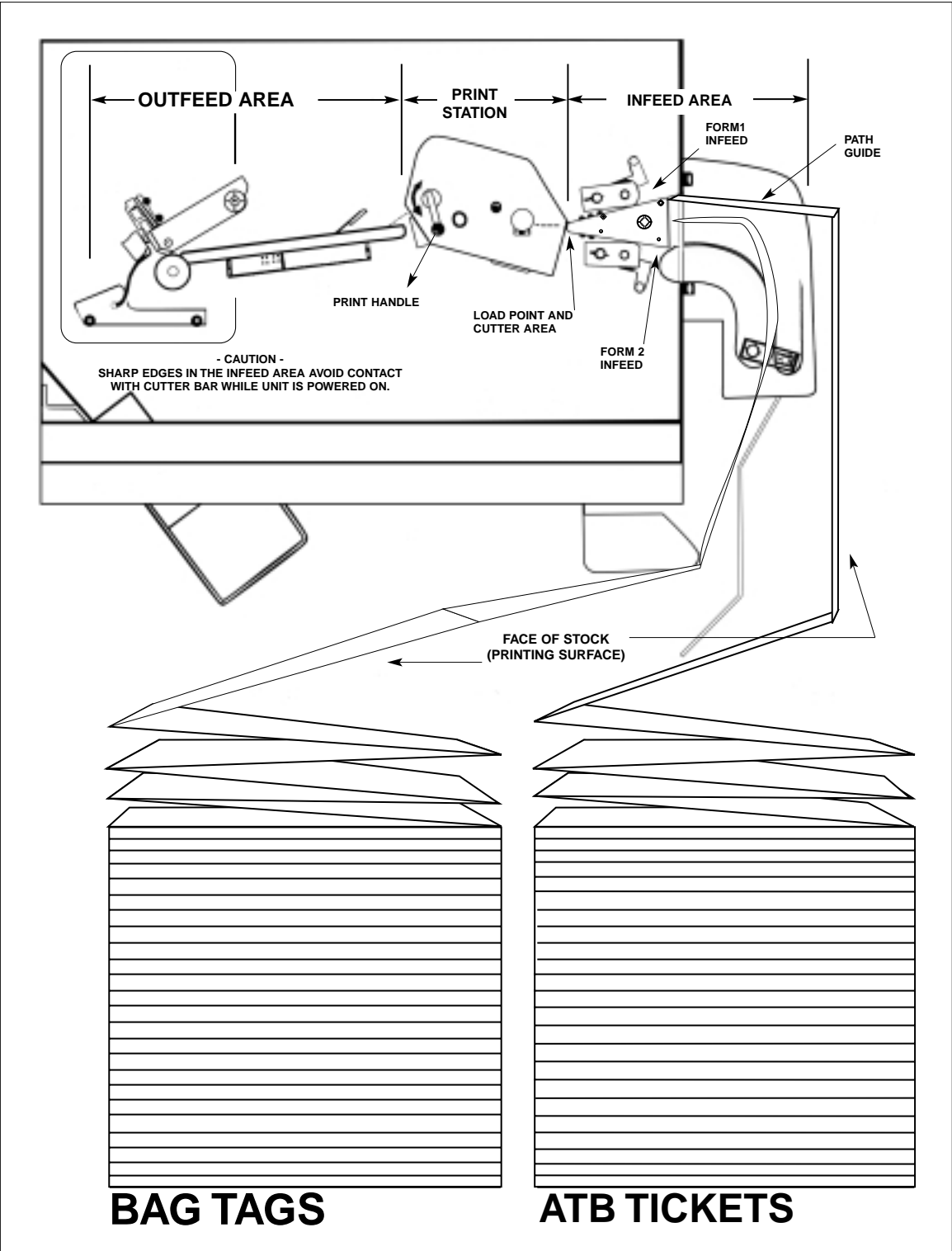
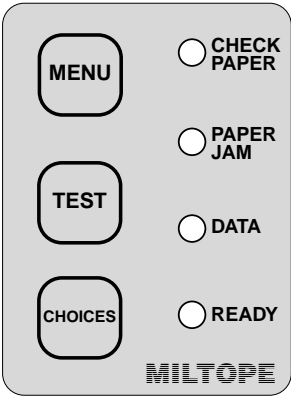


Figure 6 - Loading Instruction Label

# 5.0 Control Panel Functions

The Control Panel can be used to:

- Print test tickets and information tickets (Mode 1)
- Access the Operator Menu topics (Mode 2)



## Mode 1

- MENU button
  - Press and release to print top path 'VOID' test ticket
  - Press and hold to print top path 'PATTERN' test ticket
- TEST button
  - Press and release to print configuration ticket
  - Press and hold to print error log
- CHOICES button
  - Press and release to print bottom path 'VOID' test ticket
  - Press and hold to print bottom path 'PATTERN' test ticket

## Mode 2

- MENU button
  - Selects proper menu topic (baud rate, cut length, etc.)
- TEST button
  - Enters new value / also saves new value
- CHOICES button
  - Scrolls through choices in individual menu topics

To access and use Menu mode, follow these steps:

1. Ticket stock should be loaded into the printer. The LCD window displays 4550-41# P02 (# = Revision Letter).
2. Press and hold the MENU button and then press the Test button, continue pressing the buttons until the LCD window displays OPERATOR MENU.
3. To scroll through the MENU topic, use the MENU button stopping on the topic you wish to change. (See table)
4. Press the CHOICES button to scroll through choices in the selected topic. NOTE: the printer displays a blinking cursor for the value presently stored in the printer.
5. Once you have found the value you want, press the TEST button to enter the new value. The LCD window should now display EXIT AND SAVE?. Press the TEST button to exit and save or press the MENU button to continue entering new values.

**NOTE: DO NOT TURN OFF POWER UNTIL YOU HAVE PROPERLY EXITED THE MENU MODE.**

Topic Table:

<b>OPERATOR MENU Topics</b>
BAUD RATE?
CONFIGURATION?
* ADJ TOP LFT MGN?
* ADJ BOT LFT MGN?
ADJ TOP CONTRAST?
ADJ BOT CONTRAST?
ADJ TOP PNT SPD?
ADJ BOT PNT SPD?
* ADJ TOP CUT LEN?
* ADJ BOT CUT LEN?
CONTINUOUS TEST?
DIAGNOSTIC MODE?
** OTHER FUNCTIONS
EXIT AND SAVE?
JUST EXIT?

