44689043

CENTRONICS®
data computer corp.
LINE PRINTER DIVISION

E-SERIES BAND LINE PRINTER
MODEL III
CZ4A5-A

GENERAL INFORMATION
OPERATING PROCEDURES
PRINTER CARE
OPERATOR SUPPLIES
STATUS CODES AND CORRECTIONS

OPERATORS MANUAL

REVISION RECORD

REVISION	DESCRIPTION
MARCH 83	Pre-Release of the E-Series Band Line Printer Model III Operators Manual
A JULY 84	Release of E-Series Band Line Printer Model III and Incorporate CE Corrections and ECO PH19560.
B SEPT., 84	Revised to incorporate ECO PH20224
C JAN., 85	Revised to update series level
D APR., 85	Revised to update series level

PUBLICATION NO.	IDENTIFICATION NO.
44689043	

Revision Procedure:

The revision record page is revised for each revision package to reflect the revision sequence: (Pre-Release) Rev. 01,02 etc, (Release) Rev. A, Rev. B. Rev. C, etc. The revision record page also provides a brief description of each change. A manual update revision package will be available for manuals after the Release revision of the manual. Each page revised in an update revision package will have the month and year printed in the lower right hand corner. This same date would appear in the revision column above, just below the revision identification. An Instruction Sheet cover is with each revision package, explaining page removal and insertion and reason for the change. The instruction sheets for revision packages are then to be placed at the back of the manual as a record of the change.

MANUAL TO EQUIPMENT LEVEL CORRELATION

This manual reflects the equipment configurations listed below.

EQUIPMENT TYPE	SERIES	TOP LEVEL ASSEMBLY	COMMENTS
CZ4A5-A	08-11	59829100	
CZ4A5-C	08-11	59829102	
CZ4A5-E	08-11	59829104	
CZ4A5-F	08-11	59829105	
CZ4A5-G	08-11	59829106	
CZ4A5-H	08-11	59829107	
CZ4A5-J	08-11	59829108	

PREFACE

This publications contains Operator reference information for the E-Series Model III Band Line Printer. This manual is directed toward the needs of the Operator and provides only that information which is felt necessary for the Operator to operate and maintain these printers in a safe and efficient manner.

The publications listed below are related publications and are not normally shipped with each printer.

Publication	Publication No.
E-Series Band Line Printer Model III Maintenance Manual	44689045
E-Series Band Line Printer Model III Parts Identification Manual	44689041
E-Series Band Line Printer Model III Technical Manual	44689047
Key to Logic Symbology	95390100

WARNING This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A peripheral computing device pursuant to Subpart J of Part 15 of the FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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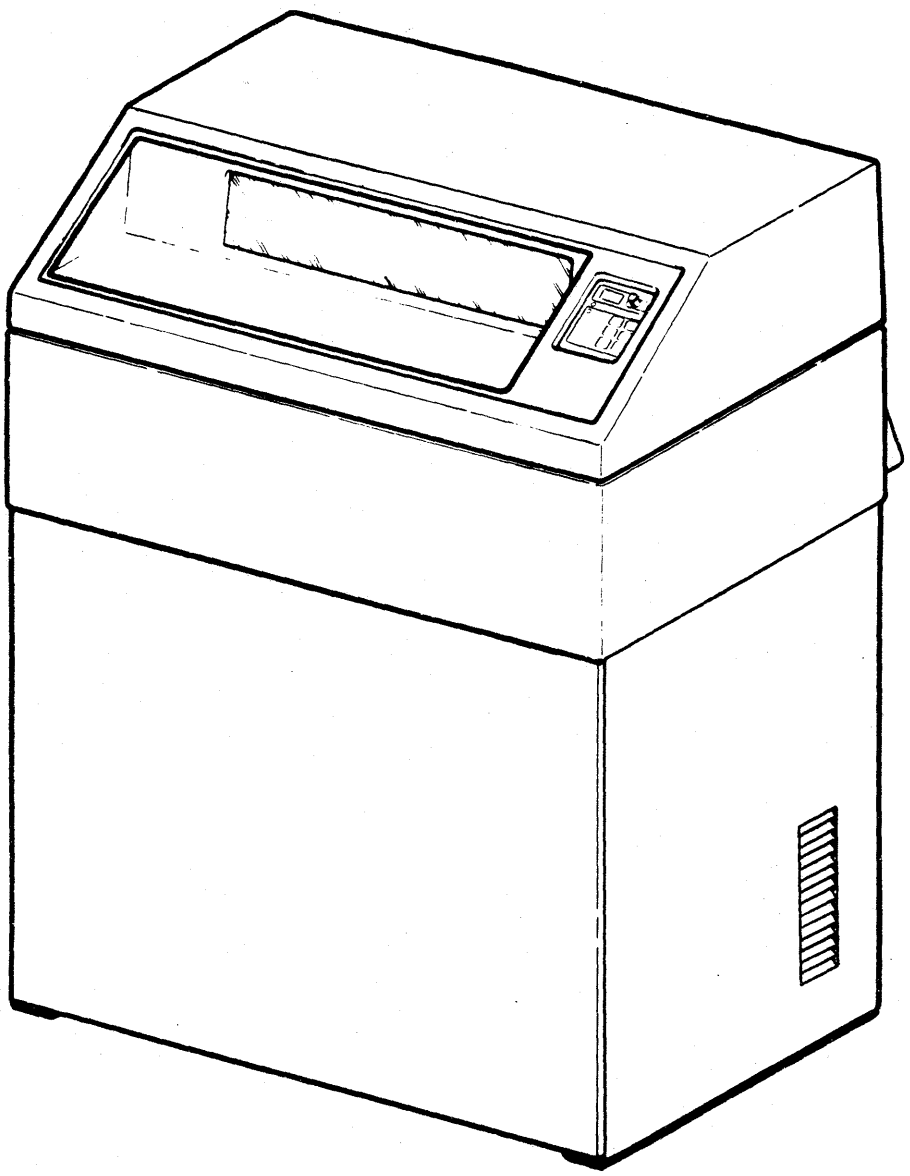


E-SERIES BAND LINE PRINTER
MODEL III

SECTION I

GENERAL INFORMATION

- PRINTER ACCESS
- CONTROL PANEL FUNCTIONS
- CONTROLS AND INDICATORS
- PRINTOUT FORMATTING

NOTE

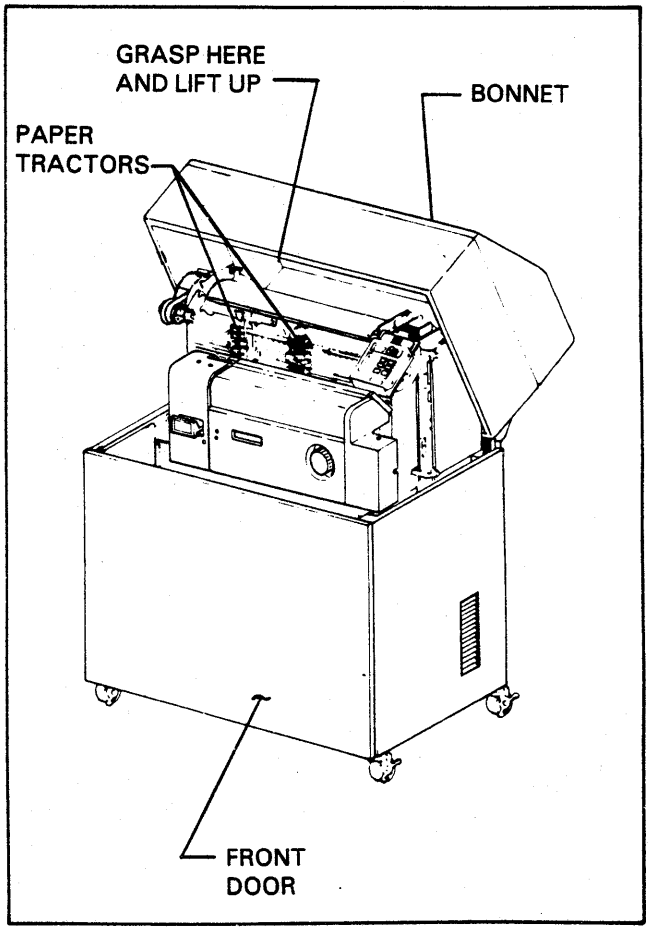
THE FRONT DOOR WILL NOT BE SHOWN IN MOST ILLUSTRATIONS AND WILL NOT BE REFERENCED IN THE TEXT. IT IS ASSUMED THAT THE OPERATOR WILL OPEN AND CLOSE THE DOOR AS NECESSARY WHEN SERVICING THE PRINTER.

OPENING THE BONNET AND DOOR

Opening the bonnet and front door exposes the printer's interior. Opening the bonnet is achieved by grasping the front of the printer's bonnet located just above the door and lifting up. The bonnet is counterbalanced and once opened, will stay opened until it is manually closed. Opening the door is achieved by pulling on the left side of the door.

CAUTION

DO NOT CLOSE THE BONNET WITH THE PAPER TRACTOR FLAPS IN THE OPEN POSITION. TRACTOR DAMAGE COULD OCCUR.



CONTROL PANEL FUNCTIONS

NOTE

CONTROL PANEL CONFIGURATIONS VARY ACCORDING TO INTERFACE OPERATION AND OPTIONAL FEATURES OF EACH PRINTER. ALL MEMBRANE SWITCHES AND INDICATORS USED ON THESE PRINTERS ARE LISTED BELOW. SOME SWITCH/INDICATORS ARE MARKED WITH DIFFERENT NAMES BUT PERFORM THE SAME FUNCTION. THROUGHOUT THIS MANUAL, ONLY THE MOST COMMONLY USED NAME (LISTED FIRST IN EACH GROUP) WILL BE USED.

SWITCH CLOSURE INDICATOR	An indicator that lights and emitts a momentary audible tone when any switch is pressed to confirm operation.
STATUS DISPLAY	The display shows the status of the printer and is used to report operator correctable conditions (such as out of paper, paper tear, etc.) and customer engineer correctable faults (such as fuse fault, ± 12 volt fault, etc.). Any display number that includes the ALARM lamp flashing on and off will require that the printer be powered OFF for 15 seconds, and then ON to recover the + 36 volt supply. The display is prioritized such that if more than one fault exists (such as out of paper and gate open) only the fault deemed more appropriate will be displayed. As faults are serviced by the operator, the display may or may not change depending on the situation, but when the operator tries to clear faults with the CLEAR or RESET switch, any remaining fault will be displayed. If no faults exist, the printer will go On Line.
ALARM or FORMS ERROR	An indicator that will light on the occurance of a fault condition. This indicator will flash when a C.E. fault occurs. Power printer OFF for fifteen seconds then power ON. If fault does not clear, contact your Customer Engineer.
CLEAR or RESET	A switch used to clear an ALARM condition. Correct fault then press CLEAR.
READY	An indicator that lights when no fault conditions exist and the printer is ready to be put On Line.
ON LINE	A switch indicator that lights when the printer is in the Ready condition and the ON LINE switch has been pressed. The interface is active only when an On Line condition exists. When the unit is On Line, pressing the switch will cause the printer to go Off Line at the completion of the pending print and/or paper motion cycle.
TOP OF FORM or FORM FEED or PAGE EJECT	A switch which when pressed, advances the paper to the Top of Forms position. This switch is only active when the printer is in the Off Line condition.
PAPER STEP or SINGLE SPACE	A switch which when pressed, causes the paper to advance one line. This switch is only active when the printer is in the Off Line condition.
TEST MODE or TEST PRINT	A switch which when pressed, lights and initiates a test print operation. TEST MODE is disabled by pressing the TEST MODE switch again and the light will be extinguished. This switch is only active when the printer is in the Off Line mode.

STOP/START

A switch which when pressed, lights and causes the printer controller to go Ready if the printer was in the Not Ready mode and no detectable faults exist.

The Ready state will be maintained until the STOP/START switch is again pressed, or a detectable fault occurs, removing the Ready condition.

Pressing the STOP/START switch while the printer is printing or moving paper will not inhibit these functions from being completed; however, new data cannot be loaded until the STOP/START switch is again pressed and the Ready Condition is established.

If the STOP/START switch is pressed during a load cycle, the printer will go to the Not Ready condition and will not respond to further data and the last line loaded will be printed.

When in the Ready condition, the START portion of the indicator is lit. Pressing the STOP/START switch when Ready, causes the STOP portion of the indicator to be lit.

DOUBLE SPACE

Pressing this switch advances forms vertically two lines at a time when the printer is in a stop condition.

SINGLE CYCLE

A switch which when pressed, will cause the printer to go On Line until one line of data is loaded. The printer will then go Off Line, print the data, and perform the indicated paper motion. This switch is only active when the printer is in the Off Line mode.

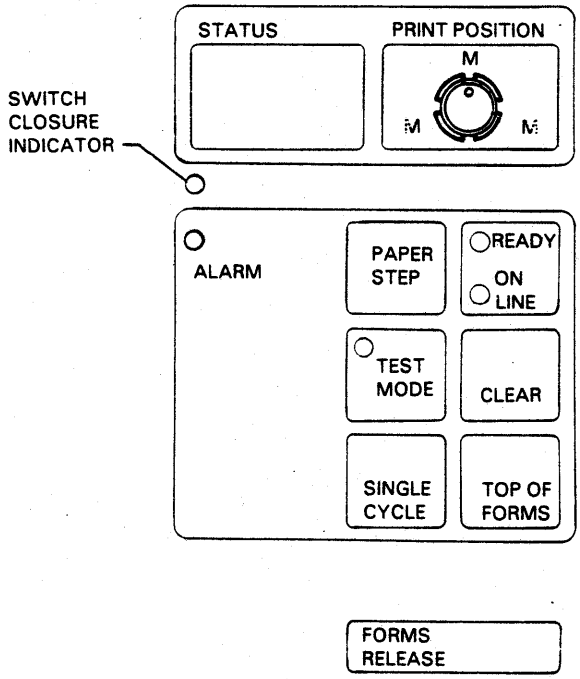
If an out of paper condition exists, pressing this switch will allow printing to the bottom of the page. The printer should not be powered OFF when restoring the paper supply.

PAPER OUT

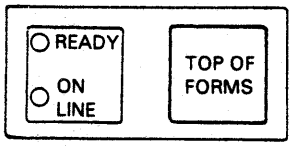
This indicator lights when the end of paper is reached.

PARITY ERR

This indicator lights when a transmission Parity Error occurs. The indicator remains lit until the Parity Error condition is removed by a Buffer Clear or Master Clear from the interface or until the control panel CLEAR or RESET switch is pressed. A Buffer Clear signal only clears the data line being sent and does not effect the printer status.



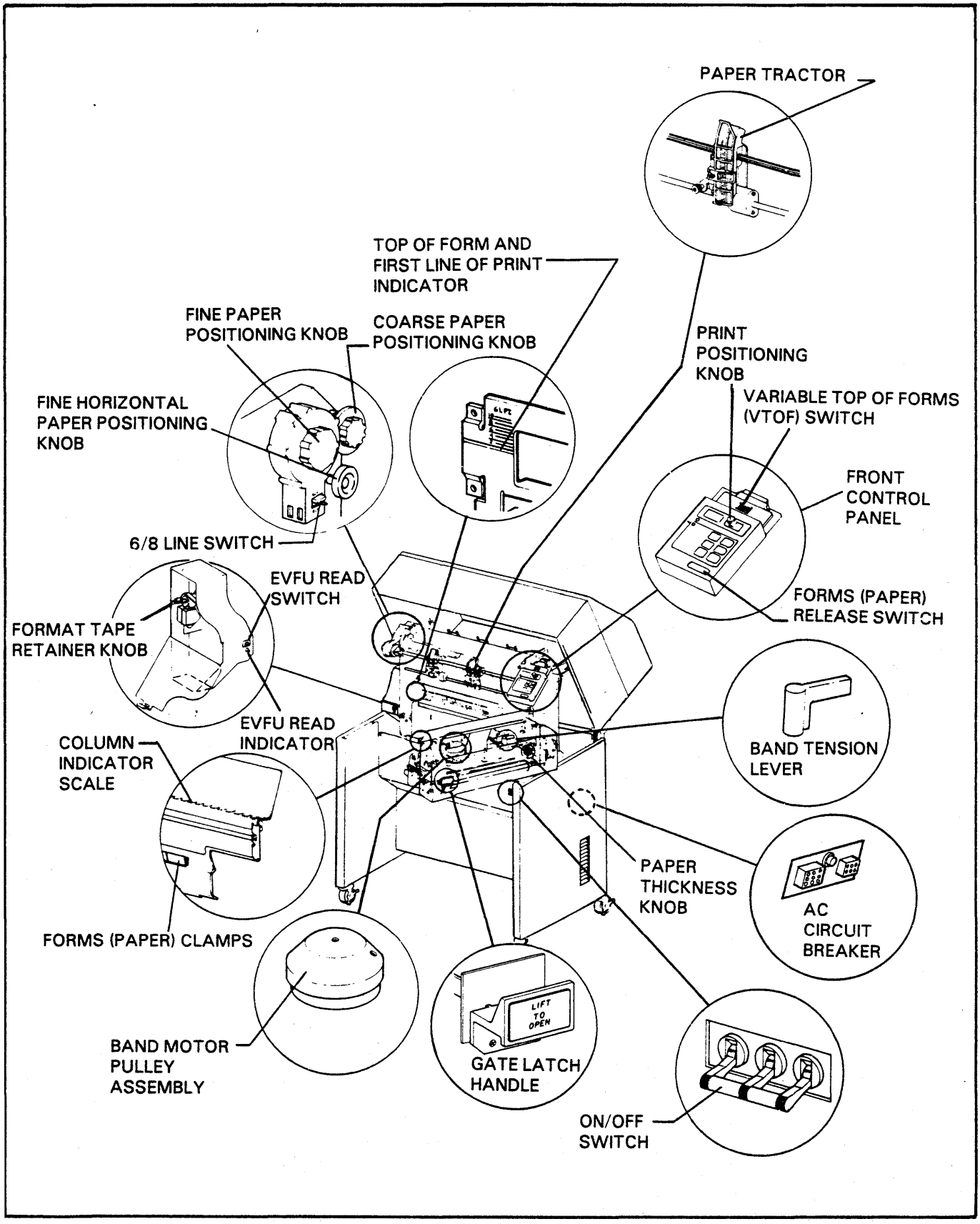
TYPICAL FRONT CONTROL PANEL SHOWN



TYPICAL REAR CONTROL PANEL SHOWN

DESCRIPTION	LOCATION	FUNCTIONAL INFORMATION
On/Off Switch	Front of pedestal	Main circuit breaker; On position-supplies ac power to all circuits; OFF position- removes ac power. NOTE: THE UNIT SHOULD NOT BE REACTIVATED FOR A PERIOD OF AT LEAST 15 SECONDS. IF THE POWER IS TURNED ON AND OFF MORE THAN THREE CONSECUTIVE TIMES, A FIVE MINUTE OFF TIME IS REQUIRED.
Gate Latch Handle	Print Gate	Lift up to release latch and swing open gate for necessary adjustments; activates print gate switch.
Forms (Paper) Tractors	Beneath bonnet window	Use to adjust coarse horizontal positioning of paper. Once the paper is loaded in the tractors and both locking knobs are locked, loosening the left tractor locking knob will allow the left and right tractors to move simultaneously. This feature provides for the horizontal repositioning of the paper without retensioning the paper between the tractors. NOTE: GATE OPEN DURING ADJUSTMENT. OPEN TRACTOR FLAPS FOR PAPER INSTALLATION OR REMOVAL BUT DO NOT CLOSE THE BONNET WITH THE TRACTOR FLAPS IN THE OPEN POSITION.
Fine Horizontal Paper Positioning Knob	Left side of printer (Lower Tractor Shaft)	Allows the operator to "fine tune" the horizontal paper for at least one character in either direction. NOTE: GATE OPEN DURING ADJUSTMENT
Band Tension Lever	Print gate	Moves band pulley to apply or release tension on the print band during band installation or removal.
Band Motor Pulley Assembly	Print gate (top center)	Manually advances band and pulley components; use during band installation
Coarse Paper Positioning Knob	Upper tractor shaft (left side)	Use to manually adjust vertical position of forms (paper). NOTE: FORMS RELEASE SWITCH MUST FIRST BE PRESSED AND HELD WHILE USING THIS CONTROL
Forms (Paper) Release Switch	Front Control Panel circuit board (beneath bonnet)	When pressed and held, allows manual advancing of forms forms (paper) using the Coarse Paper Positioning Knob. If a unit is stopped and gate opened before the processor has completed its output transfer, this switch should be operated while closing the gate to insure consistent line to line spacing.
Fine Paper Positioning Knob	Vertical advance motor Shaft. (Left Side of printer).	Provides a vertical fine paper positioning adjustment (any desired point within 0.5 in) of paper by manually rotating code disk reader. NOTE: ADJUSTMENT MADE WITH GATE OPEN. CENTER FIRST LINE OF PRINT BETWEEN TWO LINES OF TOP OF FORM (PAPER) INDICATOR. (Continued)

DESCRIPTION	LOCATION	FUNCTIONAL INFORMATION
Variable Top of Form (VTOF) Switch	Front Control Panel Circuit Board (Beneath Bonnet	Miniature switches; Set to form (paper) length. If using eleven inch forms (eleven inches from perforation to perforation) set the 8, 2, and 1 switches in the up (on) position by using a sharp tool. Automatically provides for a three line skip over perforations.
Electronic Vertical Format Unit (EVFU) Read Switch	Front of ElectronicVertical Format Unit (EVFU) tape reader	Pressing switch will manually load format tape information into the format tape memory without powering the printer OFF. Format tape information is normally loaded into memory automatically when the printer is powered ON.
Electronic Vertical Format Unit (EVFU) Read Indicator	Left side of printer under EVFU read switch on EVFU reader assembly	A red light that indicates the EVFU is loading the format tape information into the format tape memory. The light will go out when the tape has been read.
Format Tape Retainer Knob	Inside left side of Electronic Vertical Format Unit (EVFU)	Push and turn the knob counterclockwise to swing format tape retainer away from the tape drive sprocket when installing or removing format tape. Turn the knob clockwise to retain the format tape on the drive sprocket.
Top of Form And First Line Of Print Indicator	Inner Throat Plate	The Top of Form (paper) may be aligned with the aid of the Top of Form indicator. Used in conjunction with Fine Paper Positioning Knob to center the first line of print on the form between the two scribed lines on the Top of Form indicator.
Column Indicator Scale	Outer Throat Plate (top)	Use for horizontal positioning of paper.
Print Position Knob	Front Control Panel	Adjust (rotate) to achieve correct horizontal character phasing (full character appears without being clipped on either side).
Paper Thickness Knob	Print Gate (front)	Use this knob when changing from one form thickness set to another.When properly adjusted, the last copy of multi-part form will print the full character without being clipped on the top or bottom. The print position knob may be adjusted to obtain correct character phasing.
6/8 Line Per Inch (LPI) Switch	Paper Motion Reader	Vertical line spacing control: 6 or 8 lines per inch. Printer is initialized to 6 LPI. For 8 LPI, go to Stop (Not Ready) then switch to 8 LPI. NOTE: SWITCH POSITION WILL ONLY BE CHANGED WITH PRINTER IN STOP MODE FOLLOWED BY AT LEAST ONE TOP OF FORMS.
Forms (Paper) Clamp	Outer Throat Plate	Provides a constant hold on paper when forms are not advancing to provide optimum vertical print registration. Opening print gate or activating FORMS RELEASE switch will disable clamp action.


