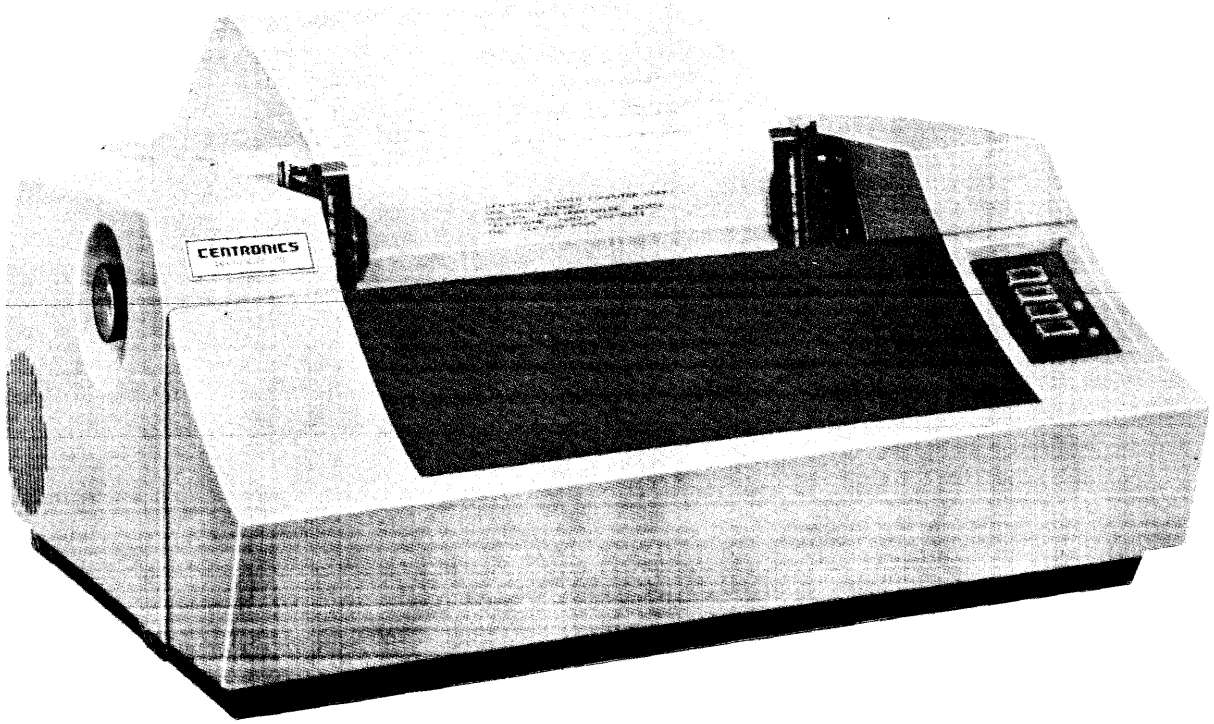
OPERATORS MANUAL

SERIES 100 PRINTERS



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INTRODUCTION

Scope

This manual contains instructions relating to the installation and operation of all Centronics' Series 100 printers. This includes uncrating and set-up procedures, operating instructions and other reference information useful to the printer operator.

General Description

The Centronics Series 100 printers are medium speed, impact printers which use dot matrix techniques for character generation. Each is a completely self-contained unit which includes the mechanical and electro-mechanical components, control logic, character pattern generator, single line buffer (132 characters) and power supply.

Available models include:

(a) Model 101 – The basic printer, prints 132-column lines at 165 characters per second.

(b) Model 101A – Similar to the Model 101, but with additional features such as paper runaway inhibit, manual line feed switch, remote select/deselect, etc.

(c) Model 101AL – Functionally the same as the 101A, but uses more compact electronics packaging.

(d) Model 101S – Prints standard 0.1-inch characters as well as large-scale (e.g., .2, .3, .4 and .7-inch high) symbols, using .1-inch dot patterns as building blocks.

(e) Model 102A – Prints at twice the speed of the 101A by using two print heads.

(f) Model 102AL – Functionally the same as the 102A, but uses more compact electronics packaging.

The model number is specified on a nameplate located on the back of the printer.

UNPACKING/REPACKING PROCEDURES

Tools you may use:

17mm Socket Wrench
Adjustable Wrench
Tinsnips or wire-cutters

UNPACKING

1. Cut the two bands (1)(strapping) around crate.
2. Lift top of crate (2) up straight.
3. Remove plastic cover from printer.
4. Remove nuts (3), washers (4), springs (5) from long bolts (8).
5. Lift printer off pallet (10).
6. Remove bolts (12) and washers (11) from bottom of platform (7).