\* Note: These topics give you the choice to increment or decrement the particular count. Use the TEST button to select either the INC or the DEC option. Then use the CHOICES button to change count to the desired value. Press the TEST button to enter.

\*\* Note: OTHER FUNCTIONS include: resetting counters, resetting error log, rotating platen, inserting a cleaning card, clearing all formats and returning to default settings.

Using the control panel to reset after a jam. **DO NOT TURN PRINTER OFF WHEN CLEARING A JAM.**

The control panel can also be used to reset the 4550 after a ticket jam. Press the TEST button and the printer will attempt to remove the jam condition itself by raising the print head while it backs up the stock. If the jam is removed, reload stock if necessary. The printer will reprint the original ticket and then continue to print any remaining tickets.

If the printer does not remove the jam condition via the TEST button, the jam condition must be removed manually. Then press the TEST button to reset the printer. Reload stock. The printer will reprint the original ticket and then continue to print any remaining tickets.

# 6.0 Standard Interface Pinouts

## Serial Pinouts

### RS232 (Standard)

Pin	Function
2	Printer Transmit
3	Printer Receive
4	RTS (+5Vdc)
5	Not Used
7	Ground
11,20	DTR (Printer Ready)



## 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 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 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.

## 8.0 Maintenance and Adjustments

Adjustments to the 4550 A/U MOD 1 printer cover two areas. These areas are:

Document Path and Electronics.

The following sections cover all adjustments normally made in the field by the service technician. Any adjustment beyond what is covered in this document is expected to be performed at the depot level by experienced technicians, who have access to the required test instruments and diagnostic equipment.

### 8.1 Mechanical Alignment (Paper Path)

Mechanical alignment of the document path in the 4550 A/U MOD 1 printer consist of six separate adjustments. These adjustments are made to:

Upper Pressure Roller, Lower Pressure Roller, Print Head Opening, Cutter, Upper and Lower Infeed Switches, and Lower Infeed Width.

The following sections are organized and written with the expectation that the person performing the adjustments will have the necessary training, tools and gauges.

**NOTE:** In order to assist the technician in the performance of these mechanical adjustments, BOCA offers a complete Printer Adjustment Kit containing the necessary gauges and specialized tools. This kit, Part Number 493214, is listed in Section 10.

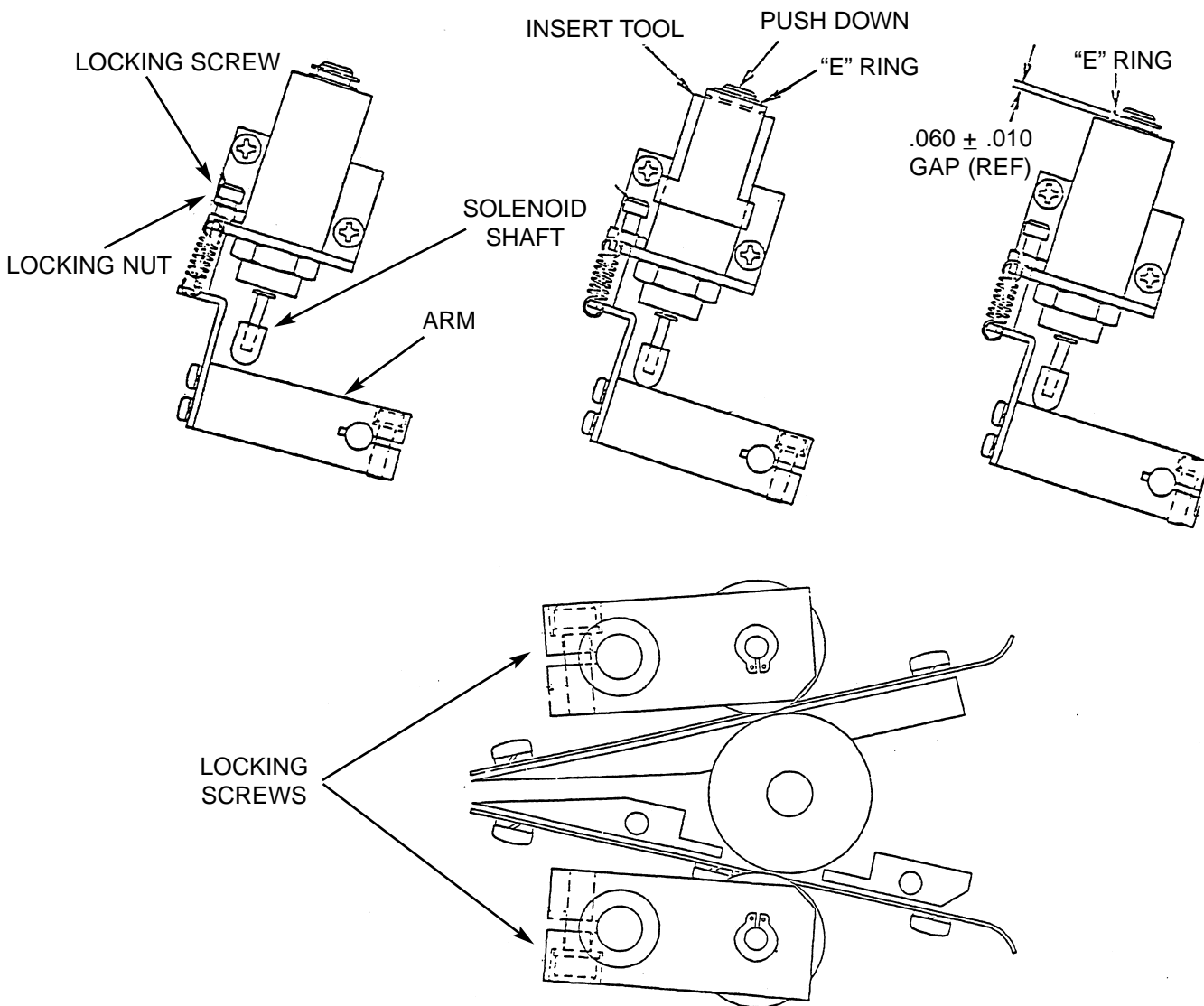
#### 8.1.1 Upper Pressure Roller Adjustment

Note: This is a two part adjustment. First the solenoid travel must be adjusted and then the pressure roller to drive roller gap.