PAPER TRACTOR
TOP OF FORM AND FIRST LINE OF PRINT INDICATOR
FINE PAPER POSITIONING KNOB
COARSE PAPER POSITIONING KNOB
PRINT POSITIONING KNOB
VARIABLE TOP OF FORMS (VTOF) SWITCH
FINE HORIZONTAL PAPER POSITIONING KNOB
FRONT CONTROL PANEL
6/8 LINE SWITCH
EVFU READ SWITCH
FORMS (PAPER) RELEASE SWITCH
FORMAT TAPE RETAINER KNOB
EVFU READ INDICATOR
BAND TENSION LEVER
COLUMN INDICATOR SCALE
PAPER THICKNESS KNOB
AC CIRCUIT BREAKER
FORMS (PAPER) CLAMPS
BAND MOTOR PULLEY ASSEMBLY
LIFT TO OPEN
GATE LATCH HANDLE
ON/OFF SWITCH

- VTOF (Variable Top of Forms)
- EVFU (Electronic Vertical Format Unit) with a reader
- DAVFU (Direct Access Vertical Format Unit)
- EVFU Reader with DAVFU

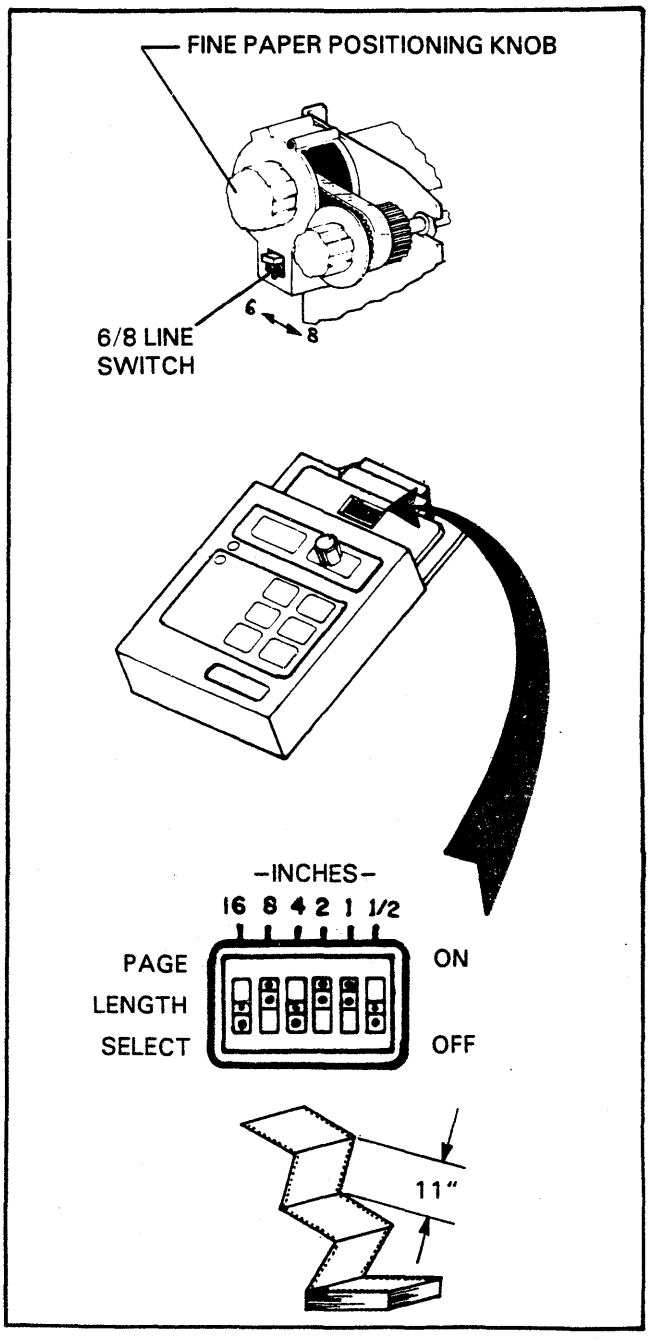
The positions of the printed lines as they are printed down the page is known as formatting. The format information is transmitted manually by the VTOF (Variable Top of Form) switch or electronically through the microprocessor by the EVFU (Electronic Vertical Format Unit).

VTOF (VARIABLE TOP OF FORM) SWITCH

Paper length is determined by the miniature switches located at the top of the Control Panel. Measure the paper length from perforation to perforation. Set the miniature switches to the ON position so that the addition of the numbers match the paper length (in inches). The example to the right shows an 11" paper with the 8, 2, and 1 switches set in the ON position (8 + 2 + 1 = 11). If using a 14" paper length, set the 8, 4, and 2 switches to the ON position. All other switches should be set in the OFF position.

NOTE

SWITCH POSITION SHOULD ONLY BE CHANGED WITH THE PRINTER IN THE OFF LINE MODE FOLLOWED BY AT LEAST ONE TOP OF FORM, PAGE EJECT, OR FORM FEED. IT WILL BE NECESSARY TO RESET THE FIRST LINE OF PRINT WHEN CHANGING PAPER LENGTH. PERFORM STEPS 12 THROUGH 18 OF PAPER INSTALLATION PROCEDURE TO RESET.

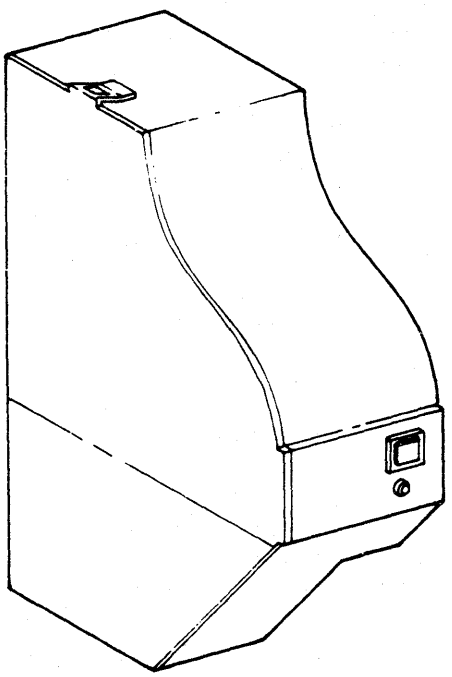


EVFU READER

If your printer is equipped with an EVFU (Electronic Vertical Format Unit) reader loading system, format loading information may be done automatically or manually. If a format tape is installed in the EVFU reader and the printer is powered ON, the EVFU reader will automatically read the format tape for the format information. See Automatic EVFU Tape Reader Load Operation.

If the printer is powered ON, and a change in format is desired, a new format tape must be punched and installed to reflect the new format instructions. This must be loaded manually by pressing the read switch on the EVFU reader. See Manual EVFU Tape Reader Load Operation.

EVFU READER

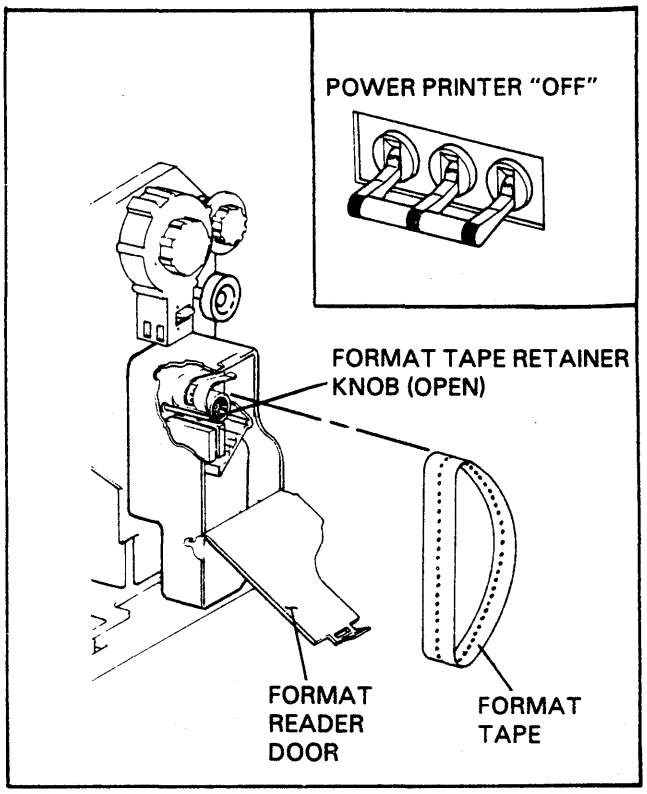


AUTOMATIC EVFU TAPE READER LOAD OPERATION

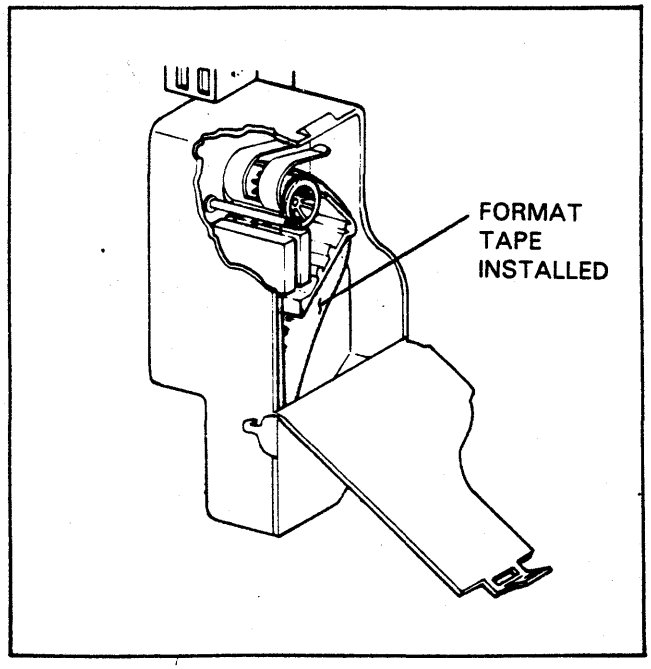
This tape reader load operation is used when loading format tape into a printer that has been powered OFF (ON/OFF switch in OFF position).

1. With printer powered OFF, raise the bonnet and open format reader door.

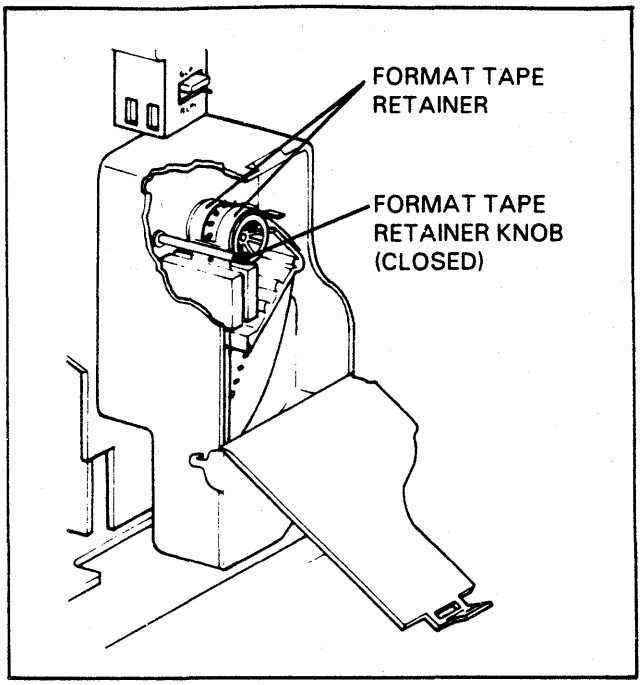
2. Open the format tape retainer by pressing in on its knurled knob next to the reader sprocket and turning counterclockwise.



3. Install the format tape with the direction arrows pointing clockwise. Refer to the tape installation label on the format reader door for tape positioning.



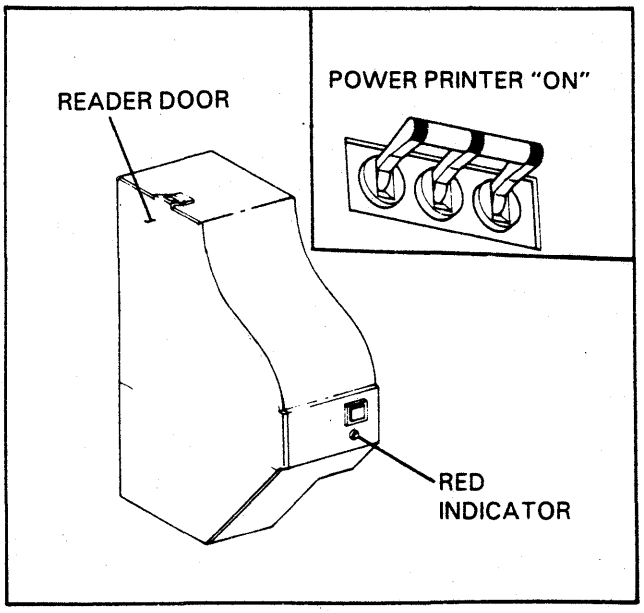
4. Close the format tape retainer by turning its knurled knob clockwise.



5. Close the reader door and power the printer ON (ON/OFF switch in ON position).

6. Within a few moments the red indicator on the front of the EVFU Reader Unit will light indicating tape load has started. The tape will be read, and the red light will go out indicating tape load is finished. If the red light fails to go out, refer to the Fault Isolation section of this manual.

7. Press the START or READY/ON LINE switch and begin data transfer.

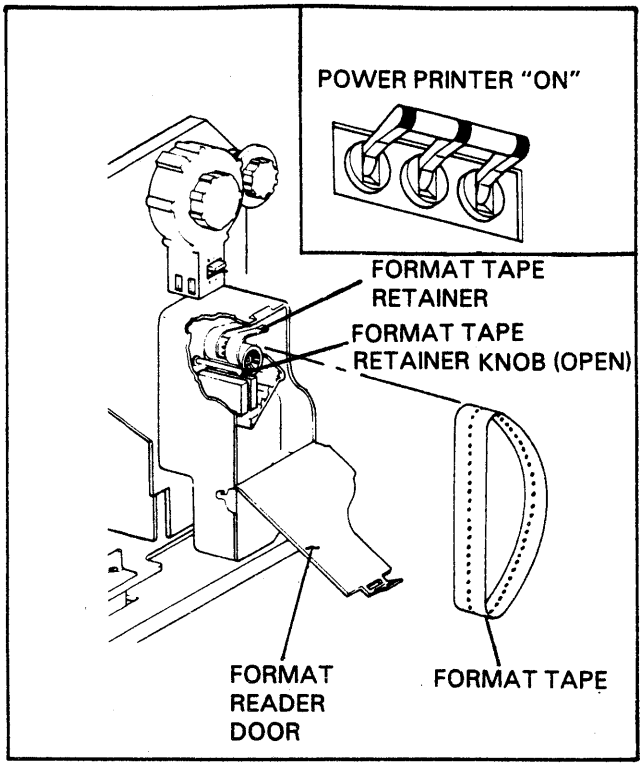


MANUAL EVFU TAPE READER LOAD OPERATION

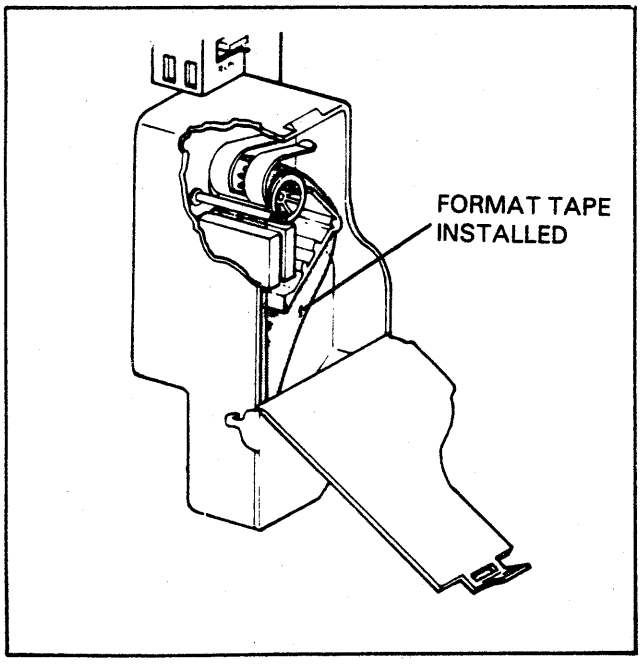
This tape reader load operation is used when loading format tape into a printer that is powered ON (ON/OFF switch in ON position). This allows the operator to change and load the format tape in the OFF LINE mode without powering the printer OFF.

1. With printer powered ON and STOP or READY light lit, raise the bonnet and open format reader door.

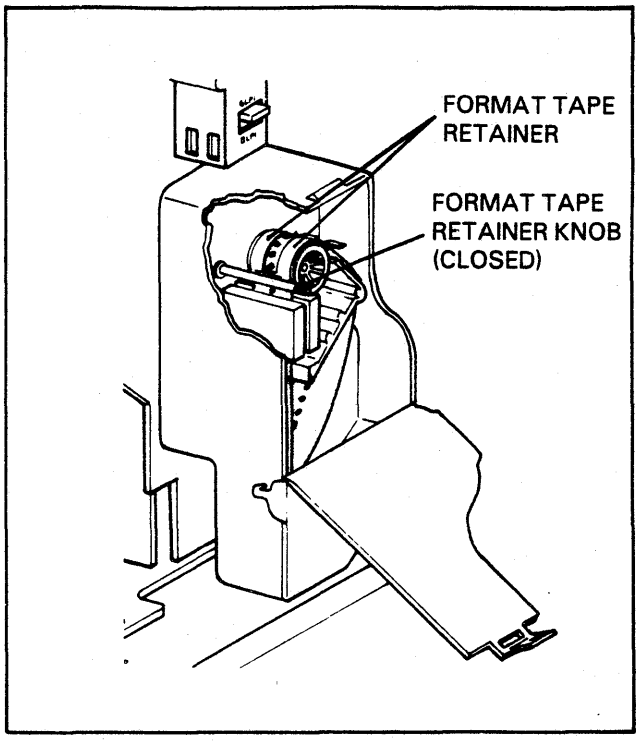
2. Open the format tape reader retainer by pressing in on its knurled knob next to the reader sprocket and turning counterclockwise.



3. Install the format tape with the direction arrows pointing clockwise. Refer to the tape installation label on the format reader door for tape positioning.



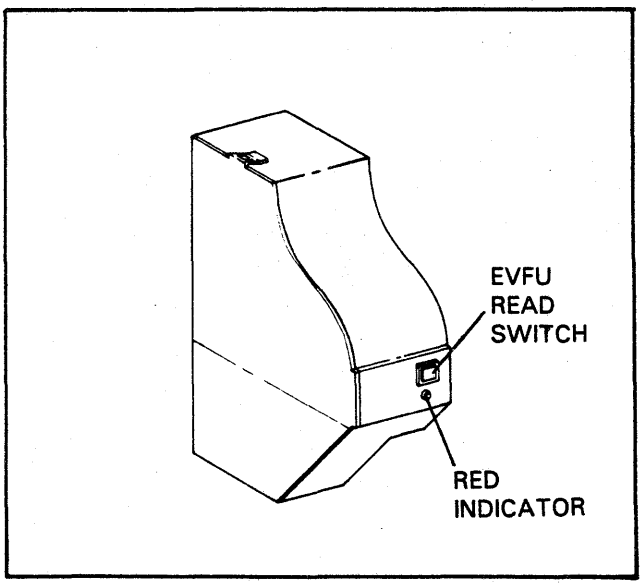
4. Close the format tape retainer by turning its knurled knob clockwise.