PRINTER MUST BE COMPLETELY REMOVED FROM ALL PALLETS

7. Remove elastic retaining bands from:

   (a) Head

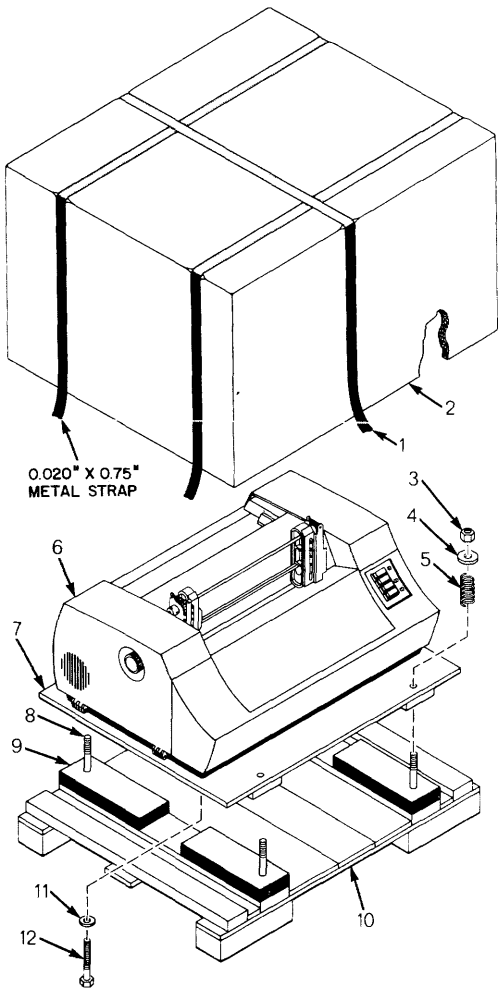
   Exercise Caution – Do not place any stress on the Video Amplifier PC Board
   (see diagram on next page)

   (b) Paper Tractor Units
   (c) Ribbon Spool right side

8. See SET UP PROCEDURE.

REPACKING

9. To repack, reverse the uncrating procedure in steps 2 through 6 and add new strapping around the crate.



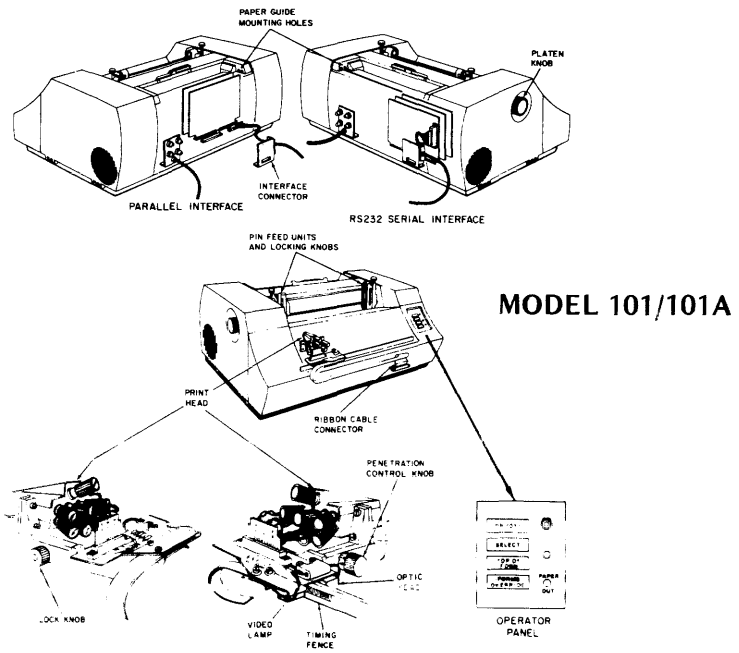
SET-UP PROCEDURES

COMPLETE ENTIRE UNPACKING PROCEDURES PRIOR TO PERFORMING THE STEPS LISTED BELOW

1. Note any discrepancies in general appearance.
2. Thread the enclosed pin feed locking knobs into the pin feed units and attach the paper guide and stacker (shipped separately) to printer using the four screws taken from the guide mounting holes. The left pin feed unit should be locked at the extreme left side.
3. Lift front cover and manually move the print head from left to right. Ensure that optic pick-up head clears the timing fence over the entire length of the fence. Caution: TIMING FENCE CAN BE DAMAGED IF THERE IS NO CLEARANCE OR IF OPTIC HEAD IS MISALIGNED.
4. Open the right and left pin feed gates, feed paper through the opening at the top of the printer and insert the paper in the pin feed units. Close the pin feed gates.
5. Adjust head penetration for optimum print quality as follows: 1) Loosen lock knob(s) and slightly increase head penetration by turning penetration control knob(s); (Note: This knob is preset to 5 prior to shipping); 2) Manually move the print head(s) across the paper and keep increasing the penetration until smudging occurs; 3) Back off on the penetration just to the point of no smudging (Approx. .006 in.); 4) Tighten the lock knob(s).

NOTE: THE NUMBERS ON THE PENETRATION KNOB DO NOT CORRESPOND TO THE NUMBER OF COPIES BEING USED.

