

DOT MATRIX SERIAL IMPACT PRINTER

MODEL 1550S/SC EP

USERS MANUAL



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Thank you for purchasing the model 1550S/SC EP.

“This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer’s instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems”. This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.”

Note:

In order to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, please use the Shield cable for interfacing with the host computer.
(US. VERSION ONLY)

This equipment is manufactured to comply with VDE-871/875. However there is no guarantee that the fault wave to other equipments will not occur in a particular connection.

**“All of the features and specifications are
subject to change without prior notice”**

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INTRODUCTION

MODEL 1550S/SC EP PRINTER

1.1 Features

The 1550S/SC EP is a sophisticated compact dot matrix printer which can greatly enhance the printout capability and control flexibility for your computer system.

It is designed for high compatibility, fast printing (180 characters per second).

A precision 9-wire print head will produce high resolution characters in a variety of printing modes: 132 characters per line in the standard mode, 218 characters per line in the compressed mode, 66 or 109 double-width characters per line in the standard mode or compressed mode respectively.

Main features of the printer also include:

- * Full 96 ASCII characters with descenders.
- * Extended character sets of international languages.
- * Subscript, superscript, and underline.
- * Programmable graphics.
- * Double-size characters.
- * Double-strike (enhanced) printing.
- * Extensive line feed control.
- * Standard 2K buffer, optionally expandable.
- * Hex Dump Function.
- * Self Test Function.
- * Color print capability (M-1550SC EP only)

In the case of an IBM PC (XT), or its equivalent, the printer is to be connected to the computer through a printer adapter card or through another adapter card which is good for connecting the printer and a monochrome display as well. The interface cable, in that case, should have a 25-pin D-shell connector on its end toward the computer and a 36-pin connector on its end toward the printer.

IBM is a trademark of International Business Machines Corp.

1.2 Printer Specifications

- (1) Type Serial Impact Dot Matrix
- (2) Print Speed 180 CPS (Draft)
120 CPS (Normal)
- (3) Print Direction Bidirectional with Logic Seek
- (4) Pin Number in Print Head 9
- (5) Line Space 1/6" (4.23mm) or programmable
- (6) Character Format
- | Dot Matrix | (H x W) | Draft | Normal |
|---|---------|-------|--------|
| Double-size characters | | 12X12 | 12X8 |
| Other characters
(ASCII, European, etc.) | | 9X12 | 9X8 |
- Character Set 2 types Type 1: Draft
Type 2: Normal
- Refer to Figure 21, 22
Double-size characters
176-223, 244 and 245

Print Characteristics
Extra Character Set

No. 1
Additional ASCII numbers from 160 to 175 for European chars.; numbers from 176 to 223 for Graphic chars.; numbers from 224 to 239 for selected Greek chars.; number from 240 to 255 for math. and extra symbols.

No. 2
The differences between No. 1 and No. 2 are ASCII numbers 3, 4, 5, 6 and 21; ASCII numbers from 128 to 159 for European chars..

Graphics

Including 50 block chars. and Programmable Graphics.

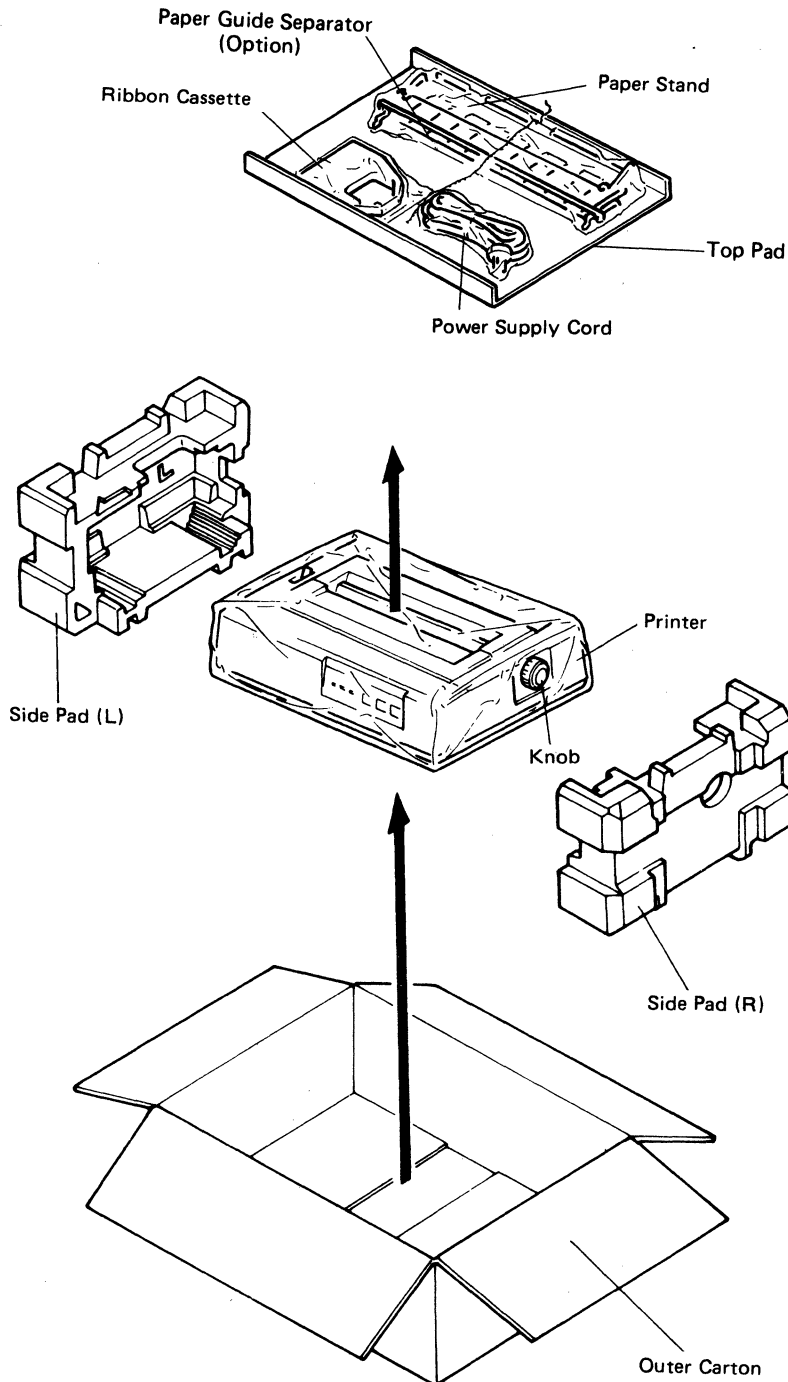
(7) Character Pitch

	Characters per inch	Maximum number of characters/line
Normal	10	132
Double Width	5	66
Compressed	16.5	218
Double Width-Compressed	8.25	109
Subscript	10	132
Superscript	10	132