1. Upper Infeed Solenoid Adjustment. (See figure 8-1)

- A. Remove media stock from the upper infeed chutes.
- B. Remove power from the printer by switching the power switch located on the printer's front panel to the "OFF" position.
- C. Loosen locking nut.

- D. Loosen locking screw until arm clears solenoid shaft.
- E. Place gauge, P/N 493199 (or alternate P/N 493458), between the E-Ring and the nylon washer of the upper infeed solenoid.
- F. Manually preload the solenoid by pressing on the top. Hold down and tighten the locking screw, until the arm is in contact with the solenoid shaft.
- G. When proper setting is obtained lock the screw with the locking nut.
- H. Verify the 0.060 inch throw of the solenoid plunger.
- I. Upper Pressure Adjustment.



**Figure 8-1**  
**Infeed Solenoid Adjustment**

2. Upper Pressure Roller Adjustment. (See figure 8-2)

A. Locate the holding tool, P/N 493209-1, on the upper actuator arm. Lock it to the solenoid mounting bracket by twisting the knob in either direction until the tool grabs.

B. Loosen the locking screw on the upper pressure roller arm.

Note: It is important that the pressure roller is in line over the drive roller.

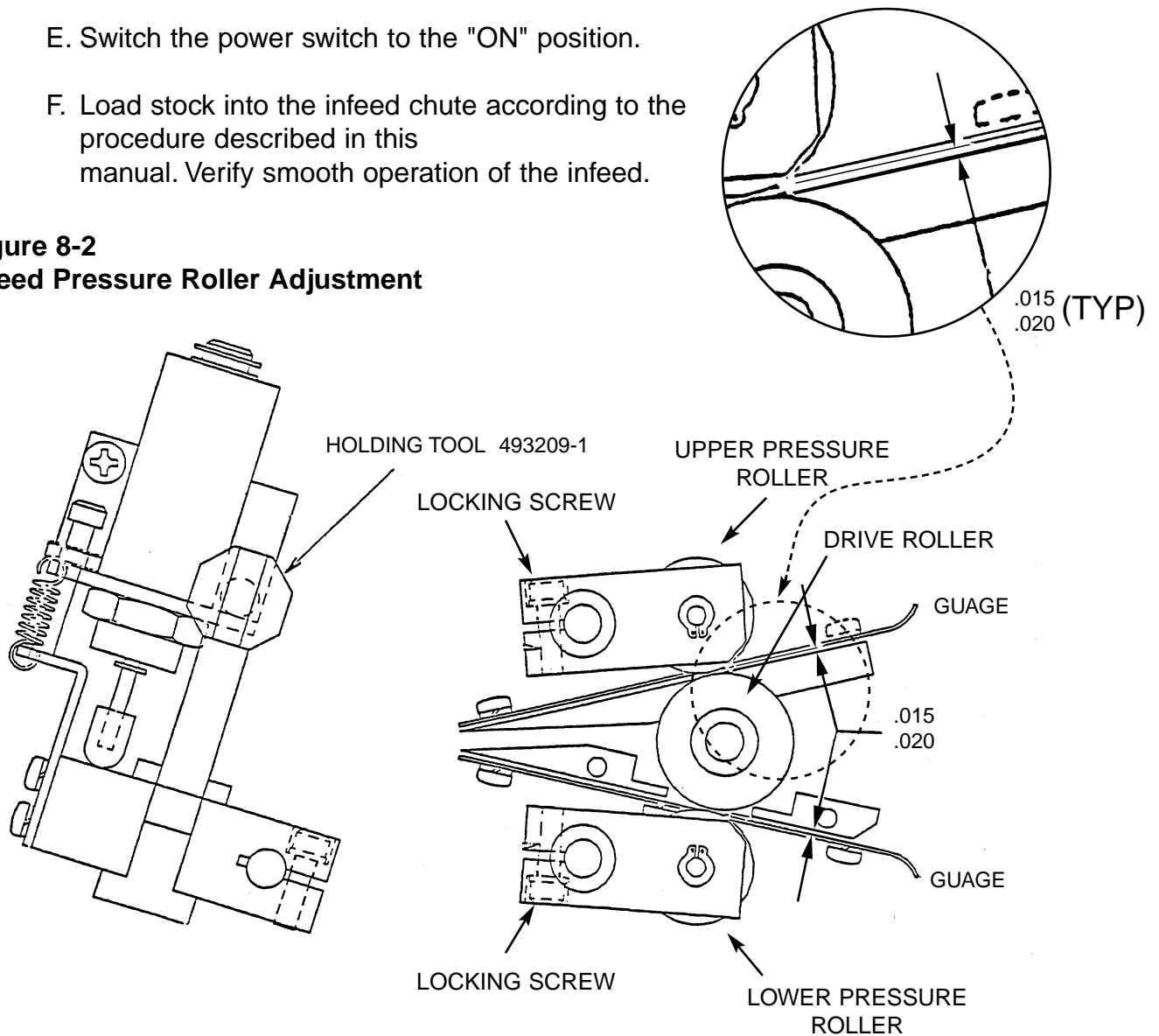
C. Place the gauge, P/N 493211, under the pressure roller, press on the pressure roller with a minimum of force and tighten the locking screw.

D. Remove the gauge and holding tool. Verify the .020 inch gap between the pressure and infeed rollers.

E. Switch the power switch to the "ON" position.

F. Load stock into the infeed chute according to the procedure described in this manual. Verify smooth operation of the infeed.

**Figure 8-2**  
**Infeed Pressure Roller Adjustment**



## 8.1.2 Lower Pressure Roller Adjustment

1. Loosen the three (3) screws that hold the infeed stepper motor in place and remove the drive belt.
2. Remove and save the three (3) screws that hold the motor and remove the infeed motor. This will provide easier access to the lower infeed solenoid.
3. Follow the procedure in paragraph 8.1.1
4. Reinstall the infeed motor, screws and drive belt. DO NOT tighten screws until the drive belt is in place.

