"DATASPEED*" 40 PRINTER

DESCRIPTION AND OPERATION

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Prepared for American Telephone and Telegraph Company by Teletype Corporation

1. GENERAL

1.01 This section provides the description and operation for the DATASPEED 40 Printer, 40P101/ZZ (80-Column Friction Feed), 40P102/ZZ (80-Column Friction Feed With Noise Reduction), 40P151/ZZ, 40P153/ZZ, and 40P154/ZZ (80-Column Tractor Feed), 40P201/ZZ, 40P202/ZZ and 40P203/ZZ (132-Column Tractor Feed), and 40P253/ZZ (80-Column Forms Access). See Fig. 1.

1.02 This section is reissued to provide coverage of the following DATASPEED 40 Printers:

(a) 40P101/ZZ and 40P102/ZZ
(b) 40P151/ZZ, 40P153/ZZ and 40P154/ZZ
(c) 40P201/ZZ, 40P202/ZZ, 40P203/ZZ, and 40P204/ZZ
(d) 40P253/ZZ

1.03 This is a general revision, therefore marginal arrows have been omitted.

1.04 The printer is an electromechanical line-at-a-time tractor or friction feed printer. It provides hard copy of data from an SSI source (Standard Serial Interface), or EIA source.

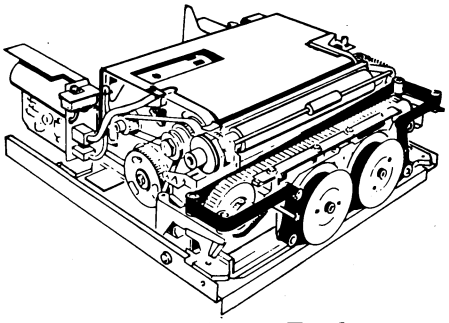
1.05 All communications to and from the printer is accomplished over a four wire (two twisted pairs) Standard Serial Interface (SSI). Pulse transformers are used on both sets of twisted pair wires to provide isolation. Transmission of data occurs at a 56K baud rate.

1.06 An alternate interface is provided for operation with an Original Equipment Manufacturer signal source. This interface requires an EIA-type bipolar voltage signal. This interface option is provided for applications where utilizing the SSI interface is not practical. The OEM interface accepts ASCII coded data (10 unit code) in serial form and provided parallel control and status signals.

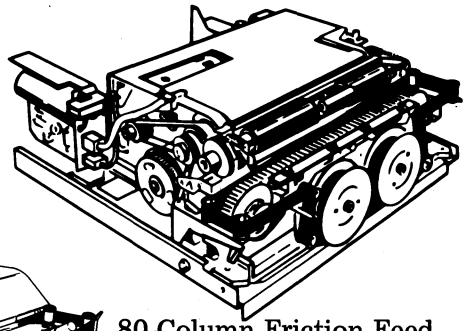
1.07 Printing is accomplished by impacting the paper and moving ink ribbon into a moving type pallet. One print hammer mechanism is provided for each column to be printed across the page. The type pallets are mounted on a continuous type carrier which is moving across the face of the printer at constant velocity. The type carrier is readily changeable and, in addition, individual pallets in a carrier can be changed.

1.08 The DATASPEED 40 Printer is designed for system arrangements that require a receive only output device, or with the additional modular components of an operator console, display module, and electronics module. The complete input/output terminal is assembled for service in a switched network or private line systems.

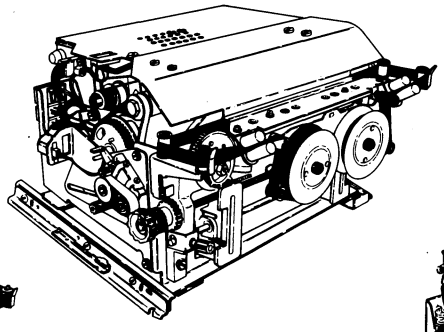
1.09 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410020).



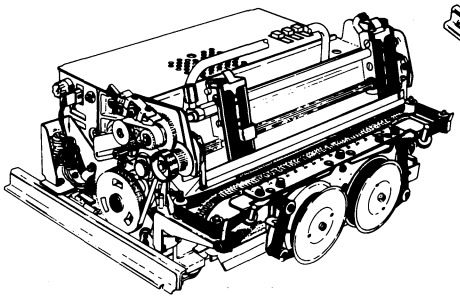
80-Column Friction Feed Printer (40P101/ZZ)



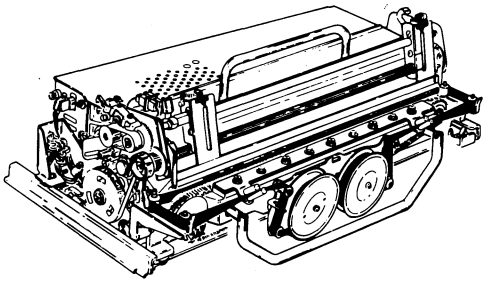
80-Column Friction Feed Printer With Noise Reduction Features (40P102/ZZ)



80-Column Forms Access Printer (40P253/ZZ)



80-Column Tractor Feed Printer (40P153/ZZ, 40P154/ZZ)



132-Column Tractor Feed Printer (40P201/ZZ, 40P202/ZZ, 40P203/ZZ and 40P204/ZZ)

Fig. 1

2. DESCRIPTION

2.01 The DATASPEED 40 Printers consist of major subassemblies and related parts (refer to Fig. 2, 3, 4, and 5). The printers are capable of operating on a 50 or 60 hertz line. This feature is determined by a sprocket on the left end of the motor shaft (refer to Fig. 2 and Section 582-210-702.

80-Column Friction Feed Printer

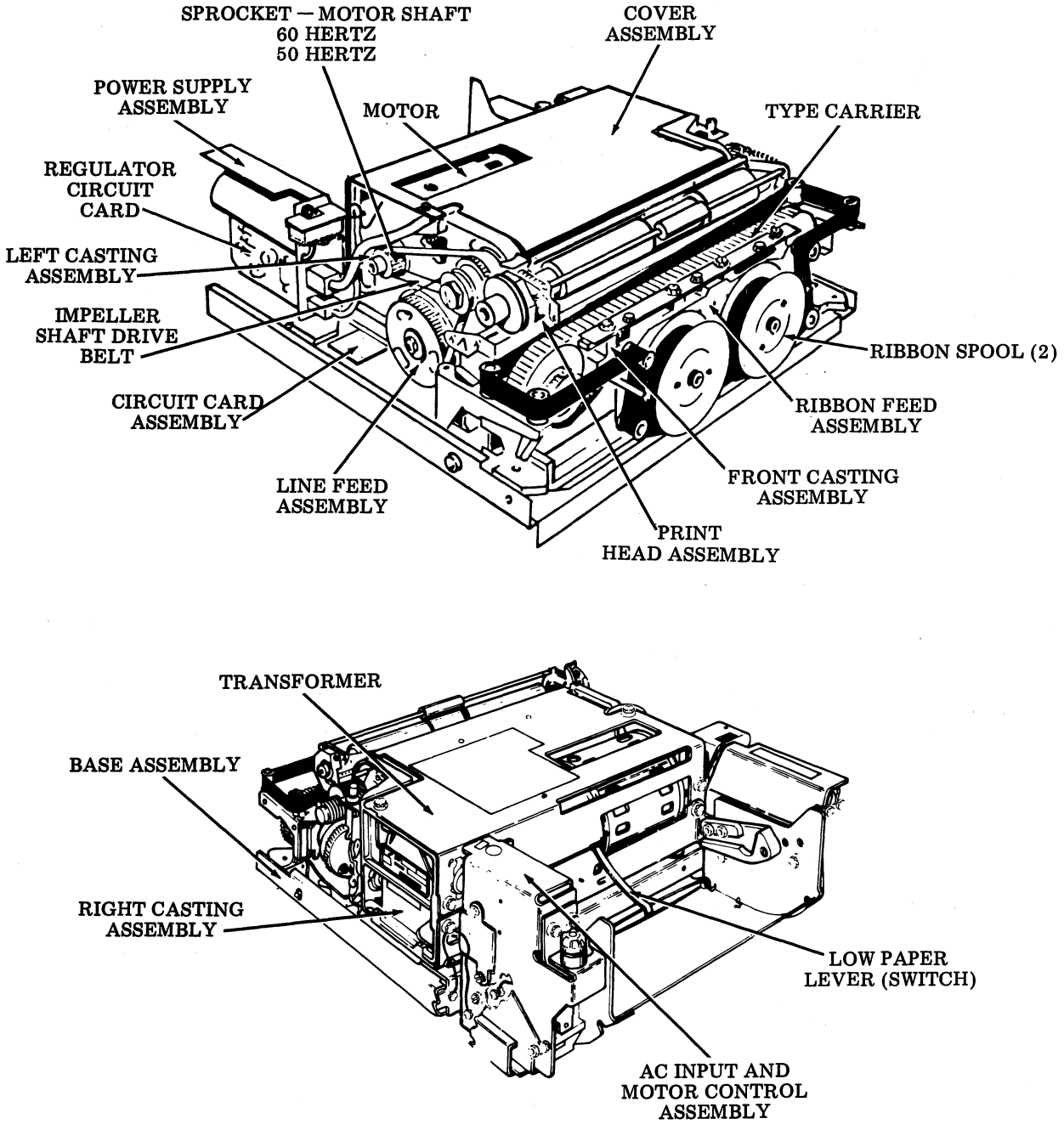
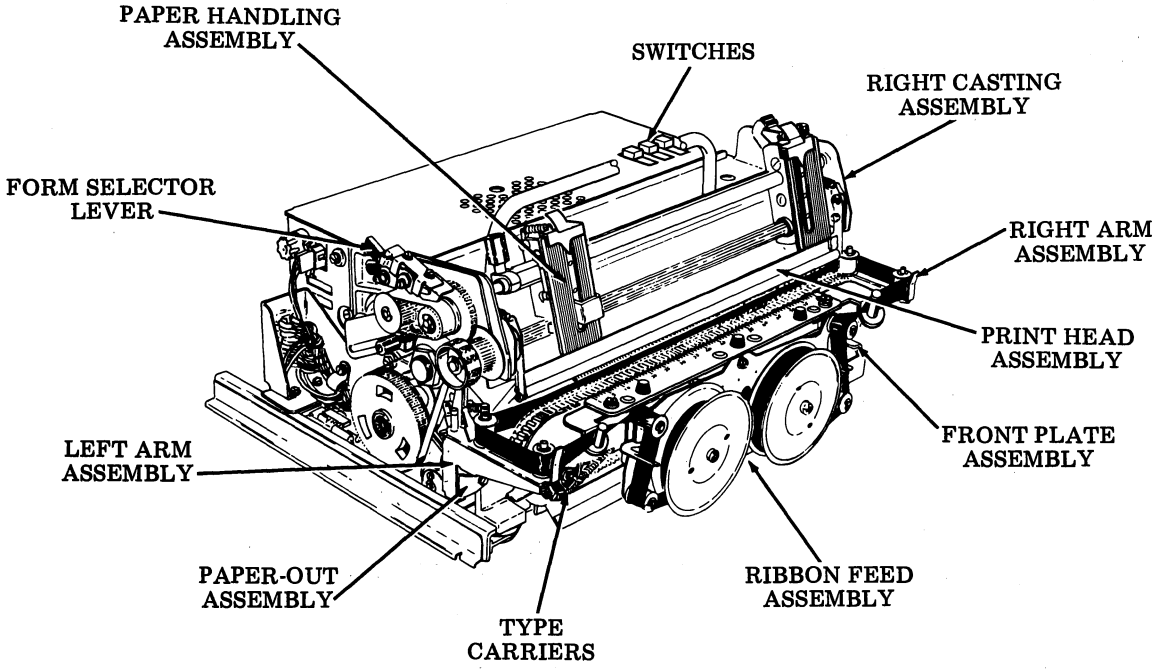


Fig. 2

80-Column Tractor Feed Printer



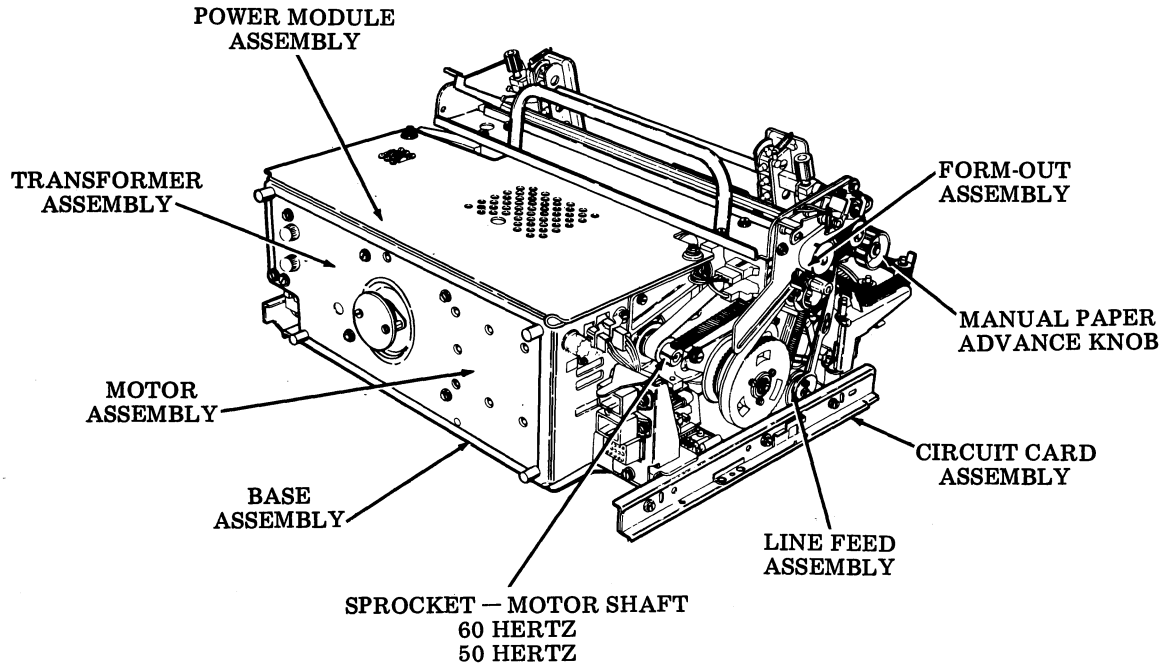
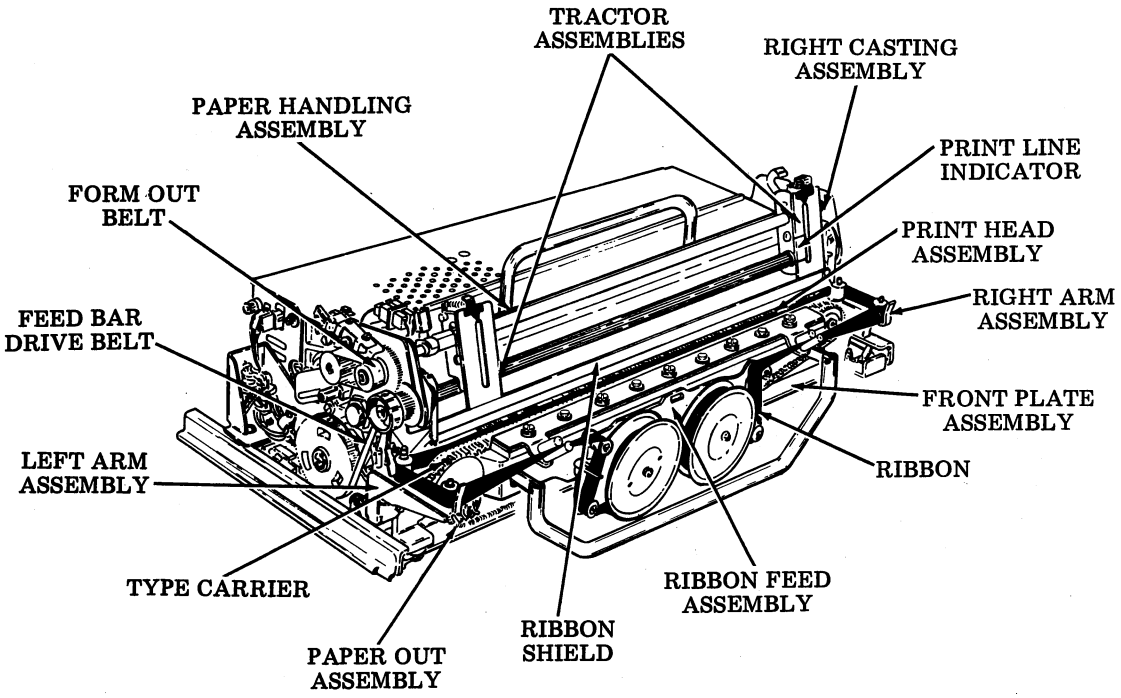


Fig. 3

132-Column Tractor Feed Printer



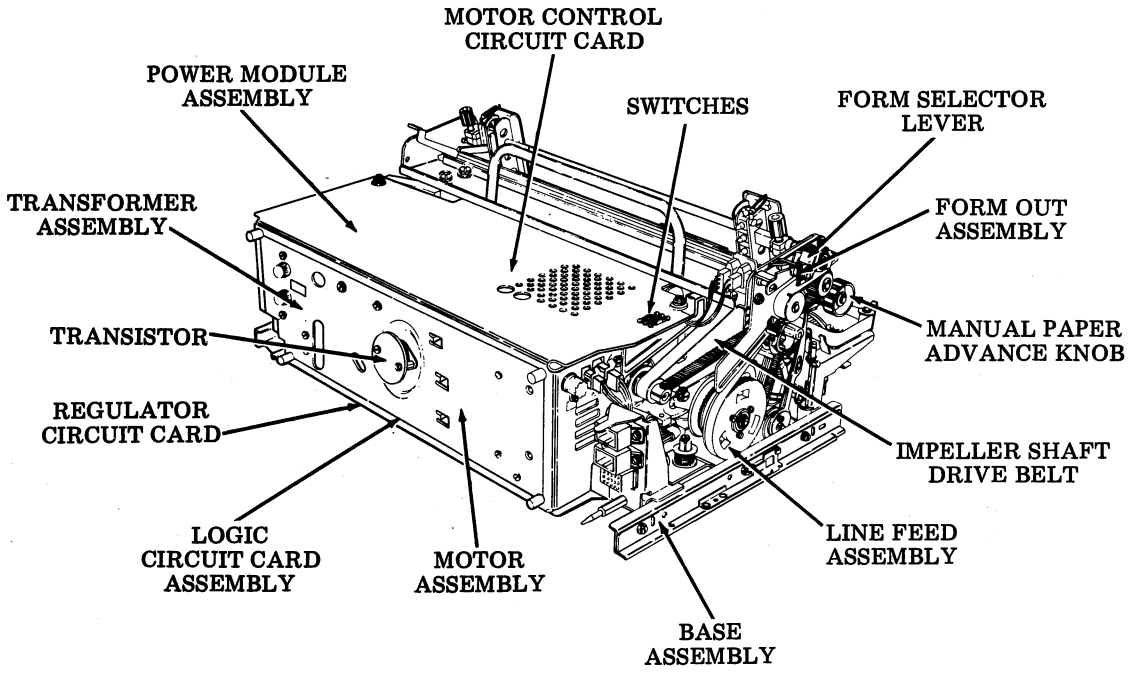


Fig. 4

80-Column (Tractor Feed) Forms Access Printer

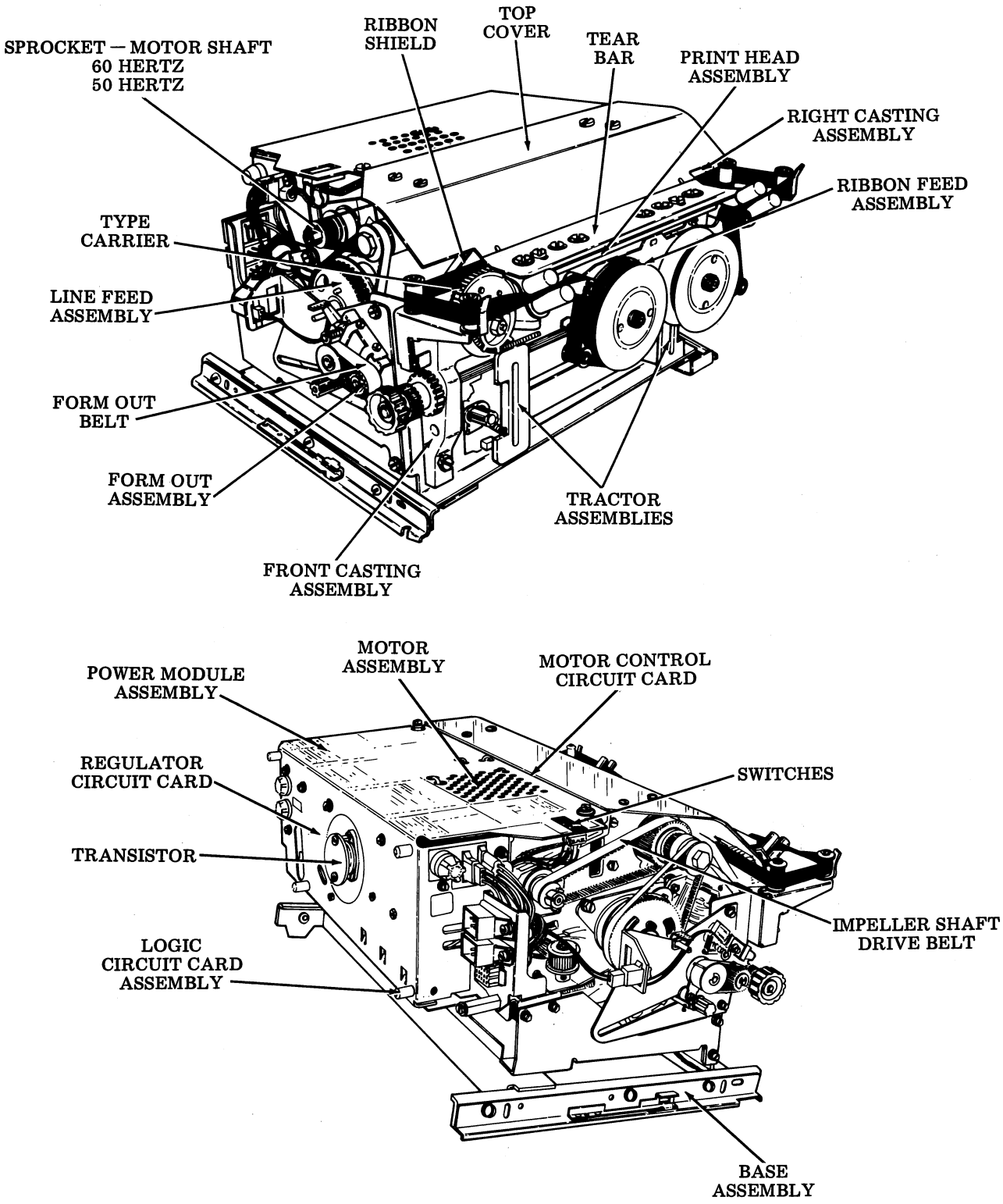


Fig. 5

CONTROLS

A. Cabinet Mounted Printer Controls (Tractor Feed Printer Cabinets)

Forms Advance Key

2.02 Local forms advance key may be provided on the cabinet (Fig. 6). If the form switch (Fig. 7) on the printer cover is set to OFF, and the form advance key operated, paper feeds out as long as the key is operated. If the form switch on the cover is set to ON and the form advance key operated, the form will feed out and stop at the next form stop. The SSI line must be connected for this key to be operational when a 410640 or 410729 printer logic card is used. When a 410071, 410076 or a 410072 logic card is used, the SSI line need not be connected.

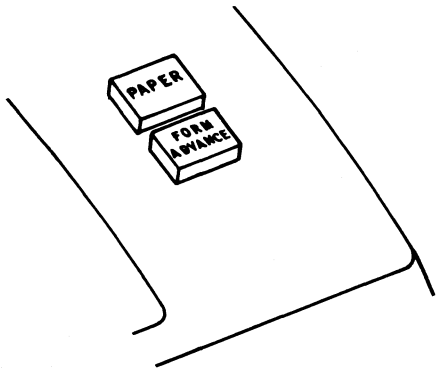


Fig. 6—Paper/Forms Advance Keys on Cabinet

2.03 Local paper advance key may be provided on the cabinet (Fig. 6). If the paper advance key is operated, the paper will feed out as long as the key is operated. The SSI line must be connected for this key to be operational when a 410640 or 410729 printer logic card is used. When a 410071, 410076 or a 410072 logic card is used, the SSI line need not be connected. The paper key will illuminate when a paper out condition is present.

B. Single/Double Line Feed Switch

2.04 The line feed (LF) switch (Fig. 7) allows the printer to function, giving one or two line feeds on the new line command. The automatic paper feedout of 16 lines is not affected.

C. Test Switch

2.05 The test switch (Fig. 7) when operated to the ON position will turn the printer motor on and print the error font symbol ( ) ( ) in every column position (80 or 132) allowed by a line feed. The right hand printer margin Option 17 is overridden when a 410640 or 410729 printer logic is used. When the printer is operating with a 410071, 410072, or 410076 logic card, the number of column positions printed must correspond with the left and right hand margin (Option 17) selected. The SSI Interface from the controller is blinded.

D. Forms Switch

2.06 The forms switch (Fig. 7) (tractor feed only) when in the ON position, enables the form out mechanism to operate on receipt of a form feed signal. When the forms switch is in the OFF position, receipt of a form feed signal results in a new line. If the option switches are set for paper feed out and for paper feed out on receipt of ETX, and the forms switch is in the ON position, the form out mechanism will also operate if the printer is taken out of the RECEIVE MESSAGE STATE or upon receipt of ETX.