- | | |
|-------------------------------|---|
| (8) Media Handling | |
| Paper Feed | Sprocket pin feed and friction feed (Selectable) |
| Paper Width | 4.25" (108mm) to 15" (381mm) |
| Number of Copies | Original plus two carbon copies (Total thickness must not exceed 0.011" (0.28mm); Minimum paper thickness is 0.002" (0.05mm)) |
| Paper Loading | From Rear-Top |
|
 | |
| (9) Interface | 8-bit Parallel |
|
 | |
| (10) Inked Ribbon | |
| Color | Black |
| Type | Cartridge |
| Life Expectancy | 2 million characters |
|
 | |
| (11) Environmental Conditions | |
| Operating Temperature | 41 to 104°F (5 to 40°C) |
| Operating Humidity | 10 to 85% RH non-condensing |
|
 | |
| (12) Power Requirement | |
| Voltage | 115 VAC, 60Hz
220 VAC, 50Hz
240 VAC, 50Hz |
| Power Consumption | 180 W max |
|
 | |
| (13) Dimensions and Weight | |
| Height | 5.7" (144.5mm) |
| Width | 21.7" (550mm) |
| Depth | 12.4" (314mm) |
| Weight | 25.4lb (11.5kg) |

SECTION II INSTALLATION

2.1 Unpacking Instructions



1. After opening the outer carton, take out the top pad in which the ribbon cassette, the power supply cord and the paper stand are packed. (The paper guide separator is optional.)
2. Hold the left and right pads with both hands and carefully draw out the printer from the outer carton.
3. Remove the left and right side pads from the printer.

Fig. 1 Unpacking (1)

- Carefully remove clear plastic packing bag from printer.

(See Fig. 2.)

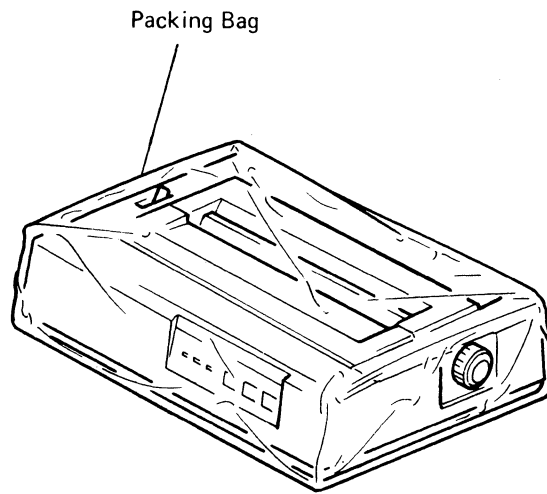
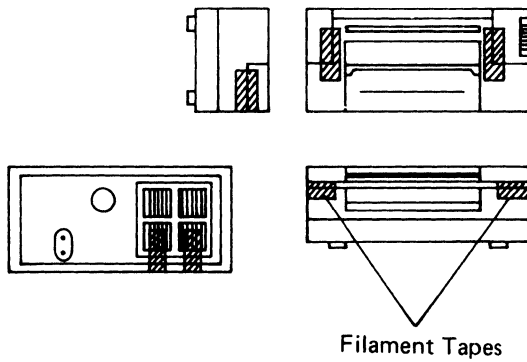


Fig. 2 Unpacking (2)



- Remove the filament tapes.

- Open the carrier cover. Then remove the corrugated tube that is provided to retain the head. (See Fig. 3.)

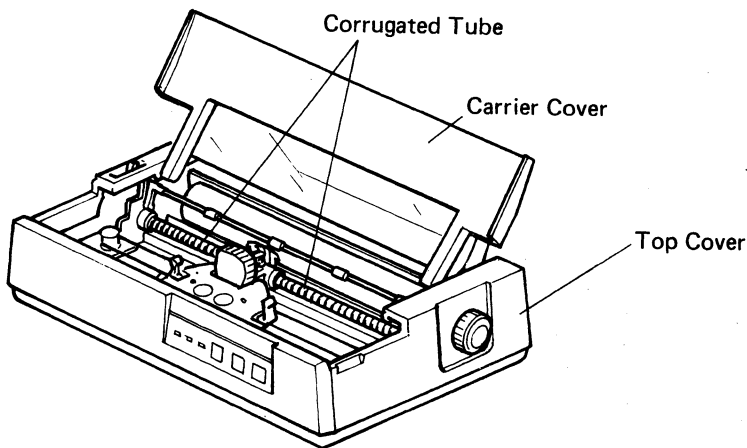


Fig. 3 Unpacking (3)

2.2 Ribbon Cassette Installation

To install the ribbon cassette on the printer, proceed as follows:

- (1) Open the carrier cover.
- (2) Gently move the printer head carrier assembly to a position where no roller is fitted on the roller shaft.
- (3) To install the ribbon cassette, turn the Cassette Drive Knob in the direction of the arrow (clockwise) to tension the ribbon. (See Fig. 4.) Holding the cassette, carefully insert the ribbon end between the ribbon guide plate and ribbon guide, and push the cassette down on the ribbon deck. At this time, align the two guide projections at the cassette bottom with the cassette guide holes. Make sure that the notches on both sides of the cassette are supported completely by the two cassette supporters. If not supported by the cassette supporters (the cassette is raised), push down on the cassette while turning the ribbon drive gear clockwise. (See Fig. 5.)

After the Ribbon Cassette is firmly in place, turn the Cassette Drive Knob in a clockwise direction to make sure the Cassette Drive Gear and the Unit Ribbon Drive Gear are locked together properly.

Note: To ease the ribbon cassette installation, set the Gap Adjusting Lever to the Gap 4 position. (Refer to section 2.6)