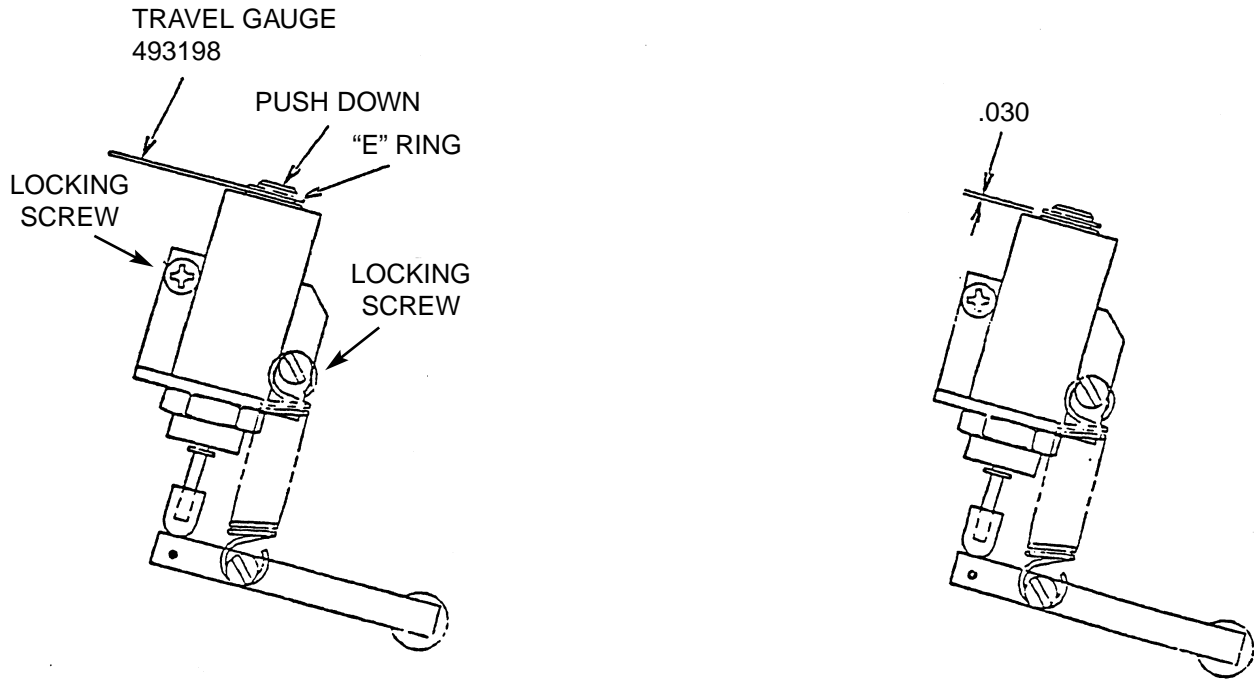
Note: Proper timing belt tension should be approx.  $\frac{1}{16}$ " deflection of the belt.

## 8.1.3 Print Head Opening Adjustment

Platen Solenoid Adjustment. (See figure 8-3)

1. Loosen locking screws on the solenoid supporting bracket.
2. Place gauge, P/N 493198, between the E-Ring and nylon washer of the solenoid core, and push down on the solenoid shaft.
3. Tighten the locking screws.
4. Remove the gauge and check the gap for 0.030 of inch clearance.
5. Rotate the nip handle (see figure 8-4) so that the print head is in the up (open) position.
6. Adjust the head switch, located under the platen solenoid, so that it is actuated with the print head in the up (open) position.
7. Rotate the nip handle so that the print head is in the down (closed) position. Verify that the switch is now deactivated.

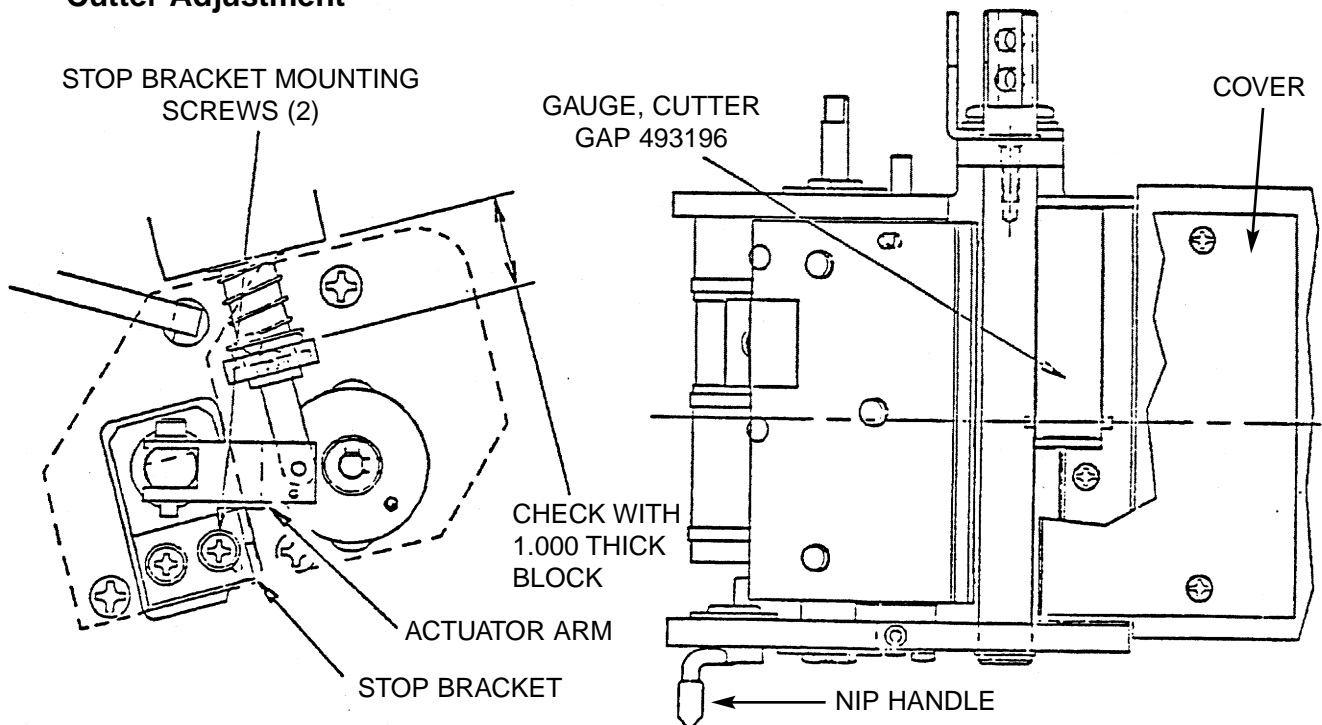
**Figure 8-3**  
**Platen Solenoid Adjustment**



### **8.1.4 Cutter Adjustment (See figure 8-4)**

1. Remove cover.
2. Loosen the two cutter solenoid stop bracket locking screws.
3. Slide gauge, P/N 493196, with the tab under the center of the cutter blade.
4. Preload the cutter manually by lifting the cutter actuator arm and holding it in this position.
5. Position the stop bracket under the cutter actuator arm so that it just makes contact. Tighten the two locking screws.
6. Remove the gauge.
7. Re-install the cover.
8. The cutter gap between the middle of the cutter and the cutter bar is 0.090 inch when cutter is open and 0.010 to 0.015 inch below the cutter bar when cutter is closed.
9. Verify cutter adjustment by observing cut operation. Cut should be smooth and clean. If the cutter does not cut properly, repeat Steps 1 through 6.