5. Close the reader door and press the EVFU Read Switch on the front of the EVFU Reader Unit.

6. At this time the red indicator on the front of the EVFU reader will light indicating tape load has started, the tape will be read, and the red light will go out indicating tape load is finished.

7. Press the START or READY/ON LINE switch and begin data transfer.



FORMAT TAPE PREPARATION

Format tapes are punched to let the printer know where to advance and stop paper. There will always be a first line of print (top of forms) and a last line of print (bottom of forms) that will have to be punched and layed out for your specific application/s.

Once familiar with punching tapes, you will know to off set the tape by 3 spaces so the splice falls into an area where there are no punched holes. This will eliminate the need for repunching holes over the area where the tape has been glued.

NOTE

FORMAT TAPES ARE ALWAYS PUNCHED IN THE 6 L.P.I. MODE, EVEN FOR USE WHEN THE PRINTER IS IN THE 8 L.P.I. MODE. BEFORE PUNCHING THE FORMAT TAPE THE TOP OF FORMS (CHANNEL 1), AND THE BOTTOM OF FORMS (EITHER CHANNEL 2, 8, or 12) SHOULD BE KNOWN. CONTACT YOUR CUSTOMER ENGINEER TO DETERMINE WHICH CHANNELS ARE DESIGNATED AS TOP AND BOTTOM OF FORMS. NO OTHER PUNCHES SHOULD APPEAR IN THE LINES (ACROSS THE TAPE) WHERE THE TOP AND BOTTOM OF FORMS IS PUNCHED.

Every line on the 6 L.P.I. or 8 L.P.I. side of the format tape presents a potential line of print when printing in either the 6 L.P.I. or 8 L.P.I. mode. The band printer electronics will interpret only the 6 L.P.I. side of the tape.

Every hole punched represents a specific line on the paper. The paper advances to the desired line, prints the data and scans the format memory for the next channel selected where data should appear.

For example, if channel 1 is designated as the first line of print and channel 2 is designated as the last line of print, 10 channels are left that can reflect different line spacing combinations for different forms that are being printed. If data is to be printed on lines 5, 7, 15, 18, 29, 50, and 61, channel 3 could be selected and punched for this specific format, leaving 9 channels open for different formats.

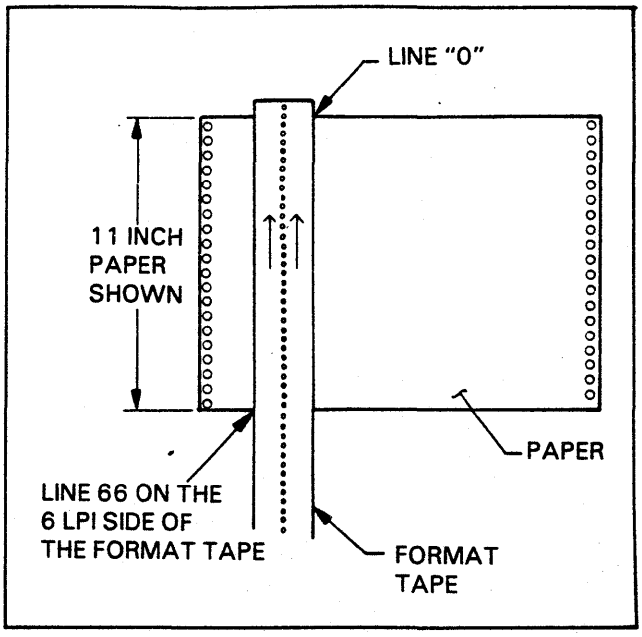
If printing in the 6 L.P.I. mode:

1. Measure the paper from perforation to perforation. If the paper measures 11 inches or more, it will not be necessary to make a multiple form length tape.
2. If the paper measures less than 11 inches, it will be necessary to punch multiple lengths of the paper (identical hole pattern) in order to get a tape length that measures at least 11 inches. It may be necessary on shorter papers to repeat the punched hole pattern 3 or 4 times until the tape measures at least 11 inches.

CAUTION

DO NOT CUT THE TAPE UNTIL ALL HOLES ARE PUNCHED.

3. Lay the format tape over the paper. Align line "0" directly over the top edge of the paper.
4. Mark the 6 L.P.I. side of the tape where the desired first line of print (top of forms) should appear. Normally this mark would appear within the first 3 lines of the top of the paper. Next to the mark write T.O.F. or first line of print to designate this specific mark as the first line of print.
5. Make sure the line "0" is still registered directly over the top edge of the paper.
6. Mark the 6 L.P.I. side of the tape where the desired last line of print should appear. Normally this mark would appear within the last 3 lines of the bottom of the paper. Next to the mark write B.O.F. or last line of print to designate this specific mark as the last line of print.
7. On paper that measures less than 11 inches, this pattern must be repeated until the format tape length measures at least 11 inches. Each form length punch pattern must be complete from top of paper to bottom of paper.



If printing in the 8 L.P.I. mode:

1. Measure the paper from perforation to perforation. If the paper measures 11 inches or more, it will not be necessary to make a multiple form length tape.

2. If the paper measures less than 11 inches, it will be necessary to punch multiple lengths of the paper (identical hole pattern) in order to get a tape length that measures at least 11 inches. It may be necessary on shorter papers to repeat the punched hole pattern 3 or 4 times until the tape measures at least 11 inches.

CAUTION

DO NOT CUT THE TAPE UNTIL ALL HOLES ARE PUNCHED.

3. Lay the format tape over the paper. Align line "0" directly over the top edge of the paper.

4. Note the line number designation on the 8 L.P.I. side of the tape where the desired first line of print (top of forms) should appear. Normally this mark would appear within the first 4 lines of the top of the paper.

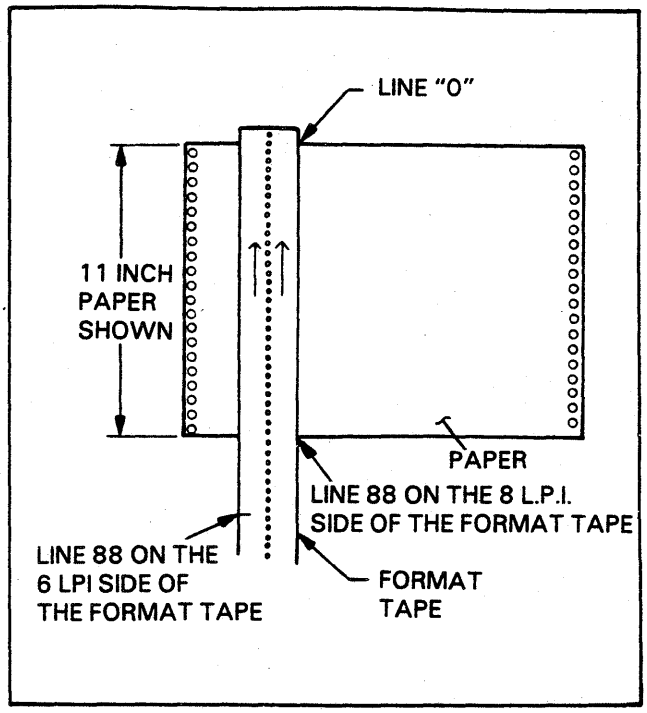
5. Mark this 8 L.P.I. line number designation on the 6 L.P.I. side of the tape. Next on the mark write T.O.F. or first line of print to designate this specific mark as the first line of print.

6. Make sure the line "0" is still registered directly over the top edge of the paper.

7. Note the line number designation on the 8 L.P.I. side of the tape where the desired last line of print should appear. Normally this mark would appear within the last 4 lines of the bottom of the paper.

8. Mark this 8 L.P.I. line number designation on the 6 L.P.I. side of the tape. Next to the mark write B.O.F. or last line of print to designate this specific mark as the last line of print.

9. On paper that measures less than 11 inches, this pattern must be repeated until the format tape length measures at least 11 inches. Each form length punch pattern must be complete from top of paper to bottom of paper.



FORMAT TAPE PUNCHING

1. Using the square hole format tape punch as illustrated, punch the channels marked on the format tape as follows:

   a. Position the Line Selector to 6 L.P.I. Slide the format tape until the line to be punched is centered under the punch bar. Engage the format tape with the sprocket pins. Set the Channel Selector to the number of the channel to be punched. Punch the hole by pressing down on the punch bar.

   b. Advance the tape to the next line to be punched with the Line Advance Tape Control. Select the channel to be punched.

   c. Repeat steps a and b until all the desired lines are punched.

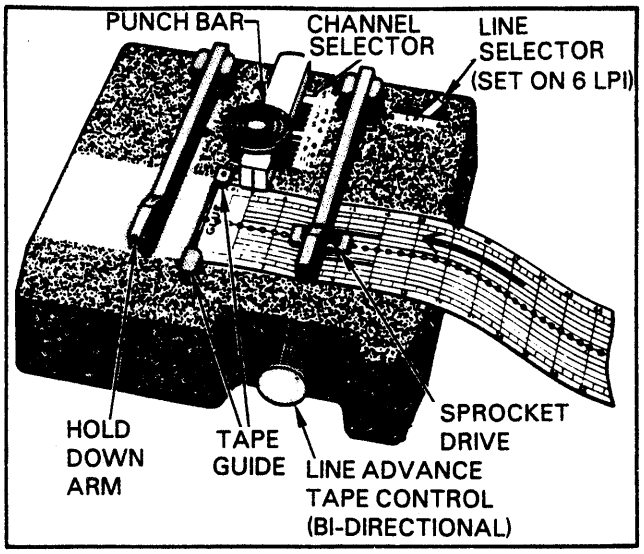
If a punch other than the 44681276 is used, refer to the illustration, then use the punch manufacturer's instructions.

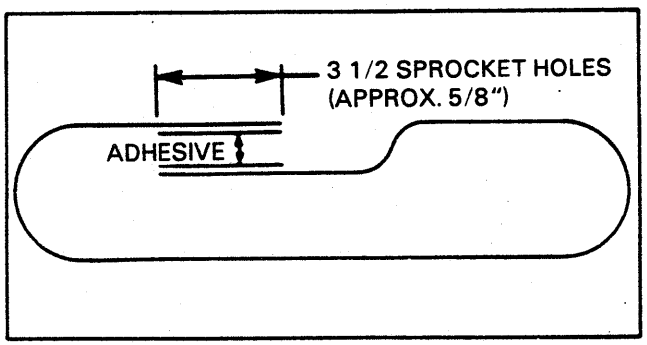
2. To splice the tape into a loop, apply a thin coat of adhesive across the width of the tape at each end as indicated. Allow the adhesive to dry until tacky. A soft-hardening adhesive should be used for maximum tape life. Recommended adhesives are Carter's Rubber Cement or Duco Cement. If the tape is equipped with self stick tape, peel off the backing and register per step 3.

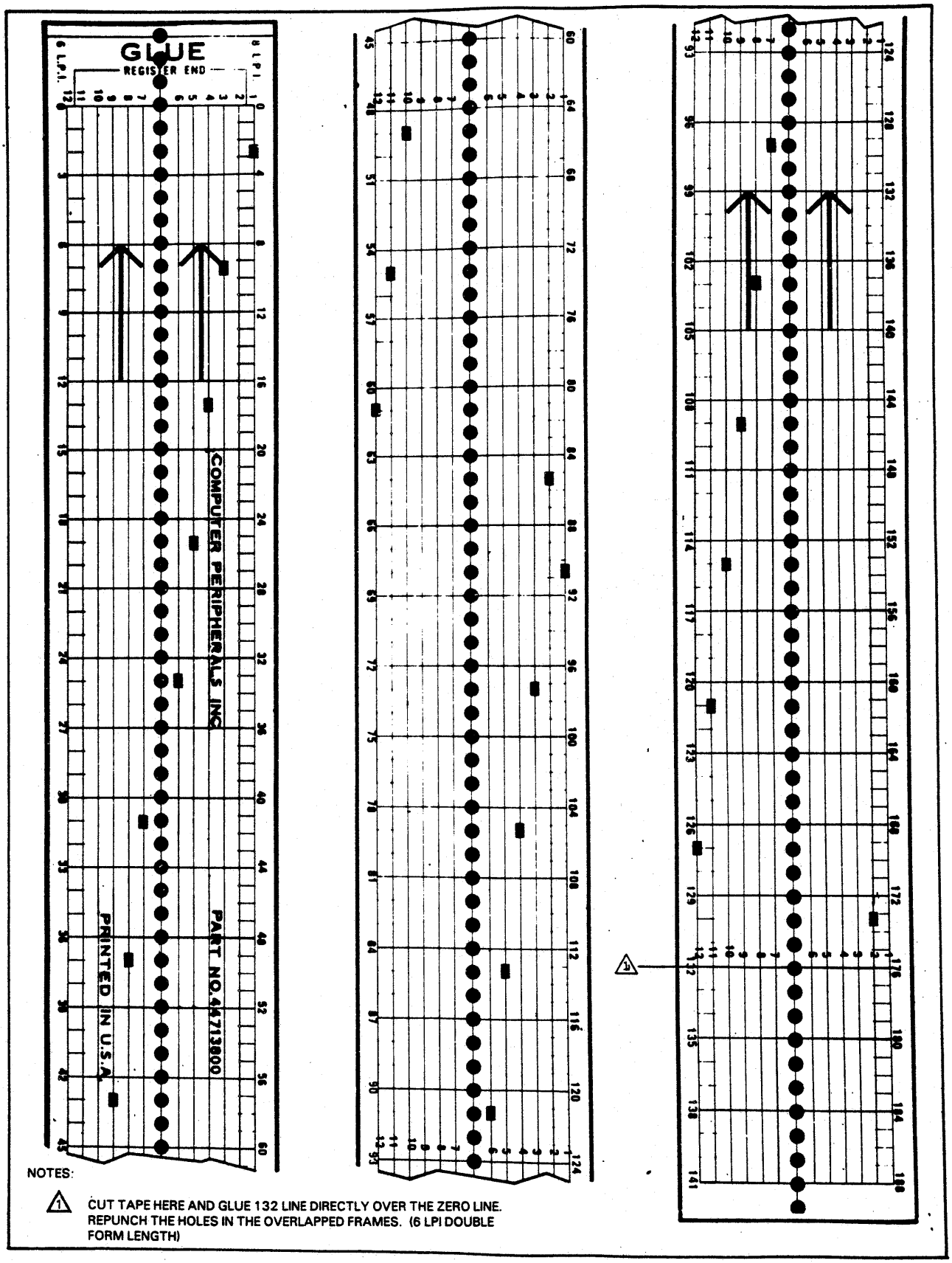
3. Place the bottom end of the tape over the top end so that the edge butts against the zero sprocket hole line and so that the overlapping sprocket holes compliment each other.

4. Apply pressure to the union until the tape is firmly bonded. Remove excess adhesive.

5. Repunch any holes that were covered up when the tape was glued.







A PUNCHED FORMAT TAPE (SAMPLE)

DIRECT ACCESS VERTICAL FORMAT UNIT (DAVFU)

Unlike the EVFU, the DAVFU does not require a format tape reader to load the controller's format tape memory. The DAVFU mode lets the data source load formatting information directly into the printer controller format memory over the interface data lines.

DAVFU LOAD OPERATION

The data source may only load format data into the vertical format memory when the printer is in the ON LINE mode. The printer's status display will display status number "10" (EVFU NOT LOADED) until the data source loads the format memory. The printer will operate if paper commands are line count type; but, if a vertical format command is sent to the printer, the printer will go to STOP and continue to display status number "10" EVFU NOT LOADED.

EVFU READER AND DAVFU

If your printer is equipped with an EVFU (Electronic Vertical Format Unit) reader and DAVFU (Direct Access Vertical Format Unit), it is necessary to determine which mode the printer will be receiving its formatting instructions.

There are two types of EVFU loading:

1. An EVFU with a reader loading system.
2. An EVFU with a DAVFU loading system.

To determine if your printer is in the EVFU reader mode:

1. Power the printer ON and watch the read light on the EVFU reader.

2. If the read light comes on, the printer is in the EVFU reader mode.

3. If a Status/Fault code "12" (FORMAT TAPE NOT INSTALLED) appears on the Status/Fault indicator, there is not a format tape installed in the EVFU reader and one must be installed.

If the printer is in the EVFU mode and the printer is powered ON, the printer will automatically read the format tape that is installed in the EVFU reader. See Automatic EVFU Tape Reader Load Operation in this section.

When the printer is already powered ON and a change in format is desired, a new format tape must be installed and punched to reflect the new format and must be loaded manually by pressing the read switch. See Manual EVFU Tape Reader Load Operation in this section.

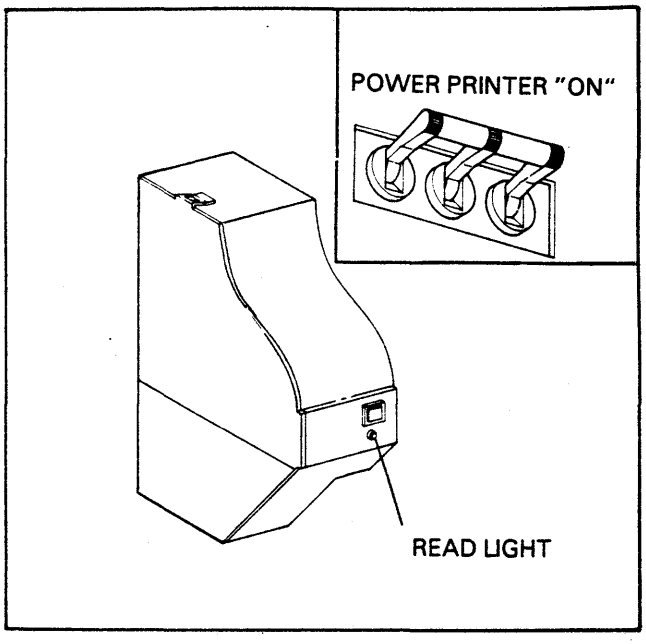
To determine if your printer is in the DAVFU mode:

1. Power the printer ON and watch the read light on the EVFU reader.

2. If the read light did not come on when the printer was powered ON, and no format tape error is present on the Status/Fault indicator, you are in the DAVFU mode.

3. Place the printer in START. A Status/Fault code "10" (EVFU NOT LOADED) should appear on the Status/Fault indicator. A format tape should not be installed. The printer is receiving it's formatting information over the interface lines.

4. Start the program. The Status/Fault code "10" should extinguish. If any other Status/Fault code is received, refer to the STATUS/FAULT GUIDE and correct if possible. If the Status/Fault code "10" does not extinguish, the processor is not able to load the formatting information. The program can still be run with the Status/Fault code "10" showing, but will be automatically formatted to an 11" paper length with a three line skip over perforations.



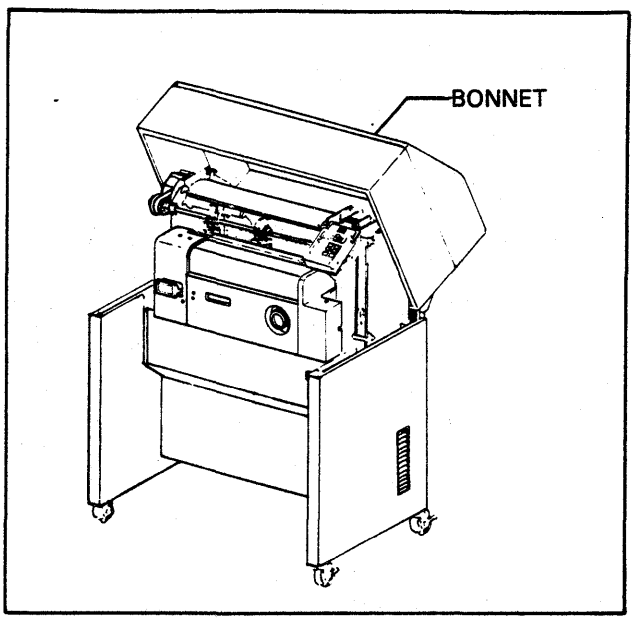
SECTION II
OPERATING PROCEDURES

- PRINT BAND REPLACEMENT
- RIBBON REPLACEMENT
- PAPER INSTALLATION
- POWER UP
- PRINTING ADJUSTMENTS

IT IS RECOMMENDED THAT YOU WEAR PLASTIC GLOVES WHEN PERFORMING THIS PROCEDURE.