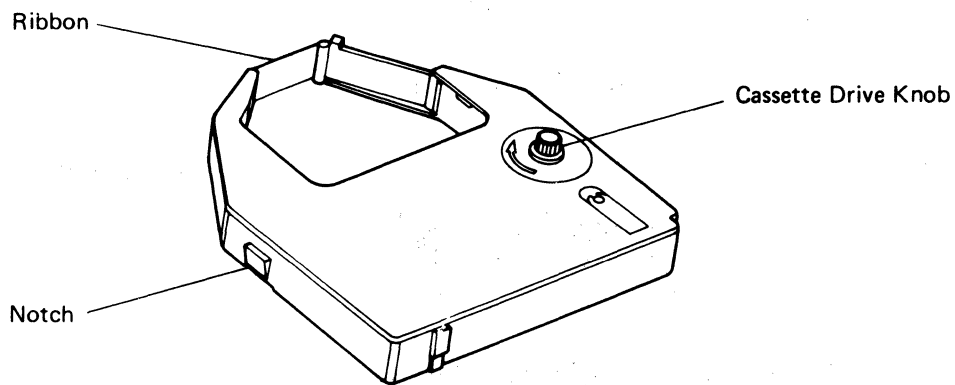


Fig. 4 Ribbon Cassette

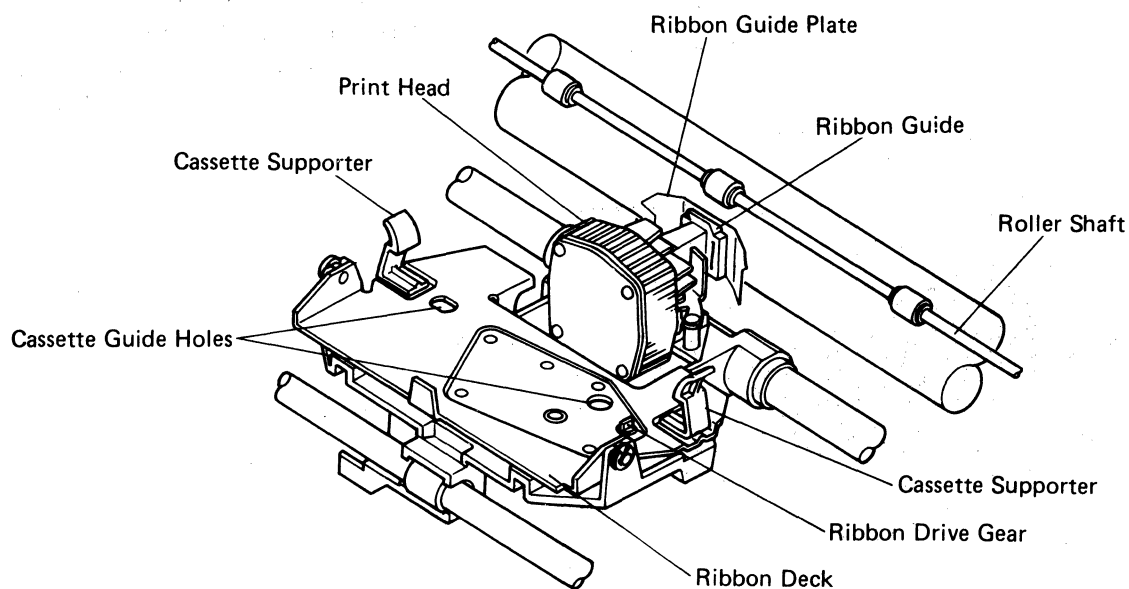


Fig. 5 Ribbon Deck without Ribbon Cassette

2.3 Paper Insertion

2.3.1 Pin Feed (fan-folded paper)

- (1) Open the paper cover.
- (2) Open the paper cutter, and pull the roller shaft toward the front of the printer.
- (3) Pull the release lever toward the front. (See Fig. 6.)

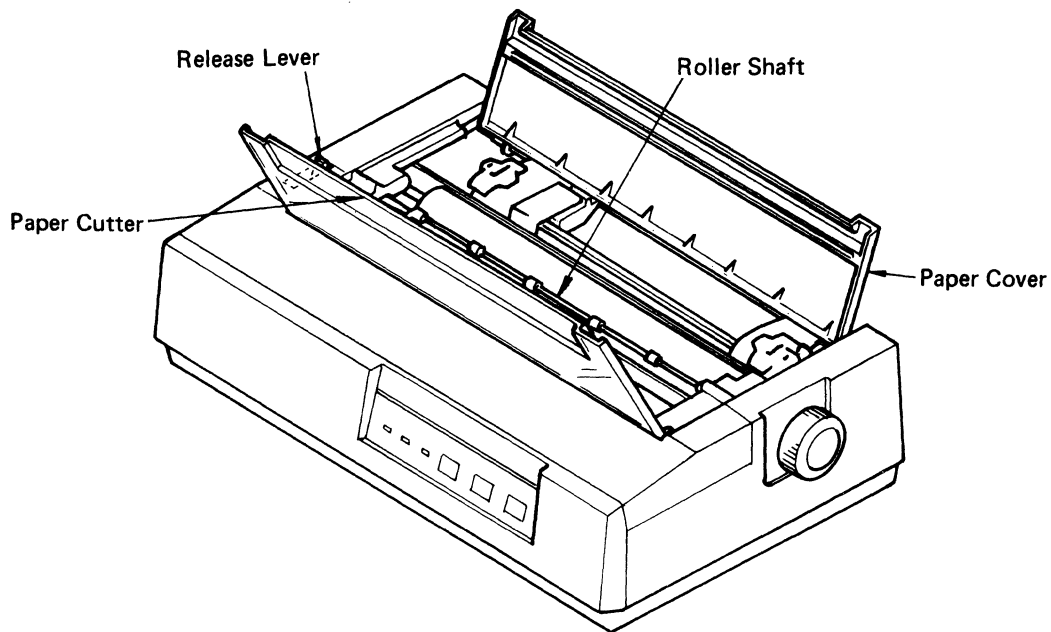


Fig. 6 Paper Insertion (1)

- (4) Lift the paper retainers on the left and right sprocket tractors.

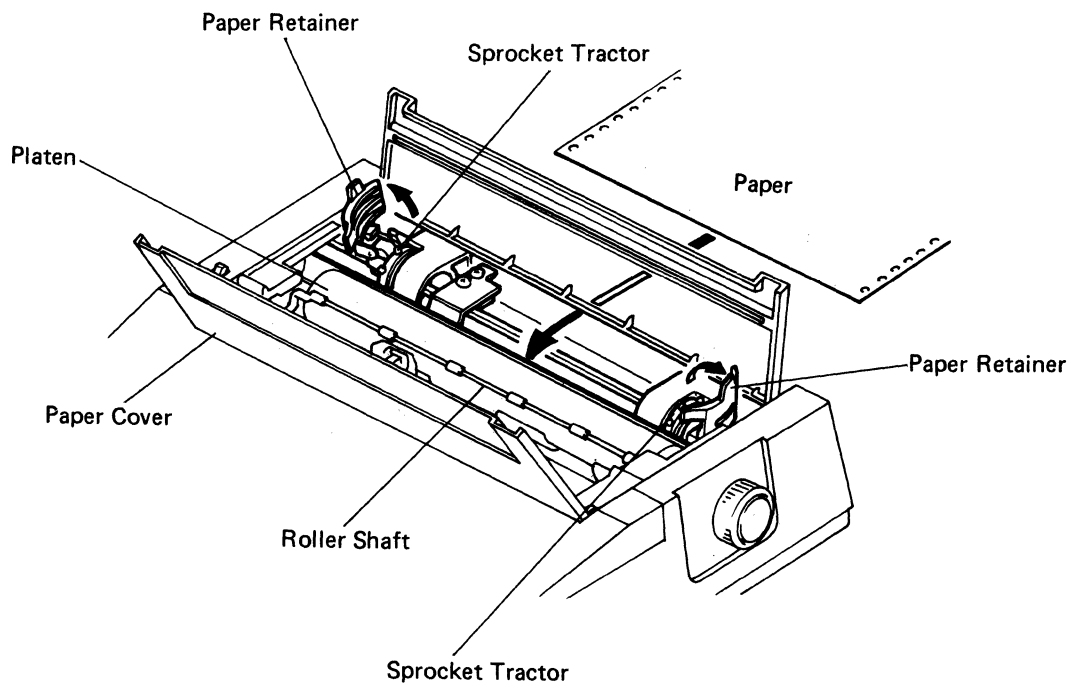


Fig. 7 Paper Insertion (2)

- (5) Fit the paper sprocket holes onto the right and left sprocket tractor pins. If the paper width necessitates adjusting the distance between the sprocket tractors, push back the right or left sprocket lever (allowing the sprocket tractor(s) to move freely) and move the sprocket tractor(s) right or left as needed to match paper width. Then pull the sprocket lever(s) forward to lock the position of the sprocket tractor(s). (Refer to Fig. 8.)