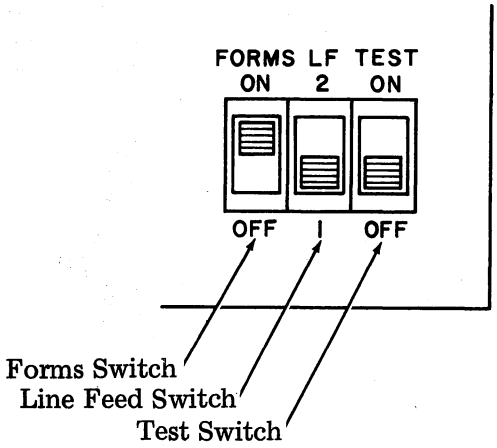


Fig. 7—Switches On Printer Cover

E. Manual Paper Advance

2.07 The manual paper advance knob (tractor feed) Fig. 8 when pulled out disengages the form tractor drive shaft from the gear permitting free movement of the forms when turning the knob.

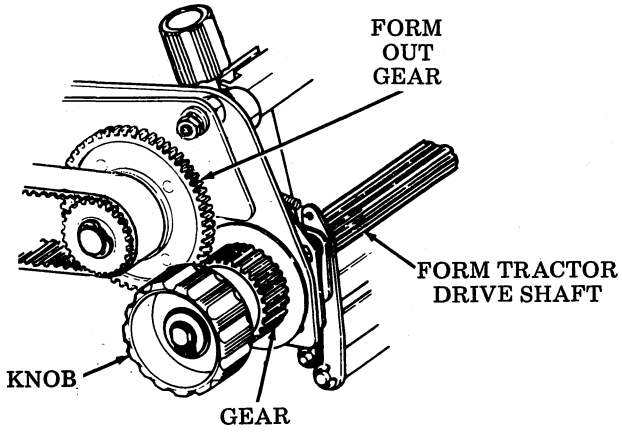


Fig. 8—Manual Paper Advance Knob

F. Paper Out/Low Paper Switch (Fig. 9)

Paper Out Switch (Tractor Feed Printer)

2.08 If a paper out condition occurs while copy is being printed, the printing stops, and sends an appropriate signal to the sender to stop transmission when Option 48a is chosen or 410640 logic card is used. The printer will not accept a new message until the paper supply has been replenished. When Option 48b is used the end of form feed contact located on the form out mechanism is gated with paper out switch so that "end of form feed" has precedence over "paper out" switch. This option is not available on 410640 logic cards. Provision is also made to light a paper out light if such has been provided on the cabinet.

Low Paper Switch (Friction Feed Printer)

2.09 If a low paper (about ten feet left on roll) condition occurs while copy is being printed, a Low Paper indicator light (Fig. 10) will turn on, but printing will continue to the end of the transmission. The printer will not accept a new message until the paper supply has been replenished.

G. Thermal Overload Switch

2.10 The thermal overload switch is provided to correct an overcurrent or a stalled condition due to excessive heating, at the motor. The switch will trip at overload causing the reset button to pop out. The manual reset button can be reached through its access hole (Fig. 11 and 12) in the cover plate (a screwdriver or other slender tool may be used to reach through this hole). The condition that caused the overload must be corrected before resetting the switch.

Note: Early production friction printers used a motor with an automatic thermal protector. If the motor experienced an overload condition the protector opened to disconnect motor power. Reset was automatic after sufficient cooling had taken place.

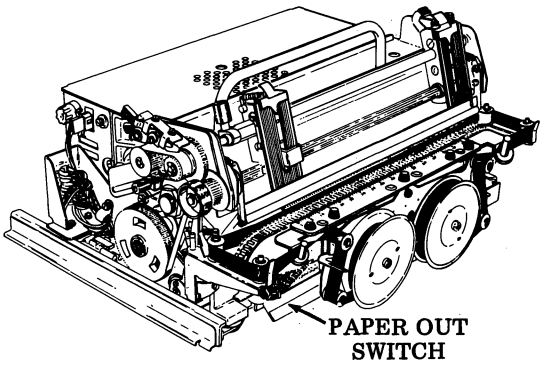


Fig. 9—Paper Out Switch (Tractor Feed Printer)

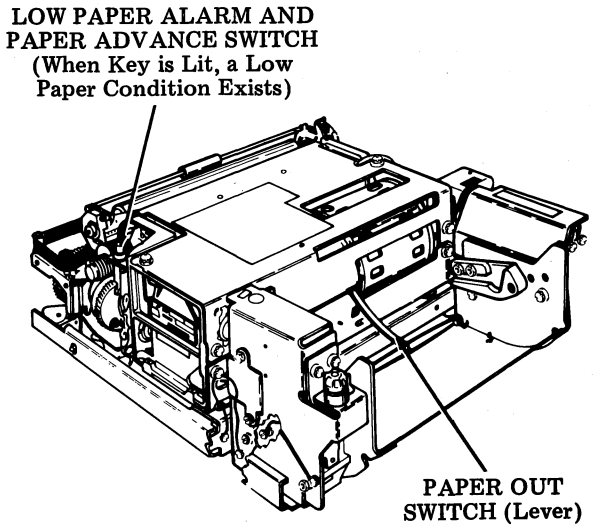


Fig. 10—Low Paper Switch
(Friction Feed Printer)

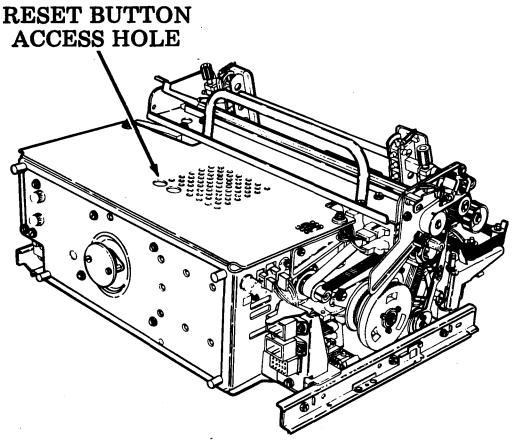


Fig. 11—Reset Button Access Hole
(Tractor Feed Printer)

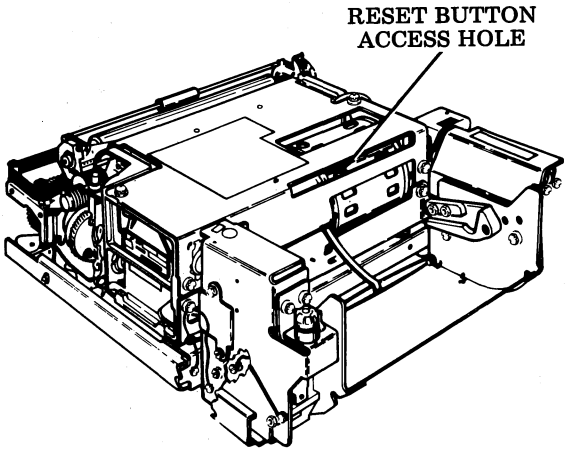


Fig. 12—Reset Button Access Hole
(Friction Feed Printer)

H. Form Selector Lever (Tractor Feed Printer)

2.11 The form selector lever (Fig. 13) when operated positions the form out contact in relation to one of four tracks on the belt depending on the particular form length desired.

I. Interlock Switch Connection

2.12 Two of the pins in the printer connector at the left rear of the (Fig. 14a) (tractor feed printer) and a two pin connector at the right rear side, (Fig. 14b) (friction feed printer) are provided for connection to cover interlock switch so that the printer will not operate with the cabinet cover open. Cabinet covers have this interlocking feature to insure the safety of the operator. For servicing purposes, this switch must be closed to allow operation on the bench if the cover is open. Electrically, the interlock switch has the effect of placing the printer into the paper out condition when the cabinet cover is open. With forms access cabinets there are 3 interlock (See Fig. 15) switches. One interlock for each door and one for the cover.

Note: The cabinet cover interlock switch disconnects the motor relay only. To disconnect primary ac power, operate a power switch which should be incorporated in any cabinet or other housing.

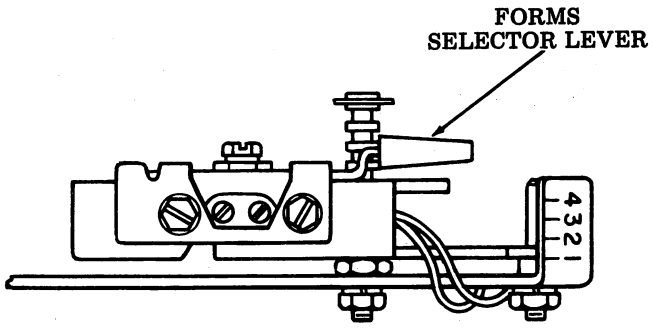


Fig. 13

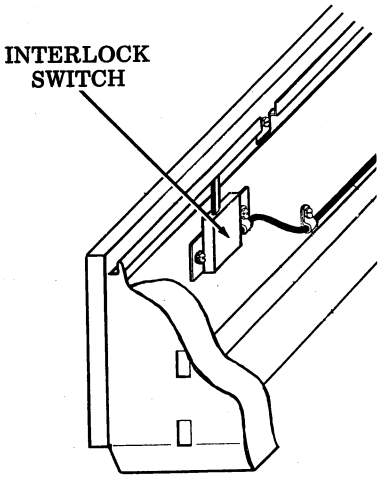


Fig. 14a

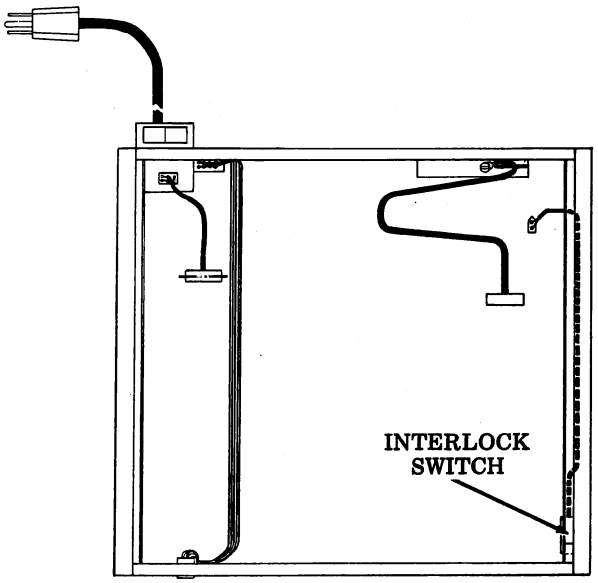


Fig. 14b

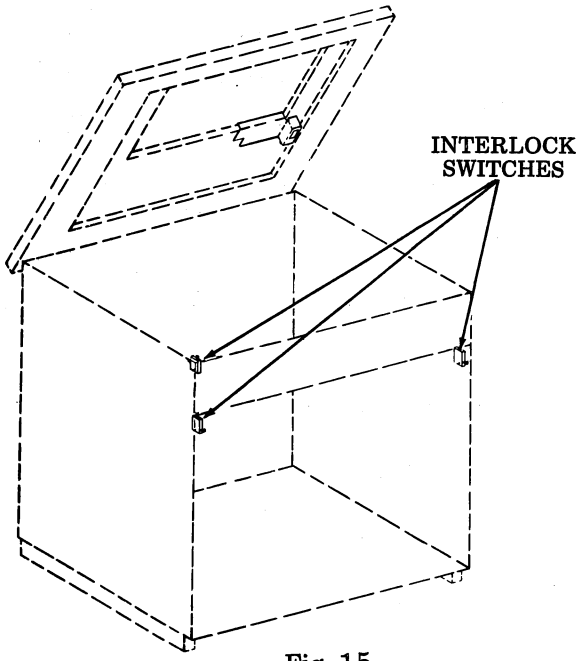


Fig. 15

FEATURES

A. Character and Line Spacing

2.13 Characters are spaced at ten characters per inch horizontally and lines are spaced at six or eight lines per inch vertically. The eight per inch line spacing printer is intended for use with the line feed setting at 2, giving four lines per inch for use with taller characters. (Tractor feed only).

B. Line Length

2.14 The maximum line length is 80 or 132 characters. An installer option on 410640 or 410729 logic cards will allow the right hand margin to be moved to the left by deleting up to 7 or 11 character positions by exercising various switch combinations located on the main logic card. See Fig. 16. Printers with 410071, 410072, or 410076 logic cards, feature left and right hand margin. Refer to Option 17.

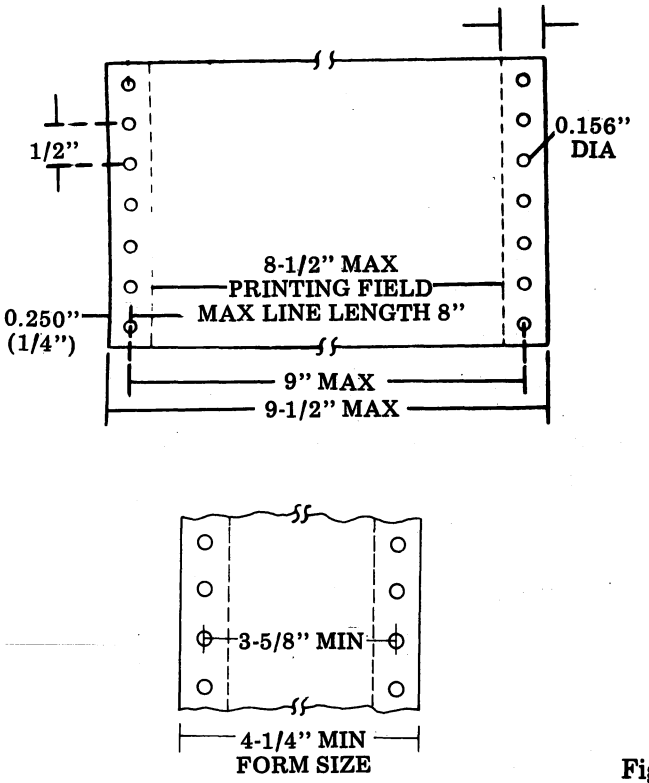
C. Variable Form Widths (Tractor Feed Printers)

2.15 The printer will accommodate sprocket feed paper with widths from 3-5/8 inches to 9 inches (80 column) and 3-5/8 inches to 14-1/2 inches (132 column). The left and right tractor assemblies are adjustable left to right to align with sprocket holes in the paper. See Fig. 16.

D. Variable Form Length (Tractor Feed Printer)

2.16 The printer will accommodate sprocket feed paper lengths from 2-1/2 inches to 22 inches. Length of forms is determined by the color of the form out belt and the position of the form selector lever. See Fig. 17.

80-Column Tractor Feed Printer



132-Column Tractor Feed Printer

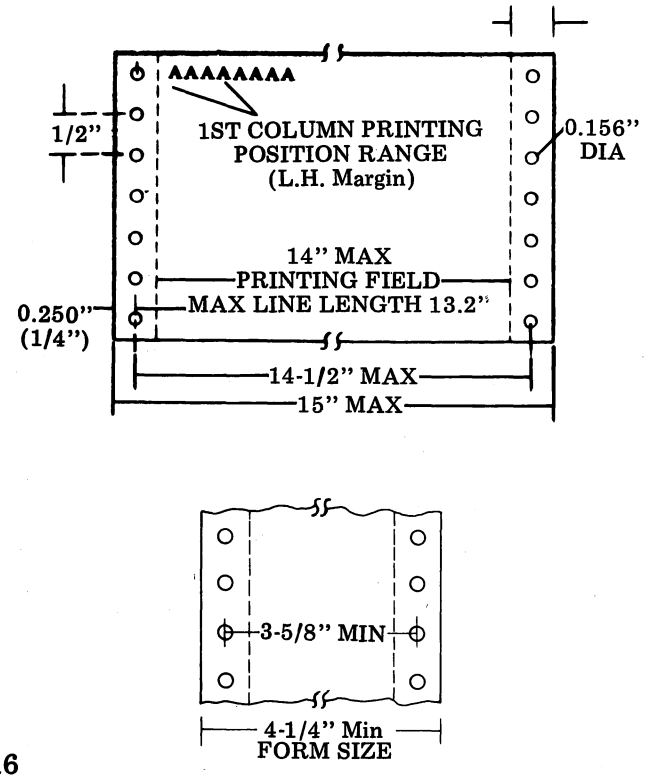
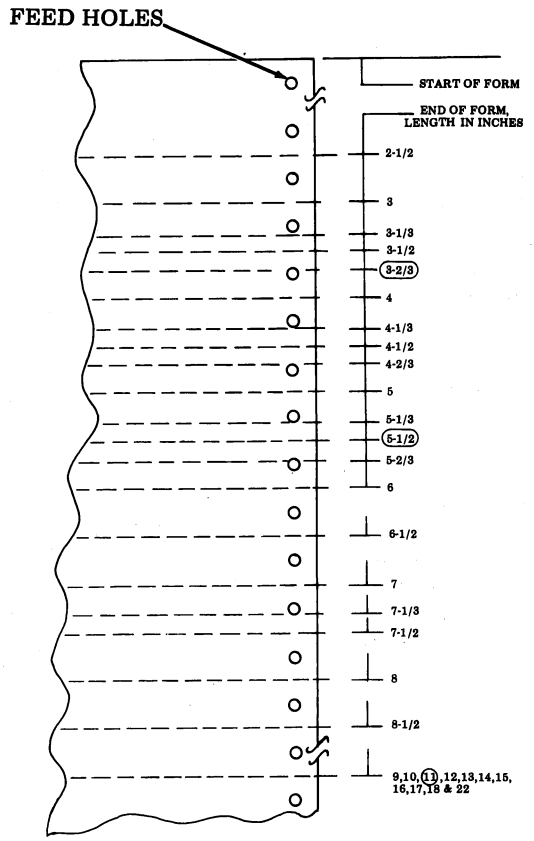


Fig. 16

Tractor Feed Printers



Enclosed form lengths are standard (blue belt).

Fig. 17

E. Form Out Belts (Tractor Feed Printers)

2.17 Ten different belts are available, see Table A. The belts are color coded to aid in identification. The form selector lever (Fig. 18) should be positioned to the proper setting for the desired form length.

F. Variable First Character Printing (Tractor Feed Printers)

2.18 The left tractor assembly is movable from side to side so that the first character can be aligned with its location on a form. The first character position center line can be brought to 0.300 inches of the center line of the left sprocket holes and can be shifted up to 0.925 inches (80 column) or 1.000 inches (132 column) from the left sprocket holes, or a little over 6 characters shift to the right. See Fig. 19.

TABLE A

Form Selector Setting				TP Part No.	Color of Belt
4	3	2	1		
Length of Form, Inches					
3-1/3†	2-1/2	5	10	402571	Amber
3-2/3†	2-3/4 *	5-1/2	11	402572	Dk Blue
4	3	6	12	402573	Yellow
4-1/3†	3-1/4 *	6-1/2	13	402574	Brown
4-2/3†	3-1/2	7	14	402575	Red
5	3-3/4 *	7-1/2	15	402576	Pink
5-1/3†	4	8	16	402577	Lt Green
5-2/3†	4-1/4 *	8-1/2	17	402578	Dk Green
6	4-1/2	9	18	402579	Lt Blue
7-1/3†	5-1/2	11	22	402580	White

*Not operable on 6 to the inch line spacing.
†Not operable on 8 to the inch line spacing printers.

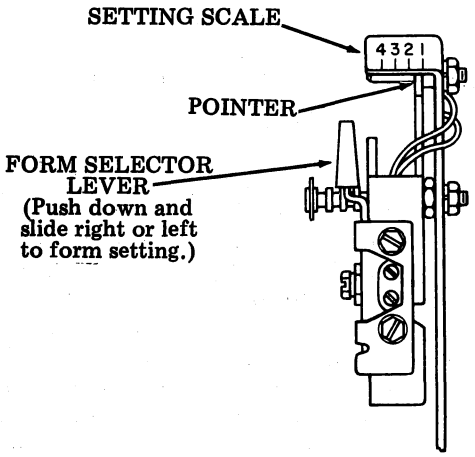


Fig. 18—Form Out Assembly (Left Side)

80-Column Tractor Feed Printer

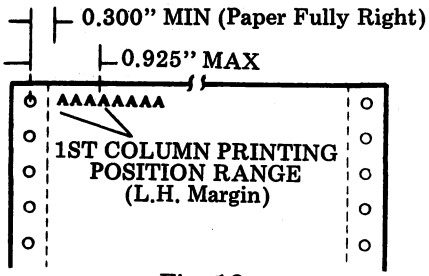


Fig. 19

132-Column Tractor Feed Printer

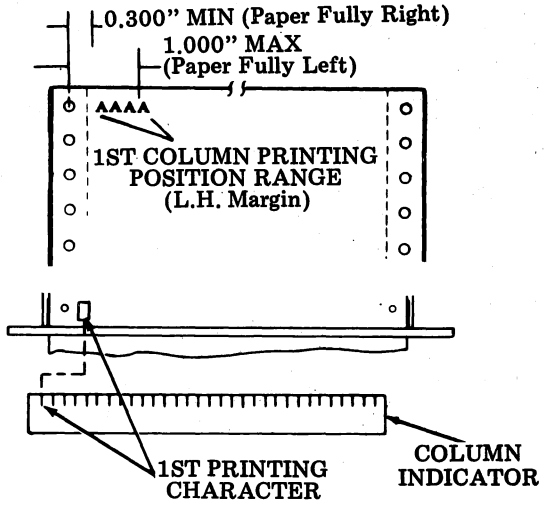


Fig. 19 (Cont)

G. Alignment Clip (Tractor Feed Printer)

2.19 The blue alignment clip on the tractor assembly, (left tractor — 80 column) (right tractor — 132 column) is used to align the first printed line on the form. By positioning the paper so that the first line is just above the paper guide ① and the top of the alignment clip ② position to any reference mark on the form (or mark with pencil). Moving the paper down so that the reference mark aligns with the bottom of the clip ③ will align the form for the desired first line printing. See Fig. 20. On forms access printers, the form is considered in the "home" position when the perforated tear line is directly behind the tear bar.

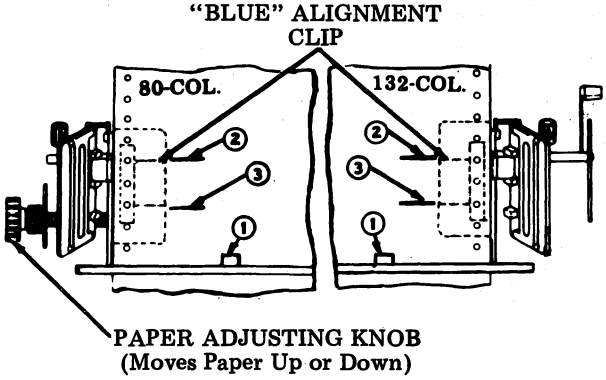


Fig. 20

H. Structure of Character Set (s) on Type Carrier

2.20 Character Sets are mounted on a continuous type carrier which has 192 (80 column) or 288 (132 column) individual type pallet slots. These slots are filled with type pallets for the characters of one or more character sets. Every character set on the type carrier begins with a slot reserved for the font identification symbol type pallet. (Space position in ASCII code.) This pallet identifies the font set by means of two alpha characters on the face of the pallet, and is also used as an optional substitution for a character received with incorrect parity or for an unavailable character. The alpha characters are intended for direct viewing of the pallet for identification purposes, and when printed will appear on the paper as a mirror image. The balance of the graphic set characters follow in increasing binary order according to the ASCII code.

I. Length of Character Fonts

80 Column

2.21 The type carrier is usually equipped with either three 64 character fonts or two 96 character fonts (192 slots total). However, fonts of different lengths may be used in the same type carrier for special purposes, subject to the restrictions listed below:

132 Column

The type carrier is usually structured with three 96 character font sets or four and a half 64 character font sets (four full 64 character font sets plus the first 32 characters of a fifth set). Fonts of differing lengths may be used in a type carrier for special purposes, subject to the following restrictions:

(a) If the longest font is <u>not</u> 64 or 96 characters, only two different lengths may be used as required to fill up the carrier, with any left over carrier slots to follow immediately after the longest font and to be filled with font identification pallets. All slots should be filled.

(b) However, if the longest font is either 64 or 96 characters, any number of font sets may be used, including as much of a particular font as is necessary to completely fill any empty slots. Shorter character fonts are simply subsets of the longest character font starting at SPACE and continuing in increasing binary order according to the ASCII code. The shorter fonts may be terminated on any character.

(c) The longest character font must contain at least 48 characters. Since the ASCII code does not contain a meaningful 48 character font, external code conversion may be required if such a font length is used as the longest font in the carrier. A signal "flag" is affixed to a pallet located so that counting starts at the sensor mechanism as the Space position nears the first print hammer. There is one flag for each font in the carrier.

J. Printing Rate

2.22 Two full lines of data are stored in the printer electronics, allowing one line of data to be printed while the next line of data is being accumulated. Printing of characters begins as soon as data is received, even though the line has not yet been filled. A new line character ends the filling of one line storage register and two new line characters end the filling of both storage registers. Characters are printed in the order in which the proper type pallet on the type carrier aligns with the proper column position. When a group of characters is in storage, simultaneous printing of several of these characters in different column positions is a possibility. Although the type carrier and printing mechanism always operate at the same rate, the printing rate (in lines per second) of the printer is related to the size of the character font being used. The maximum time (T) in milliseconds to print one line is equal to 2.56N + 32 ms., where N is the maximum number of characters in the graphic character font. For the columns 2 through 5 of ASCII (63 graphics plus a leading position), T = 2.56 x 64 + 32 or 196 ms. and for the full ASCII graphic character font T = 2.56 x 96 + 32 or 278 ms. This equates to 306 lines per minute and 216 lines per minute respectively for those two graphic character fonts. If there are no printed characters on a line, and if continuous line feeds are received, they are executed at approximately a 32 ms. rate which equates to 1875 lines per minute.

2.23 If a carrier has fonts of unequal lengths, any line containing characters found only in the longest font may require an entire carrier revolution of 192 or 288 characters in order to print the line. Allow 522 ms. (80 column) or 770 ms. (132 column) (115 lines per minute rate) before the next LF character. (T = 2.56 x 192 + 32).

2.24 When the printer is set to double line feed (as in 4 lines per inch printer) the time in milliseconds for a printed line is T = 2.56N + 52 ms.