**Figure 8-4  
Cutter Adjustment**

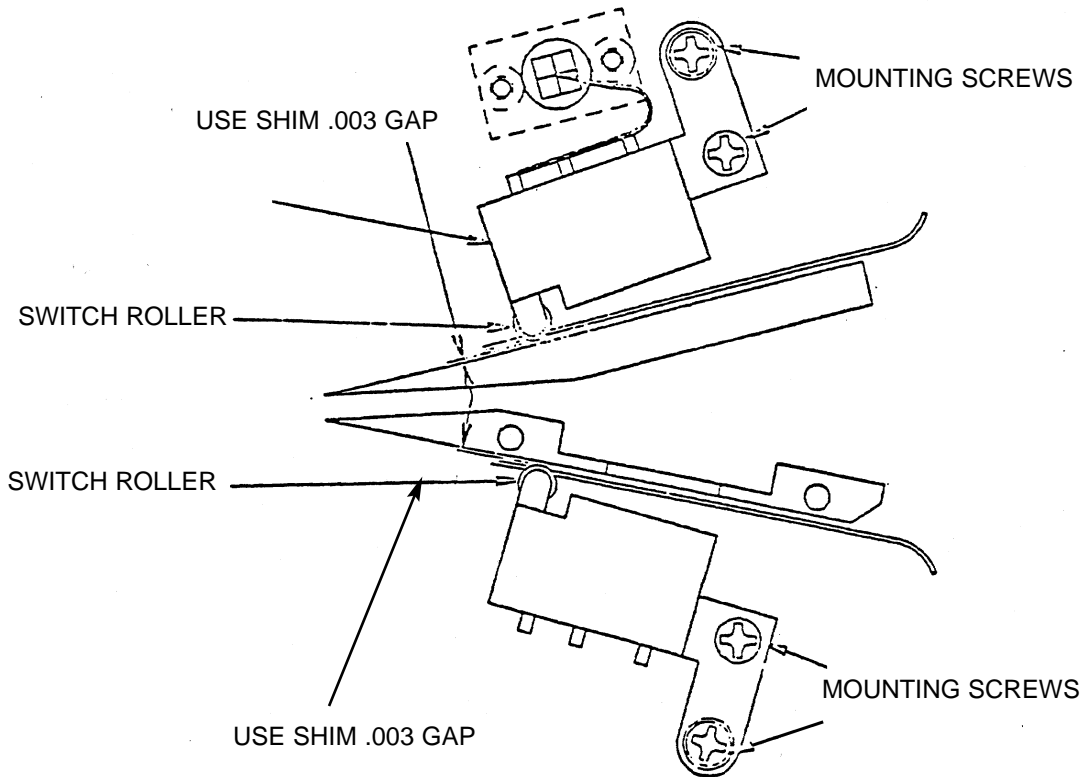


### **8.1.5 Infeed Switch Adjustment - Upper And Lower (See figure 8-5)**

Note: The switch should be activated when a 0.003 inch thick shim is inserted, and de-activated when the shim is removed.

1. Loosen the two mounting screws (Item 1) that mount the switch.
2. Place 0.003 inch thick shim under the switch.
3. Apply slight pressure on the switch until it activates and then re-tighten the two screws.
4. Remove the shim.
5. Check switch operation by inserting and removing the media.

**Figure 8-5**  
**Infeed Switch Adjustment**



### **8.1.6 Media Stabilization Tab Adjustment (See Figure 3b)**

1. Loosen the Phillips head mounting screw.
2. Insert a blank ticket coupon into the exit area of the printer, under the anti-static brush, and slide it back until it touches the platen.
3. Lower the media stabilization tab until it just clears the stock.
4. Tighten the Phillips head mounting screw.

### **8.1.7 Lower Infeed Width Adjustment**

It is factory adjusted to appropriate stock width with clearance of 0.005 to 0.010 inch. No adjustment should be necessary in the field.



## **8.1.8 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.

## **8.1.9 Rubber Drive Roller (Platen)**

The rubber drive roller should be cleaned whenever there is a visible accumulation of paper dust on it; or a minimum of once a year. Dust accumulation can shorten the print head life. Clean drive roller with a paper towel and alcohol.

1. Unlock the thermal head.
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.

## 8.2 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.

Your printer has one large printed circuit board which houses all control and power supply circuitry. This section describes board removal and proper installation. **ALL SERVICE SHOULD BE DONE WITH POWER OFF AND THE AC CORD UNPLUGGED FROM THE PRINTER.**

### 8.2.1 Logic Board (Removal)

1. Gain access to the Logic Board Assembly by removing the left side cover as viewed from ticket exit end.
2. Remove the screws that hold the logic board transfer plate.
3. Remove connectors from the main logic board, as necessary.
4. Remove Logic Board from transfer plate.

### 8.2.2 Logic Board (Installation)

1. Attach and secure Logic Board to transfer plate.
2. Attach connectors going to the main logic board.
3. Attach and secure transfer plate to printer.

## 8.3 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 Parts Replacement Procedures

USE THIS SECTION WITH THE PARTS LIST IN SECTION 10.0

Parts can be easily replaced by following the procedures described in the next sections. These procedures were written for use by qualified technicians who have received training on this printer.

As with any electronic instrument, proper safety precautions should be exercised at all times. The power cord (AC cord) should be unplugged from the back of the unit before attempting any of the following detailed procedures.

## 9.1 Upper Infeed Roller Replacement

1. Remove the 2 screws which secure the outer infeed assembly plate.
2. Loosen the set screw in the upper infeed arm assembly.
3. Remove the upper infeed arm assembly from the shaft.
4. Remove the two E-rings mounted on opposite sides of the upper infeed arm assembly.
5. Remove and replace the roller.
6. Re-install the two E-rings removed in step 4.
7. Replace the upper infeed arm assembly on the shaft.
8. Reinstall the outer infeed assembly plate using the screws removed in step 1 above.
9. Adjust the upper infeed roller gap as described in Chapter 8, section 8.1.1.