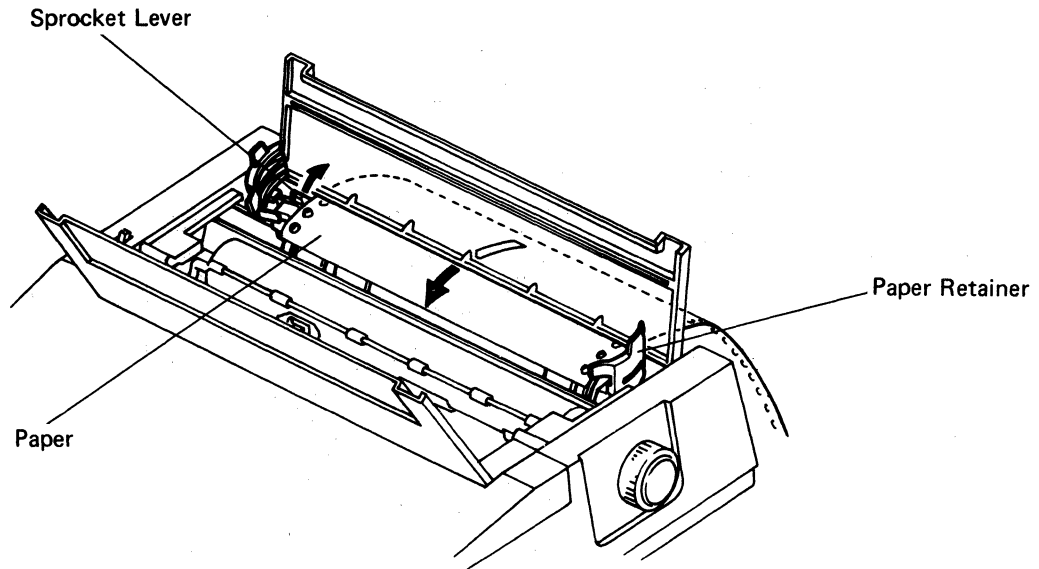


Fig. 8 Paper Insertion (3)

- (6) Now push down the paper retainer of the sprocket tractors. Turn the platen knob clockwise, bringing the paper to the front side of the platen. Return the roller shaft to hold the paper against the platen and the Release lever to the rear for pin feed operation. (See Fig. 9.)

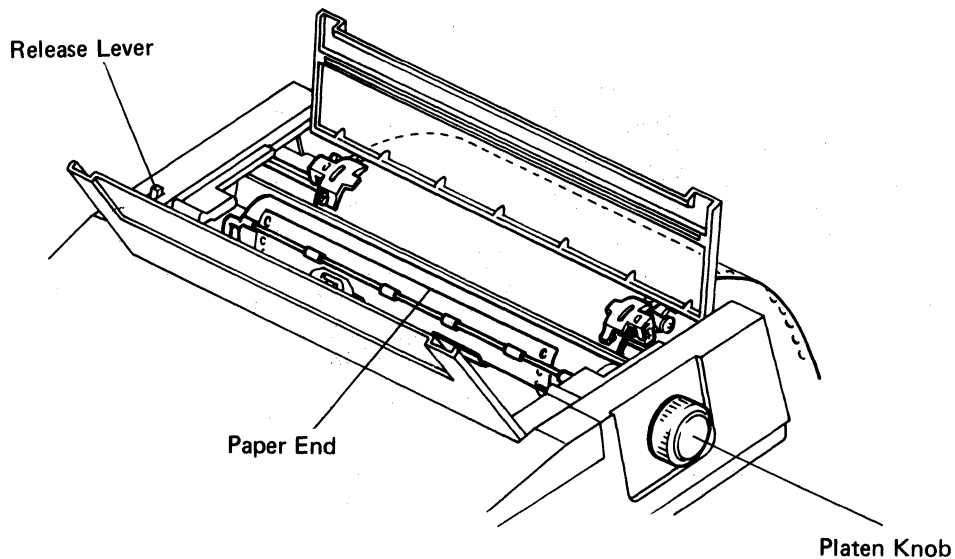


Fig. 9 Paper Insertion (4)

- (7) How to install paper stand.
Install the paper stand as shown below.

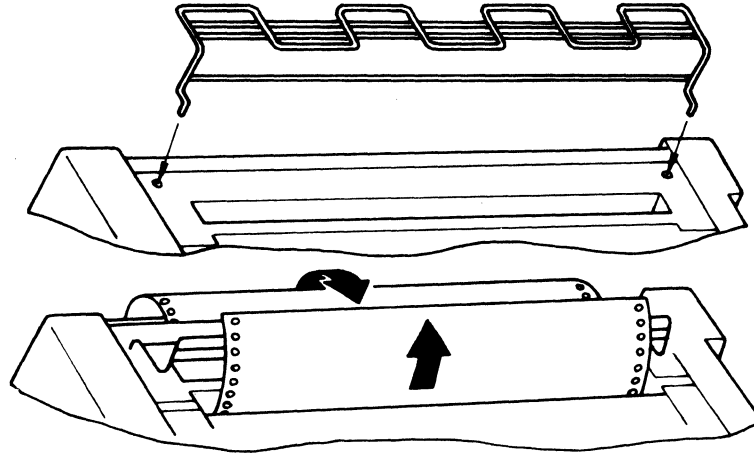


Fig. 10 Paper Insertion (5)

- (8) Positions of Bail Rollers.
When inserting paper, set the bail rollers as shown below.

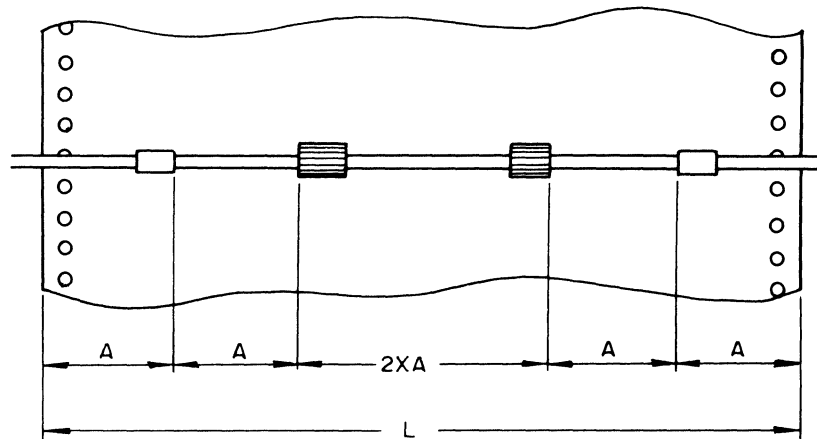


Fig. 11 Positions of Bail Rollers

L = Paper width

Example: In case of 15-inch paper: $A = \frac{L}{6} = \frac{15}{6} = 2.5$ inches (63.5 mm)

2.3.2 Friction Feed (roll paper and sheet paper)

- (1) Open the print cover, and pull the roller shaft toward the front of the printer.
- (2) Move the print head carrier assembly to the left side of the printer.
- (3) Push the release lever to the rear of the printer.
- (4) Insert the paper into the paper inlet on the paper cover (behind the paper cover for roll paper). When the paper end appears on the platen, set the paper properly, pull the release lever toward the front (to the "friction feed" position), and reposition the roller shaft and print cover. (See Fig. 12.)