K. Data Stacking

2.25 Exceeding the printing rate described above will result in data stacking. Data stacking is a recovery procedure which allows the printer to accept and print data when new line characters are received faster than the rate indicated above until the formatting fault has been found and corrected. If data stacking occurs, new line (LF) characters are ignored and the graphic characters are printed serially, line after line, until the minimum line length or time fill is received. During data stacking, the length of the line is dependent upon the size of the printer character font and the rate of reception from the communication line. For example, if the printer is equipped with the graphics in columns 2 through 5 of ASCII and is receiving data from a 1200 baud, asynchronous line (10 units per character), characters will be arriving at the printer at the rate of 120 per second.

2.26 Since 196 ms. is the maximum time required to print on line under the above conditions, receipt of a minimum of 24 characters or equivalent time fill will ensure that data is not stacked.(Refer to Table B). If lines are shorter than this minimum length, the printer will extend the printed line to approximately 24 characters (depending upon the particular character received) before printing the next line, as shown in Table C. When the data stacking recovery procedure occurs, some compromise of data may take place. The nature and frequency of this compromise are dependent upon incoming data rate and printing rate.

TABLE B

Minimum Number of Characters per line without formatting before "Data Stacking" occurs - Some Common Speeds (10 bits per character).

INPUT SIGNAL LINE SPEED BAUD	64 CHARACTER TYPE FONT		96 CHARACTER TYPE FONT		192 CHARACTER TYPE FONT	
	(80)	(132)	(80)	(132)	(80)	(132)
9600	*	+	*	+	*	+
4800	*	+	*	+	*	+
3000	60	84	*	84	*	+
2400	48	67	67	67	*	+
1200	24	34	34	34	63	93
1050	21	30	30	30	55	81
600	12	17	17	17	31	47
300	6	9	9	9	16	24
150	3	5	5	5	8	12
100	2	3	3	3	6	8
75	2	3	3	3	4	6
66	2	2	2	2	4	6
60	2	2	2	2	3	5

Usually "New Line" (Line Feed), Carriage Return, Delete, etc. characters are inserted at the end of each line. These would subtract on a one for one basis from the characters per line shown.

The minimum number of characters per line exceeds 80 characters (*), or 132 characters (+) therefore, Data Transmission to the Printer must be under control of SSI RNC or OEM DNC.

TABLE C

Examples of Printed Copy with Data Stacking

Received Form of Data	Printed Form of Data
LISTING OF TERMS ALARM CHARACTER FIELD LINE FIELD PAGE PROTECTED CHARACTER SCREEN TAB MARK	LISTING OF TERMSALARM CHARACTER FIELDLINE FIELD PAGEPROTECTED CHAR ACTERSCREENTAB MARK (Format may vary)

L. Control Characters-Recognition

2.27 The ASCII control characters LF, VT, CR and ETX are recognized by the printer which responds as follows (other control characters received by the printer are discarded):

LF — The LINE FEED character causes a new line command (carriage return and line feed) to be executed.

VT — The VERTICAL TAB character performs the same function as the LINE FEED character.

Tractor Feed

FF — The FORM FEED character causes form out to be executed if the FORMS switch is on. If the FORMS switch is off, the FORM FEED character performs the same function as the LINE FEED character.

Friction Feed

The FORM FEED character performs the same function as the LINE FEED character.

CR — The printer has the capability to perform a carriage return without line feed to facilitate the underline or overprint of data. For maximum printing rate considerations, the line terminated with CR and the data following it, that is to be overprinted, are considered to be two separate lines of information.

ETX — A printer option (18c) enables a paper feedout of approximately 16 line feeds upon detection of the END OF TEXT character.

M. Consecutive Form Feed

2.28 If consecutive form feed commands are received from the SSI or EIA interface, the form out mechanism will respond only to the first form feed command. No additional form feed commands can be executed until the form has been moved at least one additional line past the form out stop position.

N. 50/60 Hertz Operation

2.29 If the unit is to be operated from a 50 Hertz power source the 400280 motor pulley must be interchanged with the 400282 motor pulley stored at the left rear side of the printer.

O. Logic Card Options

2.30 The printer options are for the most part located on the printer logic circuit. A functional explanation is given herein for printer options. The options have assigned numbers that are consistent throughout the DATASPEED 40 literature. Refer to the appropriate station BSP for all applicable options.

2.31 The following general instructions and procedures are to be applied in implementing the options in the printer logic.

(a) All numbers associated with the options are assigned and apply only to that option.

(b) Turn off all power to the printer.

(c) Locate the circuit card that contains the option to be activated.

(d) Remove circuit card if it is a 410640 or 410076 (Refer to BSP Section 582-210-200). If circuit card is a 410072 or 410729 or 410071 the option switches are accessible on the bottom of printer without card removal.

(e) Locate the proper option switch or screw and activate as required.

(f) Replace the circuit card in its proper location. Refer to BSP Section 582-210-200.

(g) When all options have been selected, perform a checkout of the printer to verify proper operation of the option.

2.32 A number of different switches have been used to option cards. Fig. 21 shows rocker switches (A), and toggle switches (B), and their respective ON/OFF positons.

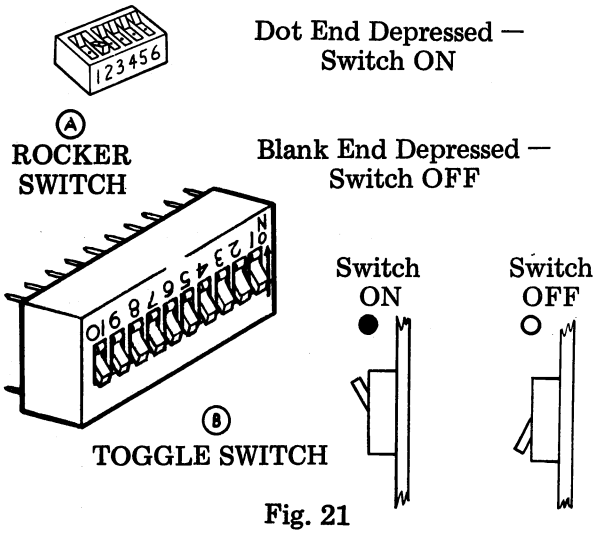


Fig. 21

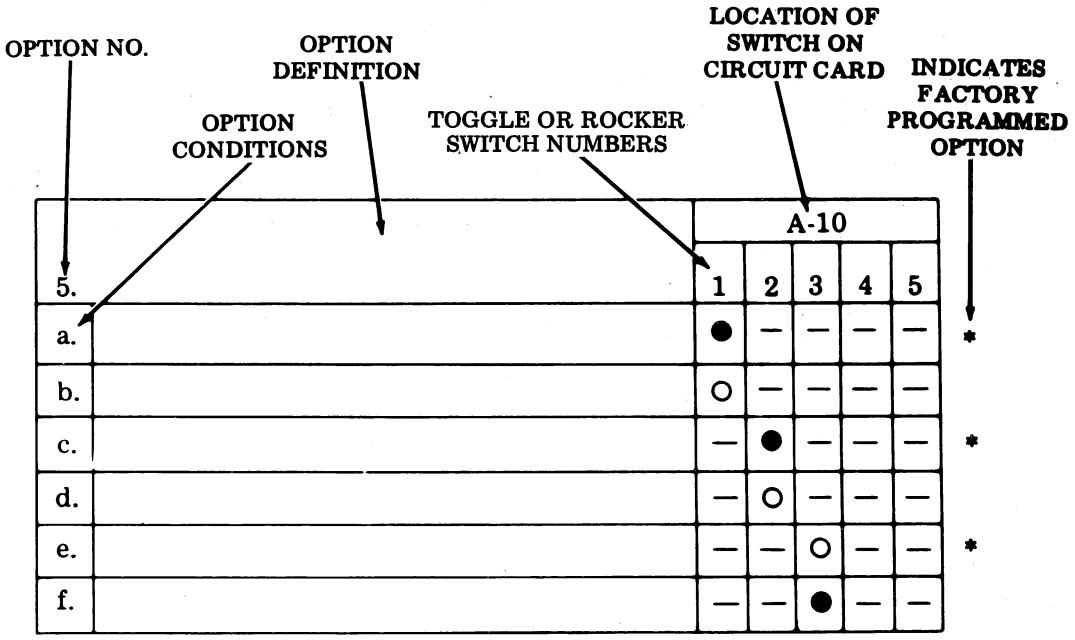
2.33 Options are presented in a tabulor format as illustrated in Fig. 22.

Option 17 — Printer Margin and Form Width

2.34 The maximum line width is 80 or 132 characters. The option will allow the right hand margin to be moved a maximum of 7 (410640 circuit card), 11 (410729 circuit card), 55 (410071 and 410076 circuit cards) or 59

(410072 circuit card) character positions to the left. The left hand margin can be moved a maximum of 13 character positions when using the 410071, 410072 or 410076 circuit cards. The left hand margin is fixed for the 410640 or 410729 circuit card.

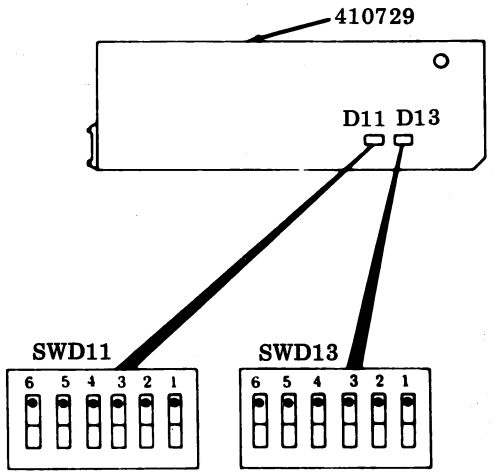
2.35 The printer circuit cards (Fig 23) are viewed from beneath printer. Access to switches is through a cutout in bottom pan of printer, except for 410640 or 410076 where card removal is necessary.



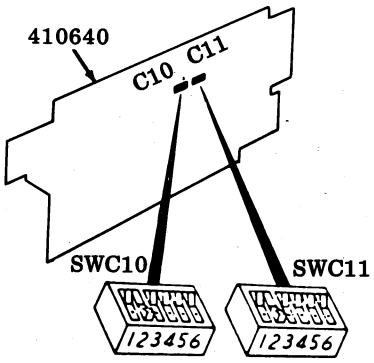
Legend:

● Indicates switch ON — dot end of rocker switch depressed.
○ Indicates switch OFF — blank end of rocker switch depressed.
— Switch position does not affect option.
* Factory programmed.

Fig. 22

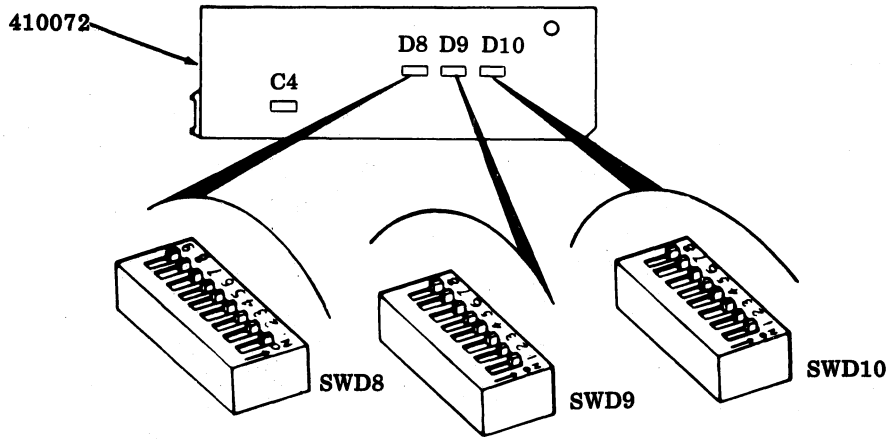


410729 — 132-Column Printer Logic Circuit Card Noncomponent Side

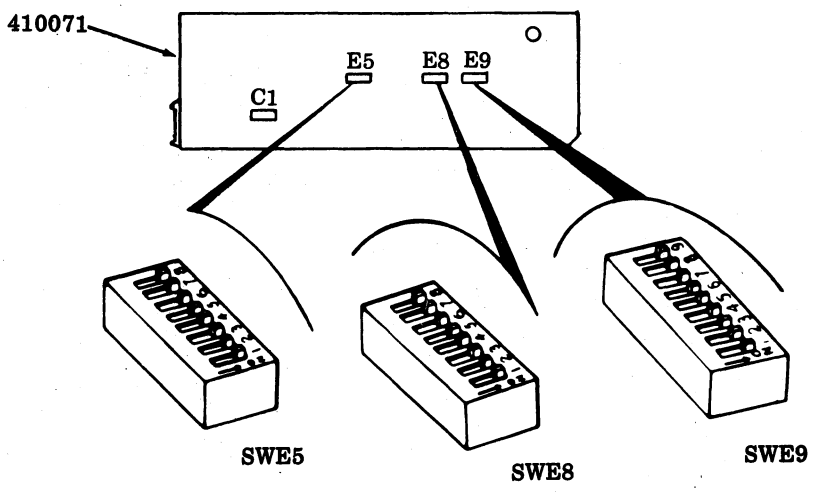


410640 — 80-Column Printer Logic Circuit Card Component Side

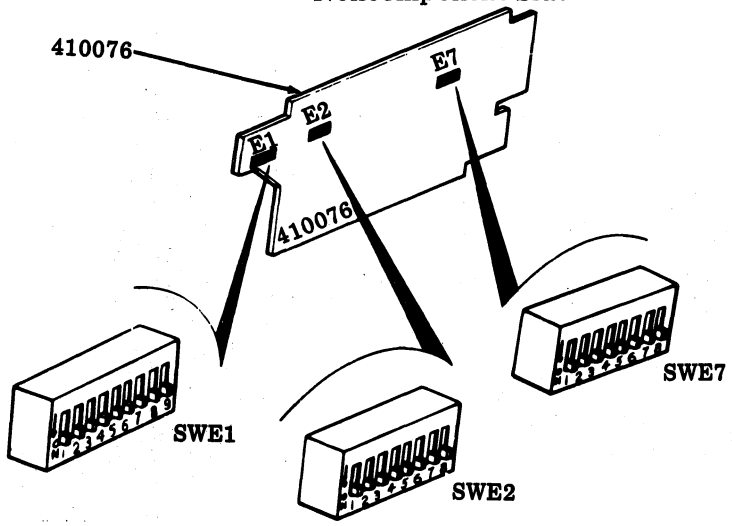
Fig. 23.



410072 — 132-Column Printer Logic Circuit Card
Noncomponent Side



410071 — 80-Column Printer Logic Circuit Card
Noncomponent Side



410076 — 80-Column Printer Logic Circuit Card
Component Side
Fig. 23 (Cont)

410640 — 80-Column Printer Logic Circuit Card

17. Printer Margin and Form Width		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
c.	Last Character on 80th Column	—	—	—	—	—	—	O	●	●	O	—	—	*
d.79.	Last Character on 79th Column	—	—	—	—	—	—	O	●	●	●	—	—	
d.78.	Last Character on 78th Column	—	—	—	—	—	—	●	O	O	●	—	—	
d.77.	Last Character on 77th Column	—	—	—	—	—	—	●	O	●	O	—	—	
d.76.	Last Character on 76th Column	—	—	—	—	—	—	●	O	●	●	—	—	
d.75.	Last Character on 75th Column	—	—	—	—	—	—	●	●	O	●	—	—	
d.74.	Last Character on 74th Column	—	—	—	—	—	—	●	●	●	O	—	—	
d.73.	Last Character on 73rd Column	—	—	—	—	—	—	●	●	●	●	—	—	

Note: Options 17a and 17b are not used.

410729 — 132-Column Printer Logic Circuit Card

17. Printer Margin and Form Width		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
e.	Last Character on Column 132	—	—	—	—	—	—	O	O	O	●	—	—	*
f.131.	Last Character on Column 131	—	—	—	—	—	—	O	O	●	O	—	—	
f.130.	Last Character on Column 130	—	—	—	—	—	—	O	O	●	●	—	—	
f.129.	Last Character on Column 129	—	—	—	—	—	—	O	●	O	●	—	—	
f.128.	Last Character on Column 128	—	—	—	—	—	—	O	●	●	O	—	—	
f.127.	Last Character on Column 127	—	—	—	—	—	—	O	●	●	●	—	—	
f.126.	Last Character on Column 126	—	—	—	—	—	—	●	O	O	●	—	—	
f.125.	Last Character on Column 125	—	—	—	—	—	—	●	O	●	O	—	—	
f.124.	Last Character on Column 124	—	—	—	—	—	—	●	O	●	●	—	—	
f.123.	Last Character on Column 123	—	—	—	—	—	—	●	●	O	●	—	—	
f.122.	Last Character on Column 122	—	—	—	—	—	—	●	●	●	O	—	—	
f.121.	Last Character on Column 121	—	—	—	—	—	—	●	●	●	●	—	—	

Note: Options 17a, 17b, 17c and 17d are not used.

410076 — 80-Column Printer Logic Circuit Card

17. Printer Left Margin and Form Width		E7								
		1	2	3	4	5	6	7	8	
a.	First Printed Column — Column 1	—	—	●	●	●	●	—	—	*
b.2.	First Printed Column — Column 2	—	—	●	●	O	●	—	—	
b.3.	First Printed Column — Column 3	—	—	●	●	O	O	—	—	
b.4.	First Printed Column — Column 4	—	—	●	O	O	O	—	—	
b.5.	First Printed Column — Column 5	—	—	O	O	●	O	—	—	
b.6.	First Printed Column — Column 6	—	—	O	O	O	●	—	—	
b.7.	First Printed Column — Column 7	—	—	O	●	O	O	—	—	
b.8.	First Printed Column — Column 8	—	—	●	O	●	O	—	—	
b.9.	First Printed Column — Column 9	—	—	O	O	●	●	—	—	
b.10.	First Printed Column — Column 10	—	—	O	●	O	●	—	—	
b.11.	First Printed Column — Column 11	—	—	●	●	●	O	—	—	
b.12.	First Printed Column — Column 12	—	—	●	O	O	●	—	—	
b.13.	First Printed Column — Column 13	—	—	O	●	●	O	—	—	

* Factory programmed.

410076 — 80-Column Printer Logic Circuit Card

17.	Printer Right Margin and From Width	E1									E2								E7								
	Last Char Printed Column Number	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
c.	80	—	—	—	—	O	●	—	●	O	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	*
d. (X)	73 61 49 37 25	—	—	—	—	●	●	—	●	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	74 62 50 38 26	—	—	—	—	●	●	—	●	O	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	75 63 51 39 27	—	—	—	—	●	●	—	O	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	76 64 52 40 28	—	—	—	—	●	O	—	●	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	77 65 53 41 29	—	—	—	—	●	O	—	●	O	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	78 66 54 42 30	—	—	—	—	●	O	—	O	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	79 67 55 43 31	—	—	—	—	O	●	—	●	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	68 56 44 32	—	—	—	—	O	●	—	●	O	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	69 57 45 33	—	—	—	—	O	●	—	O	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	70 58 46 34	—	—	—	—	O	O	—	●	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	71 59 47 35	—	—	—	—	O	O	—	●	O	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	
	72 60 48 36	—	—	—	—	O	O	—	O	●	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	

To obtain counts:

73 through 80 program as shown.
61 through 72 program as shown, then operate E7 position 2 to OFF.
49 through 60 program as shown, then operate E7 position 1 to OFF.
37 through 48 program as shown, then operate E2 position 7 to OFF.
25 through 36 program as shown, then operate E2 position 8 to OFF.

(X) Indicates desired column number.

410072 — 132-Column Printer Logic Circuit Card

17.	Printer Left Margin and Form Width	D8									
		1	2	3	4	5	6	7	8	9	
a.	First Printed Column — Column 1	—	—	●	●	●	●	—	—	—	*
b.2.	First Printed Column — Column 2	—	—	●	●	O	●	—	—	—	
b.3.	First Printed Column — Column 3	—	—	●	●	O	O	—	—	—	
b.4.	First Printed Column — Column 4	—	—	●	O	O	O	—	—	—	
b.5.	First Printed Column — Column 5	—	—	O	O	●	O	—	—	—	
b.6.	First Printed Column — Column 6	—	—	O	O	O	●	—	—	—	
b.7.	First Printed Column — Column 7	—	—	O	●	O	O	—	—	—	
b.8.	First Printed Column — Column 8	—	—	●	O	●	O	—	—	—	
b.9.	First Printed Column — Column 9	—	—	O	O	●	●	—	—	—	
b.10.	First Printed Column — Column 10	—	—	O	●	O	●	—	—	—	
b.11.	First Printed Column — Column 11	—	—	●	●	●	O	—	—	—	
b.12.	First Printed Column — Column 12	—	—	●	O	O	●	—	—	—	
b.13.	First Printed Column — Column 13	—	—	O	●	●	O	—	—	—	

410072 — 132-Column Printer Logic Circuit Card

17.	Printer Right Margin and Form Width	D8									D9								D10								
	Last Char Printed Column Number	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
e.	132	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	O	—	O	O	—	—	—	*
f.(X)	121 109 97 85 73	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	●	—	●	●	—	—	—	
	122 110 98 86 74	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	O	●	—	●	●	—	—	—	
	123 111 99 87 75	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	O	—	●	●	—	—	—	
	124 112 100 88 76	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	●	—	O	●	—	—	—	
	125 113 101 89 77	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	O	●	—	O	●	—	—	—	
	126 114 102 90 78	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	O	—	O	●	—	—	—	
	127 115 103 91 79	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	●	—	●	O	—	—	—	
	128 116 104 92 80	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	O	●	—	●	O	—	—	—	
	129 117 105 93 81	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	O	—	●	O	—	—	—	
	130 118 106 94 82	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	●	—	O	O	—	—	—	
	131 119 107 95 83	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	O	●	—	O	O	—	—	—	
	120 108 96 84	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	●	●	O	—	O	O	—	—	—	

To obtain counts:

121 through 132 program as shown.
109 through 120 program as shown, then operate D9 position 7 OFF.
97 through 108 program as shown, then operate D9 position 8 OFF.
85 through 96 program as shown, then operate D8 position 7 OFF.
73 through 84 program as shown, then operate D8 position 8 OFF.

(X) Indicates desired column number.

* Factory programmed.

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

17.	Printer Left Margin and Form Width	E5								
		1	2	3	4	5	6	7	8	
a.	First Printed Column — Column 1	—	—	●	●	●	●	—	—	*
b.2.	First Printed Column — Column 2	—	—	●	●	○	●	—	—	
b.3.	First Printed Column — Column 3	—	—	●	●	○	○	—	—	
b.4.	First Printed Column — Column 4	—	—	●	○	○	○	—	—	
b.5.	First Printed Column — Column 5	—	—	○	○	●	○	—	—	
b.6.	First Printed Column — Column 6	—	—	○	○	○	●	—	—	
b.7.	First Printed Column — Column 7	—	—	○	●	○	○	—	—	
b.8.	First Printed Column — Column 8	—	—	●	○	●	○	—	—	
b.9.	First Printed Column — Column 9	—	—	○	○	●	●	—	—	
b.10.	First Printed Column — Column 10	—	—	○	●	○	●	—	—	
b.11.	First Printed Column — Column 11	—	—	●	●	●	○	—	—	
b.12.	First Printed Column — Column 12	—	—	●	○	○	●	—	—	
b.13.	First Printed Column — Column 13	—	—	○	●	●	○	—	—	

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

17.	Printer Right Margin and From Width																										
	Last Char Printed Column Number	E9									E5								E8								
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
c.	80	○	●	—	●	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	*
d. (X)	73 61 49 37 25	●	●	—	●	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	74 62 50 38 26	○	●	—	●	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	75 63 51 39 27	●	○	—	●	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	76 64 52 40 28	●	●	—	○	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	77 65 53 41 29	○	●	—	○	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	78 66 54 42 30	●	○	—	○	●	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	79 67 55 43 31	●	●	—	●	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	68 56 44 32	○	●	—	●	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	69 57 45 33	●	○	—	●	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	70 58 46 34	●	●	—	○	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	71 59 47 35	○	●	—	○	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	
	72 60 48 36	●	○	—	○	○	—	—	—	—	●	—	—	—	—	—	●	●	—	—	—	—	—	—	—	●	

To obtain counts:

73 through 80 program as shown.
61 through 72 program as shown, then operate E8 position 8 to OFF.
49 through 60 program as shown, then operate E5 position 1 to OFF.
37 through 48 program as shown, then operate E5 position 7 to OFF.
25 through 36 program as shown, then operate E5 position 8 to OFF.

(X) Indicates desired column number.
* Factory programmed.

Option 18 — Printer Paper Feedout

2.36 The paper feedout option allows for one of three conditions to exist at the printer. They are, no paper feedout, paper feedout on loss of DSR (Data Set Ready), or RM (Receive Message) and paper feedout on loss of DSR or RM or receipt of ETX. The "no paper feedout" option is used when no message separation is required. The "paper feedout on DSR or RM Loss" option is used when separation between each message or series of messages is required. The "paper feedout on DSR or ETX" option is used when separation after each message and after each reception is required. Table D lists the printer responses obtained when Option 18 and the manual controls are used. Regardless of any Opton 18 chosen, line feed or manual paper advance will cause line feed (s).