## 9.2 Lower Infeed Roller Replacement

1. Remove the 2 screws holding on the outer infeed assembly plate.
2. Loosen the set screw in the lower infeed arm assembly.
3. Remove the lower infeed arm assembly from the shaft.
4. Remove the two E-rings mounted on opposite sides of the lower infeed arm assembly.
5. Remove and replace the roller.
6. Re-install the two E-rings removed in step 4.
7. Replace the lower infeed arm assembly on the shaft.
8. Reinstall the outer infeed assembly plate using the 2 screws removed in step 1 above.
9. Adjust the lower infeed roller gap as described in Chapter 8, section 8.

## 9.3 Print Head Replacement

1. Rotate the print head lift handle counter-clockwise to the open position.
2. Disconnect the print head cable from the print head.
3. Loosen and remove the 3 screws.
4. Remove the print head from the print station.
5. Insert the new print head into the print station and replace the 3 screws removed in step 3 above.
6. Connect the print head cable to the print head.
7. Rotate the print head lift handle clockwise to the detent position.  
(Approximately 11:30 position.)

## 9.4 Platen Roller Replacement

1. Follow steps 1 and 2 of section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Loosen the set screws attaching the drive pulley to the platen roller.
3. Unscrew the 2 screws holding in the platen bearing and platen.
4. While pushing on the platen roller shaft, remove the pulley and timing drive belt.
5. Remove the platen roller from the print station by sliding the platen roller and outer bearing towards you.
6. Remove the outer bearing from the old platen roller and install this bearing on the new platen roller.
7. Re-insert the platen roller assembly into the print station.
8. While firmly holding the platen roller assembly in position, re-install the timing drive belt and the pulley onto the shaft of the platen roller.
9. Re-install and tighten the 2 screws removed in step 2 above.
10. Align the pulley with the flats on the platen shaft and tighten the set screws.
11. Install the Main Logic Board as described in section 8.2.2.

## 9.5 Upper and Lower Infeed Switch Replacement

1. Remove the 2 mounting screws.
2. Disconnect the infeed switch cable at the connector.
3. Remove the infeed switch assembly from the infeed assembly.
4. Install the replacement infeed switch into the infeed assembly.
5. Reinstall the 2 screws removed in step 1.
6. Connect the infeed switch cable to the connector.
7. Readjust the infeed switch as described in Chapter 8, Section 8.1.5.

## **9.6 Top Of Form (TOF) Replacement**

### **9.6.1 TOF Sensor Assembly**

1. Loosen and remove the 2 screws holding the TOF sensor assembly in the sensor housing.
2. Disconnect the TOF cable from the connector.
3. Remove and replace the TOF assembly.
4. Reinstall the 2 mounting screws removed in step 1.
5. Connect the TOF sensor cable to the connector.

### **9.6.2 Media Stabilization Tab**

1. Remove the mounting screw.
2. Remove the media stabilization tab.
3. Reinstall the new media stabilization tab using the screw removed in step 1.
4. Readjust the media stabilization tab as described in Chapter 8, Section 8.1.6.

### **9.6.3 TOF Window**

1. Remove the damaged TOF window.
2. Using an Exacto-type knife or razor blade, carefully remove all traces of the black RTV (silicon rubber) adhesive from the TOF housing.
3. Apply a small dab of black RTV (silicone rubber) adhesive to the TOF housing, being careful to avoid the sensor opening.
4. Align the replacement window over the TOF housing sensor area and carefully seat the window into the RTV adhesive.

## 9.7 Print Head Lift Handle (PHLH) Assembly Replacement

1. Remove the large E-ring, located on the inside of the print station.
2. Rotate the handle out of the detent position, and slowly remove the PHLH assembly from the print station.

### CAUTION

When removing the PHLH assembly, retain the ball bearing and the spring for reinstallation.

3. Reinsert the spring and ball bearing into the machined hole in the print station, and hold it in place.

Note: A paper clip bent to a 90 degree angle, approximately 1/4 inch from the end can be used to assist in holding the ball bearing and spring in place during the assembly.

4. Place the new PHLH assembly into the opening in the print station, and slide the assembly into the print station until reaching the ball bearing. While applying light pressure against the assembly, remove any tool used to hold the ball bearing in place. With a twisting motion, fully insert the assembly into the print station.

5. Reinstall the E-ring removed in Step 1.

## 9.8 Anti-Static Brush Assembly Replacement

### 9.8.1 Bracket Replacement

1. Remove the 2 two mounting screws holding the bracket to the printer frame, and remove the bracket assembly from printer.
2. Remove the 2 nuts and 2 washers.
3. Remove the anti-static brush.

NOTE: Place parts in the same mounting position as on the original bracket.

6. Reinstall the washers and nuts removed in Step 1.

## **9.8.2 AntiStatic Brush Replacement**

1. Remove the 2 nuts and 2 washers.
2. Remove the anti-static brush.
3. Place the new anti-static brush onto the bracket studs.
4. Reinstall the washers and nuts removed in Step 1.

## **9.9 Outfeed Eject Station Replacement**

### **9.9.1 Eject Plate Replacement**

1. Remove the E-ring.
2. Unplug the sensor connection.
3. Disconnect the spring from the support shaft by sliding it toward you.
4. Slide the eject plate off the shaft by pulling it toward you.
5. Install new eject plate onto the shaft and slide it all the way back to the printer frame.
6. Install the E-ring removed in Step 1.
7. Reconnect the spring onto the support shaft by sliding it over the end of the shaft.
8. Reinstall the sensor connector.



## **9.9.2 Eject Sensor Replacement**

1. Remove the 2 screws attaching the sensor to the eject plate.
2. Unplug the sensor connection.
3. Remove the sensor from the assembly.
4. Place new sensor onto the plate and secure with the two screws removed in Step 1.
5. Reinstall the sensor connector.

## **9.9.3 Eject Roller Replacement**

1. Remove the 2 retaining screws, Figure 7-12, Item 5, and remove the plastic retaining
2. Loosen the set screw(s) item and slide roller(s) toward you and off the eject motor shaft.
3. Slide new Eject Roller(s) onto the eject motor shaft, align rollers with the eject plate rollers, and tighten set screw(s).
4. Replace the plastic retaining plate and secure with the two screws removed in Step 1.