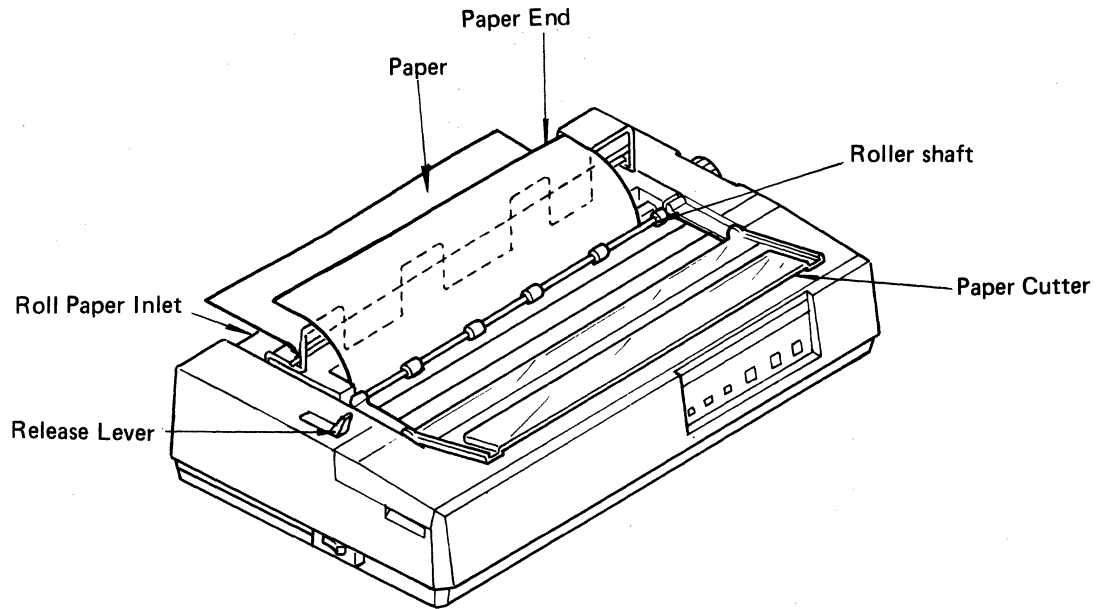
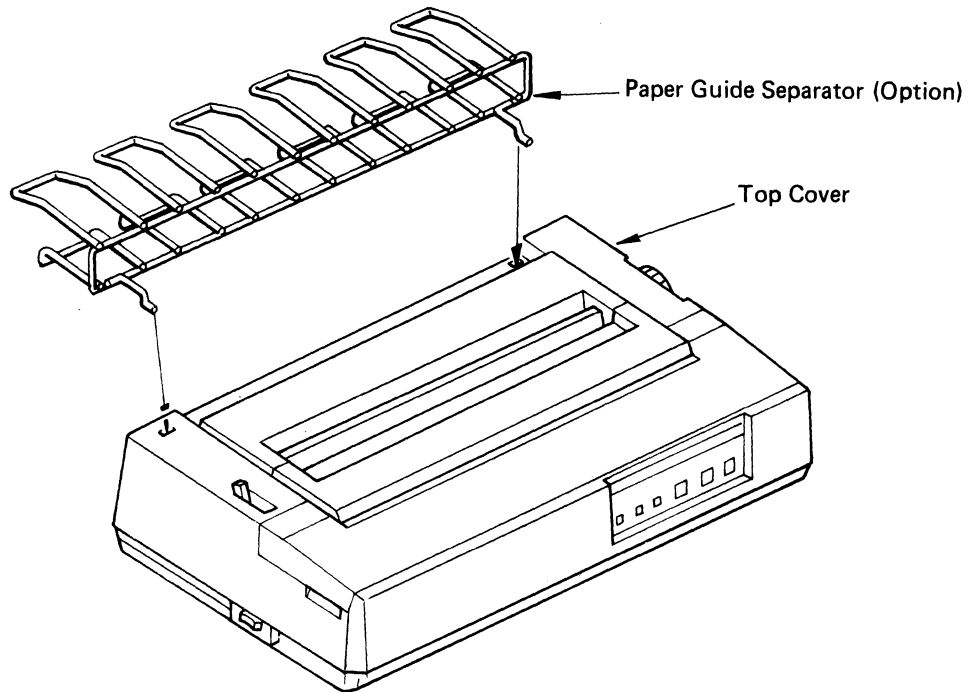


Fig. 12 Friction Feed Set-up

2.4 Use of the Paper Guide Separator (option)

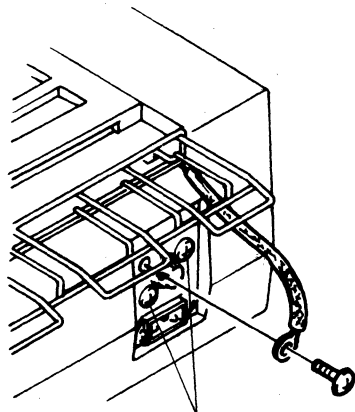
Install the optional paper guide separator on the printer as follows:

- (1) Insert the legs of the paper guide separator into the square holes on the rear of the printer top cover.



Notes:

- Connect the ground wire from the paper guide separator as follows:
Remove the screw at top left of the power supply unit plate, pass the screw through the hole at the end of the ground wire, and reposition and tighten the screw together with the ground wire.



Do not remove these two screws.

- To remove the paper guide separator from the printer, pull the ground wire on its paper guide separator side.

Fig. 13 Mounting the Paper Guide Separator

- (2) Pass the paper through the paper guide separator, and into the printer. (See 2.3 “Paper Insertion”.) When the paper end comes on the platen, draw it over the top of the paper guide separator, and drop it from the rear. (See Fig. 14.)