TABLE D

Printer Logic Card	Form Advance On ETX Option Switch And Setting		Form Advance On DSR or RM Loss Option Switch And Setting		Option Number	Printer Form Switch Setting		PRINTER RESPONSE: Form Feed on ETX	Paper Advance on ETX (16 lines)	Form Feed or Manual Form Advance causes Form Feed	Form Feed or Manual Form Advance causes Line Feed (s)	Form Feed on RM Loss or DSR OFF	Paper Advance on RM or DSR Loss (16 lines)	
410071 410072	E8 - 2 D9 - 2		E8 - 3 D9 - 3			ON	OFF							
	ON	OFF	ON	OFF										
	-	-	x		18a	x		NO	NO	YES	NO	NO	NO	
	x		x		18a		x	NO	NO	NO	YES	NO	NO	
410076 410640 410729	E2 - 6 C11 - 6 D13 - 1		E1 - 1 C10 - 1 D11 - 1											
	ON	OFF	ON	OFF										
		x	x		18a	x		NO	NO	YES	NO	NO	NO	
		x	x		18a		x	NO	NO	NO	YES	NO	NO	
410071 410072 410076 410640 410729	E8 - 2 D9 - 2 E2 - 6 C11 - 6 D13 - 1		E8 - 3 D9 - 3 E1 - 1 C10 - 1 D11 - 4											
	ON	OFF	ON	OFF										
		x		x	18b	x		NO	NO	YES	NO	YES	NO	
		x		x	18b		x	NO	NO	NO	YES	NO	YES	
	x			x	18c	x		YES	NO	YES	NO	YES	NO	
	x			x	18c		x	NO	YES	NO	YES	NO	YES	

410640 — 80-Column Printer Logic Circuit Card

18. Printer Paper Feedout		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	No Paper Feedout	●	—	—	—	—	—	—	—	—	—	—	○	
b.	Paper Feedout on DSR or RM Loss — 16 Lines or One Form	○	—	—	—	—	—	—	—	—	—	—	○	
c.	Paper Feedout on DSR or RM Loss or receipt of ETX — 16 Lines or One Form	○	—	—	—	—	—	—	—	—	—	—	●	*

410729 — 132-Column Printer Logic Circuit Card

18. Printer Paper Feedout		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	No Paper Feedout	—	—	●	—	—	—	—	—	—	—	—	○	
b.	Paper Feedout on DSR or RM Loss — 16 Lines or One Form	—	—	○	—	—	—	—	—	—	—	—	○	
c.	Paper Feedout on DSR or RM Loss or Receipt of ETX — 16 Lines or One Form	—	—	○	—	—	—	—	—	—	—	—	●	*

410076 — 80-Column Printer Logic Circuit Card

18. Printer Paper Feedout		E1									E2								
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	
a.	No Paper Feedout	●	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	
b.	Paper Feedout on DSR or RM Loss — 16 Lines or One Form	○	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	
c.	Paper Feedout on DSR or RM Loss or receipt of ETX — 16 Lines or One Form	○	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	*

410072 — 132-Column Printer Logic Circuit Card

18. Printer Paper Feedout		D9								
		1	2	3	4	5	6	7	8	
a.	No Paper Feedout	—	—	●	—	—	—	—	—	
b.	Paper Feedout on DSR or RM Loss — 16 Lines or One Form	—	○	○	—	—	—	—	—	
c.	Paper Feedout on DSR or RM Loss or Receipt of ETX — 16 Lines or One Form	—	●	○	—	—	—	—	—	*

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

18. Printer Paper Feedout		E8								
		1	2	3	4	5	6	7	8	
a.	No Paper Feedout	—	—	●	—	—	—	—	—	
b.	Paper Feedout on DSR or RM Loss — 16 Lines or One Form	—	○	○	—	—	—	—	—	
c.	Paper Feedout on DSR or RM Loss or Receipt of ETX — 16 Lines or One Form	—	●	○	—	—	—	—	—	*

* Factory programmed.

Option 19a, b, c — Printer Errored Character Symbol

2.37 Two switches provide the following three parity options:

No parity check — The 8th bit of the ASCII code is ignored. It may be either mark or space. No parity error symbol (font identifier) will be printed.

Even parity —The 8th bit is checked for even parity. The error symbol (font identifier) is printed for all characters received with odd parity.

Odd parity —The 8th bit is checked for odd parity. The error symbol (font identifier) is printed for all characters received with even parity.

Option 19d, e, f, g — Character Set

2.38 The remaining switches are set according to the type carrier used in the printer.

2.39 The type carrier used in the printer will usually be structured with either 64 or 96 character sets. The switch settings must match with the type carrier being used.

2.40 If a character unavailable for printing (not in the character set on the printer) is received, the printer will search through two font sets and then print an error symbol (font identifier) on the third attempt to locate the unavailable character. This search procedure will take approximately 320 milliseconds.

2.41 If the proper character set option switch is selected to match the type carrier set being used, the search procedure is eliminated and the error symbol is printed in place of the unavailable character immediately.

2.42 Table E shows the printer:

(a) Logic card Teletype Part Number

(b) Option switch position and setting.

(c) Printer response when a 64 or 96 character set is received.

Maximum Number of Characters in Character Set

2.43 The 96 character set option (19.d.) is arranged to print the 94 graphics defined by the second through seventh bits of the ASCII code.

2.44 The 64 character set option (19.e.) is arranged to print the 63 graphics defined by the second through fifth bits of the ASCII code.

2.45 The 192 character set option (19.f.) allows for character sets longer than 96 characters. Characters with the 8th bit marking are treated as printing characters of the extended ASCII set.

TABLE E

LOGIC CARD NUMBER	OPTION SWITCH POSITION		PRINTER RESPONSE
410071 410072 410076 410640 410729	E8 - 6 D8 - 2 E2 - 4 C10 - 3 D11 - 5	E8 - 5 D8 - 1 E2 - 5 C10 - 2 D11 - 6	
64 (or less) Character Set	On On	Off On	Error symbol printed immediately in place of unavailable character
	Off Off	On Off	Error symbol printed after second attempt to locate character (approx. 320 ms.)
96 Character Set	On Off	Off On	Error symbol printed immediately-because 64 character max switch is closed
	Off Off	On Off	Proper character is printed.
If a character unavailable in a 96 character Set is received (extended ASCII for example) and the printer is equipped with a 96 character set type carrier	Off	Off	Proper character is printed if extended ASCII option switch is selected. Error symbol if not extended ASCII.
	On Off On	On On Off	Error symbol printed.

410640 — 80-Column Printer Logic Circuit Card

19. Printer Errored Character Symbol		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	Printed on Even Parity Error	–	–	–	●	○	–	–	–	–	–	–	–	*
b.	Printed on Odd Parity Error	–	–	–	○	●	–	–	–	–	–	–	–	
c.	Not Printed on Parity Error	–	–	–	●	●	–	–	–	–	–	–	–	
d.	Printers With 96-Character Set	–	●	○	–	–	–	–	–	–	–	–	–	
e.	Printers With 64-Character Set	–	○	●	–	–	–	–	–	–	–	–	–	
f.	Printers With Extended ASCII Character Set (No Parity Check)	–	○	○	–	–	–	–	–	–	–	–	–	

410729 — 132-Column Printer Logic Circuit Card

19. Printer Errored Character Symbol		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Printed on Even Parity Error	–	–	–	●	○	–	–	–	–	–	–	–	*
b.	Printed on Odd Parity Error	–	–	–	○	●	–	–	–	–	–	–	–	
c.	Not Printed on Parity Error	–	–	–	●	●	–	–	–	–	–	–	–	
d.	Printers With 96-Character Set	●	○	–	–	–	–	–	–	–	–	–	–	
e.	Printers With 64-Character Set	○	●	–	–	–	–	–	–	–	–	–	–	
f.	Printers With Extended ASCII Character Set (No Parity Check)	○	○	–	–	–	–	–	–	–	–	–	–	
g.	Printers With Longest Char. Set Having Less Than 64 Char.	○	●	–	–	–	–	–	–	–	–	–	–	

410076 — 80-Column Printer Logic Circuit Card

19. Printer Errored Character Symbol		E1									
		1	2	3	4	5	6	7	8	9	
a.	Printed on Even Parity Error	–	–	●	○	–	–	–	–	–	*
b.	Printed on Odd Parity Error	–	–	○	●	–	–	–	–	–	
c.	Not Printed on Parity Error	–	–	●	●	–	–	–	–	–	

19. Character Set		E2							
		1	2	3	4	5	6	7	8
d.	Printers With 96-Character Set	–	–	–	○	●	–	–	–
e.	Printers With 64-Character Set	–	–	–	●	○	–	–	–
f.	Printers With Extended ASCII Character Set (No Parity Check)	–	–	–	○	○	–	–	–
g.	Printers With Longest Character Set Having Less Than 64 Characters	–	–	–	○	○	–	–	–

410072 — 132-Column Printer Logic Circuit Card

19. Printer Errored Character Symbol		D10								
		1	2	3	4	5	6	7	8	
a.	Printed on Even Parity Error	–	–	–	–	–	○	●	–	*
b.	Printed on Odd Parity Error	–	–	–	–	–	●	○	–	
c.	Printed on Parity Error	–	–	–	–	–	●	●	–	

19. Character Set		D8								
		1	2	3	4	5	6	7	8	9
d.	Printers With 96-Character Set	●	○	–	–	–	–	–	–	–
e.	Printers With 64-Character Set	○	●	–	–	–	–	–	–	–
f.	Printers With Extended ASCII Character Set (No Parity Check)	○	○	–	–	–	–	–	–	–
g.	Printers With Longest Character Set Having Less Than 64 Characters	○	○	–	–	–	–	–	–	–

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

19. Printer Errored Character Symbol		E9									
		1	2	3	4	5	6	7	8	9	
a.	Printed on Even Parity Error	–	–	–	–	–	○	●	–	–	*
b.	Printed on Odd Parity Error	–	–	–	–	–	●	○	–	–	
c.	Not Printed on Parity Error	–	–	–	–	–	●	●	–	–	

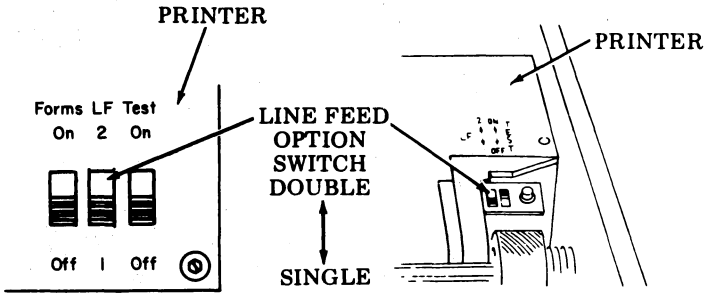
19. Character Set		E8							
		1	2	3	4	5	6	7	8
d.	Printers With 96-Character Set	–	–	–	–	●	○	–	–
e.	Printers With 64-Character Set	–	–	–	–	○	●	–	–
f.	Printers With Extended ASCII Character Set (No Parity Check)	–	–	–	–	○	○	–	–
g.	Printers With Longest Character Set Having Less Than 64 Characters	–	–	–	–	○	○	–	–

* Factory programmed.

Option 20 — Single/Double Line Feed

2.46 The LINE FEED 1, 2, slide switch (Fig. 24) enables the selection of one vertical line space between printed lines or two vertical line spaces between printed lines. Each line feed command from the printer logic to the line feed magnet is a 10ms current pulse of approximately 720 mA. The time required to execute one line feed command when the line feed switch is set at LF1 is 32ms. When LF2 is operated and a line feed command is executed the time required is 52ms.

20.	Line Feed on 80-Column Printer (See adjacent figure.)
a.	Single
b.	Double



80-Column Tractor Feed

80-Column Friction Feed

20.	Line Feed on 132-Column Printer (See figure below.)
a.	Single
b.	Double

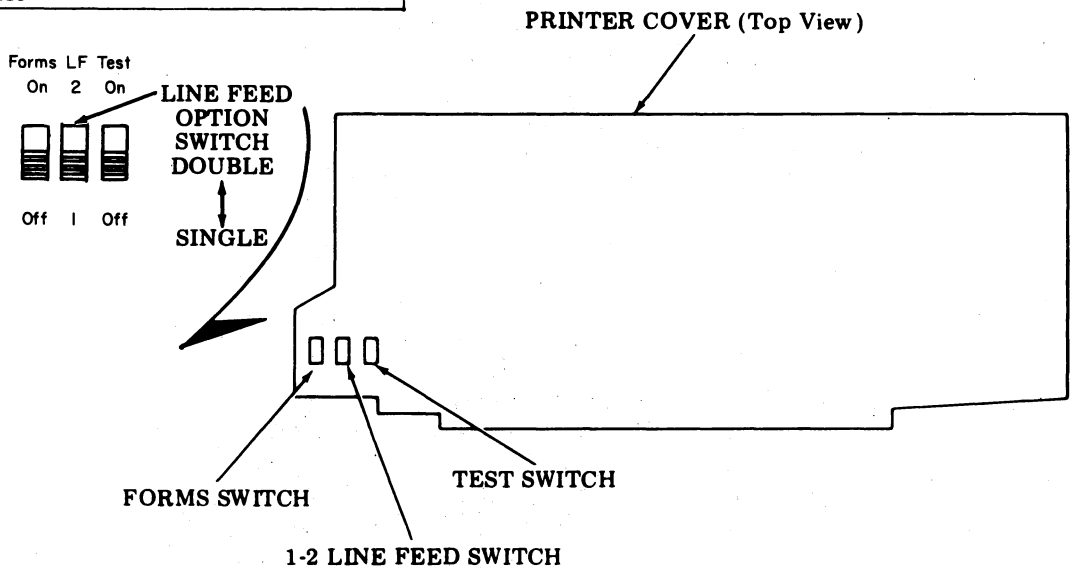


Fig. 24

Option 21 — Foldover on Up-Low Printer

2.47 When the printer is equipped with a 96 character set carrier, the foldover option (21b) may be selected to cause columns 6 and 7 of the ASCII CODE (lower case characters) to be printed whenever graphics from columns 4 and 5 (upper case characters) are received.

2.48 If the printer is equipped with a 96 character font set and Option 21a is selected, the lower case ASCII characters are printed as received.

Option 22 — Foldover on Monocase Printer

2.49 When the printer is equipped with a 64 character font set carrier, the lower case foldover option may be selected to cause columns 4 and 5 of the ASCII code (upper case characters) to be printed whenever graphics from columns 6 and 7 (lower case characters) are received. A printer using a 64 character font can thus intelligently print information received from a data source using a 96 character font (Option 22b). The following lower case characters will be printed as follows:

~	to	^
¦	to	\
{	to	[
}	to	]
`	to	@

2.50 If Option 22a is selected and lower case characters are received the errored character symbol will be printed.

410640 — 80-Column Printer Logic Circuit Card

21. Foldover on Up-Low Printer		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	Lower Case and Upper Case Print	—	—	—	—	—	—	—	—	—	—	O	—	*
b.	Lower Case Prints as Upper Case	—	—	—	—	—	—	—	—	—	—	●	—	

22. Foldover on Monocase Printer		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	Lower Case Not Folded Over	—	—	—	—	—	—	—	—	—	—	O	—	
b.	Lower Case Printed as Upper Case	—	—	—	—	—	—	—	—	—	—	●	—	*

410729 — 132-Column Printer Logic Circuit Card

21. Foldover on Up-Low Printer		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Lower Case and Upper Case Print	—	—	—	—	—	—	—	—	—	—	O	—	*
b.	Lower Case Prints as Upper Case	—	—	—	—	—	—	—	—	—	—	●	—	

22. Foldover on Monocase Printer		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Lower Case Prints as Error Symbol	—	—	—	—	—	—	—	—	—	—	O	—	
b.	Lower Case Prints as Upper Case	—	—	—	—	—	—	—	—	—	—	●	—	*

410076 — 80-Column Printer Logic Circuit Card

21. Foldover on Up-Low Printer		E2								
		1	2	3	4	5	6	7	8	
a.	Lower Case and Upper Case Print	—	—	O	—	—	—	—	—	*
b.	Lower Case Prints as Upper Case	—	—	●	—	—	—	—	—	

22. Foldover on Monocase Printer		E2								
		1	2	3	4	5	6	7	8	
a.	Lower Case Prints as Error Symbol	—	—	O	—	—	—	—	—	
b.	Lower Case Prints as Upper Case	—	—	●	—	—	—	—	—	*

* Factory programmed.

410072 — 132-Column Printer Logic Circuit Card

21. Foldover on Printers With 96-Character Set		D9								
		1	2	3	4	5	6	7	8	
a.	Lower Case and Upper Case	O	—	—	—	—	—	—	—	*
b.	Lower Case Prints as Upper Case	●	—	—	—	—	—	—	—	

22. Foldover on Printers With 64-Character Set		D9								
		1	2	3	4	5	6	7	8	
a.	Lower Case Prints as Error Symbol	O	—	—	—	—	—	—	—	
b.	Lower Case Prints as Upper Case	●	—	—	—	—	—	—	—	*

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

21. Foldover on Printers With 96-Character Set		E8								
		1	2	3	4	5	6	7	8	
a.	Lower Case and Upper Case Print	O	—	—	—	—	—	—	—	*
b.	Lower Case Prints as Upper Case	●	—	—	—	—	—	—	—	

22. Foldover on Printers With 64-Character Set		E8								
		1	2	3	4	5	6	7	8	
a.	Lower Case Prints as Error Symbol	O	—	—	—	—	—	—	—	
b.	Lower Case Prints as Upper Case	●	—	—	—	—	—	—	—	*

Option 23 — Extended ASCII on Printer

2.51 This option does not perform a parity check on the eighth bit of the ASCII character; instead, the eighth bit is treated as intelligence as in the extended ASCII character set.

410640 — 80-Column Printer Logic Circuit Card

23. Extended ASCII on Printer (Extended ASCII)		C10						C11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	†Prints Extended ASCII Characters (No Parity Check)	—	—	—	O	O	—	—	—	—	—	—	—	
b.	Does Not Print Extended Characters (See Option 19a, b, or c.)	—	—	—	—	—	—	—	—	—	—	—	—	*

†Option 23.a. requires local engineering.

410729 — 132-Column Printer Logic Circuit Card

23. Extended ASCII on Printer (Extended ASCII)		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Prints Extended ASCII Characters (No Parity Check)	—	—	—	O	O	—	—	—	—	—	—	—	
b.	Does Not Print Extended ASCII (See Option 19a, b, or c.)	—	—	—	(As in 19.)		—	—	—	—	—	—	—	*

* Factory programmed.

410076 — 80-Column Printer Logic Circuit Card

23. Extended ASCII on Printer (Extended ASCII)		E1									
		1	2	3	4	5	6	7	8	9	
a.	Prints Extended ASCII Characters (No Parity Check)	—	—	O	O	—	—	—	—	—	
b.	Does Not Print Extended ASCII (See Option 19a, b, or c.)	—	—	—	(As in 19.)		—	—	—	—	*

410072 — 132-Column Printer Logic Circuit Card

23. Extended ASCII on Printer (Extended ASCII)		D10								
		1	2	3	4	5	6	7	8	
a.	Prints Extended ASCII Characters (No Parity Check)	—	—	—	—	—	O	O	—	
b.	Does Not Print Extended ASCII (See Option 19a, b, or c.)	—	—	—	(As in 19.)		—	—	—	*

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

23. Extended ASCII on Printer (Extended ASCII)		E9									
		1	2	3	4	5	6	7	8	9	
a.	Prints Extended ASCII Characters (No Parity Check)	—	—	—	—	—	O	O	—	—	
b.	Does Not Print Extended ASCII (See Option 19a, b, or c.)	—	—	—	(As in 19.)		—	—	—	—	*

Option 39 — Forms Switch

2.52 The forms Switch Option (Fig. 25) is not available in friction feed printers. This switch will enable the Form Out feature when in the "ON" position.

Forms Switch (Under Tractor Feed Printer Cover) (80-Column Printer)

39. Forms (Tractor Feed Printer Only)		
a.	On	
b.	Off	*

Forms Switch (132-Column Printer)

39. Forms		
a.	On	
b.	Off	*

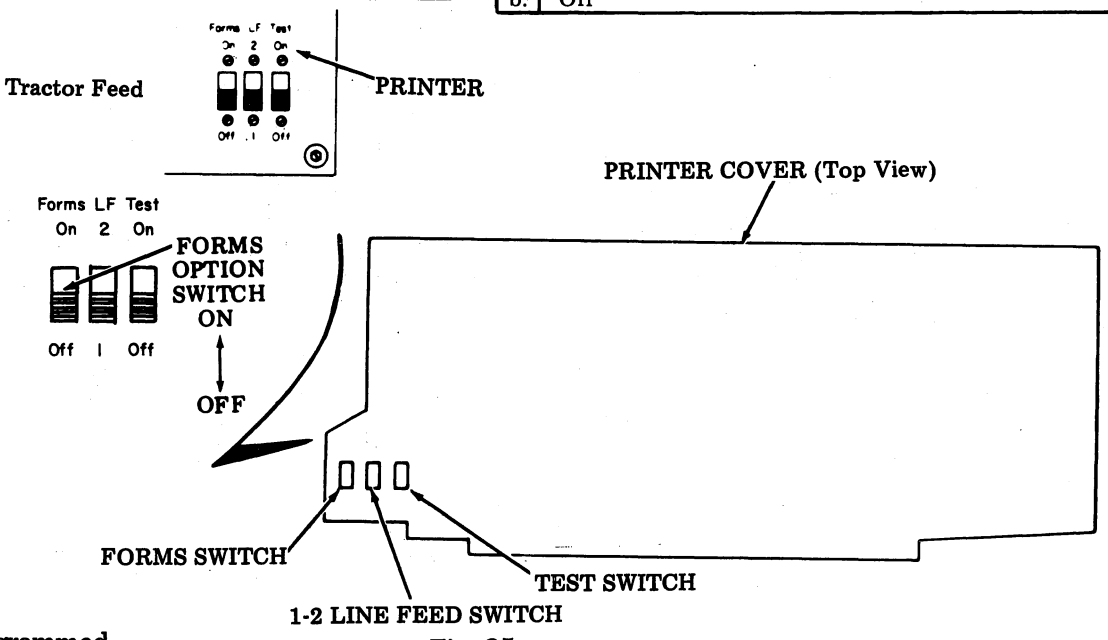


Fig. 25

* Factory programmed.

Option 48 — Incomplete Form Suppresses Paper Alarm

2.53 This option is not available in friction feed printers.

2.54 When Option 48b is used the End of Form feed contact located on the form out mechanism is gated with the Paper Out Switch so that "End of Form Feed" has precedence over the "Paper Out" Switch.

410729 — Printer Logic Circuit Card (132-Column Printer)

48. Incomplete Form Suppresses Paper Alarm		D11						D13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	No (Paper-Out Not Gated With Formout)	–	–	–	–	–	●	–	–	–	–	–	–	
b.	Yes (Paper-Out Gated With Formout)	–	–	–	–	–	O	–	–	–	–	–	–	*

410076 — 80-Column Printer Logic Circuit Card

48. Incomplete Form Suppresses Paper Alarm		E2								
		1	2	3	4	5	6	7	8	
a.	No (Paper-Out Not Gated With Form-Out)	—	●	—	—	—	—	—	—	
b.	Yes (Paper-Out Gated With Form-Out)	—	O	—	—	—	—	—	—	*

410072 — 132-Column Printer Logic Circuit Card

48. Incomplete Form Suppresses Paper Alarm		D9								
		1	2	3	4	5	6	7	8	
a.	No (Paper-Out Not Gated With Form-Out)	—	—	—	●	—	—	—	—	
b.	Yes (Paper-Out Gated With Form-Out)	—	—	—	O	—	—	—	—	*

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

48. Incomplete Form Suppresses Paper Alarm		E9									
		1	2	3	4	5	6	7	8	9	
a.	No (Paper-Out Not Gated With Form-Out)	—	—	—	—	—	—	—	—	●	
b.	Yes (Paper-Out Gated With Form-Out)	—	—	—	—	—	—	—	—	O	*

* Factory programmed.

Option 54 — Printing of Escape Sequences Suppressed

2.56 For the ESC character to be recognized, Option 54b must be installed. A two character ESCAPE sequence consisting of ESC and a final character from columns 0, 1 and 3 through 7 of the ASCII code (except ETX, EOT, NL, VT, FF, CR, SO, SI, SUB and ESC) will be print suppressed. A three character ESCAPE sequence consisting of ESC, an intermediate character (column 2 only), and a final character (any non column 2 character except ETX, EOT, NL, VT, FF, CR, SO, SI, SUB and ESC) will be print suppressed. Final characters ETX, EOT, NL, VT, FF, CR, SO, SI, SUB and ESC will not be print and function suppressed and therefore should not be used in ESCAPE sequences in systems unless the controlling device inhibits transmission of these sequences to the printer.

Option 55 — SI/SO Detection

2.57 For the SHIFT OUT (SO) character to be recognized Option 55b must be installed. The SHIFT IN/SHIFT OUT characters are used exclusively for extension of the standard graphics set. The SO invokes an additional set of 94 graphics and the SHIFT IN (SI) invokes the return to the basic 7-bit set. Use of SO character replaces the set of graphic characters of the basic 7-bit code set until the character is detected. Other control characters (bits 6 and 7 spacing and DEL) are ignored by INPUT/OUTPUT control. They are treated as if they had not been received.

Option 56 — Friction Feed/Tractor Feed Printer

2.58 This option is available on 80-column printer using the 410076 printer logic circuit card only.

2.59 Option 56a must be used for all friction feed printers. When open, a low paper signal is not interpreted as an alarm by the printer logic. The printer motor will remain ON. The low paper signal causes the printer logic to transmit a NOT SELECTABLE (RS) indication via the SSI interface thus indicating the low paper condition to the controlling device. The controlling device must now decide whether to terminate the message in process or continue until the transmission is completed.

2.60 Option 56b must be used for all tractor feed printers. When switch is closed an Interface Frequency Control (IFC) alarm signal is generated in response to a PAPER OUT and/or optional PAPER JAM. The IFC alarm signal may be delayed until the END OF FORM contact has operated. See Option 48.

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

		E9									
54.	Printing of Escape Sequences Suppressed	1	2	3	4	5	6	7	8	9	
a.	Character After ESC Printed as Received	—	—	—	—	—	—	—	○	—	*
b.	Printing of Character After ESC Suppressed	—	—	—	—	—	—	—	●	—	

		E9									
55.	SI/SO Detection	1	2	3	4	5	6	7	8	9	
a.	SI/SO Detection Not Used	—	—	○	—	—	—	—	—	—	*
b.	SI/SO Detection Enables Printing Additional Characters	—	—	●	—	—	—	—	—	—	

410072 — 132-Column Printer Logic Circuit Card

		D10								
54.	Printing of Escape Sequences Suppressed	1	2	3	4	5	6	7	8	
a.	Character After ESC Printed as Received	—	—	—	—	—	—	—	○	*
b.	Printing of Character After ESC Suppressed	—	—	—	—	—	—	—	●	

		D10								
55.	SI/SO Detection	1	2	3	4	5	6	7	8	
a.	SI/SO Detection Not Used	—	—	○	—	—	—	—	—	*
b.	SI/SO Detection Enables Printing Additional Characters	—	—	●	—	—	—	—	—	

*Factory programmed.