6. On a Series 102 printer, printouts by each head should be aligned both horizontally (separated by one intercharacter space) and vertically. To adjust the heads, refer to Section 5.2.2.3 in a Series 102 technical manual.
7. Plug the printer into the appropriate AC outlet. (Note: Printers wired for 220V/50 Hz are shipped without a 3-prong power cord connector). ALWAYS USE A 3-WIRE GROUNDED OUTLET.
8. Press ON/OFF switch on Operator Panel.
9. Ensure that video lamp is lit (located beneath the print head carriage).
10. Ensure that SELECT indicator on Operator Panel is off.
11. Press TOP OF FORM switch on Operator Panel.
12. Pull out and turn platen knob to position the paper.
13. Turn power off, and connect the printer to the desired input device (i.e., computer, exerciser, etc.) via the interface connector.
14. Turn on power and press SELECT switch on Operator Panel to enable the printer to receive data.



MODEL 101/101A

OPERATING NOTES

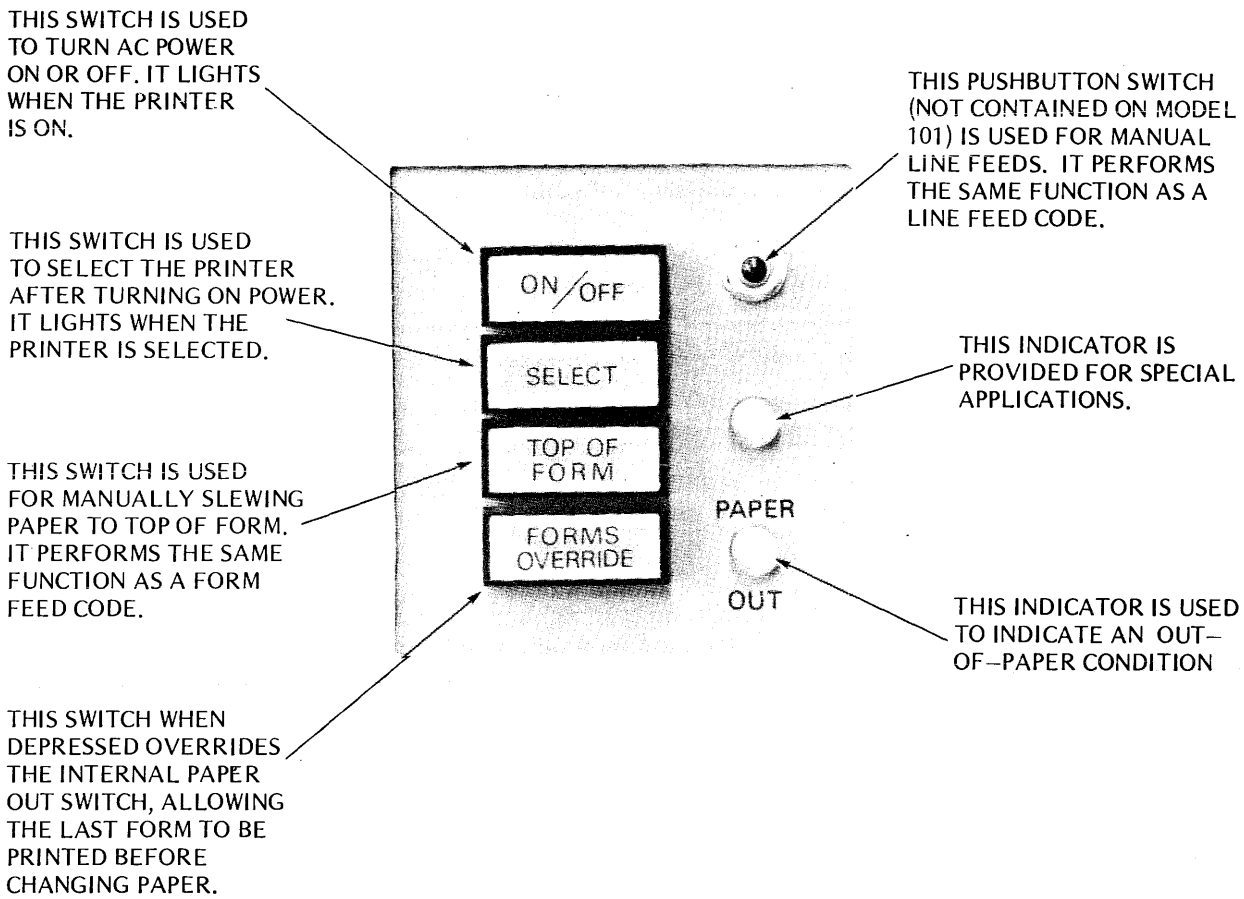
- Always plug the printer into a 3-wire grounded outlet.
- Ensure that all covers are closed and secured during operation.
- Never operate the printer without paper.
- Avoid leaning or placing objects on any part of the printer.
- Turn power off before adjusting print head or replacing ribbon.