REMOVAL

1. Raise the bonnet.

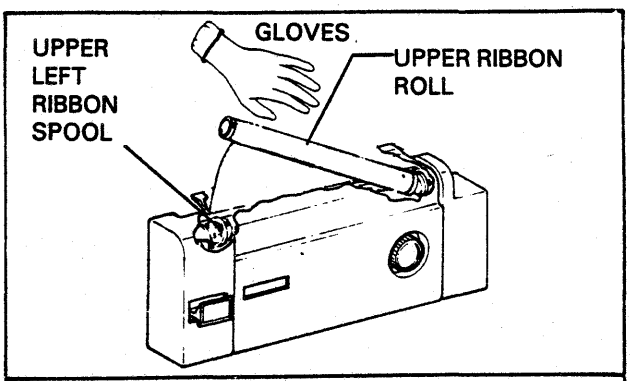


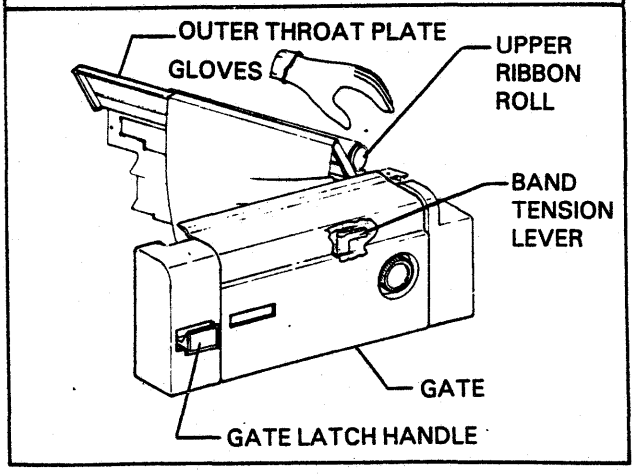
2. Open the gate by pulling up on the gate latch handle. Open the center ribbon cover by holding the gate latch handle in the up position while pulling on the ribbon cover (shown closed).

3. Open the outer throat plate (push toward printer).

4. Remove the upper ribbon roll by pushing the roll to the right and swing the left side free of the upper left ribbon spool. Unroll the upper ribbon roll enough to open the gate fully.

5. Lay the upper ribbon roll on the outer throat plate.

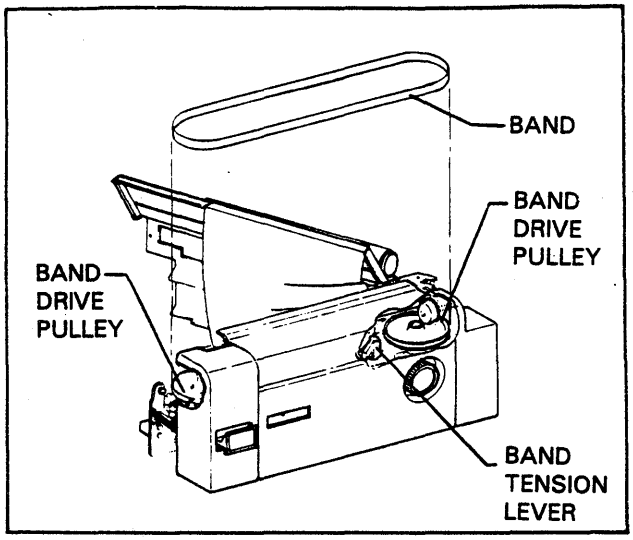




6. Rotate the band tension lever clockwise.

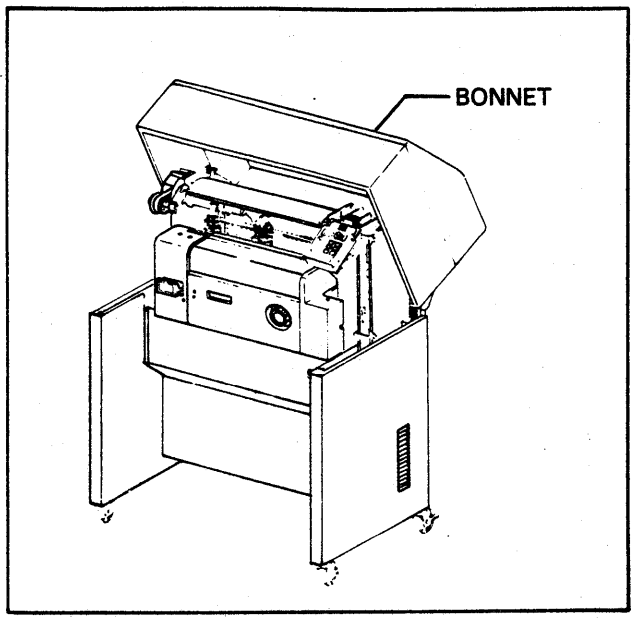
7. Lift the band gently off the two band drive pulleys.

8. Band removal is now complete.



INSTALLATION

1. Raise the bonnet.

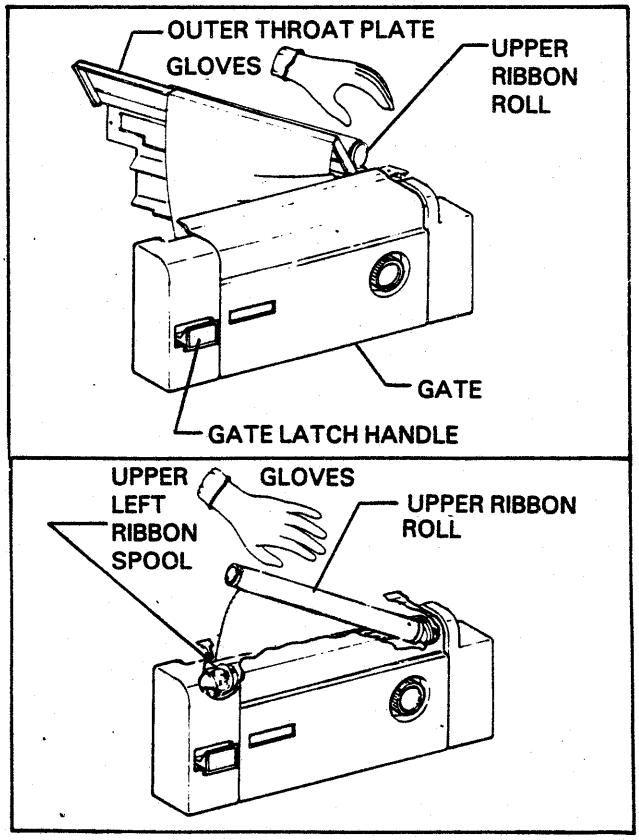


2. Open the gate by pulling up on the gate latch handle. Open the center ribbon cover by holding the gate latch handle in the up position while pulling on the ribbon cover (shown closed).

3. Open the outer throat plate (push toward printer).

4. Remove the upper ribbon roll by pushing the roll to the right and swing the left side free of the upper left ribbon spool. Unroll the upper ribbon roll enough to open the gate fully.

5. Lay the upper ribbon roll on the outer throat plate.

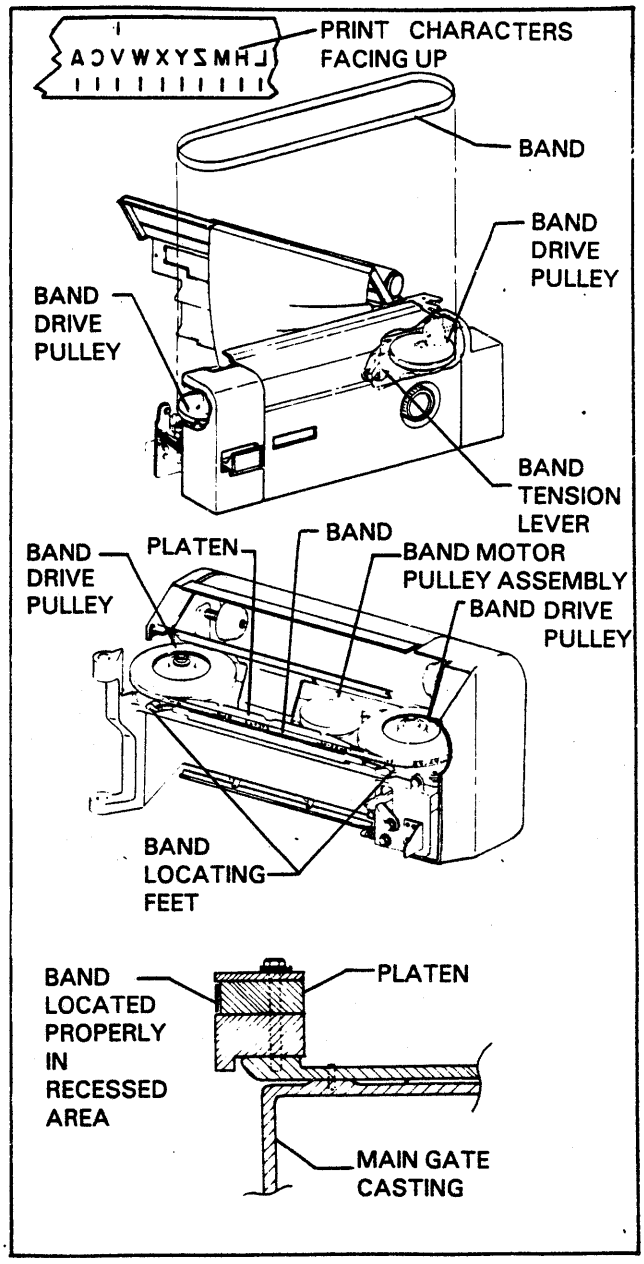


6. Rotate the band tension lever clockwise.

7. With the print characters facing up and using two hands, gently slip the band around the two band drive pulleys. The band should now rest on the two band locating feet, and wrap around the left and right band drive pulleys.

8. Firmly grasp and slowly close the band tension lever by turning it counterclockwise.

9. Manually spin the band motor pulley assembly until the band slips into the recessed area on the platen.

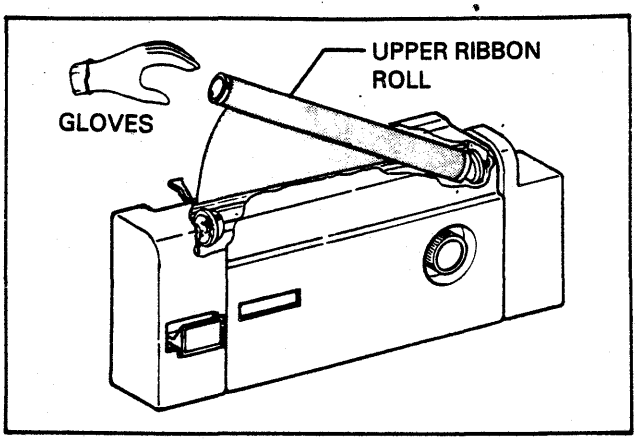


10. Reattach the upper ribbon roll (See steps 6 and 7 page 2-9/2-10).

11. Roll up the excess ribbon onto the upper ribbon roll.

12. Close the outer throat plate, center ribbon cover, gate and bonnet.

13. Band installation is now complete.



RIBBON REPLACEMENT

11.5 pages 1 part

Ribbon replacement is an operator responsibility and is necessary every 2 million lines for typical field usage or every 500,000 lines for full 132 column, sliding alpha, 100% line density. A worn out ribbon may cause ribbon binding, paper jamming, ribbon tearing and degraded printed output.

IT IS RECOMMENDED FOR THIS PROCEDURE THAT YOU USE THE PLASTIC GLOVES PROVIDED WITH THE NEW RIBBON.

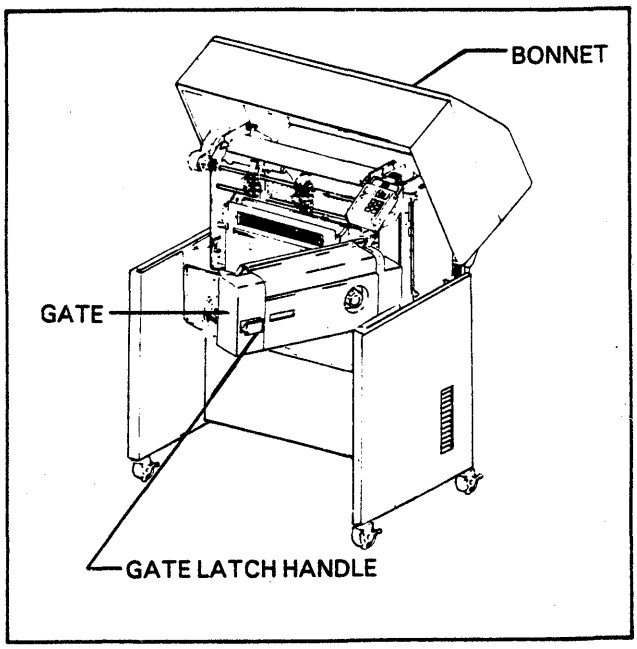
REMOVAL

1. Raise the bonnet.

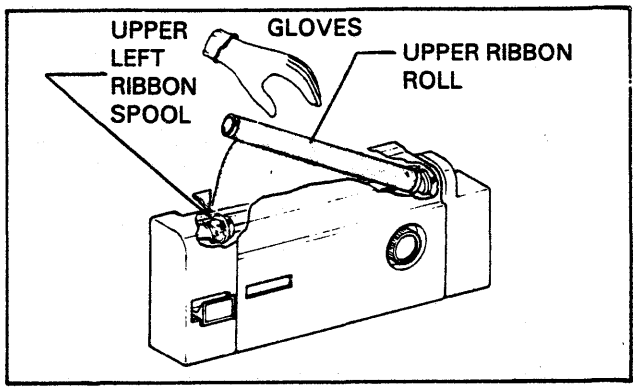
2. Open the gate by pulling up on the gate latch handle.

3. Open the center ribbon cover by holding the gate latch handle in the up position while pulling on the ribbon cover (shown closed).

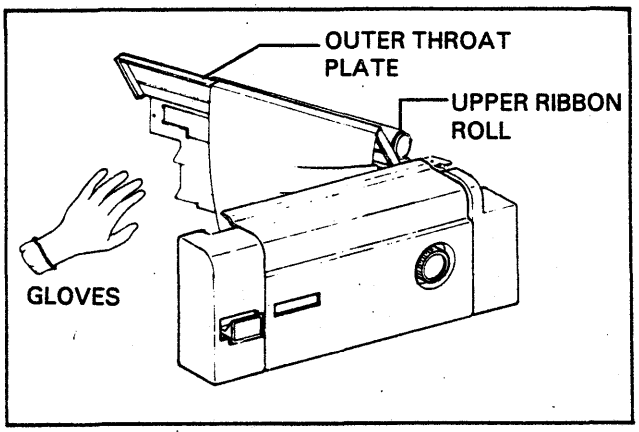
4. Open the outer throat plate (push toward printer).



5. Remove the upper ribbon roll by pushing the roll to the right and swing the left side free of the upper left ribbon spool. Unroll the ribbon roll enough to open the gate fully.



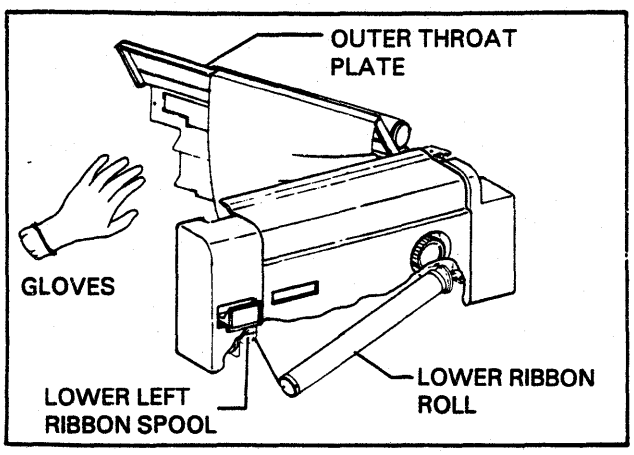
6. Lay the upper ribbon roll on the outer throat plate.



7. Remove the lower ribbon roll by pushing the roll to the right and swing the left side free of the lower left ribbon spool.

8. With your free hand, grasp the upper ribbon roll from the outer throat plate, roll the upper and lower ribbon roll together and discard.

9. Ribbon removal is now complete.

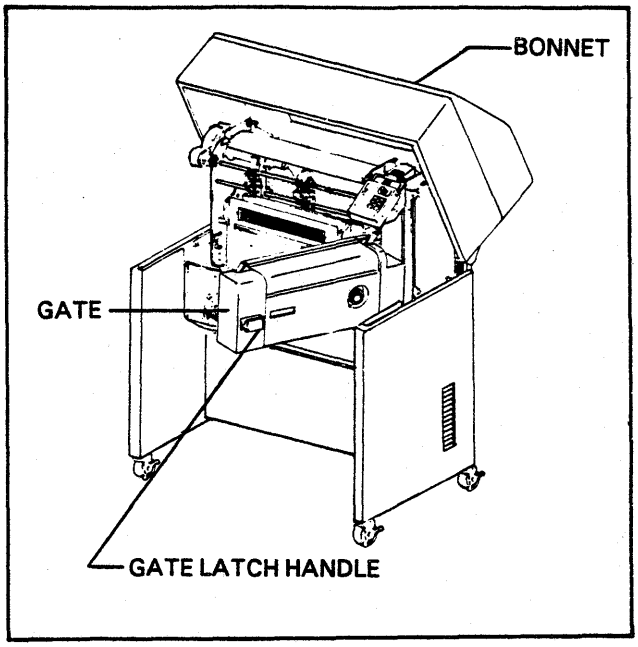


INSTALLATION

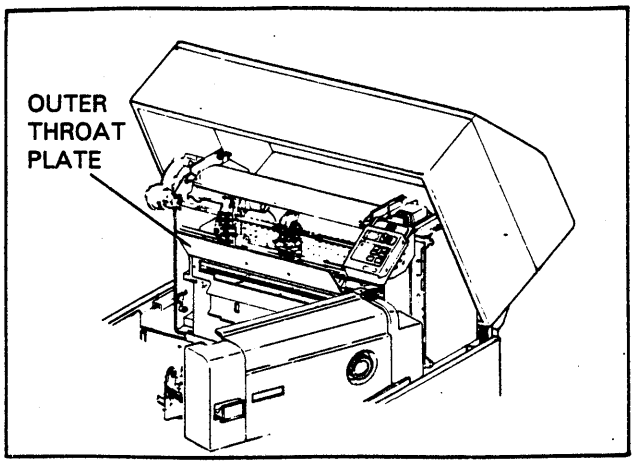
1. Raise the bonnet.

2. Open the gate by pulling up on the gate latch handle.

3. Open the center ribbon cover by holding the gate latch handle in the up position while pulling on the ribbon cover (shown closed).



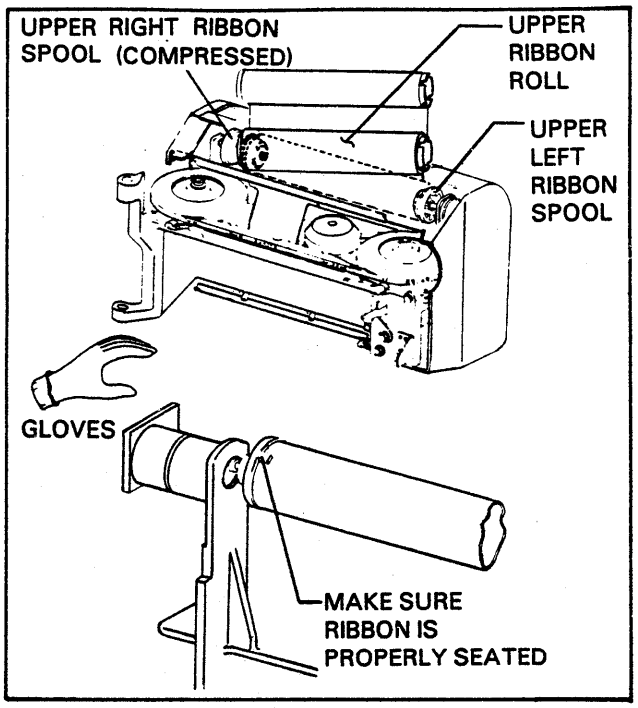
4. Open the outer throat plate (push towards the printer).



5. Install the upper ribbon roll on the upper right ribbon spool. Be sure the ribbon is unwinding the way the illustration shows.

6. Push the upper ribbon roll to the right until the upper right ribbon spool is compressed.

7. Swing the left side of the upper ribbon roll onto the upper left ribbon spool. Make sure the cutouts in the ribbon roll fit onto the cogs on the left ribbon spool.



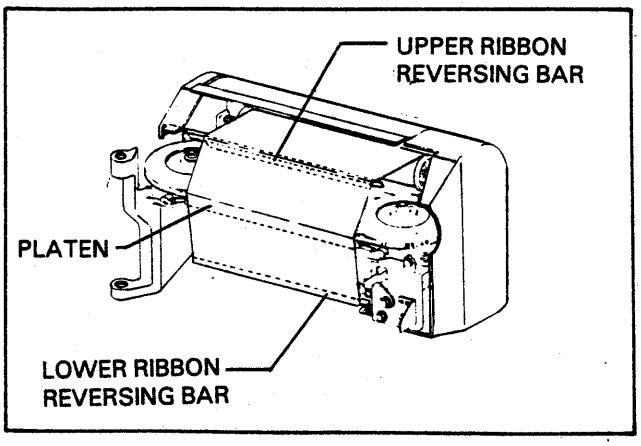
8. Bring the lower ribbon spool over the upper ribbon reversing bar, across the platen and around the lower ribbon reversing bar.