410076 — 80-Column Printer Logic Circuit Card

54.	Printing of Escape Sequences Suppressed	E1									
		1	2	3	4	5	6	7	8	9	
a.	Character After ESC Printed as Received	—	O	—	—	—	—	—	—	—	*
b.	Printing of Character After ESC Suppressed	—	●	—	—	—	—	—	—	—	

55.	Shift In/Shift Out Detection	E1									
		1	2	3	4	5	6	7	8	9	
a.	SI/SO Detection Not Used	—	—	—	—	—	—	O	—	—	*
b.	SI/SO Detection Enables Printing Additional Characters	—	—	—	—	—	—	●	—	—	

56.	Friction Feed/Tractor Feed Printer	E2								
		1	2	3	4	5	6	7	8	
a.	Friction Feed Printer — Motor Held On After Paper Alarm	O	—	—	—	—	—	—	—	*
b.	Tractor Feed Printer — Motor Turned Off After Paper Alarm	●	—	—	—	—	—	—	—	

Option 57 — SSI/OEM Interface

2.61 If Option 57a is installed the SSI interface is enabled. When Option 57b is installed, the OEM interface is inabled if the power supply is properly programmed.

Option 58 — Idle Line Motor Control

2.62 The idle line timer option, when enabled provides a 40 second marking line time out commencing from the receipt of the last data character and terminating when the printer logic automatically turns OFF the printer motor. This option, when enabled, prevents a continuous motor ON condition in the event data transmission stops prior to the end of the message. With this option disabled, the motor will remain ON under the same conditions mentioned above.

Caution: With Option 58b, the lead controlling the printer motor must go off and then on in order to start the printer motor. Failure to monitor this condition will result in lost data.

Option 59 — Speed Selection

2.63 When the printer utilizes the OEM interface, the proper baud rate must be selected to coincide with the baud rate of the data received. If a 410076 printer logic circuit card is used, the 346745 modification kit must be installed. This allows the OEM baud rate to be programmed on the 410085 circuit card (Fig. 26).

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

57.	SSI/OEM Interface	E8								
		1	2	3	4	5	6	7	8	
a.	SSI	—	—	—	—	—	—	●	—	*
b.	OEM†	—	—	—	—	—	—	O	—	

58.	Idle Line Motor Control	E8								
		1	2	3	4	5	6	7	8	
a.	Disabled — Motor Held On Indefinitely During Idle Line				O					*
b.	Enabled — Motor Turned Off After 40-Second Idle Line				●					

*Factory programmed.

410072 — 132-Column Printer Logic Card

57. SSI/OEM Detection		D8									
		1	2	3	4	5	6	7	8	9	
a.	SSI	—	—	—	—	—	—	—	—	●	*
b.	OEM †	—	—	—	—	—	—	—	—	○	

58. Idle Line Motor Control		D9								
		1	2	3	4	5	6	7	8	
a.	Disabled — Motor Held On Indenfinitely During Idle Line	—	—	—	—	—	○	—	—	*
b.	Enabled — Motor Turned Off After 40-Second Idle Line	—	—	—	—	—	●	—	—	

410076 — 80-Column Printer Logic Card

57. SSI/OEM Interface		E7								
		1	2	3	4	5	6	7	8	
a.	SSI	—	—	—	—	—	—	●	—	*
b.	OEM	—	—	—	—	—	—	○	—	++

58. Idle Line Motor Control		E7								
		1	2	3	4	5	6	7	8	
a.	Disabled — Motor Held On Indefinitely During Idle Line	—	—	—	—	—	—	—	○	*
b.	Enabled — Motor Turned Off After 40-Second Idle Line	—	—	—	—	—	—	—	●	

†An option screw change may be required on 410151 circuit card in power module. If Option 57b is selected, option screw B on 410151 must be installed from the component side.

++Requires use of 410085 OEM Card and selection of Option 61b or 61c.

*Factory programmed.

Option 60 — Auxiliary Alarm

2.64 This switch, present on the 410071 and 410072 printer logic circuit card, must be disabled (Option 60b). Option 60a, auxiliary alarm enabled, is for a future alarm mechanism not available at this time.

Option 61 — Regulator Grounding (Located in Printer Power Module or Power Supply)

2.65 Option screw A, (Fig. 27) when inserted from the component side of the 410151 circuit card assembly, connects circuit ground to frame ground. Applications utilizing the SSI printer interface must have Option A inserted. Option screw B could be inserted from the noncomponent side of the card.

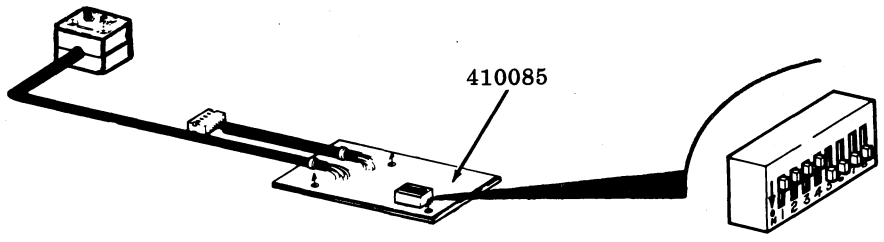


Fig. 26

2.66 Option screw A, (Fig. 27) when inserted from the component side of the 410151 Card Assembly provides the 410071, 410072 or 410076 printer logic cards with an unregulated positive voltage source for powering the OEM status and control signals from the printer to the OEM controlling device. Screw Option B must be inserted from the component side of the 410151 card when the OEM interface on the 410071, 410072 or 410076 card is used.

2.67 Circuit ground may be terminated to frame ground in the printer by leaving Option screw A (Fig. 27) inserted from the component side. Optionally, the user may wish to terminate circuit ground to frame ground on the user side of the OEM interface. In this case, optional screw A must be inserted from the non-component side of the card. Whatever the case, circuit ground must be terminated to frame ground.

410071 — 80-Column Tractor Feed Printer Logic Circuit Card

59. Speed Selection (Applies only if Option 57.b. is selected)		C1							
		1	2	3	4	5	6	7	8
a.	75 Baud	●	O	O	O	O	O	O	O
b.	150 Baud	O	●	O	O	O	O	O	O
c.	300 Baud	O	O	O	O	O	O	O	●
d.	600 Baud	O	O	●	O	O	O	O	O
e.	1200 Baud	O	O	O	O	O	●	O	O
f.	2400 Baud	O	O	O	●	O	O	O	O
g.	4800 Baud	O	O	O	O	●	O	O	O
h.	9600 Baud	O	O	O	O	O	O	●	O

*

60. Auxilary Alarm ¶		E5							
		1	2	3	4	5	6	7	8
a.	Enable	—	O	—	—	—	—	—	—
b.	Disable	—	●	—	—	—	—	—	—

*

410072 — 80-Column Printer Logic Circuit Card

59. Speed Selection (Applies Only if Option 57.b. is Selected)		C4							
		1	2	3	4	5	6	7	8
a.	75 Baud	●	O	O	O	O	O	O	O
b.	150 Baud	O	●	O	O	O	O	O	O
c.	300 Baud	O	O	O	●	O	O	O	O
d.	600 Baud	O	O	●	O	O	O	O	O
e.	1200 Baud	O	O	O	O	O	O	●	O
f.	2400 Baud	O	O	O	O	●	O	O	O
g.	4800 Baud	O	O	O	O	O	●	O	O
h.	9600 Baud	O	O	O	O	O	O	O	●

*

60. Auxilary Alarm ¶		D9							
		1	2	3	4	5	6	7	8
a.	Enable	—	—	—	—	O	—	—	—
b.	Disable	—	—	—	—	●	—	—	—

*

*Factory programmed.

¶ Option 60b must be used. Option 60a is for future alarm sensing mechanism.

410085 Circuit Card (Fig. 26) (OEM) Required only if Option 57b on 410076 card is selected. ¶¶

59. Speed Selection		SWC-3							
		1	2	3	4	5	6	7	8
a.	75 Baud	●	○	○	○	○	○	○	○
b.	150 Baud	○	●	○	○	○	○	○	○
c.	300 Baud	○	○	○	●	○	○	○	○
d.	600 Baud	○	○	●	○	○	○	○	○
e.	1200 Baud	○	○	○	○	○	○	●	○
f.	2400 Baud	○	○	○	○	●	○	○	○ *
g.	4800 Baud	○	○	○	○	○	●	○	○
h.	9600 Baud	○	○	○	○	○	○	○	●

¶¶The 410085 circuit card (part of 346745 modification kit) is mounted on the 410076 printer logic circuit card in OEM application. (The installation specification for 346745 modification kit is Specification 50906S.)

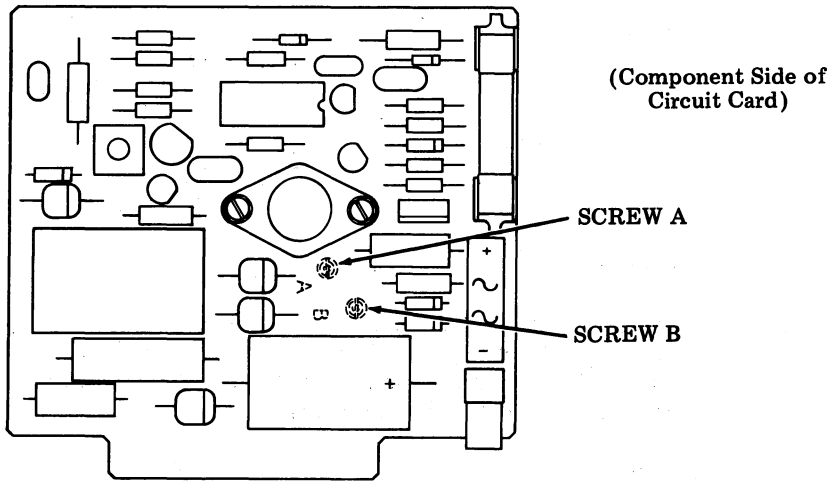


Fig. 27

410151 Circuit Card (Located in Printer Power Module or Power Supply)

61. Regulator Grounding		Screw A		Screw B	
		Component	Noncomponent	Component	Noncomponent
a.	SSI (Circuit and Frame Ground at PTR)	In	—	—	In
b.	SSI/OEM (Circuit and Frame Ground at PTR, +12 V)	In	—	In	— *
c.	OEM (Circuit Ground External to PTR, +12 V)	—	In	In	—

*Factory programmed.

TECHANICAL DATA

A. Power Source Requirements

2.68 Voltage — 115 V ac ±10% @ 50/60 ±2 hertz (40P101 Friction Feed Printer with 410640 Printer Logic Card Only)

— 115 V ac ±10% @ 50/60 ±0.75 hertz (All others)

Starting Current

2.69 Printer and printer logic — 10 amperes for 400 milliseconds maximum at 127 V ac @ 50/60 Hertz.

B. Power Consumption and Heat Dissipation

2.70 These specifications are maximum ratings with the printer and printer logic at 127 V ac.

80-Column Friction Feed Printer	150 Watts	513 BTU/HR
80-Column Tractor Feed Printer	125 Watts	428 BTU/HR
	162 Watts	554 BTU/HR
	(w/ 40C303 Integrated Controller)	
132-Column Tractor Feed Printer	160 Watts	547 BTU/HR
	197 Watts	673 BTU/HR
	(w/ 40C303 Integrated Controller)	

C. Enviromental Characteristics

2.71 The unit is adjusted to give optimum print quality at room ambient temperature of 65 degree to 85 degree farenheit. When operated at lower temperatures print quality may be light until the unit has run at least one hour and has reached operating temperature. At ambient temperatures above 85 degree farenheit there may be a reduction in ink ribbon life.

Temperature	
Storage	-40° F to +150° F
Operating	+40° F to + 110° F
Relative Humidity	
Storage and Operating	2% to 95% (non-condensing)
Altitude	
Shipping	Sea Level to 50,000 feet
Operating	Sea Level to 10,000 feet

D. Paper

80-Column Friction Feed Printer

2.72 The printer will accommodate single copy friction feed paper, 8-1/2 inches wide, 5 inch diameter teletypewriter paper roll; see Section 570-008-010, Information on Stationery for Teletypewriters. Multicopy modification kit 403380 (40P101 only) when installed will accommodate an original plus 2 copies.

80-Column Tractor Feed Printer (except 40P253)

2.73 The printer will accommodate from one original, to original plus five copies, sprocket feed paper widths from 3-5/8 inches to 9 inches between 5/32 inch diameter sprocket holes spaced 1/2 inch vertically between centers. Form lengths are from 2-1/2 inches to 22 inches. It is recommended that a maximum of 12 pound basis weight white bond paper (continuous without splices) be used with 8 pound tab black carbon paper interleaved. Use of heavier paper than this, particularly in the upper plies is not recommended. Printing within two lines of a form fold is also not recommended. Using the above paper, the original and up to five copies will print legibly using a Monocase ASCII type font. The original and up to three copies will print legibly using an up-low ASCII type font plus any additioal symbols and/or special characters such as fractions, larger than normal characters, foreign alphabet characters, etc. In any case where it is desired to vary from the above, the variation should be tried for feasibility in such areas as copy legibility and paper handling.

132-Column Tractor Feed Printer

2.74 The printer will accommodate an original plus three or more copies (depending on the paper type and thickness) of sprocket feed paper with widths from 3-5/8 inches to 14-1/2 inches between 5/32 inch diameter sprocket holes spaced 1/2 inch vertically between centers. Form lengths are from 2-1/2 to 22 inches. It is recommended that a maximum of 12 pound basic weight white bond paper (continous without splices) be used with 8 pound tab black carbon paper interleaved. Use of heavier paper than this, particularly in the upper plies is not recommended. Printing within two lines of a form fold is also not recommended. Where it is desired to vary from the above in number of copies or paper type, the variation should be tried for feasibility in such areas as copy legibility and paper handling.

80-Column Forms Access Printer (40P253) (Fig. 28)

2.75 The printer will accommodate sprocket feed paper with widths from 4-1/4 inches to 9-1/8 inches. The forms must have 5/32 inch diameter sprocket holes spaced 1/2 inch vertically between centers.

2.76 The form out mechanism can handle form lengths of 2-1/2 inches to 22 inches.

2.77 Because the line feed has a pushing, not pulling, action the following limitations must be placed upon the type and thickness of paper used in the machine to avoid paper jams:

Single Sheet Applications

2.78 Single part forms must be at least 24 pound bound paper (about 0.005 inch thick) to have sufficient stiffness to avoid jams. Very heavy single sheets (over 0.010 inch) may prove to be troublesome.

Multicopy Applications

2.79 The stack of paper used in multicopy applications must possess a stiffness at least equal to that of one sheet of 24 pound paper. This is approximated by two 16 pound sheets suitably joined at the edges. Where more than two copies are used, paper lighter than 16 pound may be used, but it is not recommended that multiple plies lighter than 10 pound stock without prior testing.

2.80 It is also recommended that multiple forms employ pressure sensitive and/or carbon backed paper to eliminate ribbon smudge problems which normally are a bit worse with heavier packs of paper.

Note: Staples and/or eyelets often used to hold multi-ply paper together can not be used in Forms Access Printers.

2.81 Perforations in forms for tear off purposes are generally in the form of slits. The longer the slit the greater the probability of paper jams, as a form tends to fall over causing the slits to buckle outwardly and catch on the tear bar. This is also a function of the weight of the paper, and number of copies. The slits should be held as narrow as practical. Generally, slits of 3/32 inch pose no problem, while slits longer than 3/8 inch may.

2.82 Where label stock is to be used, the waste between labels should be removed, as waste present at or near the folds tends to separate from the backing causing paper jams similar to that described in 2.78 above.

2.83 To be certain that forms are useable in this machine, it is recommended that they be tested on a machine. At least two cartons of forms should be used in order to provide a meaningful answer.

Forms Design (Fig. 28)

2.84 The printed lines will be located as follows:

(a) On eight line per inch machines:

The centerline of the first printed line will be 5/16 inch from the serrated tear line.

The centerline of other lines will occur in increments of 1/8 inch below the first line.

(b) On six line per inch machines:

The centerline of the first printed line will be 1/4 inch from the serrated tear line.

The centerline of other lines will occur in increments of 1/6 inch below the first line.

Note 1: In all cases, due to the line feed pushing action this machine demands, approximately the last 3-5/8 inch of forms contained in a carton cannot be printed. Therefore, wastage of the last form in a carton will occur any time printing is required on the last 3-5/8 inch.

Note 2: The act of tearing a form off the machine will result in the paper being resopositioned relative to the tractor drive pins. This will cause the first two printed lines to be closer together than normal. Using standard type pallets at eight line feeds per inch could result in the first two lines of copy touching one another. This may be avoided, if desired, by designing the form so that at least one line feed is required before text is printed.

Paper and Format Data (40P253 Forms Access Printer Only)

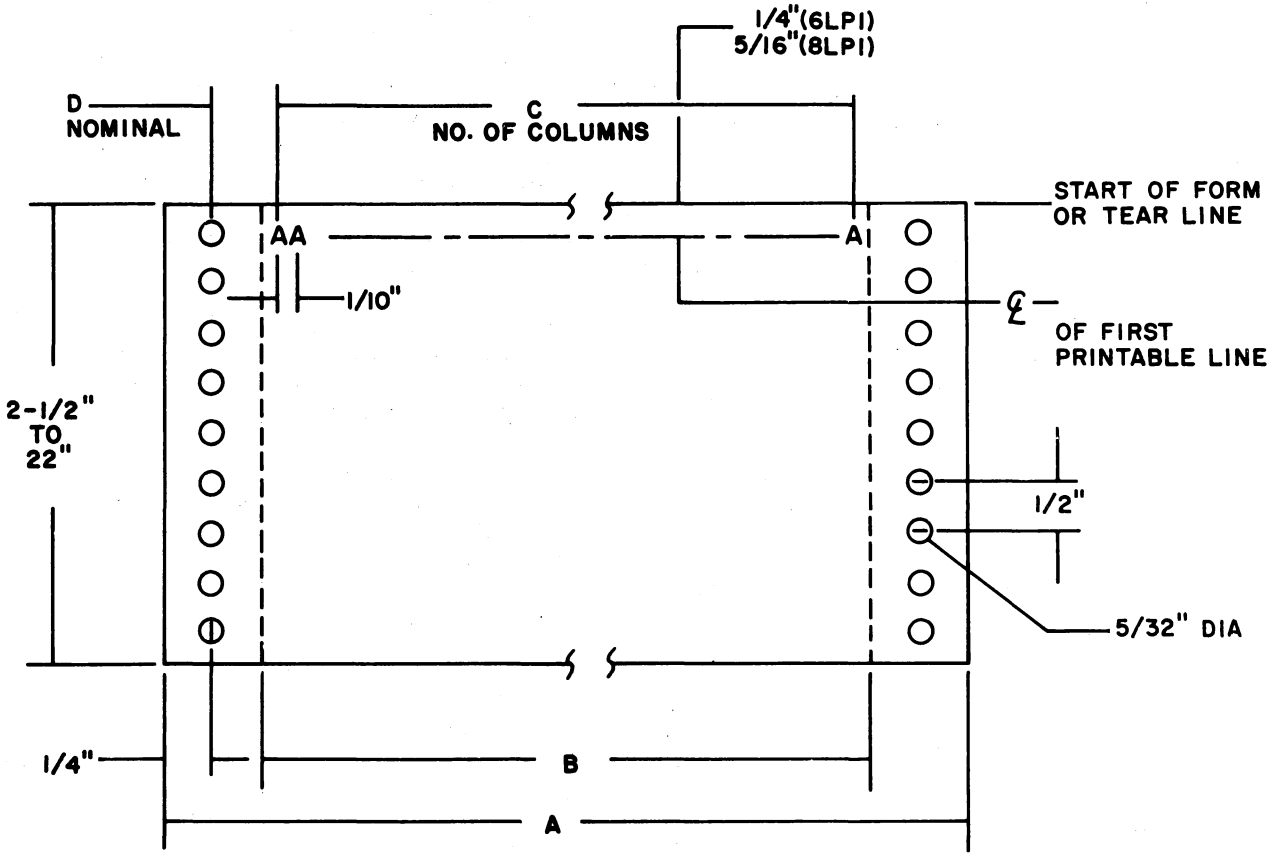


Fig. 28

A FORM WIDTHS	B PRINTING FIELD	C NO. OF COLUMNS	D LEFT HAND MARGIN
9 "	8"	80	.300"
9-1/16"	8"	80	.331"
9-1/8"	8"	80	.362"
4-1/4" MIN.	3-1/4"	—	—

Fig. 28 (Cont)

E. Ribbon

2.85 The ribbon is of nylon, 1/2 inch by 33 yards on a business machine style spool. Use part number 402444 when ordering from Teletype. This ribbon is designed to last 11.5 million printed characters or approximately 1200 feet of 14-1/2 inch wide paper when used on a properly adjusted printer. Ribbon life may be less than stated until the carrier has been used for printing of normal text a minimum of 100 hours.

2.86 Ribbon Reinker (40P203/only) — The 40P203 Printer contains a ribbon reinking mechanism which increases ribbon life to 20 million legible characters under normal operating temperature and humidity. Prolonged storage of exposed ribbons and reinkers could degrade this expected life. Authorized replacement reinkers, Teletype Part No. 407777, come in a package including two (2) reinking cartridges, one ribbon, and a disposable glove.

F. Size and Weight (Table F)

2.87 Size and weight for the various printers are given in inches and pounds respectively. All dimensions are approximate.

TABLE F

	DESCRIPTION	WIDTH	HEIGHT	DEPTH	WEIGHT *
40P101 40P102	80-Column Friction Feed Printer and 80-Column Friction Feed Printer with Noise Reduction.	14-3/4	6	16-3/4	40
40P154	80-Column Tractor Feed Printer	15	8-5/16	13-7/8	41
40P202 40P203	132-Column Tractor Feed Printer and 132-Column Tractor Feed Printer with Ribbon Reinking	22	8-5/16	14-7/32	56
40P253	80-Column Tractor Feed Forms Access Printer	16-1/4	9-1/16	14-7/16	47

*Weights are given for printer with printer logic card.

3. OPERATION

A. Mechanical Drive (Fig. 29)

Friction Feed

3.01 The impeller shaft ① is belt driven at 1500 RPM by a 3600 RPM induction motor ②.

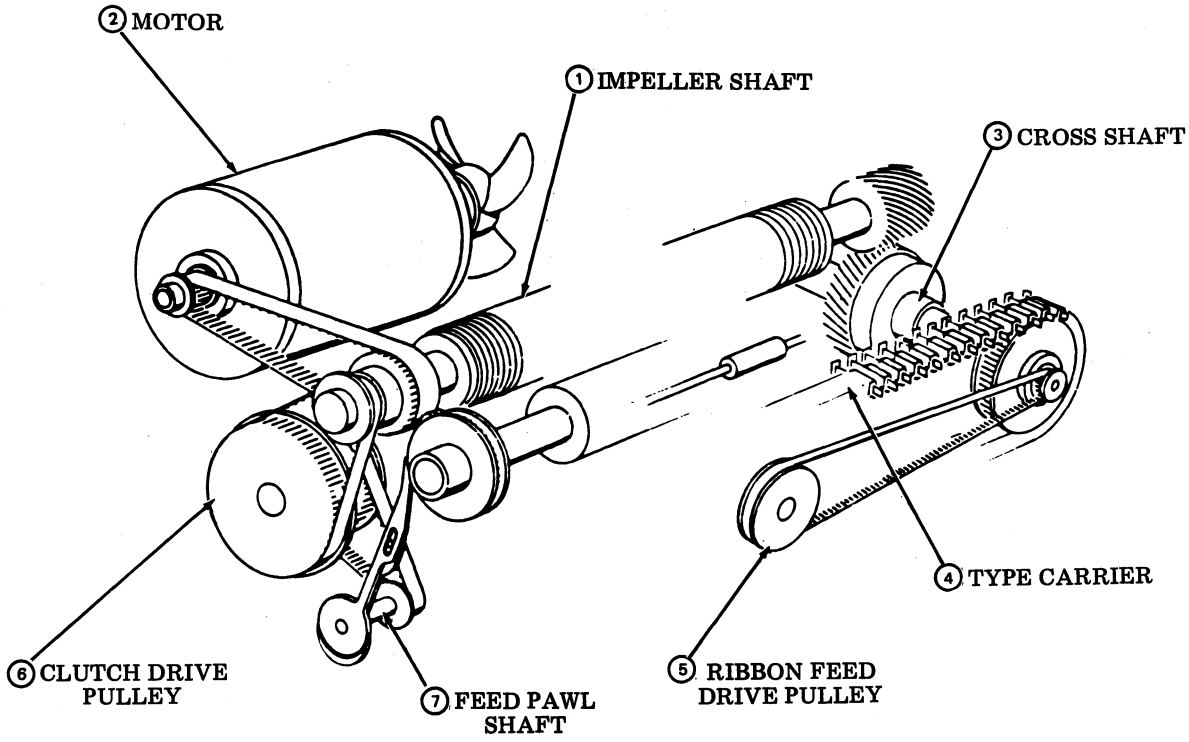


Fig. 29—Mechanical Drive Friction Feed

3.02 A helical gear on the right end of the impeller shaft drives the cross shaft ③. The large pulley on the cross shaft drives the type carrier ④ and the small pulley is belt coupled to the ribbon feed drive pulley ⑤. A belt drive pulley on the left end of the impeller shaft is coupled to the line feed clutch drive pulley ⑥, and the clutch is belt coupled to feed pawl shaft ⑦.

Mechanical Drive (Fig. 30)

Tractor Feed and Forms Access Printers

3.03 From the 50/60 Hertz two pole induction motor ①, a toothed belt and pulley set reduces the speed to approximately 1500 RPM at the impeller shaft ②. A motor pulley substitution is used on installation for the change between 60 Hertz and 50 Hertz when required. At the left end of the impeller shaft, a toothed belt and pulley set reduces the speed to approximately 510 RPM at the line feed clutch shaft ③. From the line feed clutch, a toothed belt and pulley set gives a rotational increase to the feed bar eccentric shaft ④ so that each step of the 6 stop line feed clutch results in 1/2 revolution of the feed bar eccentrics. At the other end of the impeller shaft, a right angle gear set reduces the speed to approximately 630 RPM at the right hand type carrier sprocket. From the cross shaft ⑤ of this sprocket a toothed belt and pulley set reduces the speed to approximately 200 RPM at the ribbon drive mechanism ⑥.