OPERATING GUIDE

If the printer is not operating properly, refer to the following table for possible sources of error. If the printer still fails to operate properly after performing the indicated actions, then call for service.

Symptom	Action
Printer won't print and ON/OFF indicator is off.	Try the ON/OFF switch, check the power cord, check fuses.
Printer won't print, ON/OFF indicator is on, but SELECT light is off.	Press SELECT switch.
Printer won't print, but SELECT indicator is on.	Ensure that front cover is closed, check fuses, ensure that interface cable at rear of printer is secure.
Paper skewing.	Position the paper feed tractors and tighten the fixing knobs as outlined on page 6.
Ink ribbon tracking problems.	Make sure ribbon is installed as outlined on pages 10 & 11.
Poor print quality (e.g., smudging or light print).	Adjust head penetration as outlined on page 7.
Missing dots in printed character.	Open front cover and carefully wipe timing fence with damp cloth. Caution: USE ONLY WATER AND MILD DETERGENT.
Form feed or vertical tab problem.	Check vertical format unit. (See page 8)

OPERATOR CONTROLS AND INDICATORS



The printer also contains:

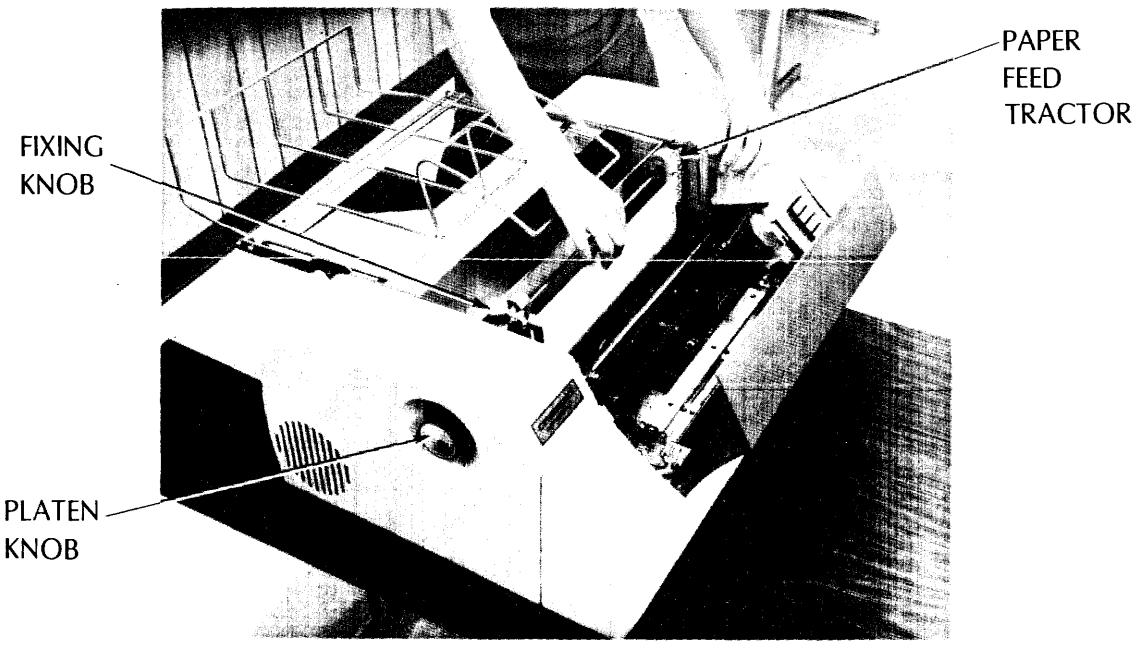
(1) A Bell Alarm – consisting of a 2-second audible tone sounded in response to a BELL code (octal 007) or a paper empty condition.

(2) A Form Thickness control knob (and lock knob) – located on the print head carriage, adjusts the penetration of the print wires on to the paper.

(3) A Platen Knob – used to manually adjust paper in the printer. The knob operates by pulling it out and rotating it in either direction.

LOADING PAPER

1. Before loading paper into the printer, first lift the front cover and open the gates for the left and right pin feed units. Make sure the left pin feed unit is locked in place at the extreme left margin.
2. Feed paper down through the slanted opening in the top of the printer. The paper will follow the forward paper pan and come up to the pin feed tractors.
3. Place the top sheet in the paper feed tractors. Make sure the holes are aligned so that the top of the sheet is parallel with the top of the printer. If necessary, loosen the fixing knob on top of the right pin feed unit and move the unit to accommodate the width of the paper. When properly adjusted, tighten the fixing knob.
4. Close the gates for the pin feed units, then close the forward cover.