9. Install the lower ribbon roll the same way as the upper ribbon roll. Reference steps 6 and 7.

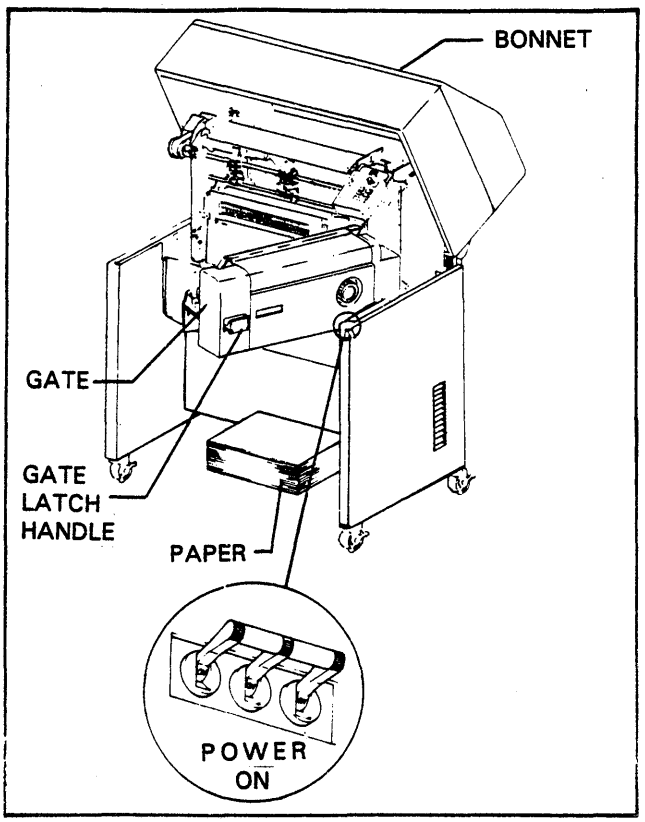
10. Roll up the excess ribbon onto the upper ribbon roll.

11. Close the outer throat plate, center ribbon cover, gate and bonnet.

12. Ribbon installation is now complete.



1. Power the printer ON.
2. Open the bonnet and gate by pulling up on the gate latch handle.
3. Place the paper below the print gate.



4. Open the left tractor flap. With the front of the paper facing you, insert the paper on the left tractor's paper drive sprockets. Close the tractor flap and lock the tractor.

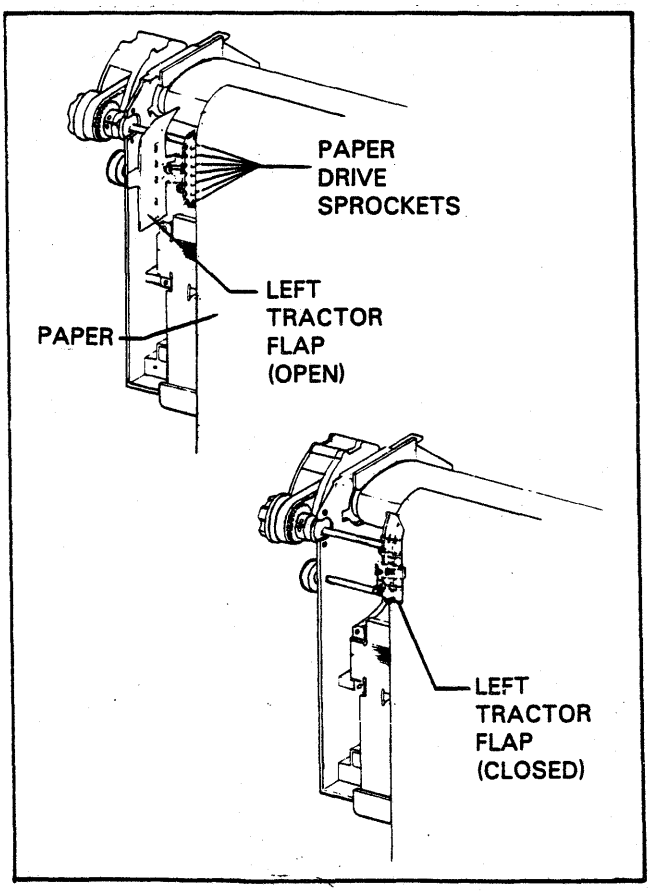
CAUTION

DO NOT CLOSE THE BONNET WITH THE TRACTOR FLAPS IN THE OPEN POSITION, TRACTOR DAMAGE COULD OCCUR.

5. Open the right tractor flap and loosen the right tractor locking knob. Slide the tractor left or right to the appropriate paper width. Insert the paper on the right tractor's paper drive sprockets so that it is centered around the drive sprockets and close the tractor flap.

NOTE

THE PAPER SHOULD BE PLACED IN THE RIGHT AND LEFT TRACTOR's DRIVE SPROCKETS SUCH THAT THERE ARE AN EQUAL NUMBER OF HOLES FROM THE PAPER PERFORATION TO THE FIRST TRACTOR DRIVE SPROCKET. THIS ELIMINATES THE POSSIBILITY OF PAPER SKEW.



6. If the paper is wrinkled (not tight) between the right and left tractors, move the right tractor (let or right) until the paper is no longer wrinkled and is centered around the drive sprockets then lock the knob.

NOTE

DO NOT STRETCH THE PAPER TIGHT ENOUGH TO CAUSE ELONGATION OF THE PAPER SPROCKET HOLES. ALSO FEEL THE PAPER SPROCKET HOLES AFTER THEY HAVE LEFT THE TRACTORS. IF THEY FEEL BURRED THE PAPER WILL NOT STACK PROPERLY. IF THE PAPER SPROCKET HOLES DO FEEL BURRED, DECREASE THE TRACTOR TENSION SLIGHTLY UNTIL THE PAPER HOLES ARE CENTERED AROUND THE DRIVE SPROCKETS.

For horizontal positioning, proceed as follows:

7. Open the outer throat plate and loosen the left tractor locking knob again. This allows the left and right tractors to move together.

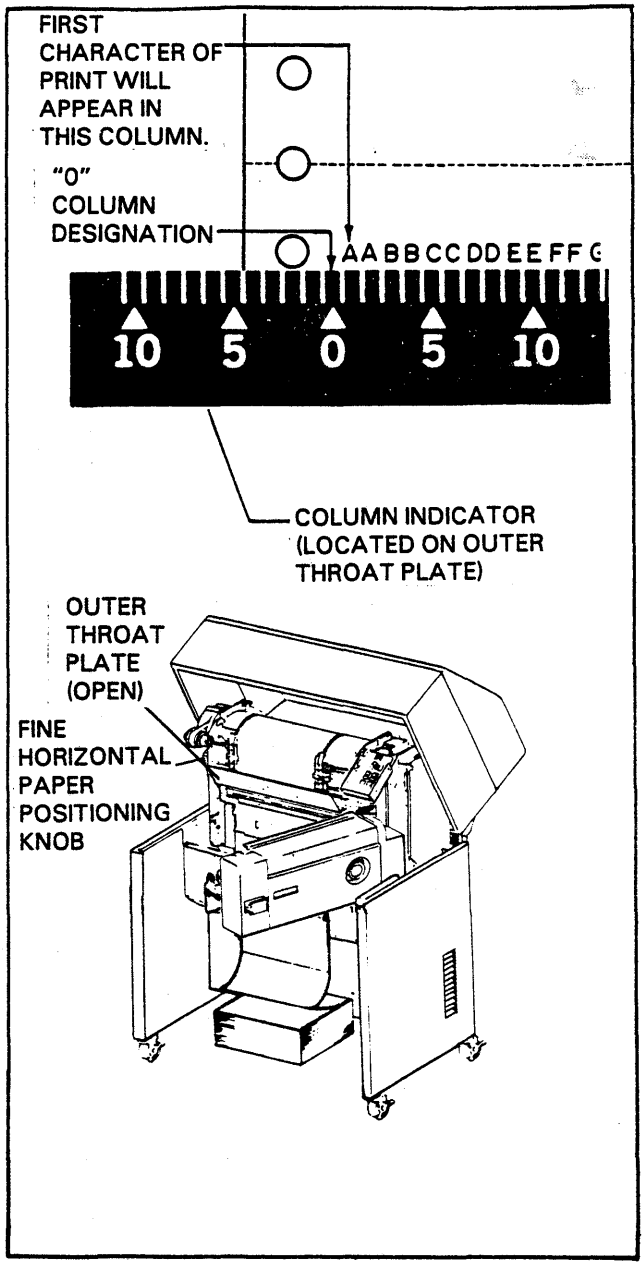
8. On the outer throat plate assembly you will notice a column indicator label. The first column (the first character of print) will occur between the "0" column designation and the first mark to the right of the "0" designation. By sliding the left tractor (right or left), position your paper where you would like your first character of print to fall and lock the knob.

9. Center the paper stack below the tractors.

10. If fine horizontal positioning is desirable, manually turn the fine horizontal paper positioning knob. This moves both tractors and the paper left or right and allows "fine tuning" of the first column of print

    The paper is now adjusted for the desired left hand margin.

11. To set up the page length, it is necessary to determine which type of vertical formatting the printer is equipped with. See Printout Formatting in section 1, perform the appropriate procedure, then continue.



12. Close the outer throat plate (against the gate).

13. Push and hold the FORMS RELEASE switch and advance the paper manually by turning the Coarse Paper Positioning Knob. The print will appear between the two long scribe lines etched in the inner throat plate. Line up the paper for your desired first line of print between these two lines.

14. Release the FORMS RELEASE switch. You have roughly setup your top of forms (paper) position.

15. Advance the paper to the top of forms by pressing the TOP OF FORMS, FORM FEED, or PAGE EJECT switch on the Control Panel. Recheck your top of paper position.

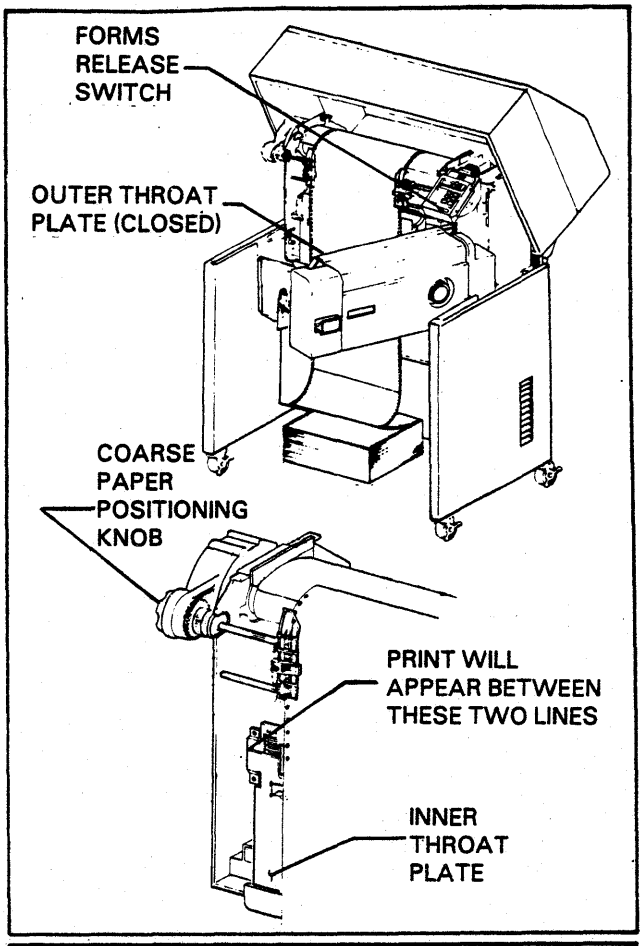
16. If fine vertical positioning is desireable, turn the Fine Paper Positioning Knob to register the paper to where the first line of print should be. The print will appear between the scribe lines etched in the inner throat plate.

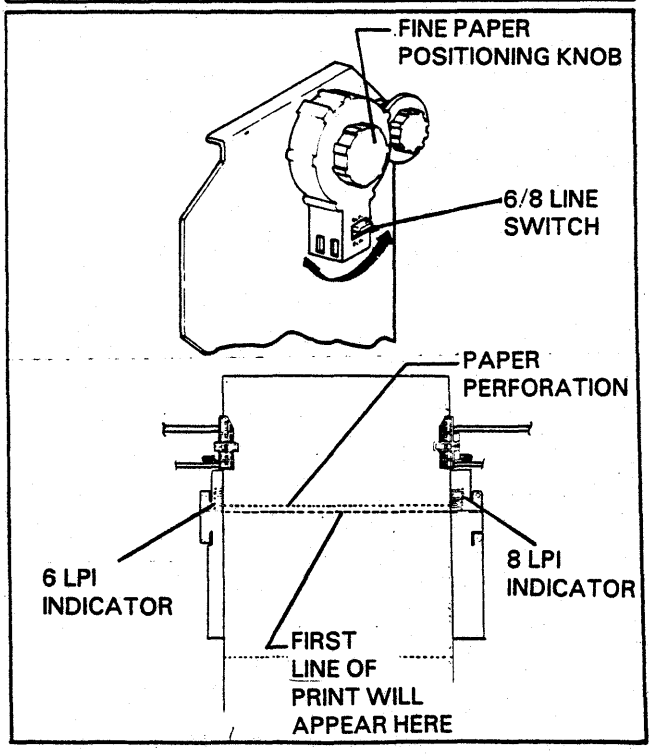
    In the example shown, the first line of print will fall three lines below the paper perforations in the 6 lines per inch mode and four lines below the paper perforations in the 8 lines per inch mode. Six or eight lines per inch is selected by the 6/8 line switch located below the Fine Paper Positioning Knob.

NOTE

BE SURE IF YOU ARE IN THE 6 LINES PER INCH MODE THAT YOU READ THE 6 LPI SCALE ON THE LEFT SIDE OF THE INNER THROAT PLATE. IF 8 LINES PER INCH IS DESIRED, POWER THE PRINTER ON, FLIP THE 6/8 LINE SWITCH TOWARD THE BACK OF THE PRINTER AND READ THE 8 LPI SCALE ON THE RIGHT HAND SIDE OF THE INNER THROAT PLATE.

SWITCH POSITION SHOULD ONLY BE CHANGED WITH THE PRINTER IN OFF LINE MODE FOLLOWED BY AT LEAST ONE TOP OF FORMS, FORM FEED OR PAGE EJECT.





17. Advance the paper a few times until there is enough paper to feed over the static eliminators mounted on the paper exit ramp and out the back of the bonnet.

18. Close the gate and bonnet.

For units equipped with a paper basket, perform steps 19 through 23.

For units equipped with a powered forms stacker, skip steps 19 through 23 and perform steps 24 through 31.

NOTE

IF THE UNIT IS LOCATED IN A CONFINED AREA AND THE PAPER BASKET CANNOT BE USED, THE PRINTED OUTPUT CAN BE STACKED ON THE FLOOR CENTERED BETWEEN THE PRINTER'S LEGS.

NOTE

IF THE UNIT IS EQUIPPED WITH THE STACK ASSIST OPTION, INSTALL THE STACK ASSIST TUBE AT THIS TIME. THIS TUBE CAN BE INSTALLED IN THE BASE OF THE PAPER BASKET FROM SIDE TO SIDE OR FRONT TO BACK, DEPENDING ON THE TYPE AND WEIGHT OF THE PAPER BEING USED. THE STACK ASSIST TUBE IS DESIGNED TO INHIBIT PAPER CURLING ALONG EITHER THE PERFORATIONS OR HOLED SIDES OF THE PAPER. TO INSTALL, LOOSEN THE SCREW, CLIP THE TUBE ONTO THE BASE OF THE PAPER BASKET AND RETIGHTEN THE SCREW.

19. Push the guide bar mounted on the paper basket toward the printer.

20. Make available enough paper so that 3 or 4 pages can rest on the paper basket.

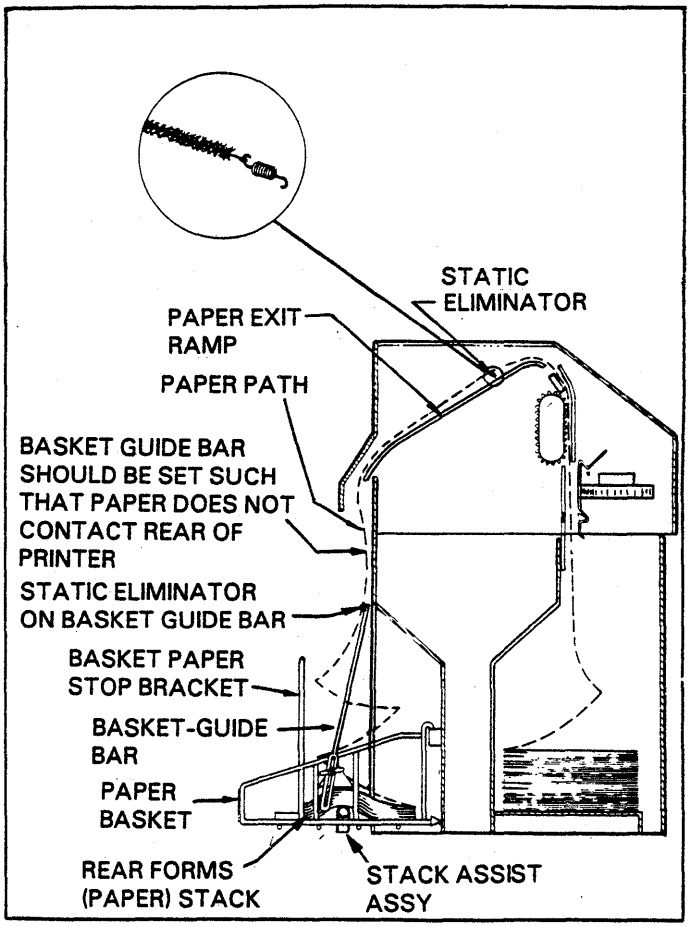
21. Feed the paper between the basket guide bar and the paper stop bracket. Lay the paper on the base of the paper basket and start a paper stack.

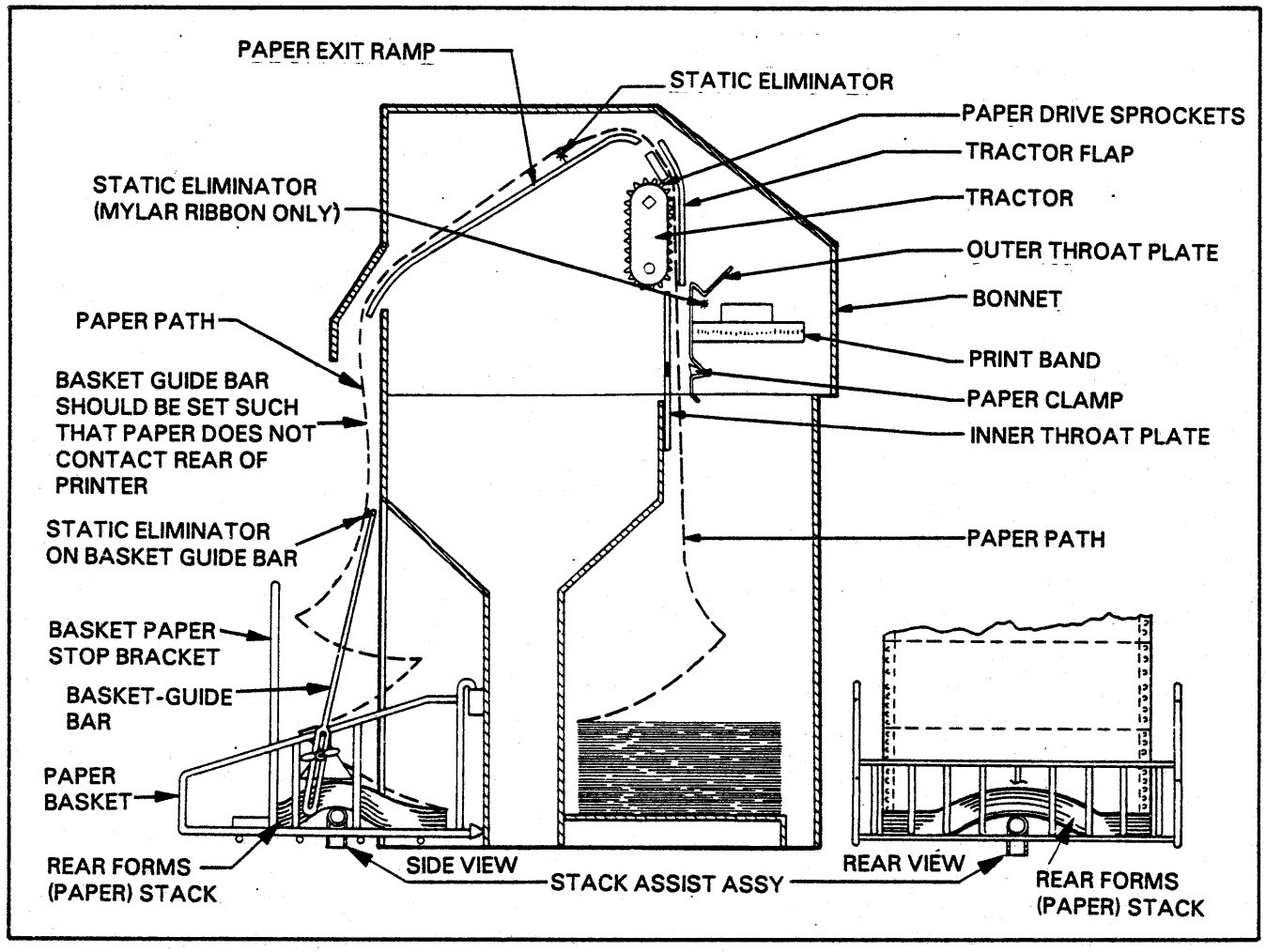
NOTE

BE SURE THE PAPER IS STARTING TO FOLD IN THE SAME DIRECTION AS IT WAS ORIGINALLY FOLDED.