## **9.10 Control Panel Assembly Replacement**

### **9.10.1 Control Panel PCB Replacement**

1. Disconnect the control panel cable at the base of the control panel PCB.
2. Remove the 4 Phillips-head mounting screws and remove the control panel PCB from the printer.
3. Place the new control panel PCB into position in the printer and secure with the 4 screws removed in Step 2.
4. Reconnect the control panel cable to the control panel PCB.

## 9.10.2 Control Panel Decal Replacement

1. Remove the 4 nuts and washers holding the control panel assembly in the printer.
2. Slide a thin blade knife between the control panel decal and the metal sub-panel, and remove the control panel decal.
3. Remove the paper backing on the new control panel decal, carefully align the decal over the sub-panel and press the two together.
4. Place the Control Panel Assembly onto the printer and secure with the four washers and nuts removed in Step 2.

## 9.11 On-Off Switch Replacement

### WARNING

Recheck AC Cord has been disconnected before attempting this part replacement

1. Disconnect the 4 connectors, on the rear of the old switch, and mark them for easy reconnection later.
2. Press the four corner tabs towards the body of the on-off switch and remove the switch from the front of the printer.
3. Install the new on-off switch by slipping it into the cutout in the front panel. With an up and down rocking motion, press the switch into position in the front panel until the retaining tabs lock it into place.
4. Reconnect the 4 connectors removed in Step 1.

## 9.12 Cutter Assembly Replacement

The cutter assembly consists of two units. These are the cutter blade and the cutter.

## 9.12.1 Cutter Blade Replacement

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Remove the front side E-ring.
3. Remove the 2 screws attaching the cutter solenoid linkage to the cutter blade, and disconnect the linkage.
4. Remove the rear side E-ring.

### CAUTION

The cutter is SHARP! Use extreme care during removal and/or replacement to prevent bodily injury.

5. Press on the cutter blade at the cap screw end and push the cutter blade through the print station. Pull the cutter blade out of the print station, being careful to avoid placing any part of your body on the sharpened cutter area of the blade.
6. Insert the new cutter blade into, and carefully slide it through, the print station.
7. Install the front side E-ring removed in Step 1.
8. Install the rear side E-ring removed in Step 3.
9. Reconnect the cutter solenoid linkage to the cutter blade and secure with the cap screws removed in Step 2.
10. Adjust cutter as detailed in Chapter 8, Section 8.1.4.
11. Install the main logic board as described in Section 8.2.2.

## 9.12.2 Cutter Replacement

NOTE: Unplug the Print Head cable for easier access to the following items.

1. Remove the 2 Phillips head screws and remove the top infeed guide.
2. Remove the 2 socket head screws from the bottom of the cutter.
3. Remove the 4 Phillips head screws.

4. Remove the cutter from the print station. Remove and retain the bar containing the 3 springs and plastic strip.
5. Install the cutter and plastic strip into print station and secure with two spring washers and two socket head screws. Tighten these two screws, then back them out 1/2 turn.
6. Re-install the bar with the 3 springs using the 4 Phillips head screws removed in Step 3.
7. Install the top infeed media guide and secure with the two Phillips head screws removed in Step 1.

### **9.12.3 Cutter Solenoid Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the cutter solenoid cable at the connectors.
3. Remove the 4 Phillips head screws and remove the cutter solenoid from the printer.
4. Insert cutter solenoid shaft into the new cutter solenoid and install the cutter solenoid into the printer. Secure the cutter solenoid with the 4 screws removed in Step 3 only finger tight, and rotate the cutter solenoid slightly to properly align the cutter solenoid shaft perpendicular to the cutter actuator arm. Correct alignment will prevent binding and premature failure of the solenoid.
5. Tighten the 4 Phillips head screws.
6. Reconnect the solenoid cutter cable.
7. Install the main logic board as described in Section 8.2.2.

## 9.13 Solenoid Replacement

The 4550 A/U MOD 1 printer has three solenoids, besides the cutter solenoid which is covered in Section 9.12.3. These solenoids are:

- Upper Infeed Solenoid
- Lower Infeed Solenoid
- Platen Solenoid

### 9.13.1 Upper Infeed Solenoid Replacement

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the upper infeed solenoid cable at the connector.
3. Using long-nose pliers, disconnect the upper infeed solenoid spring.
4. Remove the 2 Phillips head screws and remove the upper infeed from the printer.
5. Install the new upper infeed solenoid and secure with the 2 screws removed in Step 3.
6. Reconnect the spring.
7. Reconnect the upper infeed solenoid cable.
8. Adjust the solenoid as detailed in Chaptr 8, Section 8.1.1.
9. Install the main logic board as described in Section 8.2.2.

### 9.13.2 Lower Infeed Solenoid Replacement

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the lower infeed solenoid cable at the connector.
3. Using long-nose pliers, disconnect the lower infeed solenoid spring.
4. Remove the 2 Phillips head screws remove the lower infeed solenoid from the printer.

5. Install the new lower infeed solenoid and secure with the 2 screws removed in Step
6. Reconnect the spring.
7. Reconnect the lower infeed solenoid cable.
8. Adjust the solenoid as detailed in Chapter 8, Section 8.1.2.
9. Install the main logic board as described in Section 8.2.2.

### **9.13.3 Platen Solenoid Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the platen solenoid cable at the connector.
3. Using long-nose pliers, disconnect the platen solenoid spring.
4. Remove the Phillips head screw.
5. Remove the slotted screw/spring support, and then remove the platen solenoid from the printer.
6. Install the new platen solenoid and secure with the Phillips head screw removed in Step 4 and the slotted screw/ spring support removed in Step 5.
7. Reconnect the spring.
8. Reconnect the platen solenoid cable.
9. Adjust the solenoid as detailed in Chapter 8, Section 8.1.3.
10. Install the main logic board as described in Section 8.2.2.

### **9.14 Infeed Stepper Motor Assembly Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the infeed stepper motor cable at the connector.