TOP OF FORM ADJUSTMENT

1. With the printer turned on, press the TOP OF FORM Switch. This aligns the top of form hole in the vertical format paper tape, directly over the light source in the paper tape reader.
2. Use the platen knob to adjust the paper so that the desired top line on the form is aligned vertically with the print head. This adjustment is performed by pulling out the platen knob and rotating it in either direction. Once aligned, each time a Form Feed code (octal 014) is received or the TOP OF FORM Switch is pressed, the paper will slew to this same line at the top of the next form.

FORMS THICKNESS CONTROL

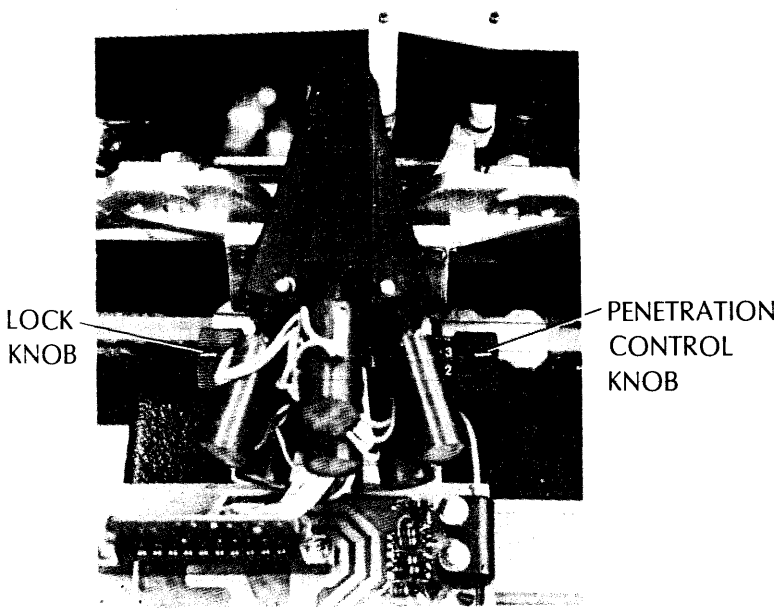
Two adjustment knobs on either side of the print head carriage control the clearance between the platen and the face of the print head. This clearance must be adjusted according to the thickness of the forms being used. On a Series 102 printer, the two heads must be adjusted independently.

To adjust the print head for optimum print quality perform the following steps:

1. Loosen the Lock knob on the left side of the print head.
2. Increase the penetration of the print wires on to the ribbon by slightly turning the Penetration Control knob.
3. Manually move the print head across the paper. Keep increasing the penetration until smudging occurs.
4. Back off on the Penetration Control knob just to the point of no smudging.
5. Tighten the Lock knob to secure the print head in position.

Note

Numbers on Penetration Control knob do not correspond to the number of copies used.



VERTICAL FORMAT UNIT

Vertical formatting in the Series 100 printers is controlled by a paper tape in the Vertical Format Unit. This unit is located on the upper left side of the printer just under the left cover.

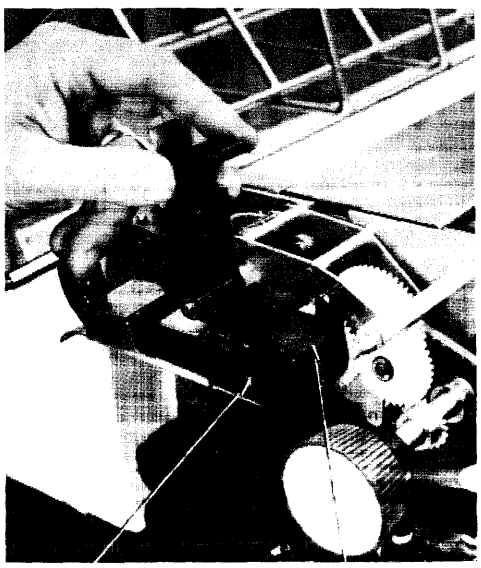
The tape is a standard 1-inch wide, 8-channel, black opaque paper tape. The sprocket holes, located between Channels 3 and 4, have a 1/10 inch pitch between holes. Channel 5 defines the Vertical Tab (VT) format and Channel 7 the Top of Form (TOF) format. The tape reader and paper feed mechanisms are mechanically linked so that each line feed advances both the paper by one line and the paper tape by one sprocket hole, on a 6 line-per-inch printer.

Reception of a Vertical Tab code (octal 013) advances the paper (and tape) to the next hole in Channel 5. For example, if the holes in Channel 5 are spaced six sprocket holes apart, each Vertical tab will advance the paper six lines (one inch).

Similarly, reception of a Form Feed code (octal 014) or pressing the TOP OF FORM switch advances the paper (and tape) to the next hole in Channel 7.