22. Pull the basket guide bar away from the printer until the paper is pulled away from the back of the printer. The paper should come out of the bonnet, run along the static eliminator mounted on the basket guide bar and fold down onto the paper basket.

23. The paper is now ready for printing.





OPERATOR PAPER HANDLING CHECK LIST (IN CASE OF PAPER HANDLING PROBLEMS)

A. Are the paper holes centered around the drive sprockets?

B. Are paper sprocket holes being elongated?

C. Do paper sprocket holes feel burred?

D. Is paper stack centered below tractors?

E. Is paper folding in same direction it was originally folded?

F. Recheck paper basket set up procedure

FOR UNITS EQUIPPED WITH POWER STACKER

A. Perform previous steps A thru E.

B. Do paper perforations match the platform paper scales and are the paper guide fingers just touching the front of the paper stack?

C. 1) For single part paper, are the outside rollers engaged over the sprocket holes and inside rollers engaged and spaced evenly across paper?

2) For multipart paper, are the inside rollers engaged and outside rollers disengaged?

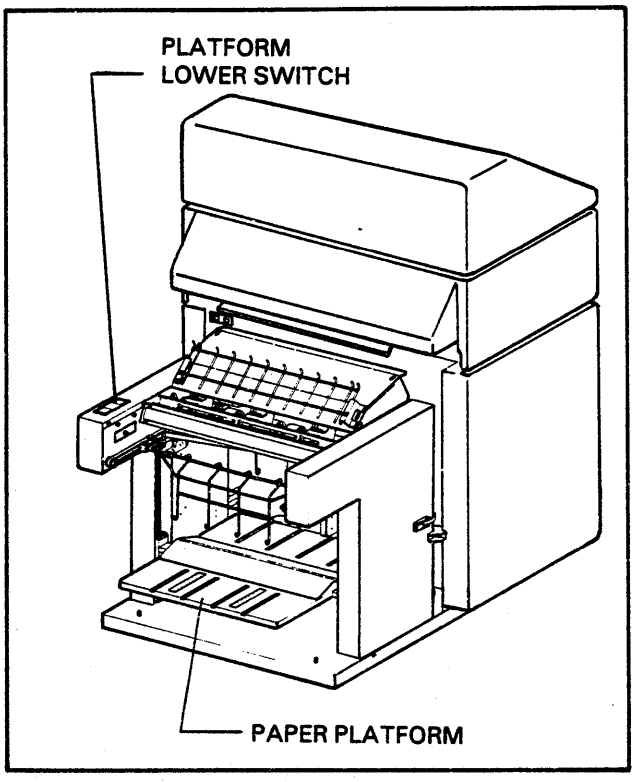
D. Recheck power stacker set up procedure.

For units equipped with a powered forms stacker, perform steps 24 through 31.

NOTE

IF THE UNIT IS LOCATED IN A CONFINED AREA AND THE POWERED FORMS STACKER CANNOT BE USED, THE PRINTED OUTPUT CAN BE STACKED ON THE FLOOR CENTERED BETWEEN THE PRINTER'S LEGS.

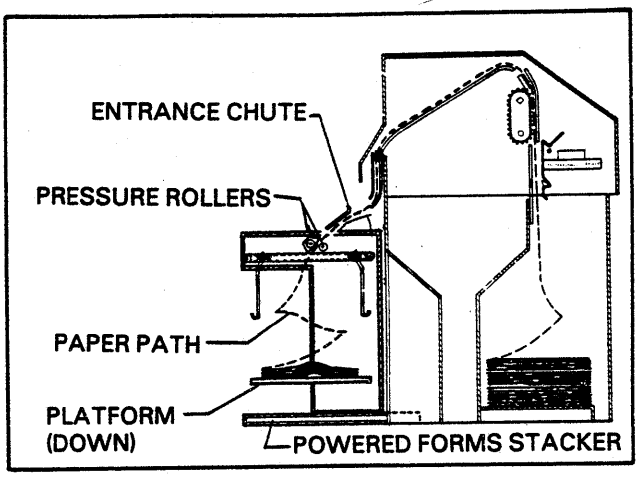
24. Lower the paper platform by pressing the LOWER switch on the stacker's Control Panel.



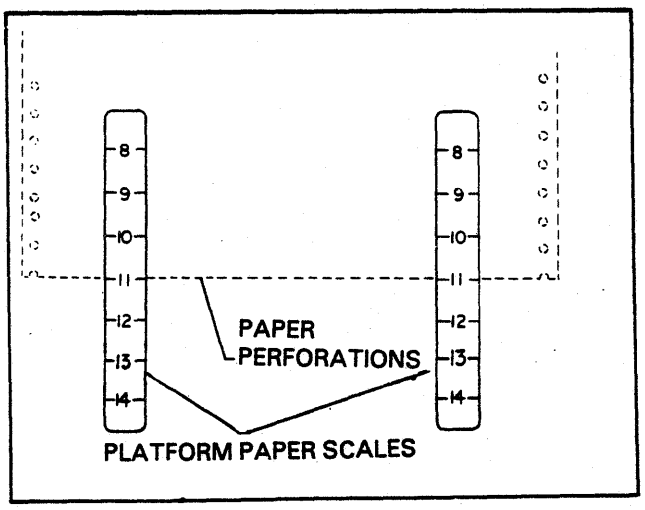
25. Disengage the pressure rollers by pushing on the center of the assembly and feed the paper between the stacker's feed rollers and pressure rollers. Make available enough paper so that 3 or 4 pages are resting on the paper platform and a paper stack has started.

NOTE

BE SURE THE PAPER IS STARTING TO FOLD ON THE PLATFORM IN THE SAME DIRECTION AS IT WAS ORIGINALLY FOLDED.

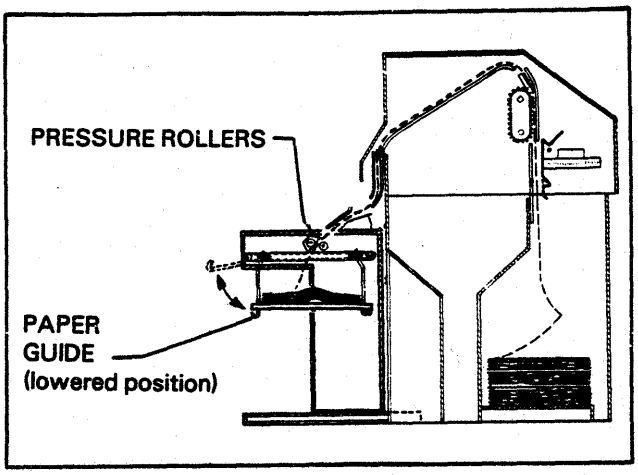


26. If using 11" paper (11" from perforation to perforation), place the paper perforations over the 11 designations on the two platform paper scales, or the appropriate designations for your size form. Also vertically align the downward path of the paper on the paper scales. Readjust the paper stack approximately every five inches of vertical height of the forms.

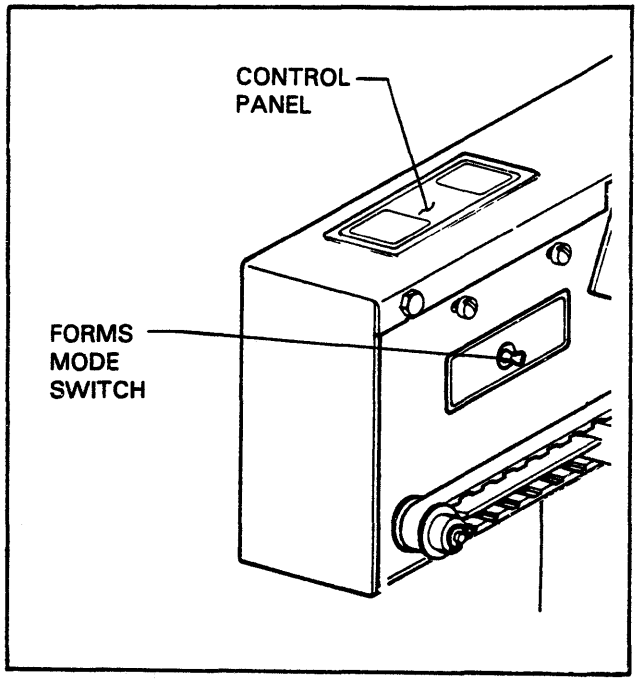


27. The paper guide will pivot up into a raised position or down into a lowered position. Normally this is put into a raised position to clear paper mis-stacks or to remove printed forms. Pivot the paper guide to its lowered position and raise the paper platform by pressing the RAISE switch on the stacker's Control Panel.

28. When the paper platform is up, push the paper guide in until the metal fingers just touch the front edge of the paper. Once the stacker is operational, the platform will automatically lower as paper accumulates on the platform.



29. Set the FORMS MODE switch to either the Single or Multi position; Single for single part paper, Multi for multiple part paper. This switch is located beneath the stacker's Control Panel on the inside surface.

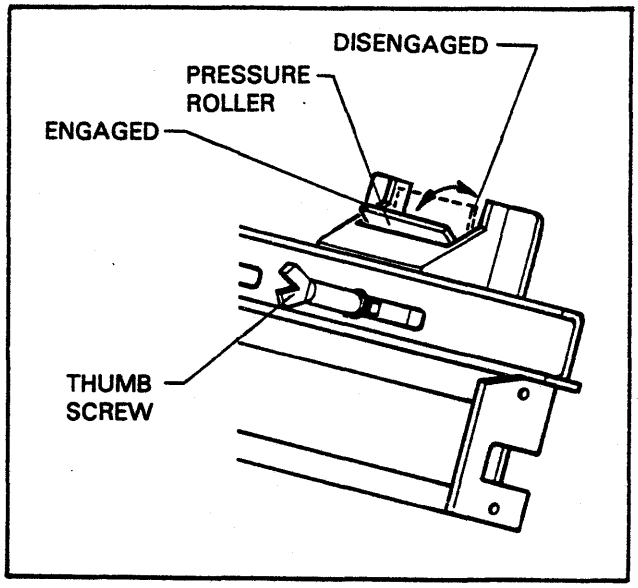


30. Position the stacker's pressure rollers by loosening their thumb screws and sliding them left or right as follows:

    a. For single part forms, it is recommended that the outer pressure rollers be positioned and engaged over the paper's sprocket holes in order to reflatten the holes after printing. The inner pressure rollers should be equally spaced across the length of the form and should also be in the engaged position.

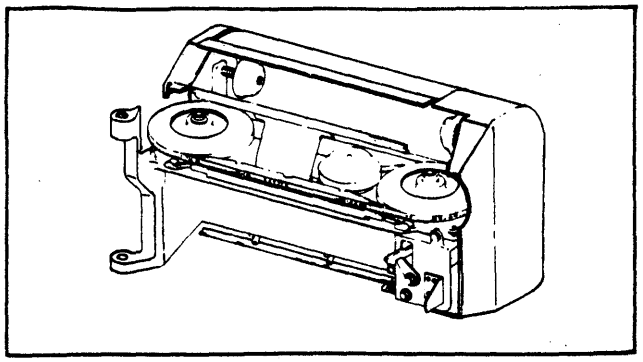
    b. For multiple part forms, the outer pressure rollers should be disengaged and the inner pressure rollers should be equally spaced across the forms, i.e. as if the forms were cut into thirds.

31. The paper is now ready for printing.

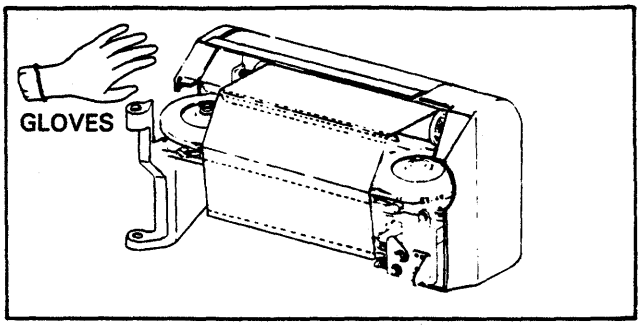


1. Plug the printer into a suitable ac power source.

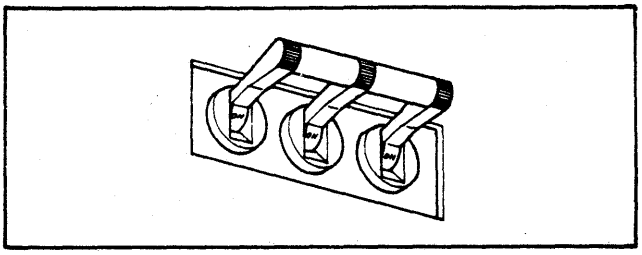
2. Install the print band. See page 2-4 for the Print Band Installation procedure.



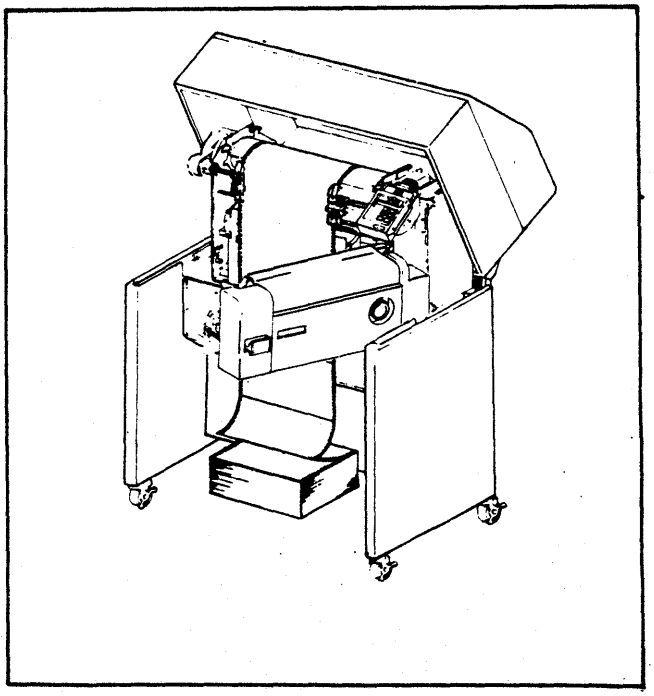
3. Install the ribbon. See page 2-8 for the Ribbon Installation procedure.



4. Turn on the main circuit breaker (ON/OFF Switch).



5. Install the paper. See page 2-11 for the Paper Installation procedure.



6. Check the Status indicator and make sure there are no faults. If a fault exists, refer to the STATUS GUIDE page 5-2 and correct if possible.

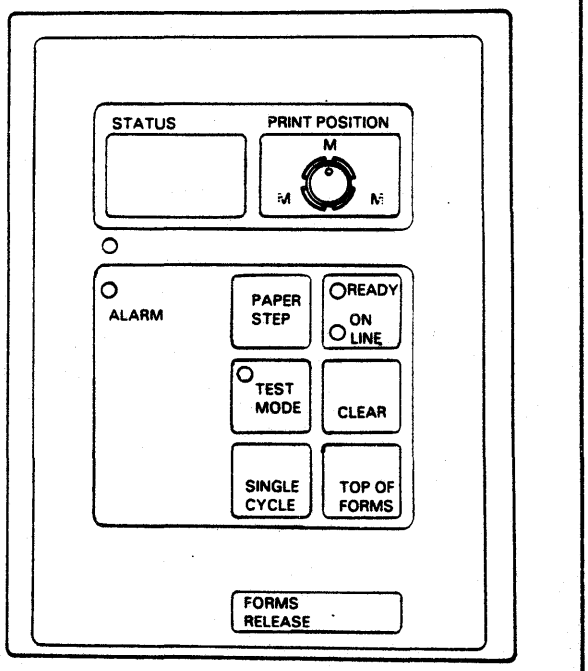
7. The printer is now ready for operation.

8. During initial printing, adjust the Print Position knob for optimum quality print-out. See page 2-23 for the Printing Adjustments.

WARNING

NOISE LEVEL WITH BONNET OPEN WHILE PRINTING MAY BE HAZARDOUS TO HEARING. KEEP EXPOSURE TO A MINIMUM.

TYPICAL CONTROL PANEL SHOWN



PRINTING ADJUSTMENTS

This procedure assumes the printer has been properly loaded with paper, ribbon and band.

1. Power the printer ON.

2. If the printer is equipped with a READY light and it is lit, or the ALARM or FORMS ERROR light is not lit, push the TEST MODE or TEST PRINT switch located on the Control Panel. If the ALARM or FORMS ERROR light is lit, a fault exists. Refer to the STATUS GUIDE page 5-2 and correct if possible.

WARNING

NOISE LEVEL WITH BONNET OPEN WHILE PRINTING MAY BE HAZARDOUS TO HEARING. KEEP EXPOSURE TO A MINIMUM.

3. Push the TEST MODE or TEST PRINT switch and print enough lines so you can check vertical and horizontal print-out registration.

4. Push the TEST MODE or TEST PRINT switch to end the print cycle.

5. If vertical and/or horizontal positioning is necessary, see steps 7 through 18 of the Paper Installaton procedure.

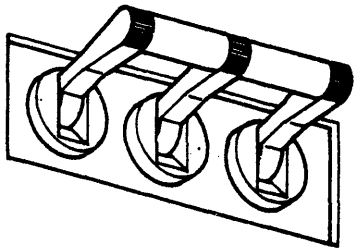
6. Examine the print-out and make sure the characters printed are of equal density on both sides.

7. When varying paper thickness (single to 6 part) is used, it will be necessary to adjust (rotate) the paper thickness knob (located on the front of the gate) to achieve uniform top to bottom character printing.

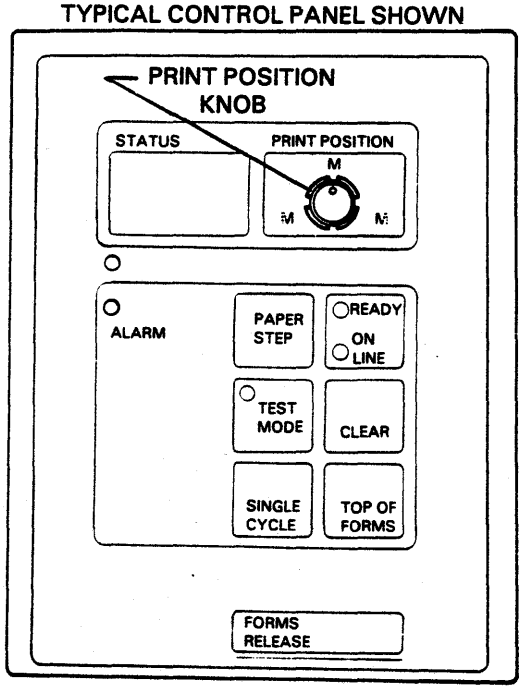
8. If the left or right sides of the characters are missing or not of equal density, push the TEST MODE or TEST PRINT switch and rotate the Print Position knob to achieve maximum character quality. Once the Print Position Knob is adjusted, it will not be necessary to readjust the knob when changing to a different paper thickness due to the automatic compensation provided by the Paper Thickness knob.

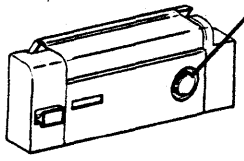
   The example to the right shows sample print-outs in need of a print position adjustment and a print-out with the print position properly adjusted.

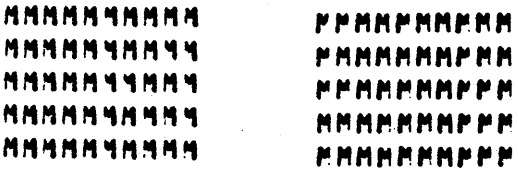
POWER PRINTER "ON"



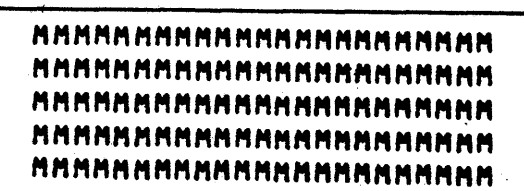
TYPICAL CONTROL PANEL SHOWN







PRINT-OUT IN NEED OF PRINT POSITION ADJUSTMENT



PRINT-OUT WITH PRINT POSITION PROPERLY ADJUSTED.