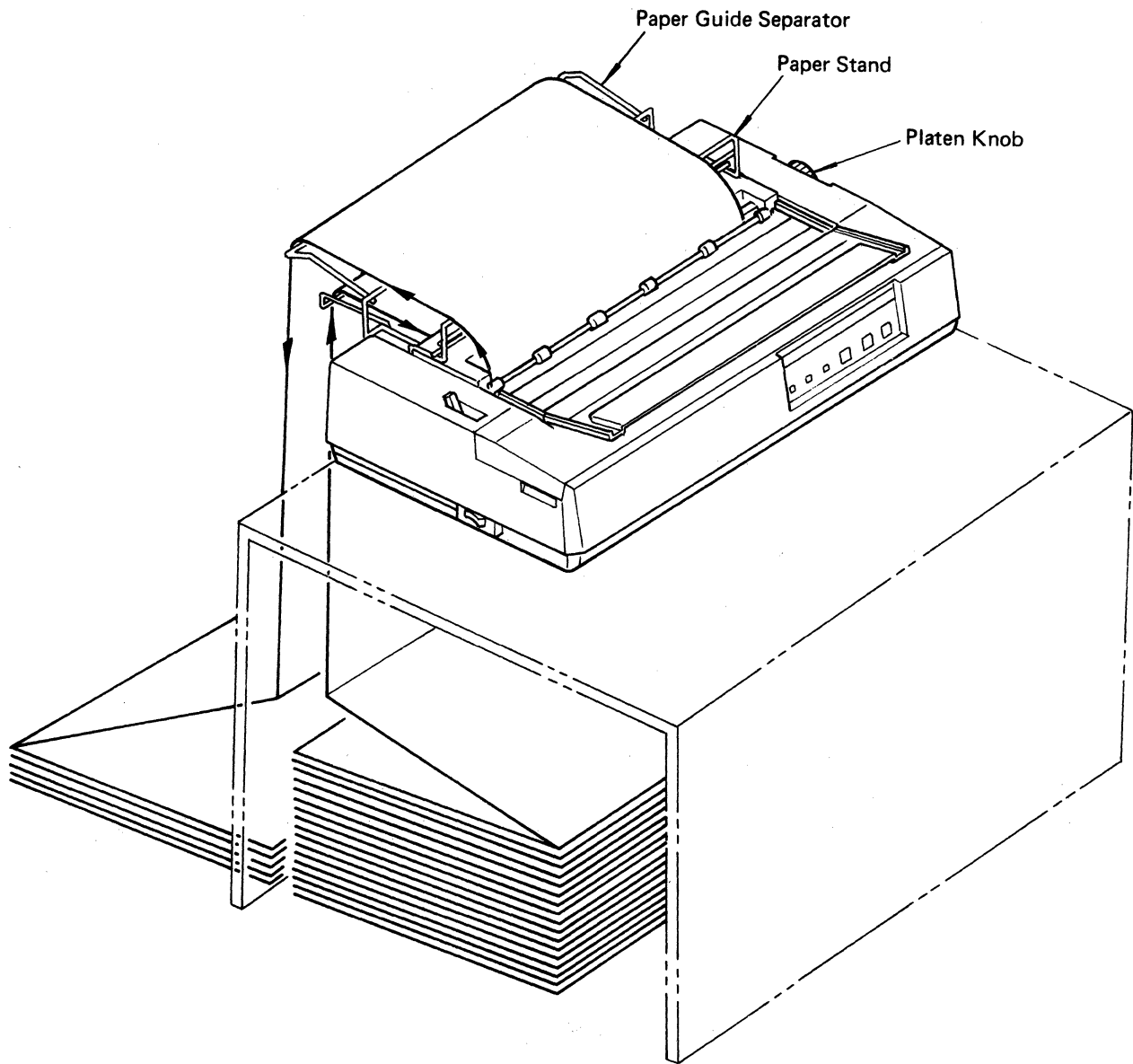


Fig. 14 Example of Paper Guide Separator Application

2.5 Print Position Adjustment

After the paper is properly installed, turn the platen knob clockwise to adjust the print position.

2.6 Adjustment of Gap between Dot Head and Platen

The gap between the Print head and the platen is adjustable in 4 steps.

- (a) When the gap adjusting lever is moved fully counterclockwise, the gap between the Print head and the platen will be narrowed to the limit. The lever is usually set at this position when a single sheet paper is used.
- (b) To obtain high printing quality, move the gap adjusting lever to adjust the gap.

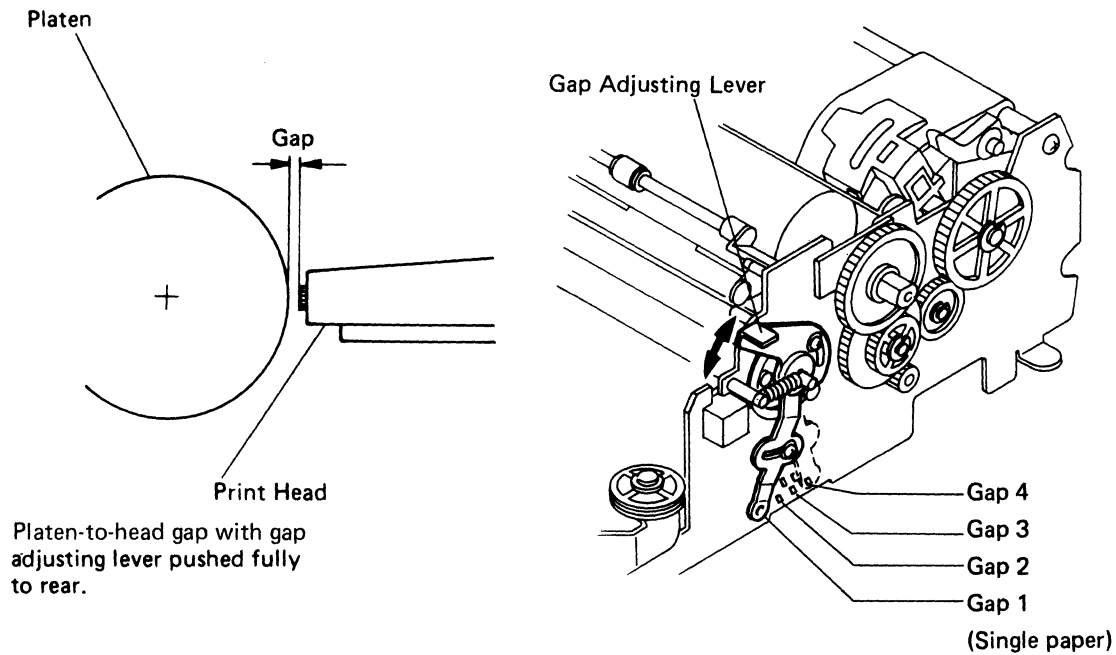


Fig. 15 Gap Adjustment between Dot Head and Platen

2.7 Power Cord Connection

Connect the attached power cord to the printer, and insert the plug into the AC outlet.