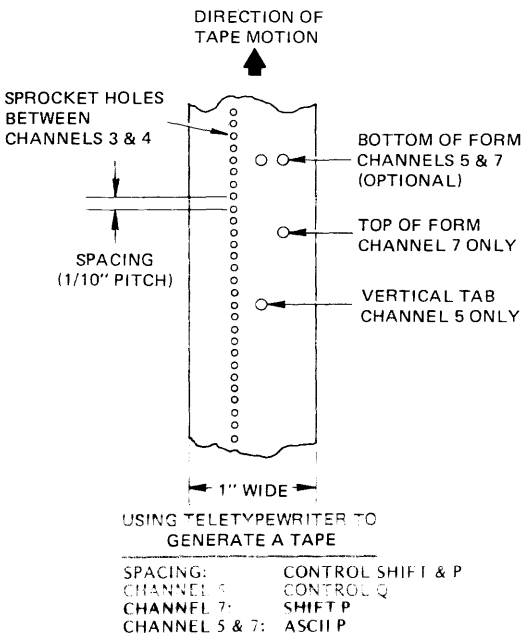
As an optional feature on some printers, a hole in both channels 5 and 7 indicates bottom of form (BOF). Detection of this condition automatically advances paper to the top of the next form. BOF and TOF indications on tape must be separated by at least one line.

On the standard paper tape shipped with the printer, Vertical Tab holes are spaced six sprocket holes apart in Channel 5, (corresponding to a 1-inch tab) and Top of Form holes are spaced 66 sprocket holes apart in Channel 7 (corresponding to an 11-inch form).



VERTICAL FORMAT TAPE READER

VERTICAL FORMAT TAPE



VERTICAL FORMAT TAPE

1. Generating a Master Tape

   To generate a master tape on a Teletypewriter unit, use the following procedure:

   a. Turn LOCAL Switch on Teletypewriter unit to extreme clockwise position.

   b. Turn punch switch to ON. (Use black opaque tape only.)

   c. Press HERE IS key several times to generate a tape leader.

   d. To generate a Vertical Tab hole in Channel 5, press and hold the CONTROL key and then press Q.

   e. To generate a Top of Form hole in Channel 7, press the SHIFT and P keys.

   f. To generate a hole in both Channels 5 and 7 (Vertical Tab and Top of Form), press the P key alone.

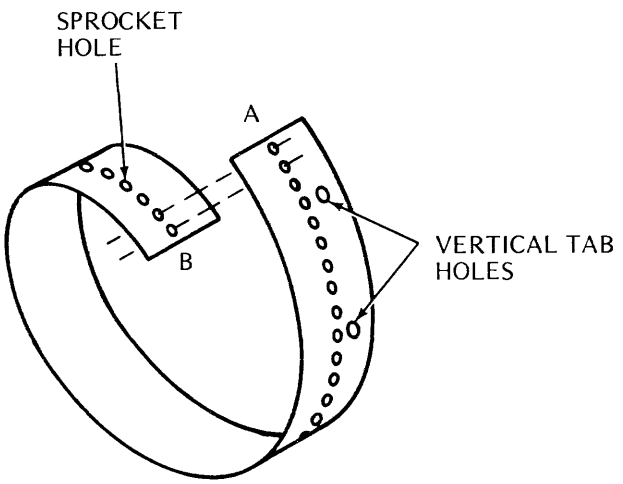
   g. To space the tape between holes, press and hold the CONTROL and SHIFT keys, then press P. One sprocket hole will be generated each time the P key is pressed.

   h. After the tape has been fully generated, press the HERE IS key to generate a rear trailer of sprocket holes. Remove the tape from the reader.

2. Splicing the Tape

   a. As shown in the figure, overlap the two ends of the tape (A and B) and place the sprocket holes over one another to properly align the two ends. Arrange the splice so that the distance between consecutive Form Feed holes is the same all around the tape.

   b. Glue both ends of the tape together.



3. Duplicating the Tape

   a. Insert the master tape in a Teletypewriter reader and lock it in.

   b. Turn the switch to START and a duplicate tape will be punched automatically.

RIBBON REPLACEMENT
(See diagram on opposite page)

To replace the ribbon, open the front cover and loosen the Lock knob on the left side of the print head(s). Note setting on the Penetration Control knob, then set knob to No. 5. In the Model 102A, repeat this for both print heads. Open side covers. Remove caps from ribbon reversing guides. Swing ribbon tension arms clear of spools. Lift spools from axles. Place empty spool (partially wound) on right-hand axle. Insert ribbon through right-hand reversing guide and thread through idlers and ribbon guides. Place full spool on left-hand axle, assuring that ribbon is inserted in left-hand ribbon reversing guide. Replace ribbon reversing guide caps. Close side covers. Readjust Penetration Control knob to original setting and lock. In Model 102A, readjust Penetration Control knob for both heads.