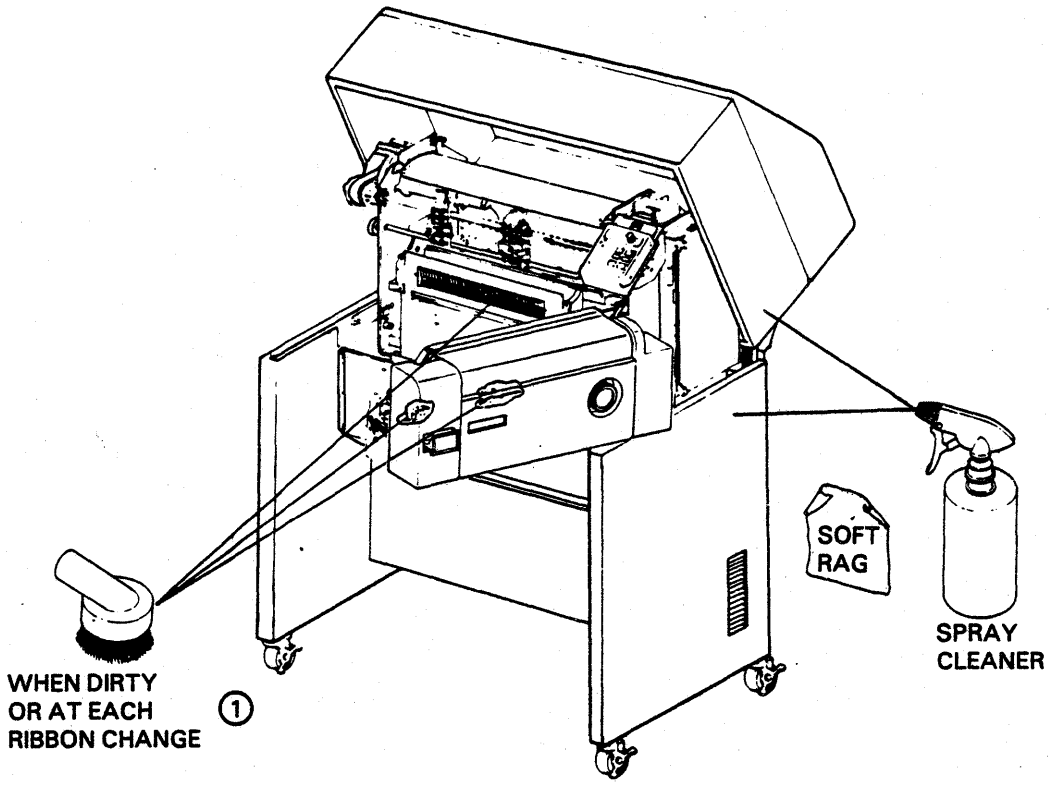
SECTION III
PRINTER CARE

- OPERATOR MAINTENANCE
- CLEANING PROCEDURES
- RIBBON SHIELD REPLACEMENT

OPERATOR MAINTENANCE

The operator is responsible for performing the routine maintenance procedure described below. Other levels of maintenance should be referred to and performed by trained service personnel to prevent possible injury to the operator and damage to the printer.

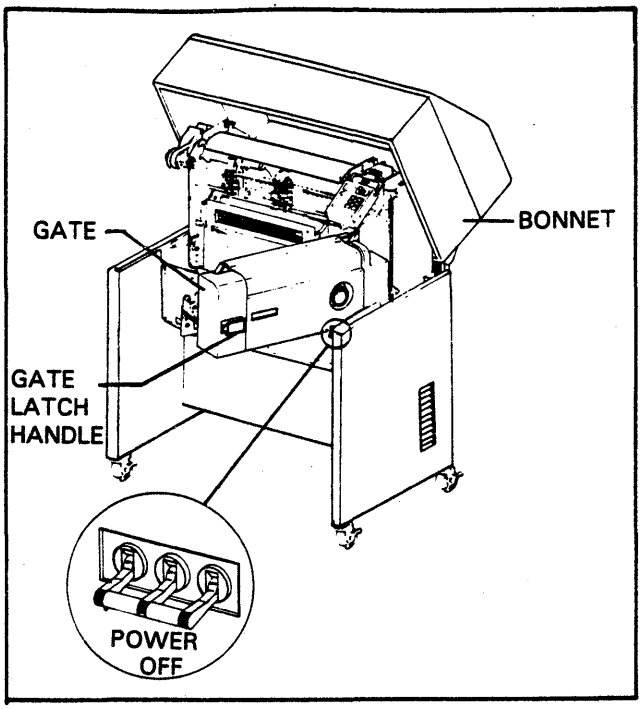
AREA	MATERIALS REQUIRED	SCHEDULE	
Hammer Bank	Vacuum Cleaner	When dirty or at each ribbon change	} ①
Band path	Vacuum Cleaner	When dirty or at each ribbon change	
Mag Pick-ups	Vacuum Cleaner	When dirty or at each ribbon change	
Cabinet (exterior)	Spray Cleaner - soft rags	As required	
Cabinet (interior)	Vacuum Cleaner	As required	
Bonnet window	Water-soft rags	As required	



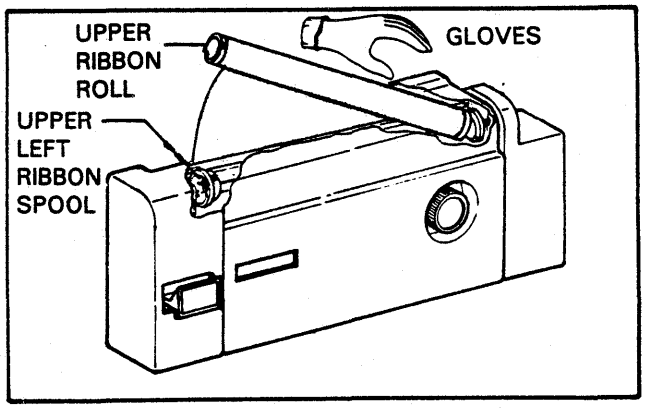
① ALSO VACUUM EVERY 250,000 LINES IF THE PRINTER IS BEING USED IN AN ACCELERATED PRINT PATTERN SUCH AS 100% SLIDING ALPHABET.

CLEANING PROCEDURES

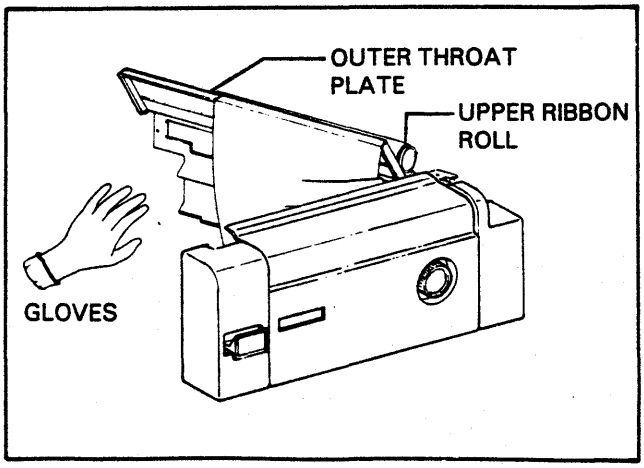
1. Power the printer OFF.
2. Raise the bonnet.
3. Open the gate by pulling up on the gate latch handle. Open the center ribbon cover by holding the gate latch handle in the up position while pulling on the ribbon cover (shown closed).
4. Open the outer throat plate (push toward printer).



5. Remove the upper ribbon roll by pushing the roll to the right and swing the left side free of the upper left ribbon spool. Unroll the ribbon roll enough to open the gate fully.



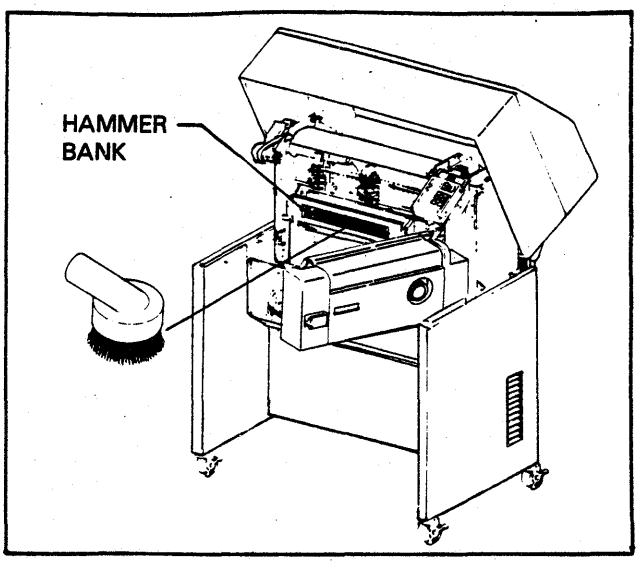
6. Lay the upper ribbon roll on the outer throat plate.

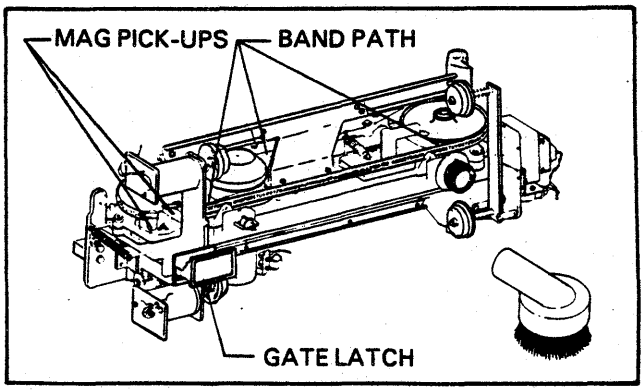


7. Vacuum the hammer bank area thoroughly.

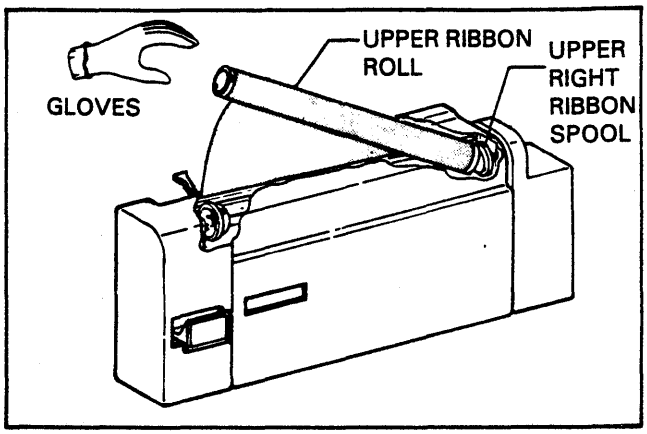
8. Vacuum the entire band path and the mag pick-ups located behind the gate latch handle.

9. Vacuum the cabinet interior.





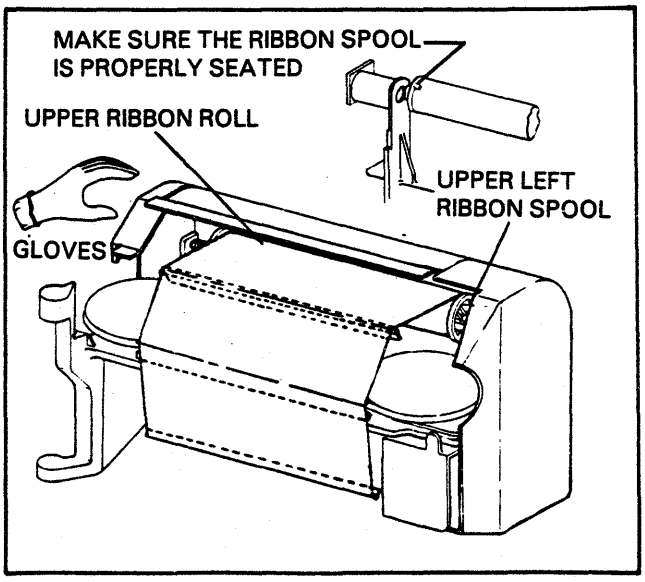
10. Install the upper ribbon roll on the upper right ribbon spool and push to the right until the spool is compressed.



11. Swing the left side of the upper ribbon roll onto the upper left ribbon spool making sure the cutouts in the ribbon roll fit onto the cogs on the left ribbon spool.

12. Roll up the excess ribbon onto the upper ribbon roll.

13. Close the outer throat plate, center ribbon cover, gate and bonnet.



RIBBON SHIELD REPLACEMENT

Tools and Material Required:

a. Soft rags.
b. Rubber cement solvent; Bestine, Ross or equivalent.
c. One upper ribbon shield and one lower ribbon shield.
d. Single edge razor blade, exacto knife or equivalent.

REMOVAL

Ribbon shield replacement is an operator responsibility and is necessary every 6 million lines. A worn out or misaligned ribbon shield may cause smudging on the paper, ribbon binding, paper jamming or degraded printed output.

1. Read and become familiar with this entire removal and installaion procedure before attempting ribbon shield replacement.

2. Power printer OFF and open bonnet.

3. Open the gate by pulling up on the gate latch handle.

4. Locate the upper and lower ribbon shields. They are located on the outside surface of the outer throat plate assembly.

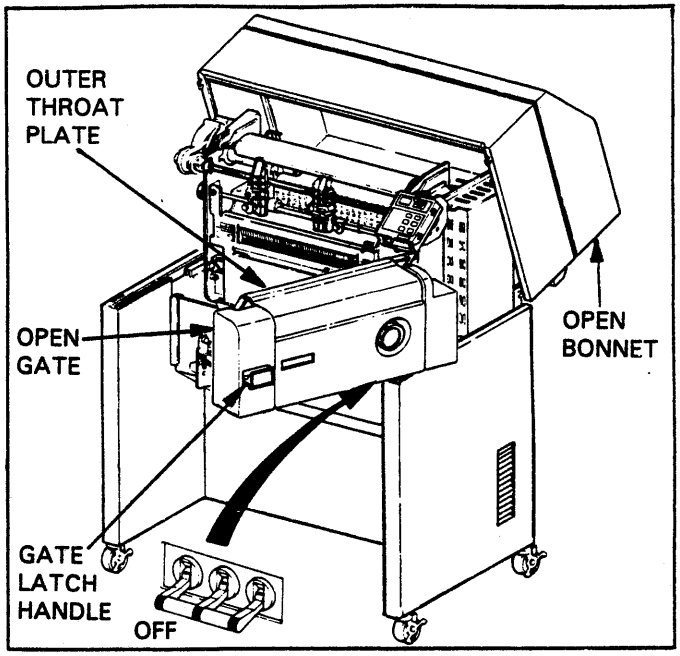
5. Grasp the grounding clip and pivot it out and up as shown in the illustration.

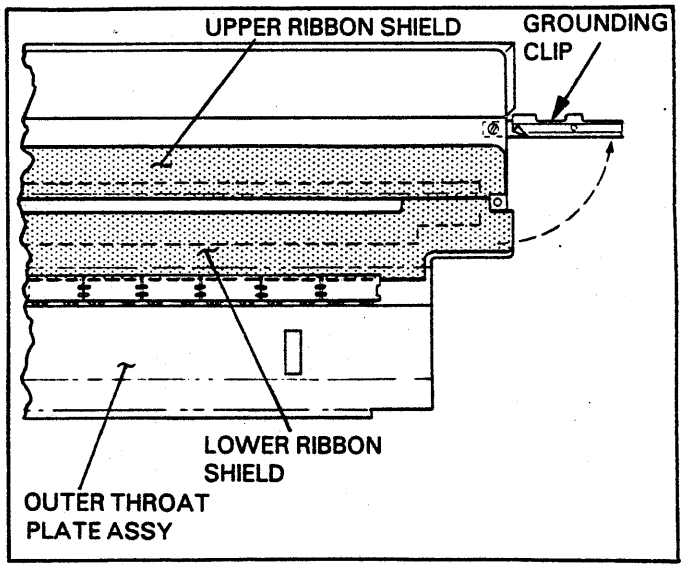
6. With a single edge razor blade, lift one edge of the shield. Remove the upper and lower ribbon shields. Slow removal will leave less adhesive residue on the outer throat plate. Any residue or plastic remaining on the surface can be removed with the razor blade.

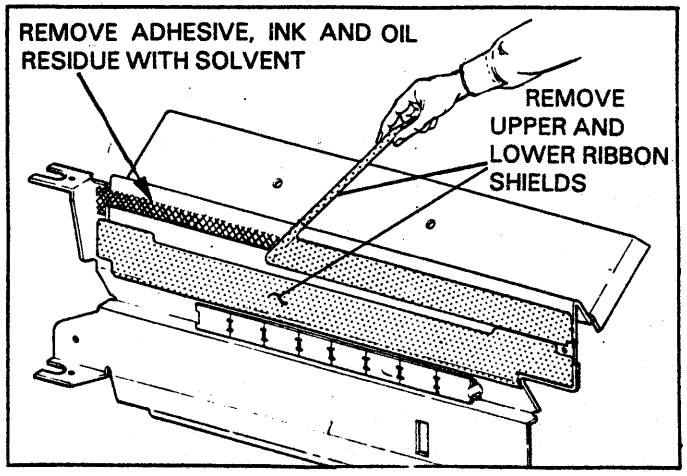
7. Clean all the adhesive, ink and oil residue from the outer throat plate assembly using a soft rag and rubber cement solvent. Residue is removed by soaking the rag with solvent and rubbing rigorously. Repeat as necessary using a clean area on the rag for each application of solvent. Once the area is clean, allow to air dry for several minutes.

NOTE

IT IS VERY IMPORTANT THAT ALL RIBBON SHIELD MOUNTING SURFACES BE CLEANED THOROUGHLY AND THAT ALL OLD ADHESIVE RESIDUE BE REMOVED BEFORE INSTALLING NEW RIBBON SHIELDS.







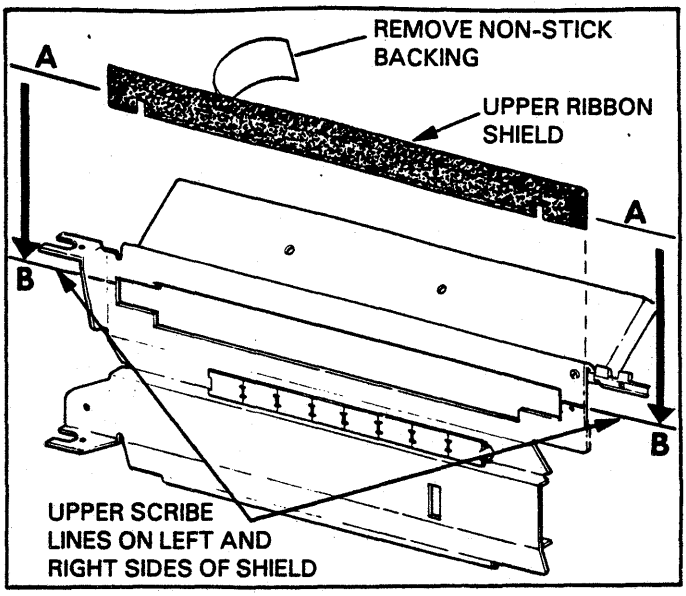
INSTALLATION

NOTE

PROPER ALIGNMENT OF RIBBON SHIELDS IS IMPORTANT TO ASSURE GOOD PRINT QUALITY

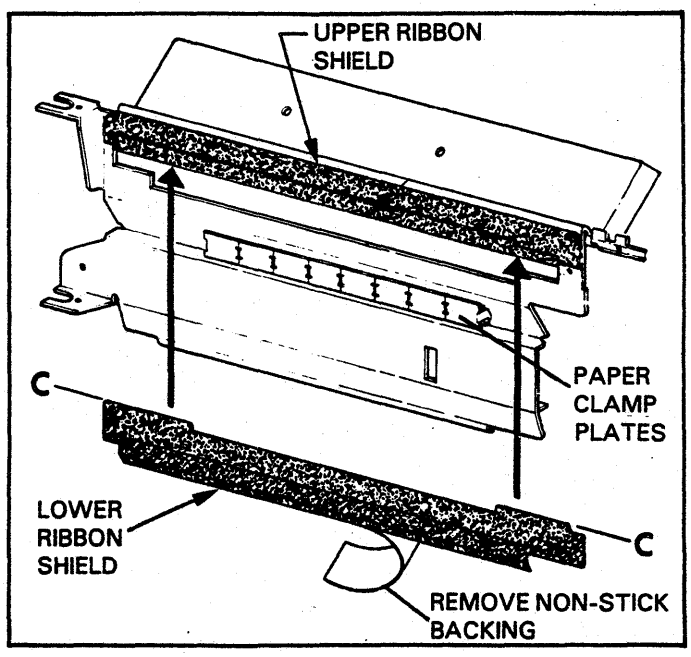
8. Remove non-stick paper backing from adhesive areas on back of new upper ribbon shield.

9. Align upper ribbon shield surface "A" with scribe lines "B" on outer throat plate. Also align the right edge of the ribbon shield with the right edge of the throat plate. Assure that the entire surface of the ribbon shield is not bowed or creased before pressing ribbon shield firmly to throat plate.



10. Remove non-stick paper backing from adhesive on back of new lower ribbon shield.

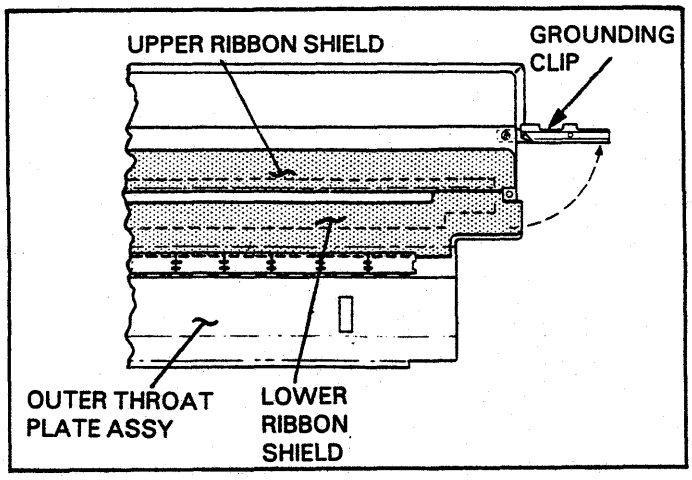
11. Align lower ribbon shield edge "C" on or slightly below the same scribe lines. Also align the right edge of the lower ribbon shield with the right edge of the upper ribbon shield. Assure that the entire surface of the ribbon shield is not bowed or creased before pressing ribbon shield firmly to throat plate. Tuck the lower edge of the lower ribbon shield behind the paper clamp plates.