3.04 The feed bars ⑦ engage and drive the forms tractor drive gear ⑧ which in turn drives the form out mechanism gear ⑨. The form out mechanism gear drives the form out mechanism drive pulley which causes the form out belt ⑩ to travel around the idler pulley and the drive pulley.

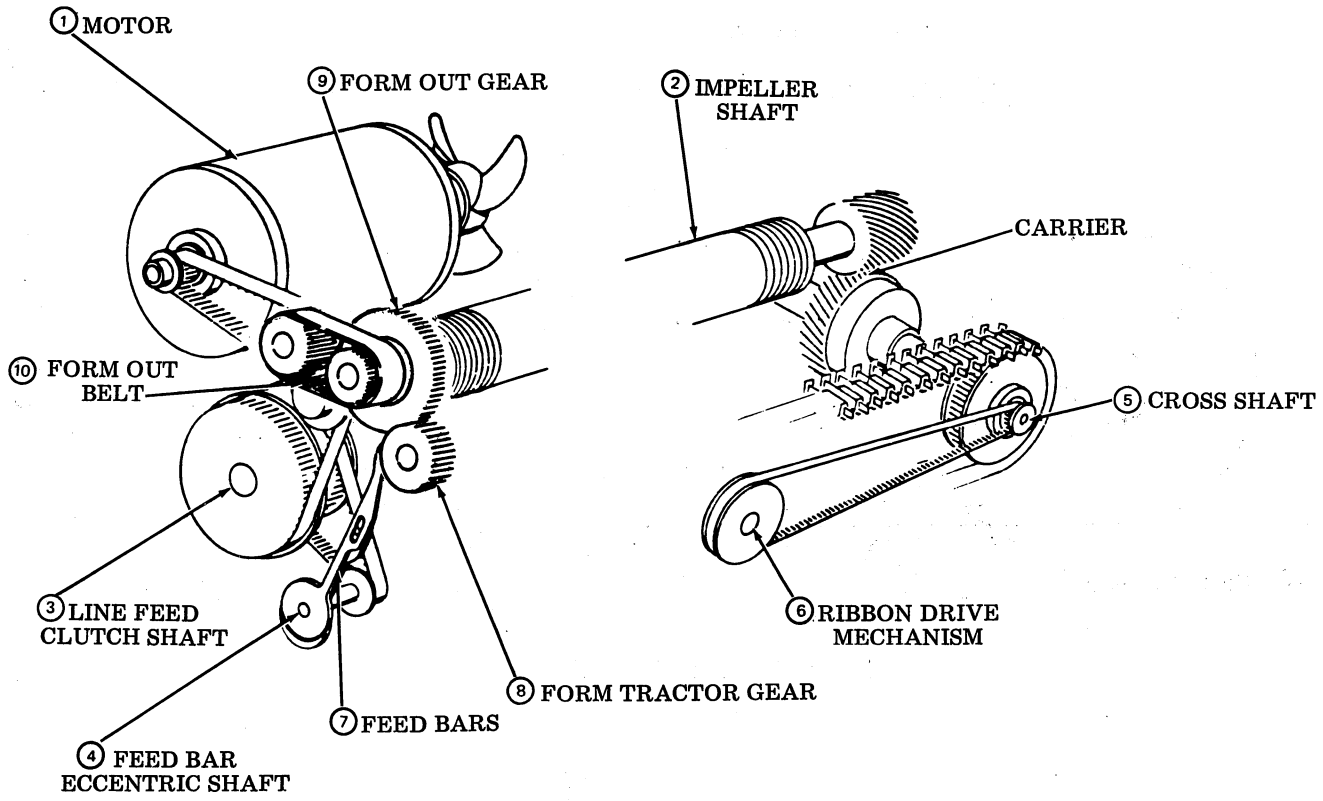


Fig. 30—Mechnical Drive Tractor Feed and Forms Access

B. Paper Feed

Friction Feed Printers (Fig. 31)

3.05 The line feed magnet ① is energized by the printer circuit card ② with a 24 volt pulse. When the armature ③ is attracted, its extension trips the six top line feed clutch ④ which drives the eccentric shaft ⑤ . The eccentric shaft operates both feed pawls ⑥ alternately to rotate the paper feed shaft ⑦ . A pressure roller ⑧ holds the paper against the feed roller.

Tractor Feed Printers (Fig. 32)

3.06 Paper feed is accomplished by rotating the forms tractor drive shaft ① by means of two toothed feed bars ② , driven one at a time by two eccentrics which are 180 degrees out of phase with each other. These feed bars engage and rotate a gear mounted on the forms tractor drive shaft. Each one-half revolution of the eccentric shaft ④ will cause the forms tractors ⑤ to advance the paper one-sixth of an inch. The eccentric shaft is caused to rotate by the action of a six stop clutch which engages when the line feed magnet is energized. The six stop clutch is geared up three to one to the eccentric shaft to give the required one-half revolution for each step of the clutch. The feed bars are held in engagement with the forms tractor gear by pressure from a roller mounted on a spring loaded bail.

C. Form Out Mechanism (Fig. 33)

Tractor Feed Printers Only

3.07 The form out mechanism is designed to continuously monitor form motion and stop the form, (through a contact closure), with the first line of the form in the print position of the printer.

3.08 The form out mechanism permits use of a variety of form length. See 2.17 and 2.18. The form out mechanism divides the various form lengths into discrete line feeds. See 2.07.

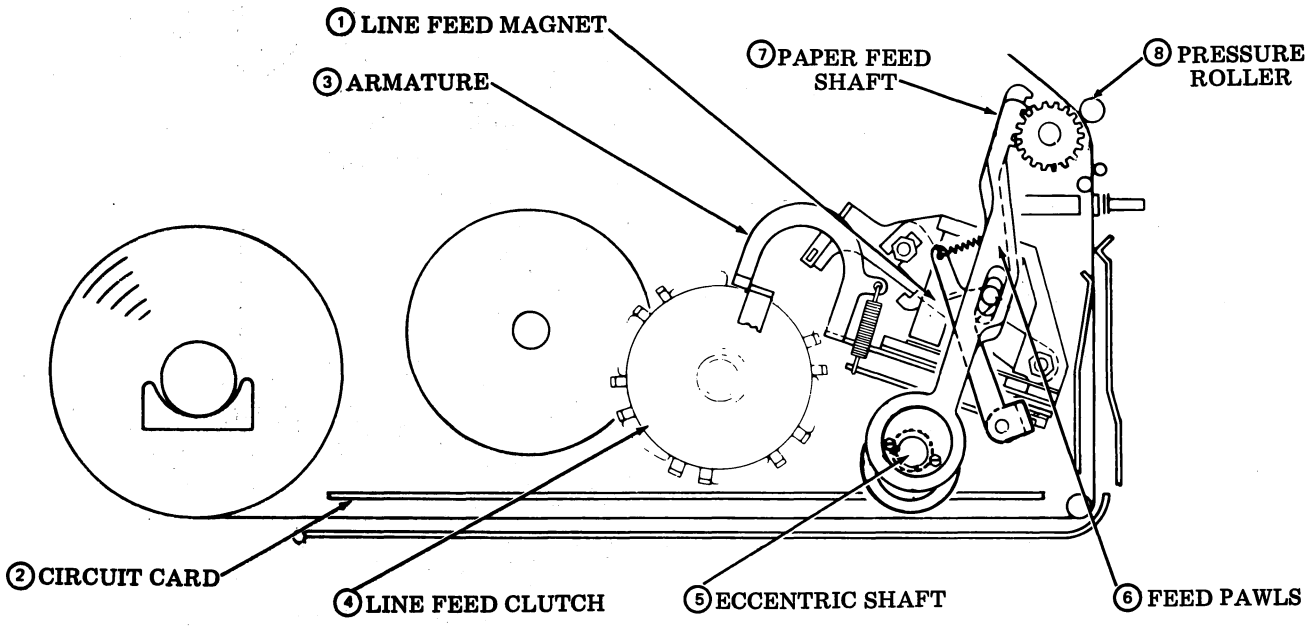


Fig. 31—Friction Feed Printers Paper Feed

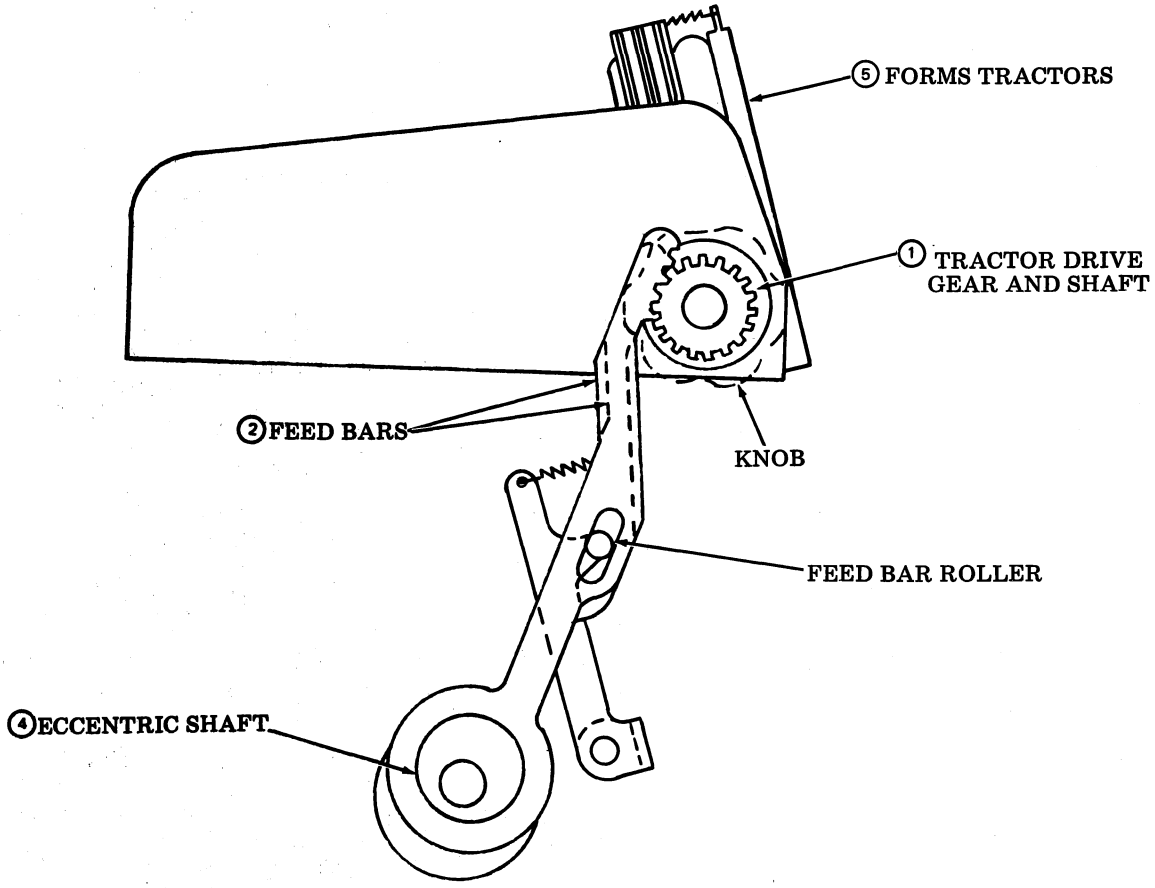


Fig. 32—Paper Feed Tractor Feed

3.09 A toothed belt, with the number of teeth of the belt corresponding to the number of the lines on a particular form, has four tracks molded to the back side of the belt. Each track has a unique lobe, or protrusion, located accurately opposite a tooth. Track 1 and associated cam has a division factor of 1, track 2 has a division factor of 2, and so on for tracks 3 and 4. See 2.18.

3.10 A gear which provides paper drive to the printer also drives the form out gear and belt sprocket and causes the belt to move one tooth position for every line feed of the form. A contact is positioned in relation to one of the 4 tracks of the belt depending on the particular form length being used. The form is adjusted when loaded so that Line 1 of the form is in the print position when one of the belt lobes has just closed the contact. The lobes will now close the contact at Line 1 for all succeeding forms. This form adjustment is done by means of the print line adjusting knob which is pulled out to disengage the line feed mechanism permitting free movement of the forms tractors when turning the knob. See 2.29.

3.11 The forms access printer may not respond to a form feed command if the form is within one line feed of the "home" position. (The form is at the "home" position when it is located so that the perforated tear line is directly behind the tear bar.)

3.12 For printer operation (Form Access Printer), any form feed command must occur with a minimum of two lines remaining before reaching the home position; likewise, a form feed command must come after a minimum of two lines paper advance.

3.13 There is no form out mechanism on friction feed printers.

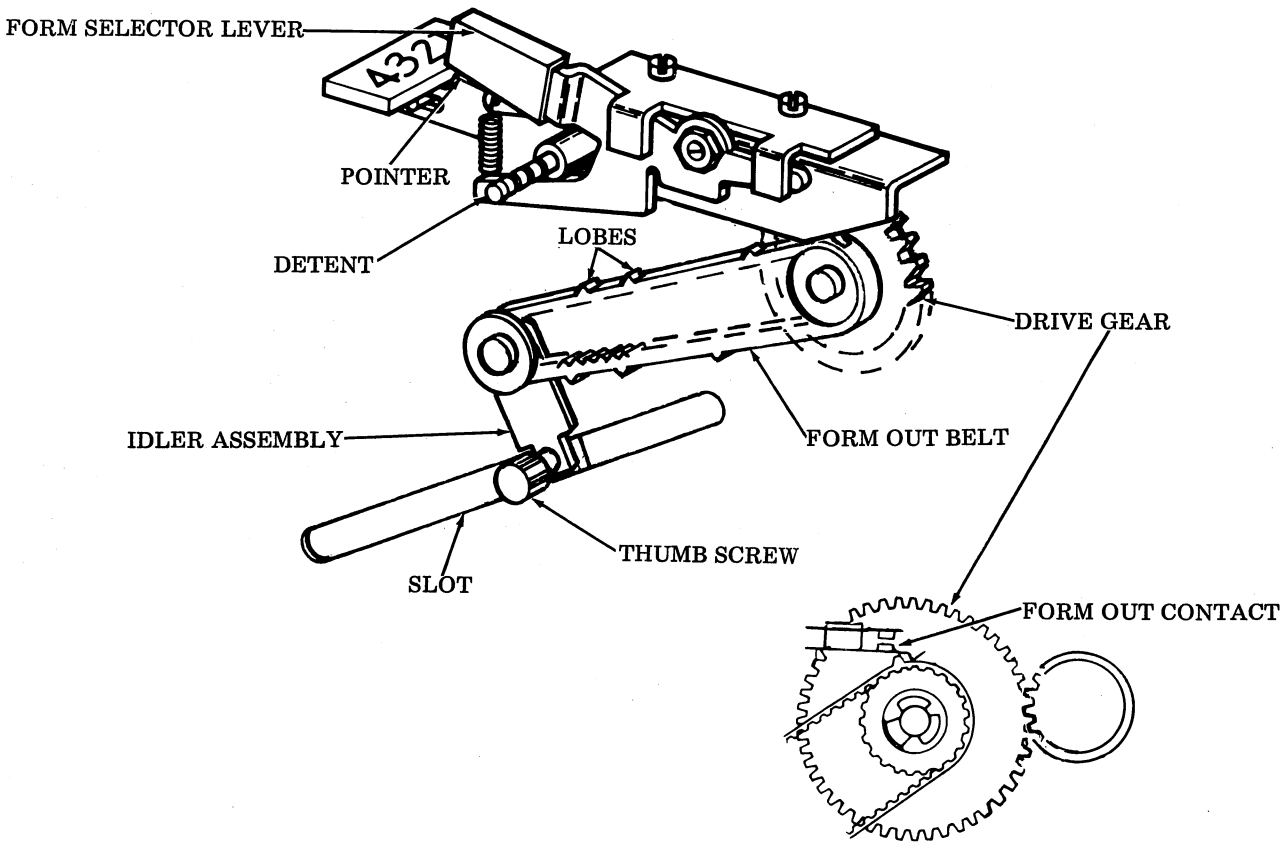


Fig. 33—Form Out Mechanism

D. Paper Routing and Alignment

Friction Feed Printers (Fig. 34)

3.14 In friction feed printers the paper is routed from a roll at the rear of the printer forward through a tray and paper straightener and up through the pressure and feed roller assembly. There is an adjustable paper control rod above the print line to position the paper in relation to the ribbon to eliminate ribbon smear and maintain type alignment. The control rod is linked to the pressure roller assembly to provide easy threading of paper when the pressure roller is released. In the event of a paper jam below the print line or if the paper does not feed through the unit when loading a new roll, pivot the printer and open the lower paper tray to clear or route paper if necessary.

Tractor Feed Printers (Fig. 35 and 36)

3.15 Paper is routed from a supply, not provided with printer, under the front of the printer, up through a paper guide, past the typing area and through a forms tractor assembly. Adjustable paper guides position the paper in relation to the ribbon to eliminate ribbon smear and maintain acceptable type alignment. The paper guides above the print line are pivoted to swing out of the way when threading paper. The forms tractors have pivoted lids which also swing out of the way to facilitate threading the paper.

3.16 The right forms tractor is adjustable for width by means of a thumb screw so that differing paper widths may be used. The entire forms assembly is adjustable for left margin by means of a thumb screw on the left forms assembly. A total movement of 0.625 inch for 80-column, 0.700 inch for 132-column is provided from an extreme position of 0.300 inch between the sprocket holes and the center of the first column. Vertical alignment of the form in relation to the line of printing is done by pulling the knob at the left of the forms tractor mechanism and frees the forms tractor for operation with the knob. This alignment is necessary only when a new forms supply is loaded into the printer.

Forms Access Printer (Fig. 37)

3.17 Paper is routed from a supply (not provided), under the front of the printer, through a forms tractor assembly, up through a paper guide chute, past the typing line, behind the ribbon shield and out the slot between the tear bar and top cover. The forms tractors have pivoted lids which swing open to facilitate threading the paper.

3.18 The right forms tractor is adjustable for widths by means of a clamp lever so that different paper widths may be used. The entire forms drive assembly is provided with an operator adjustment for positioning the forms paper in relation to the first print column. Both margins are selectable with switch options on the printer logic card.

3.19 When a new supply of forms is loaded into the printer, the paper must be aligned by the blue paper advance knob. Align the serrated tear line of the form directly behind the edge of the tear bar.

3.20 The paper guide chute consists of a rear mylar pressure guide and routes the paper against the front mylar guide just below the type line and against the tear bar just above the type line to maintain acceptable type alignment. A detachable mylar shield separates the paper and ribbon at the type line to minimize ribbon smear and provides protection for left edge of the form with respect to carrier motion.

3.21 Labeled forms that have the waste around the labels removed should not be reversed manually through the paper chute unless caution is exercised to prevent snagging of labels over the ribbon-paper shield causing damage to label and/or shield.

Note: Instructions for loading the paper are printed on the top plate of the printer.