3. Remove the 3 Phillips head screws which mount the infeed stepper motor to the stand offs.
4. Remove the infeed drive belt and the infeed stepper motor from the printer.
5. At this point, if necessary, the infeed drive pulley can be replaced. Loosen the 2 set screws, remove and replace the infeed drive pulley. Be sure you tighten the set screws properly onto the flats of the shaft after installation is completed.
6. Loosen the 2 set screws on the stepper motor pulley, and remove the infeed stepper motor pulley from the old infeed stepper motor. Install the pulley onto the new motor, being careful to align one of the set screws with the flat on the motor shaft.
7. Install the new infeed stepper motor and/ or infeed drive belt into the printer and insert the 3 screws removed in Step 2. Slide motor downwards, applying pressure enough to maintain approx.  $\frac{1}{6}$ " deflection of the belt while tightening the mounting screws.
8. Install the main logic board as described in Section 8.2.2.

## **9.15 Platen Stepper Motor Assembly Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.
2. Disconnect the platen stepper motor cable at the connector.
3. Remove the 3 Phillips head screws which mount the platen stepper motor to the stand offs.
4. Remove the timing belt and the platen stepper motor from the printer.
5. At this point, if necessary, the platen drive pulley can be replaced. Loosen the 2 set screws, remove and replace the platen drive pulley. Make sure the pulley does not touch the printer frame, Tighten the 2 set screws properly after installation is completed.
6. Loosen the 2 set screws on the stepper motor pulley, and remove the pulley from the old platen stepper motor. Install the pulley onto the new motor, being careful to align one of the set screws with the flat on the motor shaft. Tighten the 2 set screws after installation is completed.

7. Install the new platen stepper motor and/or timing belt into the printer and insert the 3 screws removed in Step 2. Slide the motor downwards, pressure enough to maintain approx.  $\frac{1}{16}$ " deflection of the belt while tightening the mounting screws.

8. Install the main logic board as described in Section 8.2.2.

## **9.16 AC Line Filter Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to access the printer electronics and move the main logic board assembly out of the way.

2. Cut and remove tie wraps, as necessary.

3. Remove UL approved grounding.

4. Disconnect the wiring harness from the AC line filter terminals.

5. Remove the AC line filter from the printer.

6. Install the new AC line filter into the printer.

7. Reconnect the AC line filter wiring harness.

8. Reconnect the UL approved grounding.

9. Install new tie wraps, as necessary.

11. Install the main logic board as described in Section 8.2.2.

## **9.17 RS-232 Interface Printed Wiring Assembly Replacement**

1. Follow steps 1 and 2 of Section 8.2.1 to move the main logic board out of the way.

2. Disconnect the interface cable.

3. Remove the 2 nuts and washers from the interface connector on the rear of the printer, and remove the interface PCB.

4. Install the new interface PCB and secure it with the 2 washers and nuts removed in Step 3.



5. Reconnect the interface cable to JINT on the interface PCB.
6. Install the main logic board as described in Section 8.2.2.

## **9.18 Eject Motor Replacement**

1. Disconnect the eject motor cable at the connector.
2. Remove the eject roller(s) as detailed in Section 9.9.2, steps 1 and 2.
3. Remove the 3 Phillips head screws and remove the eject motor.
4. Install the new eject motor and secure with the 3 screws removed in Step 3.
5. Install the eject roller(s) as detailed in Section 9.9.2, Steps 3 and 4.
6. Reconnect the eject motor cable at the connector.

## **9.19 Infeed Drive Roller Replacement**

1. Remove the 2 E-rings.
2. Remove the 2 screws.
3. Remove the infeed pulley set screws.
4. Remove the pulley and drive belt.
5. Slide outer infeed mounting plate towards you.
6. Loosen the 2 screws holding the infeed plate assembly.
7. Slide the infeed roller shaft out of the infeed assembly and remove the infeed roller.
8. Place the new infeed roller into the infeed assembly, and carefully insert the infeed roller shaft through the infeed roller and the inner infeed plate.
9. Tighten the 2 screws loosened in Step 6.
10. Reinstall the outer infeed mounting plate onto the infeed assembly, and reinstall the two screws removed in Step 2.

11. Reinstall the pulley and drive belt removed in Steps 4 and 5.
12. Apply Loctite to the 2 infeed pulley set screws and reinstall into the pulley.
13. Replace the E-rings removed in Step 1.

# 10.0 RECOMMENDED SPARE PARTS LIST

USE THIS PARTS LIST WITH FIGURES 2 THRU 5

ITEM	QTY in Unit	*Recommended Spares QTY	PART NO.	DESCRIPTION
1	1	2	422770	Main Logic Board
2	1	2	P38-1003	Display Panel
3	1	2	421671	Control Panel
4	1	2	422557-A/U	Cable, Print Head
5	2	2	492099-1X	Switch, Upper and Lower
6	1	2	422808-115	Transformer, 115V Primary (not used for 230V installation)
7	1	2	422808-230	Transformer, 230V Primary (not used for 115V installation)
8	1	2	492092	Eject Motor
9	2	2	422590	Stepper Motor, Infeed and Platen
10	1	2	P31-1000	AC Receptacle and Filter
11	2	2	422183-3	Pulley, 22T
12	1	2	P28-1013	On-Off Switch
13	1	2	422943	LCD Harness
14	1	2	422944	Control Panel Harnes
15	1	2	422945	Switches and Sensor Harness
16	1	2	422946	Upper and Solenoid Harness
17	1	2	422947	Cutter Solenoid Cable
18	1	2	422948	Upper Right and Eject Motor Harness
19	1	2	422949	I/O Cable
20	1	2	492064-1	Platen
21	1	2	492062-1	Roller, Infeed, Upper and Lower
22	1	2	M402-14	Print Head
23	1	2	493322-1	Sensor, TOF
24	1	2	492116	Window, TOF
25	1	2	493248	Stabilizer, Media
26	1	2	492160	Handle, Print Head Lift
27	1	2	493805	Bracket, Anti-Static Brush
28	1	2	492121	Brush, Anti-Static
29	2	2	P50-1013	Drive Belt (94T)
30	1	2	493175	Eject Plate
31	1	2	493205-1	Eject Sensor
32	1	2	492063	Roller, Eject
33	1	2	492063	Decal, Control Panel
34	1	2	492006	Cutter, Blade
35	1	2	492070	Cutter, Rotary Shaft
36	1	2	493993	Solenoid, Cutter
37	3	2	492108-1	Solenoid, Infeed and Platen
38	1	2	422190-6(A/U)	Interface Connector Board
39	1	1	493214	Alignment Kit

\* **RECOMMENDED SPARES QTY** is the recommended spares to maintain in stock on a per site basis for one to five units.