SECTION III OPERATION

3.1 Appearance and Nomenclature

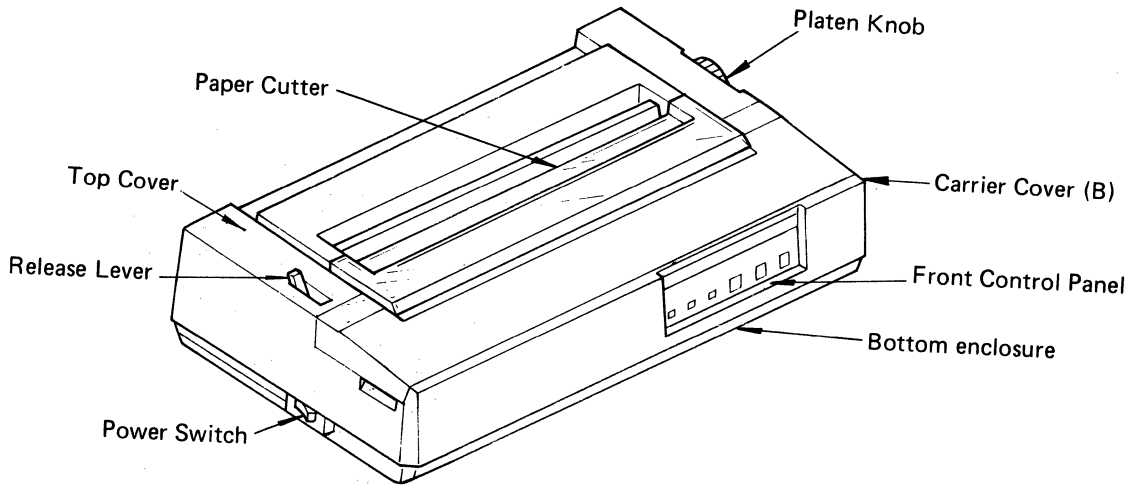


Fig. 16 Front Exterior View

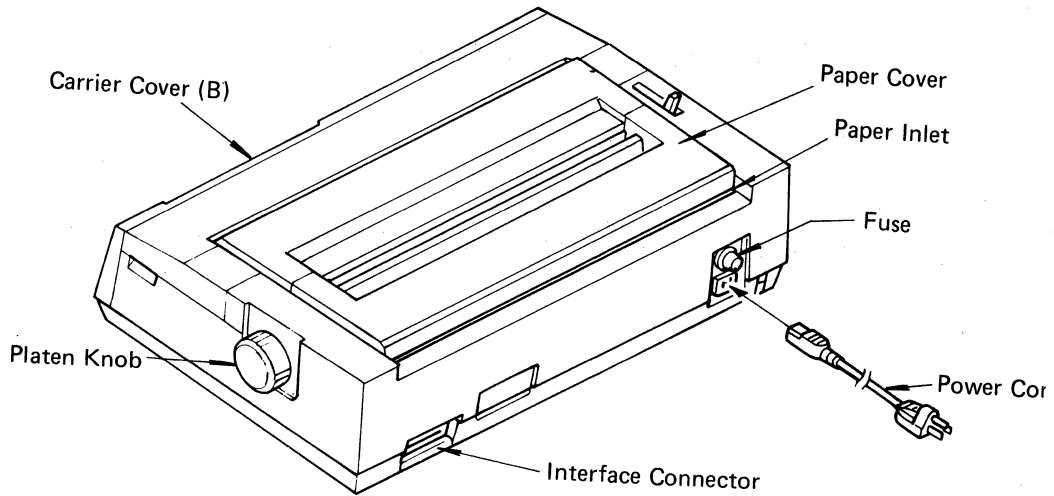


Fig. 17 Rear Exterior View

3.2 Power Switch and Control Panel

(1) Power Switch

The power ON-OFF switch is located on the left side of the printer.

Its • mark side should be pushed to turn it ON.

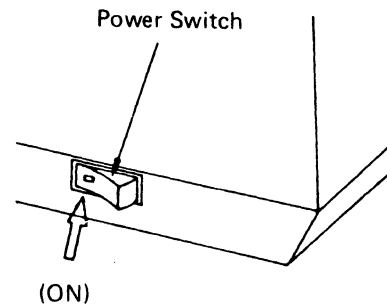


Fig. 18 Power Switch

(2) Control Panel

The control panel is located at the right front of the printer. As shown in Fig. 19, the panel has 3 push switches, 2 green LEDs, and one red LED.

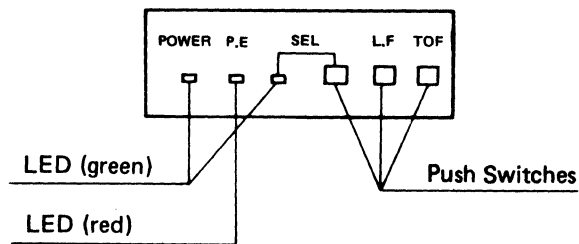


Fig. 19 Control Panel

3.3 Operating Switches

The 3 operating switches are of the push type and are located in the right hand section of the control panel.

3.3.1 SEL (Select) Switch

- (a) SELECT and DESELECT states alternate with every push.
- (b) When power is applied, the printer will become SELECT.

Data transmission and printing of data in the DATA BUFFER can be stopped temporarily. To perform this operation, press the SEL switch with the LF switch already depressed. To resume printing and data transmission, press the SEL switch.

3.3.2 LF (Line Feed) Switch

- (a) One line feed occurs with every push.
- (b) When the switch is kept depressed, paper is fed one line as far as 4 lines. Thereafter, continuous forward line feed takes place until the switch is turned off.
- (c) Line feed can be performed only when the printer is in a DESELECT state.

3.3.3 TOF (Top of Form) Switch

- (a) When this switch is pressed, the paper feeds to the next TOF position.
- (b) TOF can be performed only when the printer is in a DESELECT state.
- (c) Paper advance is done only once even if this switch is kept depressed.

3.4 Alert Switches

3.4.1 PE (Paper Empty) Switch

- (a) This is a microswitch located near the bottom of paper feed platen which detects the end of paper or absence of paper.
- (b) When the end of paper is detected, printing is stopped. When the SEL switch is pressed to continue printing, the printer prints one line and then stops.
Upon detection of paper empty by this switch, the PE lamp lights, and the printer is deselected. The printer is deselected immediately when the printer power is turned on or if PE status has been detected when an INPUT PRIME is entered.

3.4.2 Cover Interlock Switch

- (a) This is an interlock switch which detects that the top cover is opened.
- (b) Upon detection of cover opening during printing, the printer automatically stops and is deselected after printing one line. If not during printing, the printer is immediately deselected.
- (c) To select the printer again, it is necessary that the SEL switch is depressed after closing the top cover.

3.5 Indicator Lamps

The following lamps are located on the control panel.

3.5.1 SEL Lamp (Green)

This lamp is lit when the printer is in the SELECT state.

3.5.2 PE Lamp (Red)

This lamp is lit when the PE microswitch is activated.

3.5.3 Power-On Lamp (Green)

The lamp is lit when the printer power is on.

3.6 Other Functions

3.6.1 Self-Test Function

M1550SEP has a Self-Test function to check printing operation. To activate Self-Test, perform the following steps:

- (a) Turn power ON. Check to see that the carriage is returned to the left home position. Turn power OFF.
- (b) Install paper (see Section 2-3).
- (c) With the TOF button depressed, turn power ON, then release the TOF button. The printer will automatically print the preprogrammed test pattern, perform line feed, and print again. The Self-Test function will continue, providing a sample of the print capabilities.
- (d) To stop Self-Test, turn power OFF.

3.6.2 Print Start Conditions

There are following conditions which causes print start, in addition to receiving the print command from host computer.

- (a) When data for whole one line without any print command is received. (Whether line feed is performed or not is determined by changing the DIP switch.)
- (b) When there are data remaining in the line buffer at the time of deselection of the printer. In this case, the printer prints out data in the line buffer, and stops the head carrier at the position where printing of all remnant data is completed.
- (c) When the print data buffer becomes full. The printer prints out data and stops the head carrier.

3.6.3 PE Over Ride Function

- (a) When the SELECT switch is depressed after detection of PE and following printing, the printer is deselected, and print data of one line in the buffer is printed out and then returns to DESELECT status again.