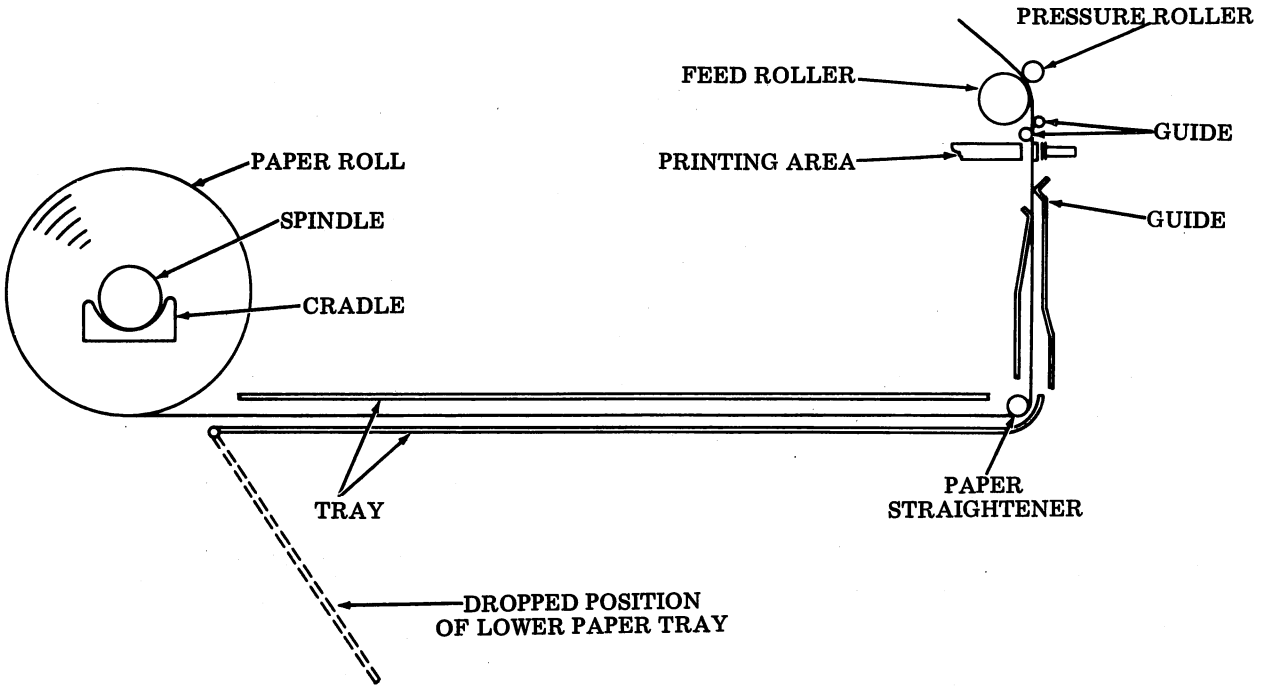


Fig. 34—Friction Feed Paper Routing

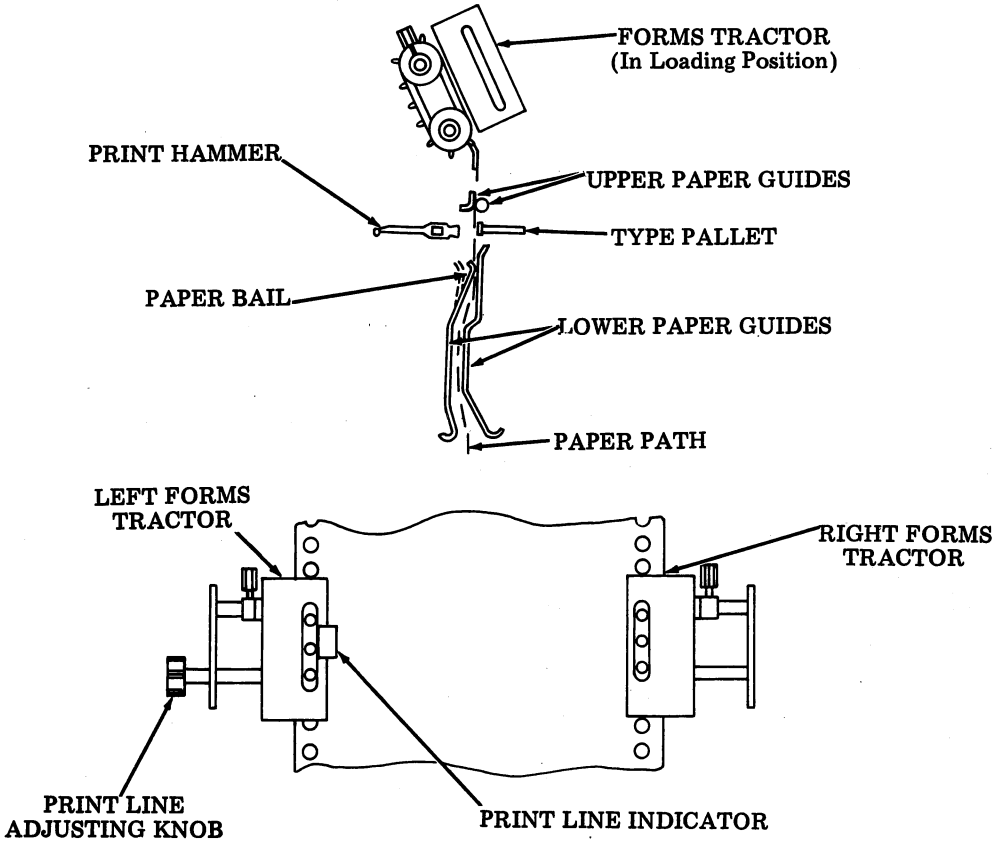


Fig. 35—80-Column Tractor Feed Paper Routing

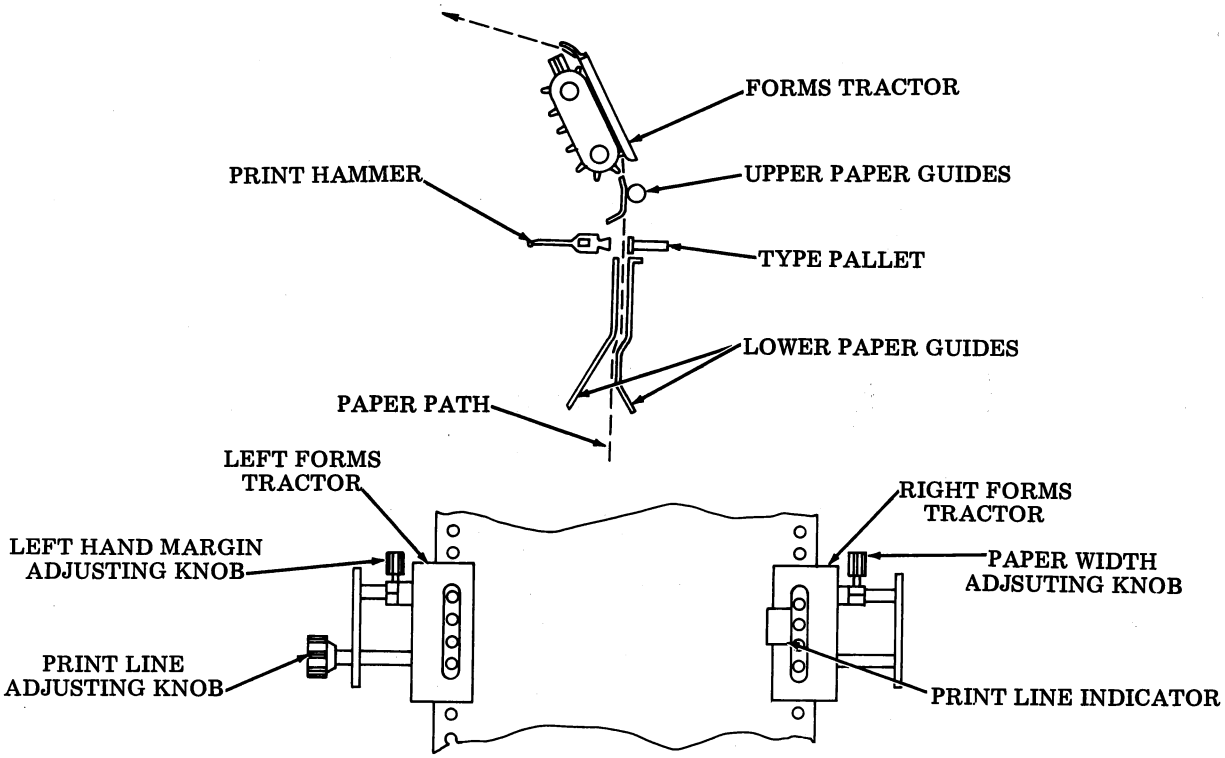


Fig. 36—132-Column Tractor Feed Paper Routing

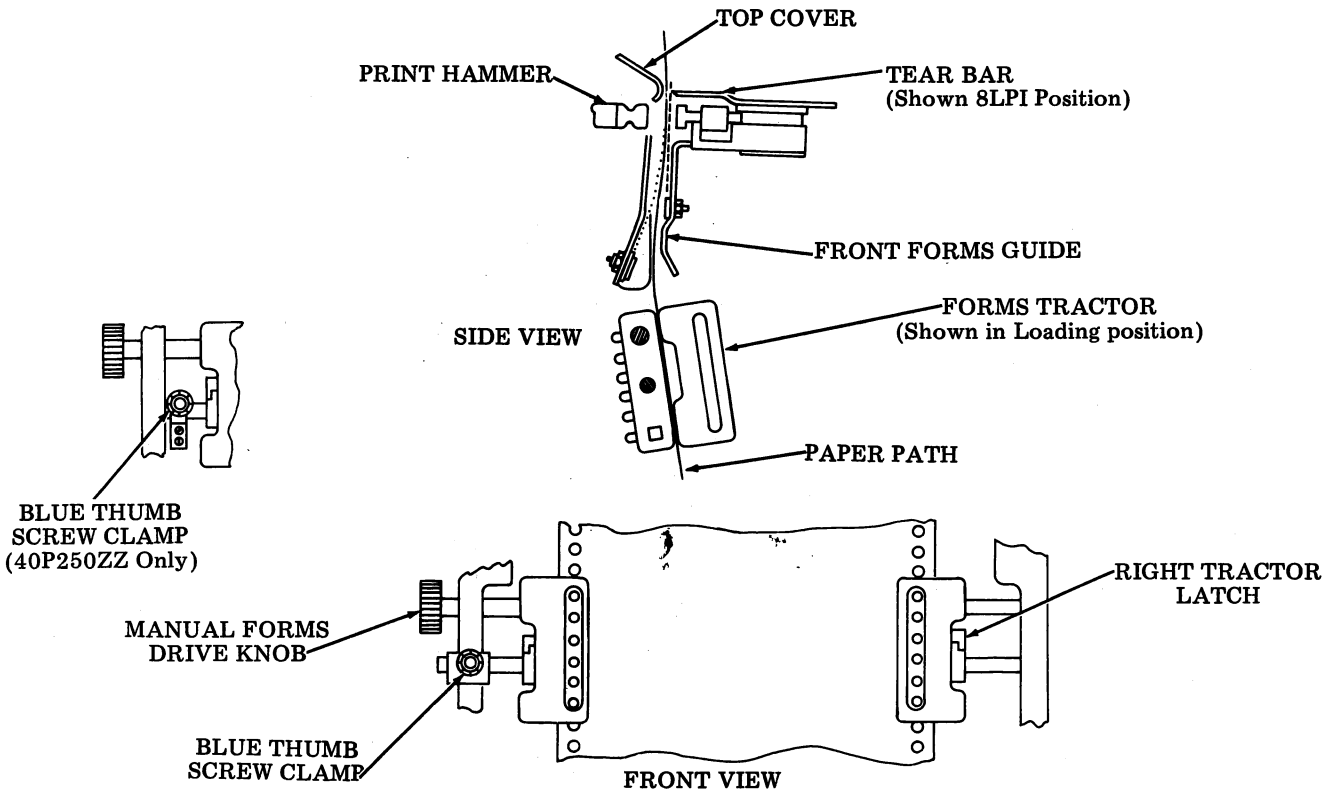


Fig. 37—Paper Routing Forms Access Printer

E. Impact Control of Multicopy Paper

3.22 The printer provides for automatic impact control for single or multicopy paper. In the hammer bank all the hammers are contained in the hammer guide and held together by the hammer bumper. The purpose of the bumper is not only to cushion the rebound of the hammer after printing impact but also to tailor the impact energy to print single or multicopy paper.

3.23 Fig. 38 shows one print hammer held in the returned position by the return spring against the bumper, and a pallet against the back-up bar. With the back-up bar properly adjusted the gap "B" equals the distance "A" plus the pile up of a 6-ply paper with cabron inserts. The hammer when fired will impact the 6-ply paper without the bumper interfering. Removing more sheets of paper, the bumper will absorb more energy and leaves less energy for printing impact. The bumper also cushions the hammer rebound after printing impact. Refer to paragraph 2.75 through 2.87 for paper and multicopy restrictions.

F. Ribbon Feed (Fig. 39)

3.24 The ribbon feed mechanism mounted on front of the printer provides an average ribbon feed rate of four inches per second.

3.25 A sensing arm ① on either side is raised by an eyelet ② on the ribbon near the end of the roll which causes the ribbon reversing mechanism to reverse direction. A belt driven pulley ③ is the drive input to the ribbon mechanism which is belt driven from an extension pulley on the cross shaft ④.

3.26 The ribbon is routed diagonally across the front of the type carrier to use the maximum ribbon area.

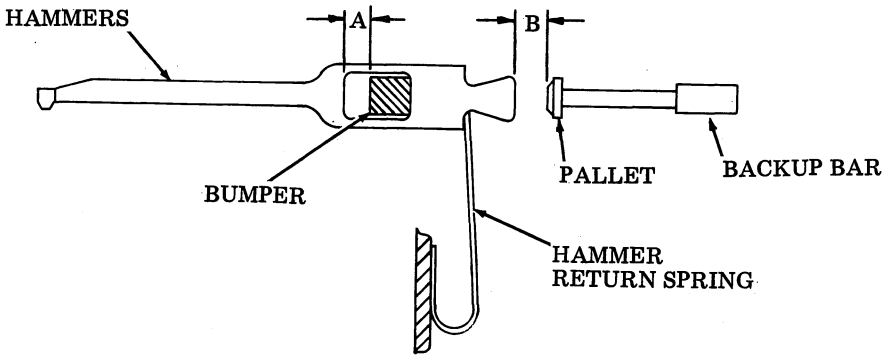


Fig. 38

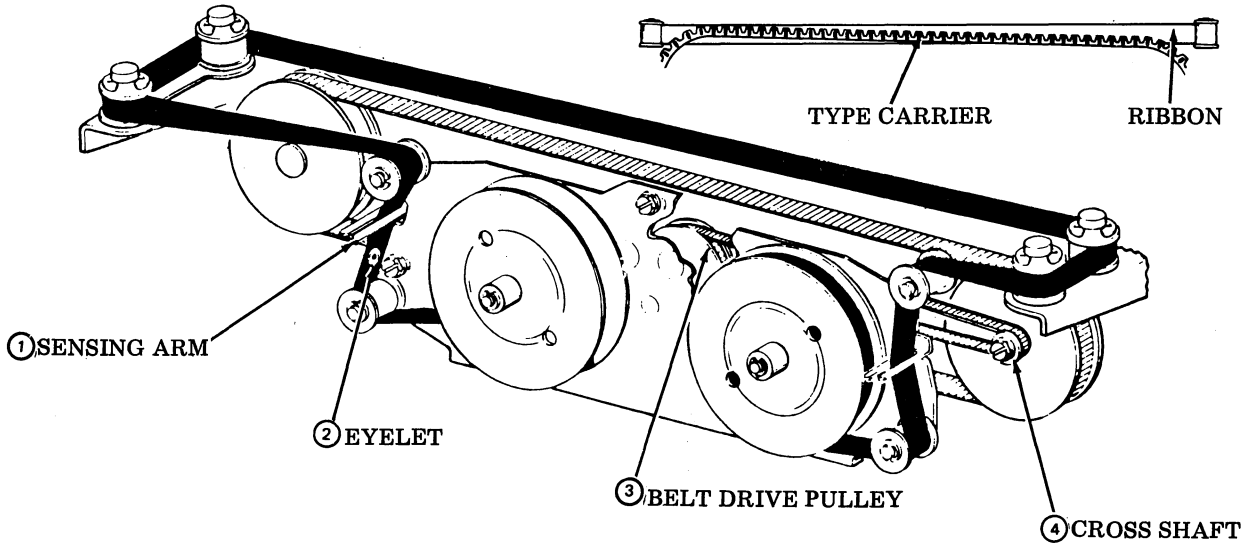


Fig. 39—Ribbon Feed

G. Printing (Fig. 40)

3.27 The electronics of the logic card ① controls the mechanism for each column in the print head. The print head contains the coil banks, interposer banks, armature banks, hammer banks, and the interposer. A pulse from the logic card will energize the magnet core ② , and its associated armature ③ is attracted to the magnet. The magnetic attraction of the armature then pushes its associated interposer ④ up into the continuously rotating impeller teeth ⑤ . At this point the impeller tooth pivots the interposer forward to strike its corresponding hammer ⑥ . The hammer impacts the paper ⑦ and the ribbon ⑧ into the intended type pallet ⑨ .

H. Printer Timing Signals (Fig. 41)

3.28 The printer contains two (2) magnetic sensors which provide timing information to the printer electronics which indicates the mechanical events in the printer. Firing of a given hammer is initiated by a pulse from the printer logic card. This pulse must be in phase with the related impeller of that hammer and also must cause the desired character to print. Two sensors are needed to give this result.

3.29 The TCA-3 (Type Carrier Advance) sensor is located on the right side of the impeller shaft and is mounted on a spring loaded bracket about the centerline of the impeller shaft. A sixteen (16) tooth timing wheel is mounted on the end of the impeller shaft. When the shaft rotates, the timing wheel teeth pass by the magnetic sensor and produce an output signal for every 0.150 inches of type carrier movement. This sensor is angularly adjustable about the impeller shaft by means of an adjusting screw. The adjustment is used to advance or retard the firing of individual magnets to insure that the magnets fire at such a time as to cause the interposers to fall midway between their respective impeller teeth.

3.30 The FLAG SENSOR is located on a bracket mounted about the centerline of the cross shaft assembly where the sensor can sense the passing of the font "flags". These "flags" consist of small ferromagnetic pieces mounted on certain type pallets in the type carrier. When one of these flags passes the sensor, the resulting low level signal is called the font reset signal and indicates to the printer logic the start of another character set. This sensor is also adjustable by means of a hand lever and locking screw.

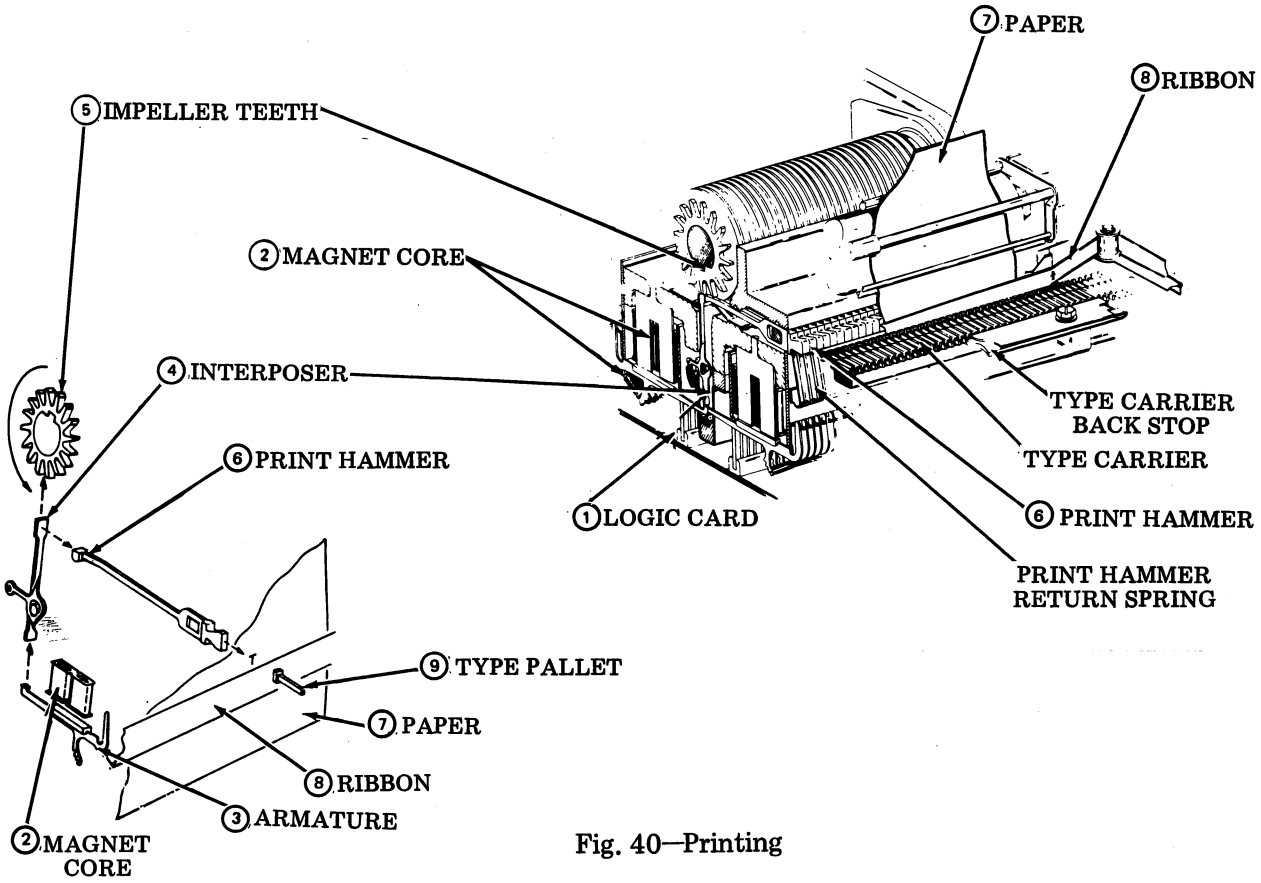


Fig. 40—Printing

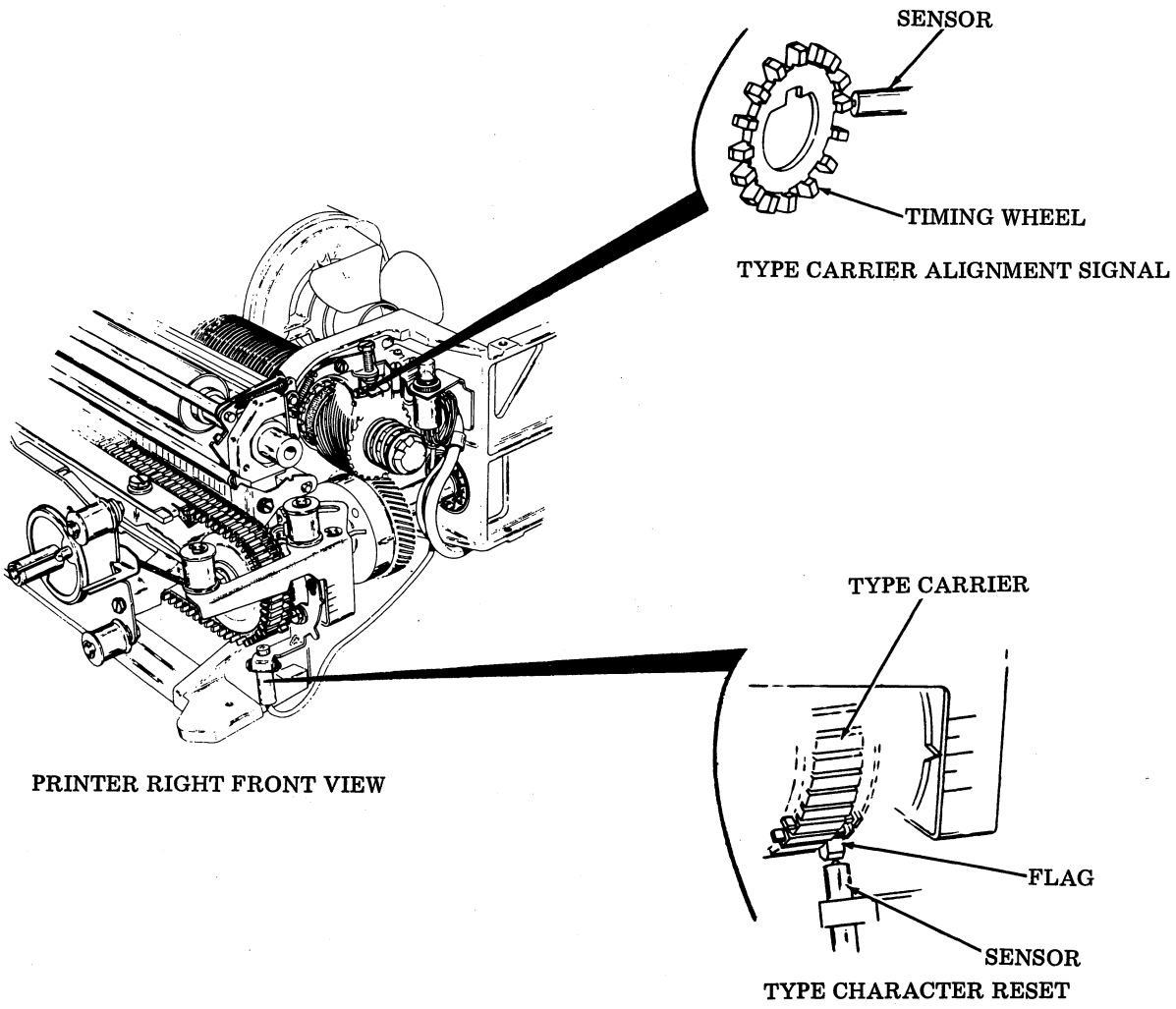


Fig. 41—Printer Timing Signals

I. Impeller to Print Hammer Alignment (Fig. 42)

3.31 The impeller is made up of 80 or 132 impeller segments each having 16 teeth, and these impeller segments correspond to the columns across the printed line. The teeth of the impeller pass the rear of the hammers at the same frequency as the pallets pass the front of the hammers. Because of the hammer to type pallet spacing, every third hammer lines-up with every second type pallet. In this example, type pallets I, G, E, C and A line-up with impeller and print hammer columns 1, 4, 7, 10 and 13. Movement of 0.050 inch of the type carrier results in a new alignment, with H, F, D and B lining up with columns 3, 6, 9 and 12 respectively. A second 0.050 inch movement lines up type pallets I, G, E, C and A with column 2, 5, 8, 11 and 14. At this point, the sequence repeats and the order of striking the hammers is consistent with the alignment of the type pallets to the hammers.

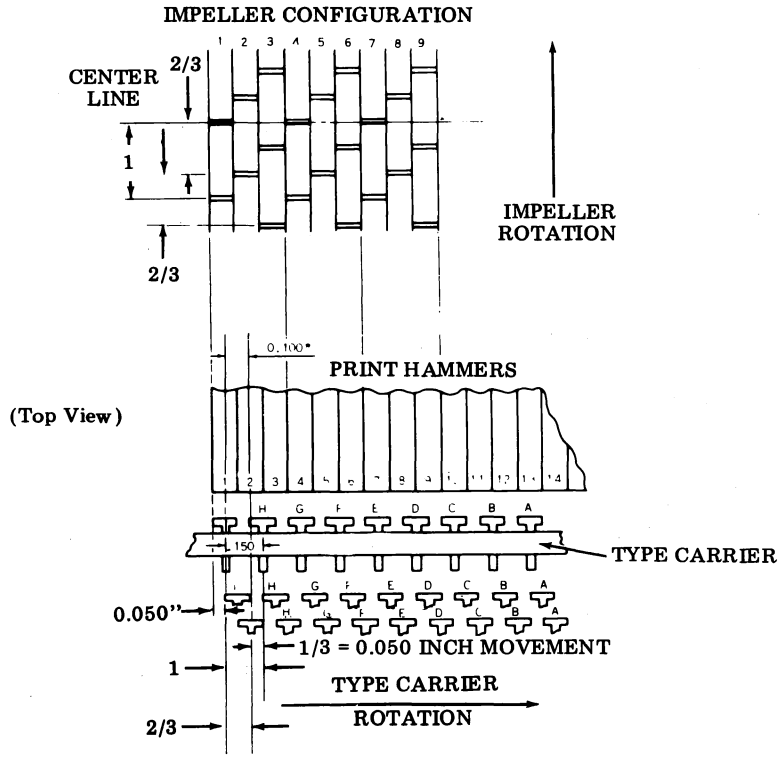


Fig. 42—Impeller to Print Hammer Alignment

J. Firing the Print Hammer (Fig. 43)

3.32 The printer contains 2 magnetic sensors which provide timing information to the printer electronics which indicates the mechanical events in the printer.

3.33 The firing of a hammer is initated by a pulse to its armature. This pulse must be in phase with the related impeller of that particular hammer, and also has to produce the desired character off the type carrier when fired.

3.34 Fig. 43e shows one print hammer mechanism in the idle condition with the impeller rotating at 1500 rpm in the direction shown. Fig. 43a shows the armature in a fully attracted position away from its armature stop. The interposer is now pushed against its spring in front of a rotating tooth of its impeller and bottoms against the bumper. Fig. 43b shows the impeller tooth picking up the interposer, rotating it about the bumper and impacting the hammer. The duration of impact is very short. Fig. 43c shows the relation of the components right after impact. The hammer is shown in free flight aiming for the pallet passing in front. The interposer follows close behind the hammer, pivots about the bumper, and pulls out from underneath the armature. With the armature still attracted, the interposer is free to be pulled away from the impeller by means of the interposer spring. The interposer spring will also rotate the interposer counterclockwise and brings it to a stop against the bumper. The backstop and armature are shown in Fig. 43d along with the hammer rebounding after impacting a pallet. The armature drops out of the way of the interposer, and the interposer will reset under the armature shown in Fig. 43e. The time it takes for the impeller tooth to move the interposer to the hammer for impact equals the time it takes for the armature to fully insert the interposer against its bumper. The bumper also cushions the rebound of the interposer when resetting after impact.

K. Impeller to Type Carrier Phasing (Fig. 44)

3.35 The type carrier ① , is driven by a drive sprocket ② mounted on the cross shaft ③ at the right side of the printer. The cross shaft gear ④ coupled to the gear at the right end of the impeller shaft ⑤ permits phasing between the impeller shaft and the type carrier. This phasing lines up the print hammers ⑥ to impact the pallets ⑦ centrally.

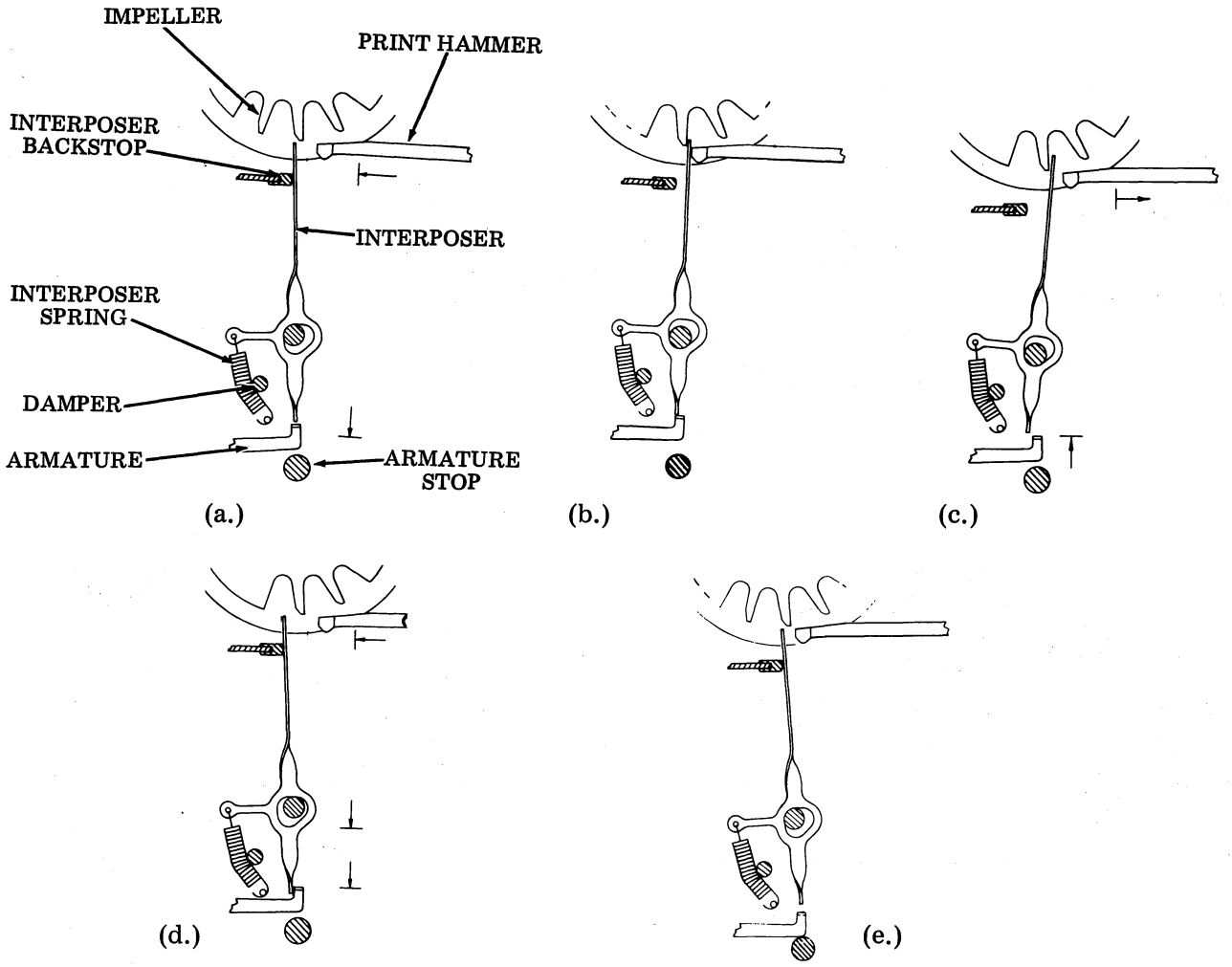


Fig. 43

3.36 An idler sprocket ⑧ is mounted on an eccentric mounting and is spring ⑨ loaded in order to maintain a tension on the type carrier. As the type carrier passes through the printing area, the type pallet stems are held between the top guide ⑩, the track ⑪, and the back-up bar ⑫. The track guides the pallet faces so they are parallel to the hammers.