RIBBON SPECIFICATIONS

The printer uses a 1-inch nylon ribbon mounted on 3-inch diameter spools. The following four colors are available:

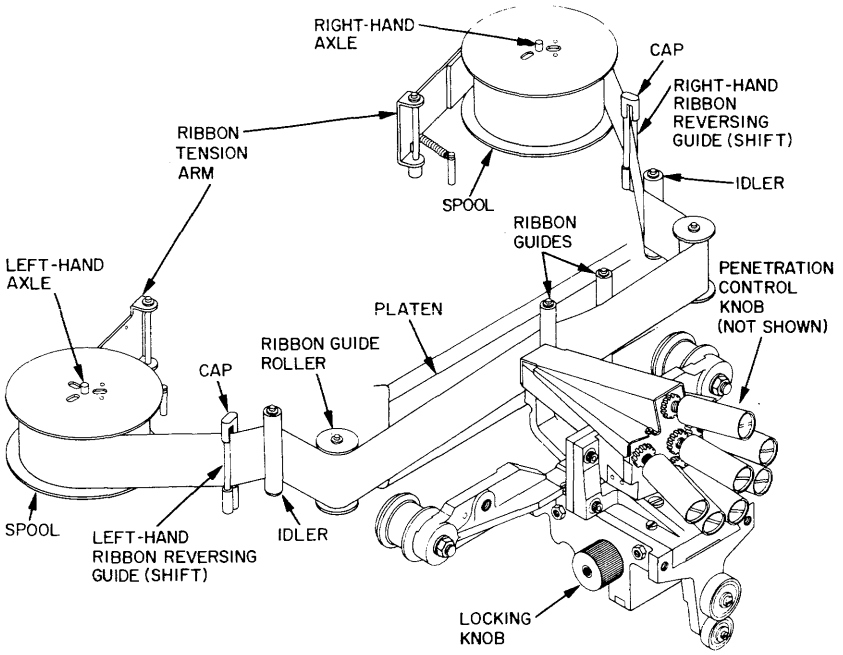
Black	—	Part No. 63002293-01
Red	—	Part No. 63002293-02
Green	—	Part No. 63002293-03
Blue	—	Part No. 63002293-04

PAPER SPECIFICATIONS

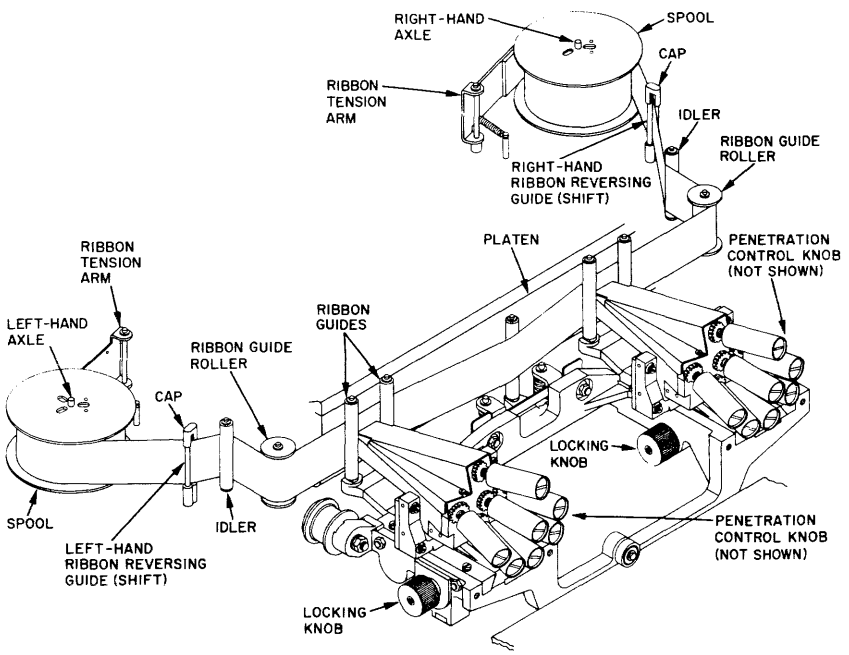
The printer uses continuous form paper with standard feed holes on each edge. Paper widths from 4 to 14-7/8 inches can be accommodated by the printer. Using multiple-part form, one original and up to 4 copies can be printed, all very legible. Paper weight specifications are as follows:

Single-Part Forms:	15 to 20 lb
Multiple-Part Forms:	Original — 12 to 15 lb Copies — 9 to 12 lb, last copy 15 lb (Maximum of five parts)
Carbon Paper:	7-1/4 lb with medium hardness