12. Grasp the grounding clip and pivot it down and to the left until it clips over the edge of the throat plate and is flush with its edge.

13. Close gate and bonnet.

14. Power printer On and return it to service.



SECTION IV
OPERATOR SUPPLIES

- **PAPER SPECIFICATIONS**
- **RECOMMENDED RIBBONS**
- **BAND CONFIGURATIONS**

GENERAL INFORMATION

Paper for continuous forms must be of sufficient weight and strength to prevent the sprocket holes from tearing out during form-feeding, skipping, and ejecting operations.

The form, when removed from the carton, must be flat and the edges and folds must not be damaged. The assembly of multiple-part forms must be even and the perforations intact when forms are stacked before feeding.

The paper must not be so stiff as to cause improper feeding or excessive bulging, particularly at the perforation fold, and should be free of paper dust and lint.

SPROCKET HOLES

The forms must have sprocket holes punched along both margins 0.25 ± 0.03 inches from the paper edge to the hole center lines. The distance between hole center lines must be 0.5 ± .005 inch non-accumulative in any five inch length, and the diameter of holes must be 0.156 ± .005 inch. The distance across the sheet between sprocket hole center lines must be uniform within 0.015 inch. The two top and two bottom sprocket holes (four total holes per sheet) may be oversize to as large as .200 inch diameter to permit ring binding the completed printout. The sprocket holes should be free of chads. Presence of chads on the print line can cause loss of printed characters. If paper does not conform to this specification, degraded forms handling may occur.

FASTENING

Multiple part forms and carbons should be secured together by a method that pervents any sheet or carbon from shifting position relative to other sheets within the form. Otherwise, print quality and the forms performance through the printer could be adversely affected. For maximum efficiency, forms should be fastened in both margins. The fastening technique used should not include metallic staples or hard fasteners. Recommended types of fastening include temporary fastening such as crimping, hook lock, Speedilocks, and Stan Locks.

FORMS THICKNESS

Maximum forms thickness is in the print area 0.020 inch (five parts of 12 lb., one part of 15 lb., five carbons of 7 lb.) and 0.030 inch over the crimp fastenings in the sprocket holes of the forms. Forms thickness must be uniform over its entire surface except as noted above.

PERFORATIONS

Horizontal perforations between forms should be perpendicular to the center line of the sprocket holes. Perforations should permit easy separation, but should not tear or catch in ordinary handling or feeding through the printer. Perforations should be uniform in length and spacing to ensure proper and efficient tearing.

RECOMMENDED GENERAL PURPOSE FORMS

Single Part - 15 lb. to 125 lb.

Multiple Part - generally composed of sheets 11.5 lb to 15 lb. with one-time carbon sheet of from 7 lb. to 9 lb. Total thickness of print area of forms should not exceed .020 inch with any combination of paper and carbon. Note: The number of legible copies needed is a factor in determining the weight of the paper and carbon to be used in multiple part sets. Forms consisting of more than two 15 lb. or three 13 lb. sheets within the set should be tested under operating conditions to determine feeding and legibility acceptance.

For special applications, carbonized paper or carbonless forms can be used to obtain extra legible copies.

FORMS SIZE WITHOUT POWERED STACKER

Forms may be 4 inches to 16.25 inches wide, including margins and 8 inches to 14 inches long from fold to fold. Forms in excess of 12 inches long will require the cabinet doors to be opened to accomodate the input stack. Under these conditions, stacking may require additional operator intervention and quiet cabinet acoustical specifications will not be met.

FORMS WITH POWERED STACKER

The powered stacker will stack forms that meet the following criteria:

	Min.	Max.
Form Length	8 Inches (20 cm)	12 Inches (30 cm)
Form Width	4 Inches (10 cm)	16.75 Inches (42.5 cm)
Form Weight (Single)	15 Pound (68 kg)	102 Pound (46.3 kg)
Form Weight (2-5 Part)	35 Pound (2 Part) (15.87 kg)	105 Pound (Part) (47.6 kg)
Form Weight (six-part)	85 Pound (38.5 kg)	102 Pound (46.3 kg)
Stack Height	0	15 Inches (38 cm)

The following forms can be handled by the stacker but will requre additional operator attention to avoid misstacks.

		Less Than	Greater Than
Form Length		8 Inches (20 cm)	12 Inches (30 cm)
Form Width		4 Inches (10 cm)	16.75 Inches (42.5 cm)
Form Weight	-Single Part	15 Pound (6.8 kg)	102 Pound (36.3 kg)
	-2-5 Part	35 Pound (15.87 kg)	105 Pound (47.6 kg)
	-Six Part	85 Pound (38.5 kg)	120 Pound (46.3 kg)

Forms containing perforations in addition to those on which folding is intended, will also require additional operator attention.

CONDITION OF FORMS TO PERMIT PROPER STACKING PERFORMANCE

Forms used must be free from loose edges, flaps, wrinkles or protrusions. Multipart forms should also be adequately crimped. Crimped fastenings spaced two inches apart on both sides of the form have proven satisfactory. The forms should also have no perforations except those on which folding is intended.

RECOMMENDATIONS FOR IMPROVEMENT OF PRINT QUALITY

a. Use premium paper for best print quality.

b. On multipart forms use lighter weight paper to improve manifolding. The minimum recommended forms weights are 11.5 lb. first and last parts and 10 lb. inner parts.

c. On multipart forms use 5 lb. carbon tissue instead of 7 lb. carbon tissue to improve manifolding.

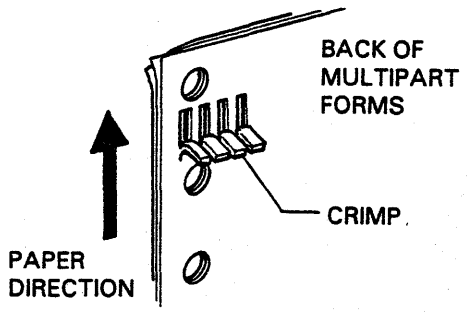
d. Use more highly calendered (smooth finish) forms (smear is less likely).

e. Any fasteners will be at least 0.25 inch from any printing area.

f. On multiple forms, glue should not be used for fastening as it results in light print on copies in the area near the glue.

g. On six part forms, use a carbon paper with approximately 2/3 actual carbon material deposited on the last sheet of carbon tissue. This will produce crisper, clearer characters on the sixth (6th) copy.

h. On multipart forms, the bottom portion of the paper crimp (with paper orientated"up" in the direction of feed) should be the attached portion rather than the pierced thru portion. This will minimize forms decolation due to paper feed forces which results in light print (due to loose forms, air entrapment, and hammer energy waste).



RECOMMENDATION FOR IMPROVED FORMS HANDLING

a. Use 18 lb. or heavier single part forms.

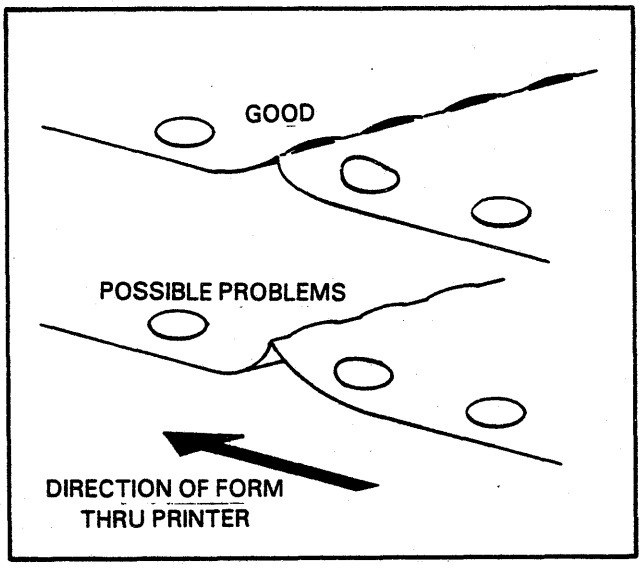
b. Forms should be free from loose edges, flaps, wrinkles, or protrusions.

c. Forms length of between 8 inches and 12 inches handle best.

PERFORATIONS/FOLDS

Some forms, because of customer requirements and/or manufacturing processes, will not readily flatten as they are unfolded and will require back-folding to remove the fold retention (tenting effect). Back folding is available from most forms manufacturers and can be specified, if necessary, when forms are ordered.

The form handling problems associated with "tenting" can be aggravated by cupped ties along the perforation which are oriented such that they are more likely to catch when feeding thru the printer. Consult forms manufacturers representative for corrective measures



FORMS STORAGE

Forms should be stored in a computer room type environment for at least 48 hours prior to using and should not be stored on their edges.

RECOMMENDED RIBBONS

PART NUMBER	INK COLOR	RIBBON MATERIAL	RIBBON THICKNESS	RIBBON LENGTH
59703000	BLACK	NYLON	.005 IN. (0.127 MM)	25 YARDS (22.85 METERS)
59703001	BLACK	NYLON	.0032 IN. (0.0762 MM)	35 YARDS (31.99 METERS)
59703002	BLACK	NYLON	.004 IN. (0.1016 MM)	25 YARDS (22.85 METERS)
59703003	BLACK	NYLON	.004 IN. (0.1016 MM)	35 YARDS (31.99 METERS)

RIBBON SPECIFICATIONS

Ribbon replacement is an operator responsibility and is necessary every 2 million lines for typical field usage or every 500,000 lines for full 132 column, sliding alpha, 100% line density. A worn out ribbon may cause ribbon binding, paper jamming, ribbon tearing, and degraded printed output.

The ribbon width is 15 ± 0.062 inches. The governing factor on length is the diameter of the ribbon on the spool. It must not be greater than 3.38 inches in diameter or interferences will result. The ribbon must have a conductable reversing foil on each end for automatic ribbon reversal.

When an application requires most of the printing near one edge of paper, the ribbon spools may be exchanged end for end for increased ribbon life. The ribbon motion is controlled by the printer. Ribbon motion stops 800 msec. after printing stops to prevent ribbon smear.

Extensive printing of a test pattern at 100% density in any column may cause ribbon to wear faster or to cut through at the ribbon reverse point. This will not occur when printing under normal print density conditions.

BAND CONFIGURATIONS

BAND (CHARACTER SET)	PRINTER MODIFICATION REQUIRED (Service Personnel)
64, 96 ASCII STANDARD	NO
64, 96 NON ASCII OPTIONAL	*YES - ROMS Added
48, 128 OPTIONAL	*YES - ROMS Added

*Additional ROMS are required only when the band is first installed in the printer. Subsequent band changes do not need modifications.

SECTION V

STATUS CODES AND CORRECTIONS

- **STATUS GUIDE**
- **FAULT ISOLATION**
- **INTERLOCKS**

If the following codes cannot be cleared, perform the following steps before calling your Customer Engineer:

a. Record the displayed code as soon as it occurs, then attempt to recover the printer by powering if OFF for fifteen seconds the ON with the main power ON/OFF switch. Do not power ON and OFF more than three times in any five minute period. If the code cannot be cleared, perform the rest of this procedure.

b. Record the following information from the sticker on the back of the printer:

- Equipment Ident Number
- Series Code
- Part Number
- Serial Number

c. Record any information that may help the C.E. determine the possible cause of the problem. (was the printer printing when the code occurred? Is the line spacing even? Is the printed data correct or is it unreadable?)

d. Record any observations prior to, during, or after the code occured that may help the C.E.

Place the telephone number of your Customer Engineer below.

STATUS GUIDE

STATUS NUMBER DISPLAYED	STATUS NUMBER DEFINITION	CORRECTIVE ACTION REQUIRED
1	Print gate open or not latched properly.	Close print gate securely so that its safety interlock switch is depressed. Closed gate will remove displayed number.
2	Not Defined.	
3	Not Defined.	
4	Paper tear or jam at tractor.	Reload paper (forms) in tractors. Status number will stay displayed until ON LINE mode is entered. May also be cleared by CLEAR switch on Control Panel.
5	Out of paper (optional Paper Out switch on Control Panel is lit).	Install paper (forms). Status number will stay displayed until the CLEAR switch is pressed.
6	Power stacker not ready (status used on printers with power stacker option only).	Clear paper (forms) jam in stacker (paper tear or stacker full). Status number displayed will be removed when paper jam is cleared.
7	No faults exist in printer and ON LINE light is off.	Status only - No corrective action required.
8	TEST MODE switch on Control Panel has been pressed and is lit.	To enter TEST MODE press switch when Off Line. Status number will stay displayed until TEST MODE switch is pressed again.
9	Printer is on line with data source awaiting data (ON LINE light on Control Panel is lit).	Status only - No corrective action required.
10	Vertical format information has not been loaded into the printer's vertical format memory.	Load vertical format tape via printer's format reader or load vertical format memory data over data lines from data source.
11	Vertical format information is in the process of being loaded.	Status only-no corrective action required. Status number displayed will be removed when vertical format information has been loaded and verified.
12	Attempted to load vertical format information without a format tape in tape reader.	Install format tape in tape reader and press Format Tape Load switch on format reader. Status number displayed will be removed when load cycle starts.
13	Format tape reader started to read tape but never finished.	Check format reader for jam or improperly installed tape. Install tape and press Tape Load switch. Status number will stay displayed until tape load cycle starts.

STATUS NUMBER DISPLAYED	STATUS NUMBER DEFINITION	CORRECTIVE ACTION REQUIRED
14	No top of forms information received during vertical format load cycle.	Add Top Of Forms information to format tape or format data from data source. Start of format load cycle will remove displayed number.
15	Vertical Format tape is too long. Maximum length is 30 inches (762mm) or 180 lines at 8 LPI.	Correct length of format tape. Install tape on reader and press Tape Load switch. Start of format load will remove displayed number.
16	The data source has selected a format channel that is not valid for your format configuration.	Correct vertical format software at data source so it agrees with the printer's valid format channel configuration.
17	Vertical format load information from data source (DAVFU) is not correct.	Correct vertical format load information at data source. Status number displayed will be removed by start of data source load cycle.
18	Vertical format data load cycle from data source is too long. Maximum length is 180 lines.	Correct vertical format data load information at data source so it does not exceed maximum number of lines. Displayed number will be cleared by start of load cycle.
19	Tape reader is unable to read or verify format tape (tape is punched improperly).	Check format tape for improperly located and puched holes and make necessary corrections. Displayed number will be cleared by start of load cycle.
20	VTOF switch (Vertical Top of Form) counter on the Control Panel are all set at OFF (000).	Counter must be set for some page length in order to function. Displayed number will be cleared by making valid selection and moving paper.
21	Format code from data source is not valid for this printer's configuration.	Format code from data source must be revised or internal printer programming switches must be setup properly for your configuration (Call Customer Engineer). Cleared by pressing ON LINE switch.
22	Master Clear from data source is on constantly and will not let printer function.	Master Clear from data source is hung up and must be cleared. Removal of Master Clear will remove displayed number.
23	Print band not installed or improperly installed.	Print band is not installed, is upside down or does not track properly. Displayed number will be removed when print gate is open to install band.
24	Vertical Format memory data in printer has changed since it was loaded.	Reload vertical format data into printer memory. If problem persists, call Customer Engineer. Displayed number will be removed with start of reload cycle.

STATUS NUMBER DISPLAYED	STATUS NUMBER DEFINITION	CORRECTIVE ACTION REQUIRED
25	Vertical format channel selected by data source is not in vertical format memory.	Improper format information loaded or format channel on tape not punched. Load correct format data. Displayed number will be removed by start of load cycle.
26	Optional Reset (Printer Controller Clear) switch on Control Panel is being pressed.	Releasing Reset switch will remove displayed number.
27	Band Image is not loaded.	Call Customer Engineer.
28	Not assigned.	None.
29		
30	Controller ROM error.	Call Customer Engineer.
31	EVFU ROM error.	
32	System RAM error.	
33	EVFU RAM error.	
34	Buffer RAM error.	
35	Illegal character register error.	
36	Image ROM error.	
37	No Image ROM installed.	
38	Image RAM not available.	
39	Invalid text ROM.	
40	Band motor overcurrent fault.	The ALARM indicator on the Control Panel will be flashing when these status number are displayed. Flashing indicates the +36 volt power supply has shut down. Power printer OFF for 15 seconds and ON (Use printer ON/OFF switch) to clear printer logic and to recover the +36 volt supply. Attempt to operate printer. If status number persists, call Customer Engineer.
41	Ribbon motor fault.	
42	12V fault.	
43	Hammer fault.	
44	Horizontal End Stop fault.	
45	Home fault.	
46	Horizontal Motion Error fault.	
47	"H" switch fault.	
48	Fuse fault (+36V).	

STATUS NUMBER DISPLAYED	STATUS NUMBER DEFINITION	CORRECTIVE ACTION REQUIRED
49	Paper runaway.	Same as Status Numbers 40 thru 48 on previous page.
50	Paper runaway (hardware failure).	
51	Unidentifiable C.E. fault.	
52	Line space error.	Press Clear switch on Control Panel to remove displayed number. If status number persists, call Customer Engineer.
53	Band sync error.	
54	Not Assigned.	None.
55		
56	I/O Parity error.	Call Customer Engineer.
57	No default image ROM.	
58	Unable to identify band.	Check band installation could be wrong band or upside down. Call C.E.
59	Compare fault.	Call Customer Engineer.
60	Input cycle in progress.	
61	Print cycle (Waiting for SCAN SYNC INT.)	
62	Horizontal motion cycle.	
63	Vertical motion cycle.	
64	Band ID in process.	
65	Not assigned.	None.
66		
67		
68		
69		
70	Image word count error.	Call Customer Engineer.
71	Invalid image start code.	
72	Print attempt with no image.	In I/O image mode but hasn't been loaded. Call C.E.

STATUS NUMBER DISPLAYED	STATUS NUMBER DEFINITION	CORRECTIVE ACTION REQUIRED
73	6/8 LPI strobe count error.	Call Customer Engineer.
74	Not assigned.	None.
75		
76		
77		
78		
79		
80	C.E. Test Print/Not valid test.	Customer Engineer use only.
81	C.E. Test Print/Sliding pattern.	
82	C.E. Test Print/Cycle with no printing.	
83	C.E. Test Print/Horizontal only.	
84	C.E. Test Print/Vertical only.	
85	Not assigned.	
86	C.E. Test Print/Text Mode.	
87	Not assigned.	None.
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		

SYMPTOM	PROBABLE CAUSE	ACTION REQUIRED
Printer can not be powered ON (no lights or motor sounds).	A. Printer is not plugged in.	A. Locate the plug and reconnect.
	B. Building's power to wall socket is not on, or socket is defective.	B. Have wall socket check by buildings electrician.
	C. Printer's AC Circuit breaker is tripped.	C. Press AC circuit breaker switch on powered stacker plug.
	D. Problem is not operator correctable.	D. Call the Service Representative.
Printer does not go to ON LINE, ALARM indicator is flashing.	A. Problem is not operator correctable.	A. Power the printer OFF then 15 sec. later ON again. Attempt restart.
		B. If problem persists, call the Service Representative.
Printer consistently tears forms.	A. Too much horizontal tension on the forms.	A Readjust right tractor to decrease tension.
	B. Forms stack is not centered below the print station.	B. Reposition the forms stack.
	C. Forms are skewed from left sprocket holes to to right sprocket holes.	C. Reinstall the forms insuring the same level feed holes engage both tractors.
	D. Problem is not operator correctable.	D. Call Service Representative.
Printout is light.	A. Ribbon is excessively worn.	A. Replace the ribbon.
	B. Ribbon has not reversed due to improper installation or defective ribbon.	B. Check the ribbon for proper installation or missing shorting strips.
	C. Problem is not operator correctable.	C. Call the Service Representative.
Print Characters are missing left or right sides.	A. Print Position knob is misadjusted.	A. Readjust the Print Position knob.
Printout is smudging.	A. Ribbon shield is excessively worn.	A. Replace the ribbon shield.
	B. Ribbon is inked excessively.	B. Replace the ribbon.
Line spacing is incorrect.	A. Printer's vertical format information (format tape, or data source format program, or vertical form length switch on Control Panel) does not match vertical format program for form being used.	A. Check that the printer's vertical format has been programmed for the form being used.
	B. Problem is not operator correctable.	B. Call the Service Representative.

INTERLOCKS

DESCRIPTION	FUNCTIONAL INFORMATION
Print Gate Switch	Located on printhead structure, activated by print gate latch. Open position-removes power from band and ribbon motors. Closed position-requires 7 second delay before attaining operable condition.
Out of Paper Switch	Located on print gate; activated by forms (paper). Generates out of paper signal to processor to stop data transmission.
Forms (paper) Motion Verification Detector (Forms Tear Or Jam Detector).	Located on the right tractor and monitors forms (paper) movement through the tractors. Paper motion failure such as paper tear or paper jam will stop paper motion until it is cleared and the ON LINE switch is pressed.