3.37 The pallets are spaced at 0.150 inches apart on the type carrier, and the hammers are spaced at 0.100 inches apart. One-third of the pallets line up at any one time. With a 0.050 inch movement of the type carrier, another third of the pallets line up, and with another 0.050 inch movement, the remaining third of the pallets are in line. This three-phasing operation is controlled by the type carrier alignment timing pulses, which are arranged in sequence.

L. Printing Sequence (Fig. 45)

3.38 The printer logic is capable of storing two 80 or 132 character lines of information. When the first line is being printed, the second line is being stored. Printing begins as soon as the particular type pallet is aligned with the column which contains the corresponding character to be printed. Fig. 45 shows the first 27 columns with the stored message and progessive postioning of the type carrier to illustrate a typical printing sequence. In the first type carrier position shown, the pallet E lines up with the third column where an E is stored and the E is printed. The next printing, sequence 2, occurs four alignments later when C is printed in the eighth column. In the third sequence, both columns 2 and 11 are printed simultaneously. The process continues until all characters in the line are printed.

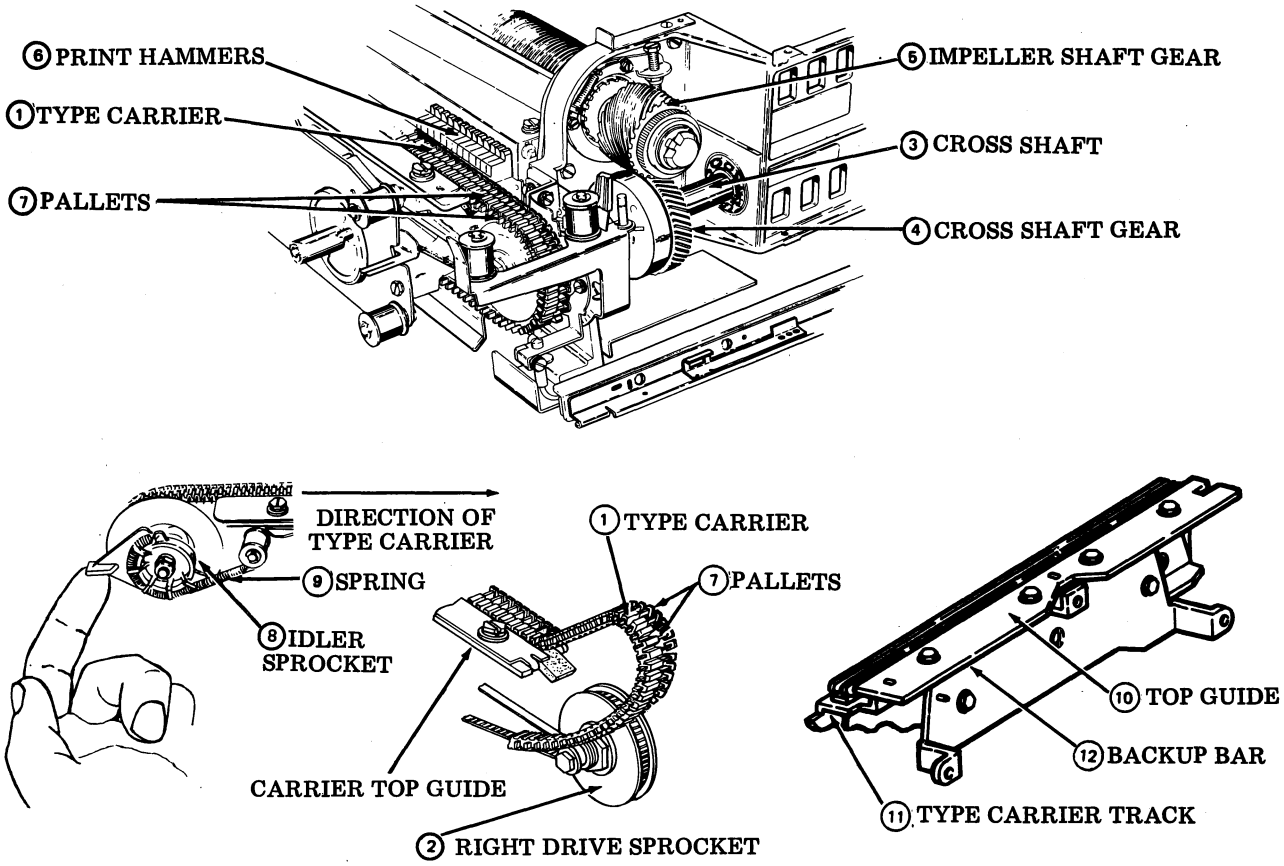


Fig. 44—Impeller to Type Carrier Phasing

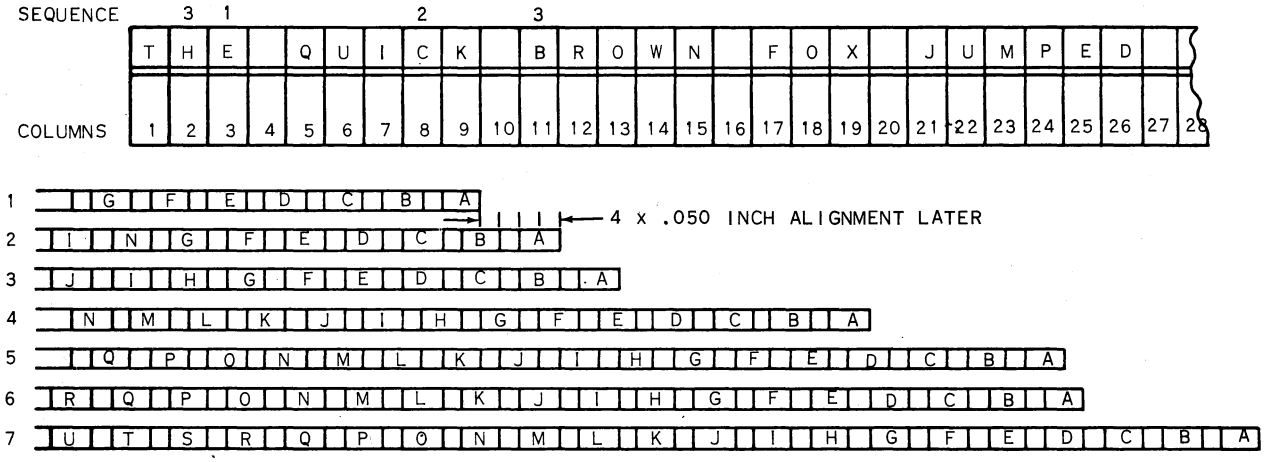


Fig. 45—Diagram of a Printing Sequence for an Actual Message

M. Restrictions on Continously printed Characters

3.39 There are some characters which, by their nature and the geometry of the printer, should never be printed continuously across the line because faulty horizontal alignment of these characters will result.

These characters are:

for "AA" or "AL" (64 character font) " , ' , and ^.

for "AB" or "AG" (94 character font) " , ' , ` , ^, and ~.

3.40 Do not print consecutive lines of underline characters "___", for they may damage the ribbon and/or the printer. An occasional line of continouus underlines is permissible.

N. Printer Logic (Fig. 46)

3.41 The interface to the printer is SSI or EIA from an external controller data set or computer. The printer logic circuit card sends timing and control information to the controller circuits. The data, timing, and control information are formated in a SSI word (Table G) or EIA (Fig. 47); some typical examples are shown in Table G. Refer to Chart A, for a brief description of the operational sequence.

3.42 The SSI interface is a four-wire (send and receive pair) communication loop which is the carrier for the 18 bit words that are exchanged between units within a terminal at 56K baud rate, refer to Fig. 46. The receive pair (information to printer) receives both message control information and ASCII data. The send pair (information to controller) sends printer status information. The SSI bit assignments are identified in the Table.

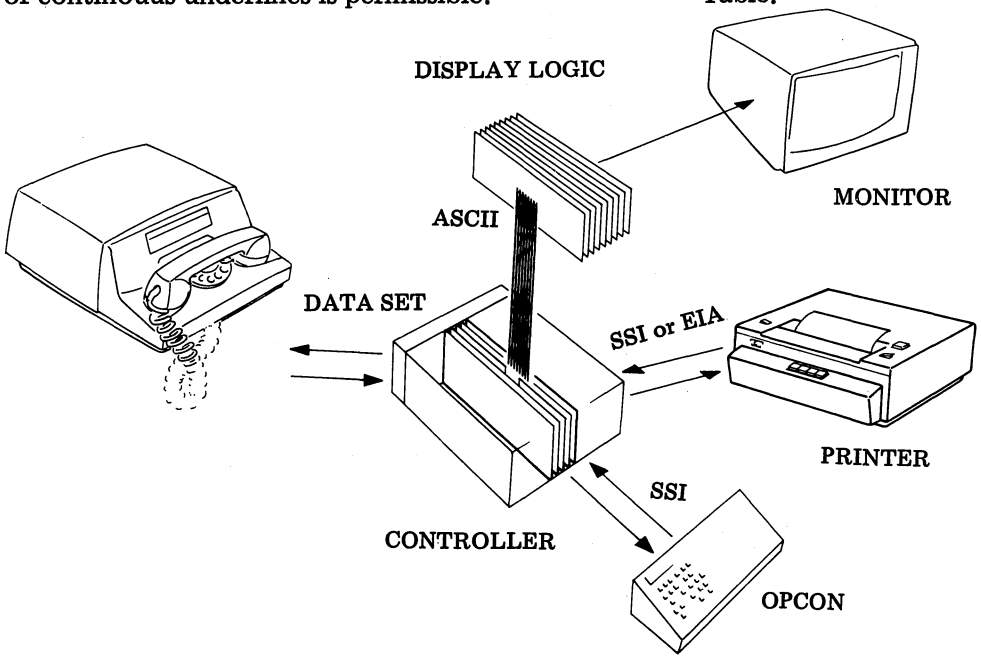


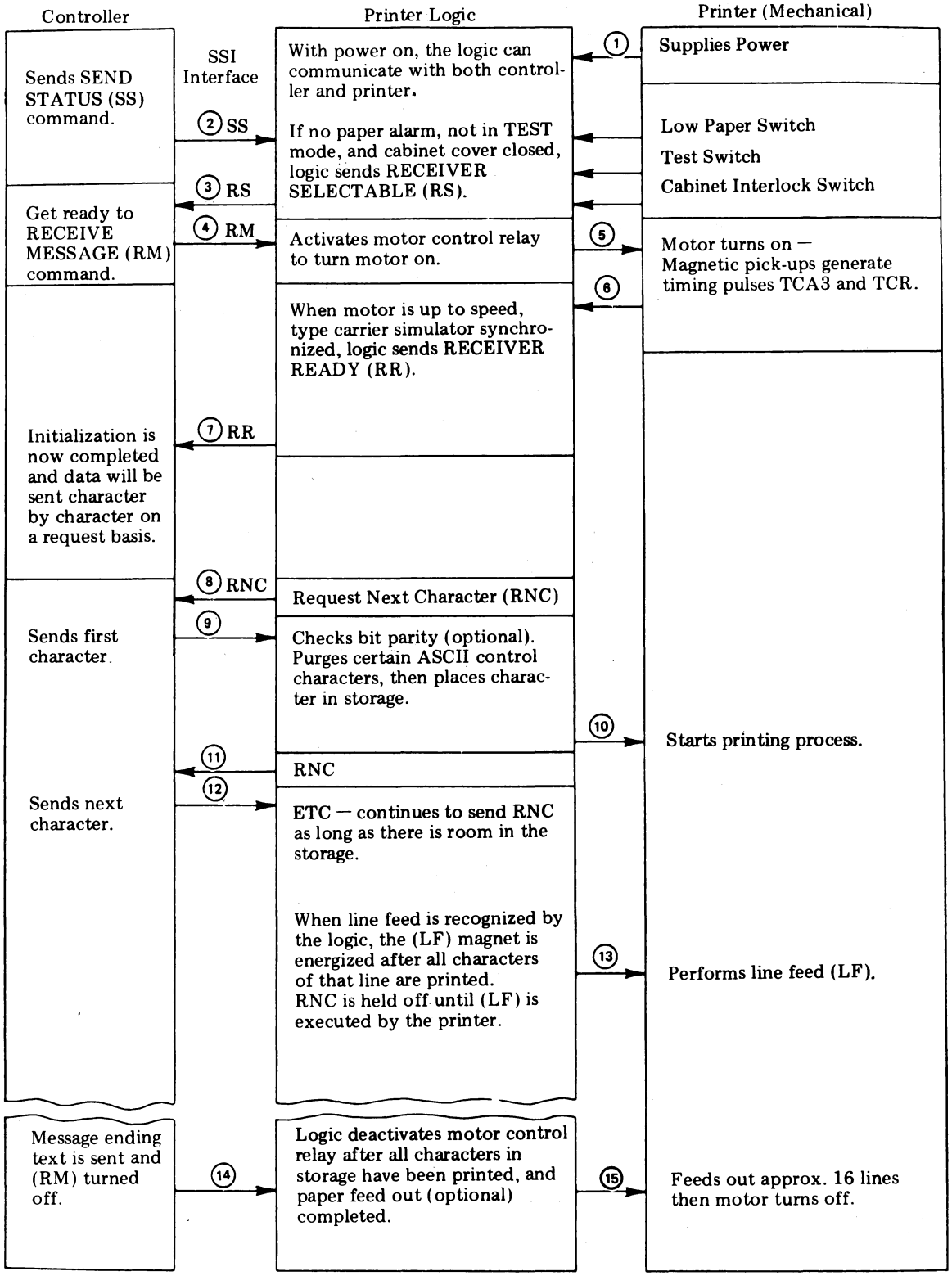
Fig. 46—Printer Logic

TABLE G

BIT	Control Word to Device		Control Word to Controller		ASCII Data Word	
1	Start of Word	(0)	Start of Word	(0)	Start of Word	(0)
2	Steer	(0)	Steer	(0)	Steer	(1)
3	Initialize	(1)	———	(0)	ASCII BIT 1	
4	Send Status (Request)	(1)	———	(0)	ASCII BIT 2	
5	———	(0)	Receiver Selectable	(1)	ASCII BIT 3	
6	Receive Message	(1)	Receiver Ready	(1)	ASCII BIT 4	
7			Request Next Character	(1)	ASCII BIT 5	
8					ASCII BIT 6	
9					ASCII BIT 7	
10					ASCII BIT 8	
11 to 18	BITS 7-18 are not used and remain (1)		BITS 8-18 are not used and remain (1)		BITS 11-18 are not used and remain (1)	

CHART A — OPERATIONAL SEQUENCE

Note: The operational sequence starts with item ①, printer supplies power to the logic circuit card and proceeds through item ⑮ .



O. OEM (Simplified EIA)

3.43 The "Simplified" EIA Interface allows a properly equipped DATASPEED 40 Printer to be used in applications not requiring a device controller. Character-at-a-time transfer of ASCII coded data is possible by a direct connection to an EIA type interface.

3.44 When this interface is provided, the user must be made aware of a restricted message format. The two line buffer of the printer is incapable of performing repeated short lines of data or multiple new line requests. A condition will occur called "data stacking" (See 2.25). When short lines of data are to be sent, each line must be padded with space, nulls or delete characters. The total length of the sent line is determined by a combination of the number of characters in the type font and the line speed of the printer.

3.45 The maximum permissible signal distortion of the printer must not exceed 25% at speeds up to 4800 bps. At speeds above 4800 bps, distortation of the line is not to exceed 6%. High rates of speed will require some rewiring of the interface cable to the printer.

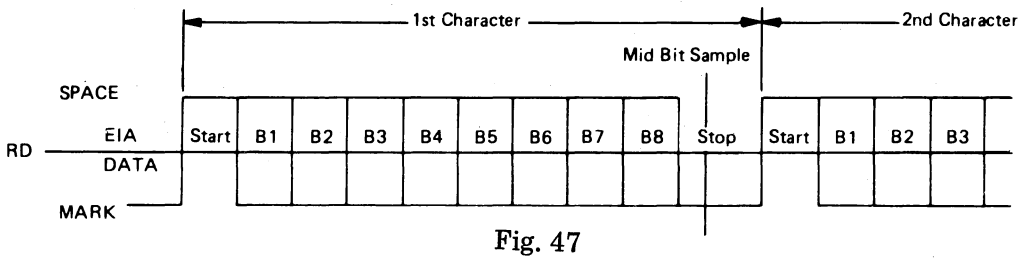


Fig. 47

3.46 The Device Selectable (From Printer) signal indicates the printer's ability to receive data. In the logic "1" state (positive voltage level), this lead indicates that the printer does not have; (1) an auxiliary alarm, (2) a PAPER OUT and/or optional PAPER JAM, and (3) an open cabinet interlock switch. A circuit card option, when implemented, will delay the transition to a logic "0" state (negative voltage level) until the END OF FORM contact has operated.

3.47 The Device Next Character (From Printer) signal indicates the printer's ability to receive a character. When ON (positive voltage level), this signal indicates that the printer is ready to process a character. An OFF state (negative voltage level) indicates the printer is NOT ready to process a character and another character should not be sent until this signal reverts to the ON state. The sending source should monitor this signal. The time required for this signal to pass through the transition region DOES NOT conform to EIA requirements. It is recommended that the user minimize the total capacitive loading on this signal interchange circuit at all baud rates. This is required due to possible minimum pulse width of the DNC signal.

3.48 The Request Device ON (to Printer) signal is required to turn ON the printer motor. An ON command is a positive voltage level and an OFF command is a negative level. As a prerequisite for a motor ON command, the user should monitor the terminal's ability to receive data via the Device Selectable Status Signal.

3.49 The Device Ready (from Printer) signal indicates the printer motor is up to speed and the printer is ready to receive. A Device Ready indication is a logic "1" or positive voltage level on this lead. A Device Not Ready indication is a logic "0" or negative voltage level. If loss of Device Ready occurs during data transmission, the printer logic will turn off the printer motor and this signal will switch to the logic "0" state.

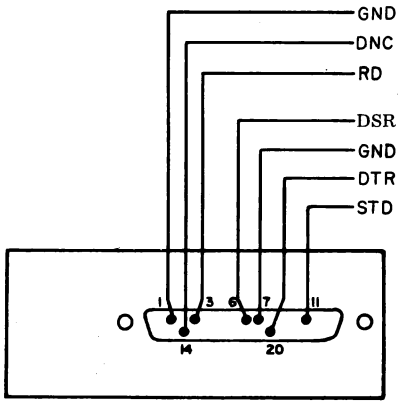
3.50 DATA (To Printer) must be presented on this lead in serial form utilizing ASCII character coding. A 10 unit code character structure must be used. Each character must consist of a START bit (SPACE), 8 DATA bits (MARK or SPACE), and a STOP bit (MARK). A MARK is a negative voltage level and a SPACE is a positive voltage level. See Table E and Fig. 48.

3.51 Circuit common return ground is used to reference all signal interchange interface leads. The printer is to be optioned to connect circuit ground to frame ground on the user side of the "interface".

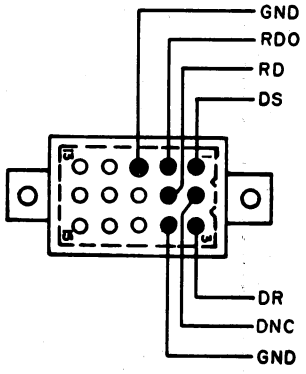
TABLE E

EIA PIN Interface	J115 ON TRACTOR FEED PRINTER
1 Protective Ground*	7 Frame Ground
7 Signal Ground*	6 Logic Ground
3 Received Data-10 bits per character (1 start, 7 information, 1 parity, 1 stop)	5 Data (to Printer) Received
6 Data Set Ready (motor held on when DSR is on)	4 Request Device On (to Printer)
20 Data Terminal Ready indicates power on and absence of alarm conditions. Low paper, paper-out, jams, etc. cause this lead to turn off immediately.)	1 Device Selectable (from Printer)
14 Device Next Character (to be turned on when a new character can be accepted).	2 Device Next Character (from Printer)
11 Secondary Transmitted Data (indicates motor is on and running at printing speed)	3 Device Ready (from Printer)

*Signal Ground and Frame Ground should be tied together internally by selecting an option on the power supply circuit card, or externally by the user.



EIA Interface Connector



Printer Connector

Fig. 48

Note: Refer to 1658CD or 2008CD or 2009CD for further EIA interface suggestions.

4. SUPPLEMENTAL INFORMATION

(a) How to Operate Manual

Section 999-301-121 Printer Operation and Maintenance
Section 999-305-121 Forms Access Printer

(b) Bell System Practices

SECTION	TITLE
582-210-200	Installation
582-210-400	Wiring
582-210-500	Testing and Troubleshooting
582-210-700	Adjustments and Lubrication
582-210-702	Disassembly/Reassembly and Parts
582-210-750	Routine Maintenance

5. MODIFICATION KITS

5.01 Modification kits that may be used with the DATASPEED 40 Printers and the associated installation specifications are listed below. The 50000S series specification is supplied with the modification kit or may be ordered separately from Teletype Corporation.

MOD KIT OR TP NO.	SPECIFICATION	PRINTER	FEATURES
402618 402633	50811S	80F	Instructions for Installing the 402618 and 402633 Modification Kits to Provide an Improved Motor Control Relay and 50/60 Hertz Motor (40P101)
403380	50815S	80F	Instructions for Installing the 403380 Modification Kit for Multicopy Roll and Single Copy Fanfold Paper
405905	50819S	80F	Instructions for Installing a 405905 Modification Kit to Provide an Improved Spindle
402617 402868 402878	50827S	80F, T 132T	Instructions for Installing and Using the 402617 Adjusting Gauge, the 402868 Bar Gauge and the 402878 Pallet Depth Gauge
408040	50834S	80F, T	Instructions for Installing the 408040 Modification Kit to Prevent Loosening of Motor Fan
402866	50836S	80T	Instructions for Installing the 402866 Modification Kit to Provide Improved Ribbon Tracking
402845	50841S	80F, T 132T	Instructions for Installing the 402845 Modification Kit on Ribbon Feed Mechanism
402850	50847S	80T	Instructions for Installing 402850 Modification Kit to Convert a 80-Column Tractor Feed Printer for Printing on Multi-Ply Forms Without an Ink Ribbon

MOD KIT OR TP NO.	SPECIFICATION	PRINTER	FEATURES
402936	50868S	80T	Instructions for Installing 402936 Modification Kit that Provides a Replaceable Ribbon Shield on 80-Column Tractor Feed Printers
408660	50869S	132T	Instructions for Installing 408660 Modification Kit to Provide a Retaining Device to Prevent Possible Separation of the Paper Handling Assembly (with Handle) from the 132-Column Printer Side Castings During Maintenance or Installation
407104	50873S	80F	Instructions for Installing 407104 Modification Kit to Equip Friction Feed Printer (40P101) with Acoustical Noise Reduction Parts
408646	50880S	80F, T 132T	Instructions for Using 408646 Printer Test Set with all Friction and Tractor Feed Printers
408680	50882S	80T	Instructions for Installing 408680 Modification Kit that Provides a Redesigned Paper-Out Actuator for 80-Column Tractor Feed Printer
400378	50885S	All	Instructions for Installing 400378 Modification Kit to Replace the Friction Feed 400204 Front Casting with 402858 Front Casting and Associated Parts
402920	50901S	80 or 132T	Instructions for Installing 402920 Modification Kit Providing a Device to Sense Paper Jams and Treat the Signal as Paper Out
408681	50904S	132T	Instructions for Installing the 408681 Modification Kit to Provide Redesigned Paper-Out Switch
407790	50905S	132T	Instructions for Installing the 407790 Modification Kit to Provide a Reinking Device on a 132-Column Tractor Feed Printer
408990	50913S	80T	Instructions for Installing the 408990 Modification Kit to Provide a Reinking Device on a 80-Column Tractor Feed Printer
407800	50924S	80 or 132T	Instructions for Installing 407800 Meter Roller Set on a 80- or 132-Column Tractor Feed Printer
407777	50925S	80 or 132T	Instructions for Installing 407777 Ribbon Cartridge Set on a 80- or 132-Column Tractor Feed Printer
406273 406274 406275 406276 400101 402707	50929S	All	Instructions for Installing Modification Kits 406273, 406274, 406275, 406276, 400101 and 402707 to Equip the Print Head with Wear Rod Retainers