RIBBON REPLACEMENT DIAGRAMS



(A) SERIES 101



(B) SERIES 102

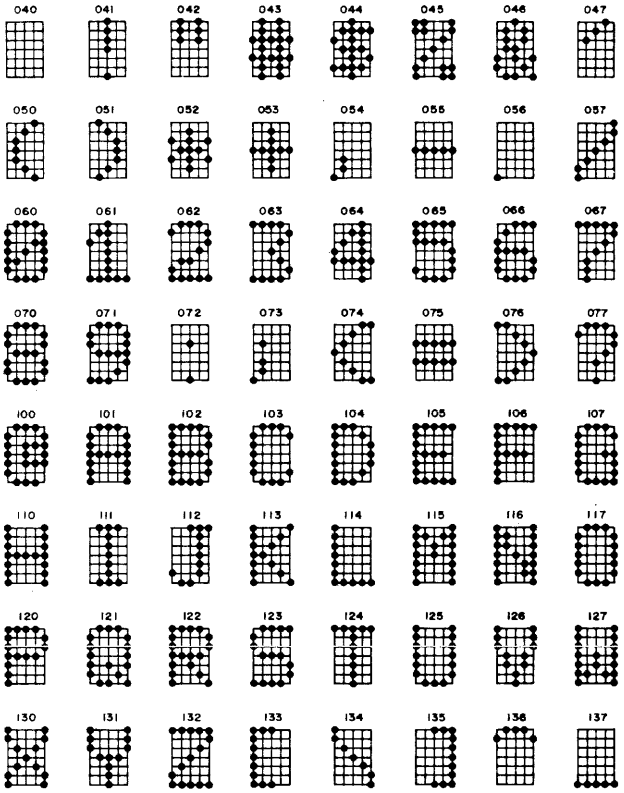
SPECIAL CONTROL CODES

Reception of any of the following control codes from the input device will cause a special printer action, as described below.

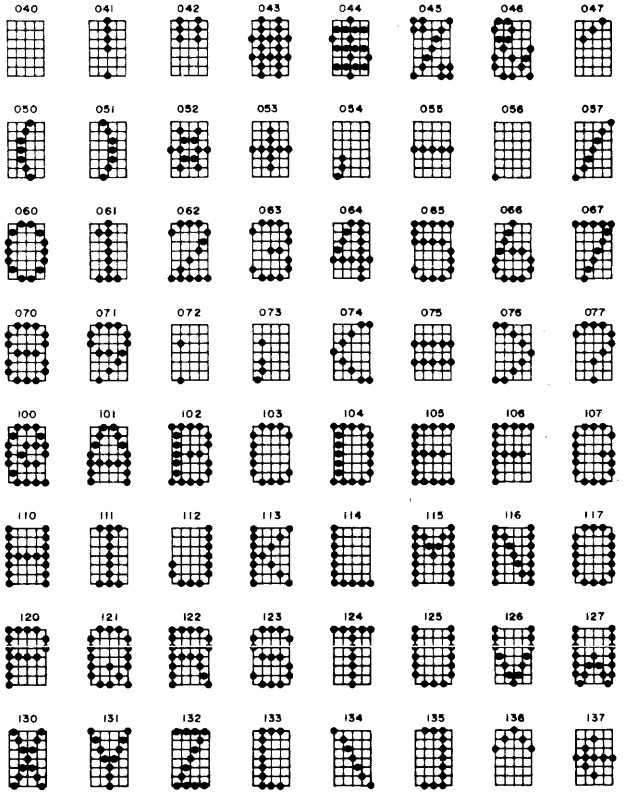
Function	Octal Code	Description
BELL	007	Generates an audible tone, about two seconds in duration, in the speaker at the rear of the printer.
LINE FEED	012	Advances the paper one line.
VERTICAL TAB	013	Advances the paper until the next hole in Channel 5 of the VFU paper tape is reached.
FORM FEED	014	Advances the paper until the next hole in Channel 7 of the VFU paper tape is reached.
CARRIAGE RETURN	015	Causes the line of characters stored in the printer buffer to be printed. As a standard feature, an automatic line feed occurs after printing the line.
ELONGATED CHARACTER	016	Prints entire line of up to 66 characters as expanded characters (double width). Note: Because of the two print heads and internal logic in the 102A, a line of elongated characters must be received in the following order: (1) first 33 printable characters, (2) 33 "Don't care" characters, (3) next 33 printable characters, and (4) carriage return code. The 102AL, however, prints the first 66 characters double width.
SELECT	021	Selects the printer (i.e., makes it available to receive data). Not available on Model 101.
DE-SELECT	023	De-selects the printer (i.e., prevents the printer from receiving data). Not available on Model 101.
DELETE	177	Clears the buffer and initializes the printer electronics.

STANDARD CHARACTER SETS

STANDARD 5 x 7 CHARACTER MATRIX



STANDARD 9 x 7 CHARACTER MATRIX



USASCII CODE

$b_7b_6b_5$ → (Bits)					$0\,0\,0$	$0\,0\,1$	$0\,1\,0$	$0\,1\,1$	$1\,0\,0$	$1\,0\,1$	$1\,1\,0$	$1\,1\,1$
b_4 ↓	b_3 ↓	b_2 ↓	b_1 ↓	Row \ Column	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL
					CONTROL CODES		STANDARD				OPTIONAL	

Notes:
1. ▭ Indicates control codes recognized by Centronics printers
2. Underscore (octal 137) is replaced by a back-arrow in the standard 9 x 7 matrix