3.6.4 Print Stop Function in Case of Emergency

If the LF switch is kept depressed until completion of one line printing after the SEL switch is pressed to deselect the printer, the printer stops without printing out the remaining data in the data buffer. To print out the remnant data, press the SEL switch to select the printer.

3.6.5 Received Data Hexadecimal Print Out Function

- (a) When printer power is turned on while depressing the LF switch, data received from the host computer is printed out in hexadecimal.
- (b) The hexadecimal print out mode is cleared when the printer power is turned off.

3.7 DIP Switches Setting

The DIP switches on the control circuit board enable the operator to select wide varieties of control modes and print functions.

The initial factory settings and the operator-selectable modes and functions are shown in the tables in the subsequent pages.

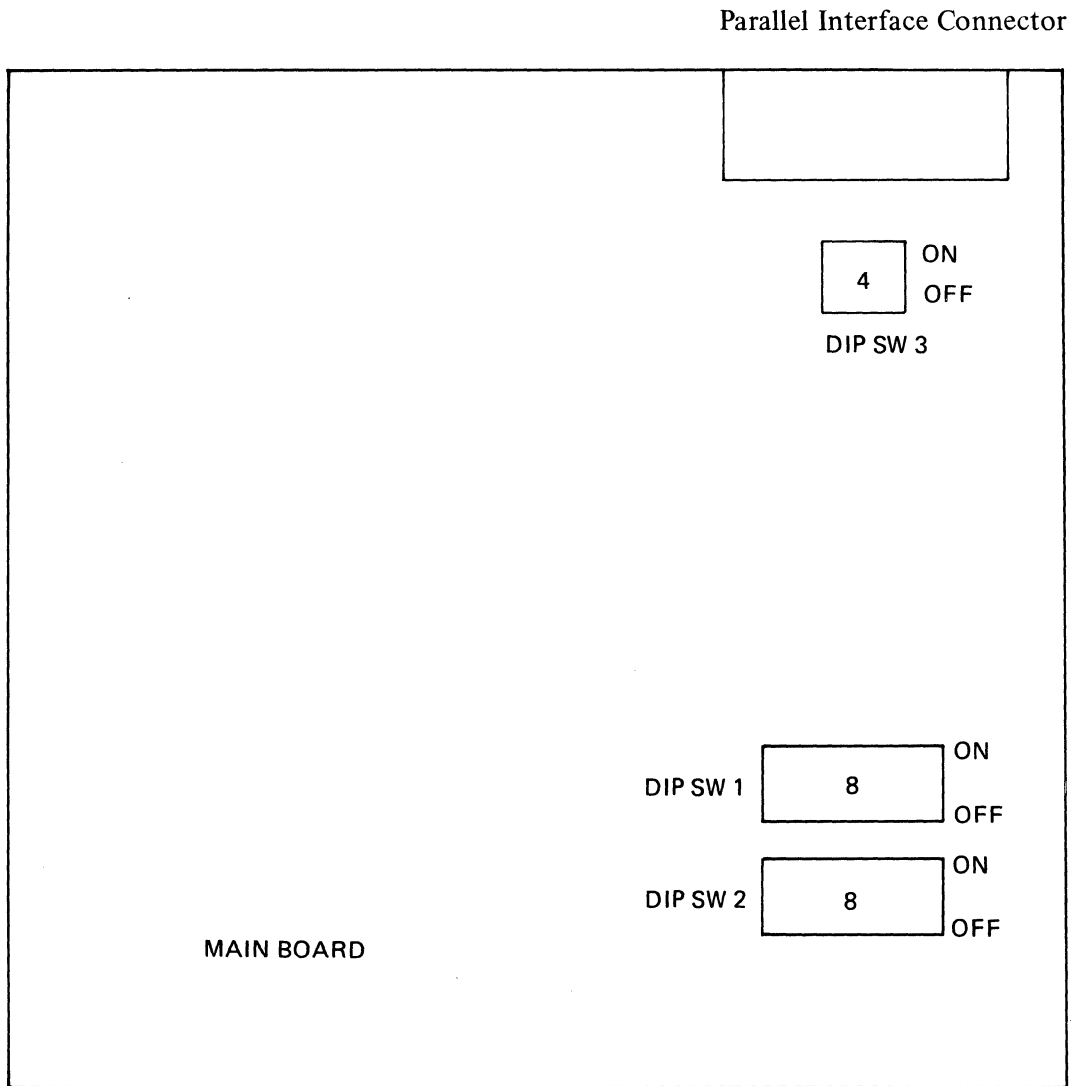


Fig. 20 DIP Switch Locations on Control Circuit Board

For DIP-SW 1

Switch No.	Function	ON-Position	OFF-Position	Factory Setting
1-1	Not applicable			ON
1-2	CR	Print only	Print & LF	ON
1-3	Buffer Full	Print only	Print & LF	OFF
1-4	Cancel Code	Invalid	Valid	ON
1-5	Not applicable			ON
1-6	Error Buzzer*			OFF
1-7	CG	NO. 2	NO. 1	OFF
1-8	SLCT IN Signal	Fixed initially	Not fixed initially	ON

For DIP-SW 2

Switch No.	Function	ON-Position	OFF-Position	Factory Setting
2-1	Form Length	12 inches	11 inches	OFF
2-2	Line Spacing	1/8 inch	1/6 inch	OFF
2-3	Auto Feed XT Signal	Fixed initially	Not fixed initially	OFF
2-4	1 inch skip over perforation	Valid	Invalid	OFF
2-5	Print Direction of Bit Image Unidirection/Bidirection	Set by Host	Unidirection	OFF
2-6	Print Quality	Normal	Draft	OFF
2-7	1-line buffer or n-line buffer	1-line	n-line	OFF**
2-8	Not applicable			OFF

Remarks:

* The Error Buzzer function is currently excluded.

** Increased throughput speed may be achieved by adopting n-line buffer.

For DIP-SW 3

Switch No.	Contents		Factory Setting
3-1	36 Pin	INPUT BUSY	OFF
3-2	36 Pin	SLCT IN	ON
3-3	14 Pin	GND	OFF
3-4	14 Pin	AUTO FEED XT	ON

3.8 Connecting the Interface Cable

The connector cable from the interface should be connected as shown in Fig. 21.

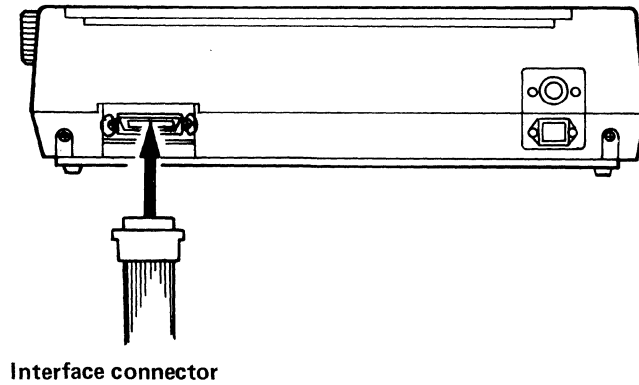


Fig. 21 Interface Connection

Connector Pin Assignment and DIP-SW 3

Pin 18 is connected to +5V.

Pin No.

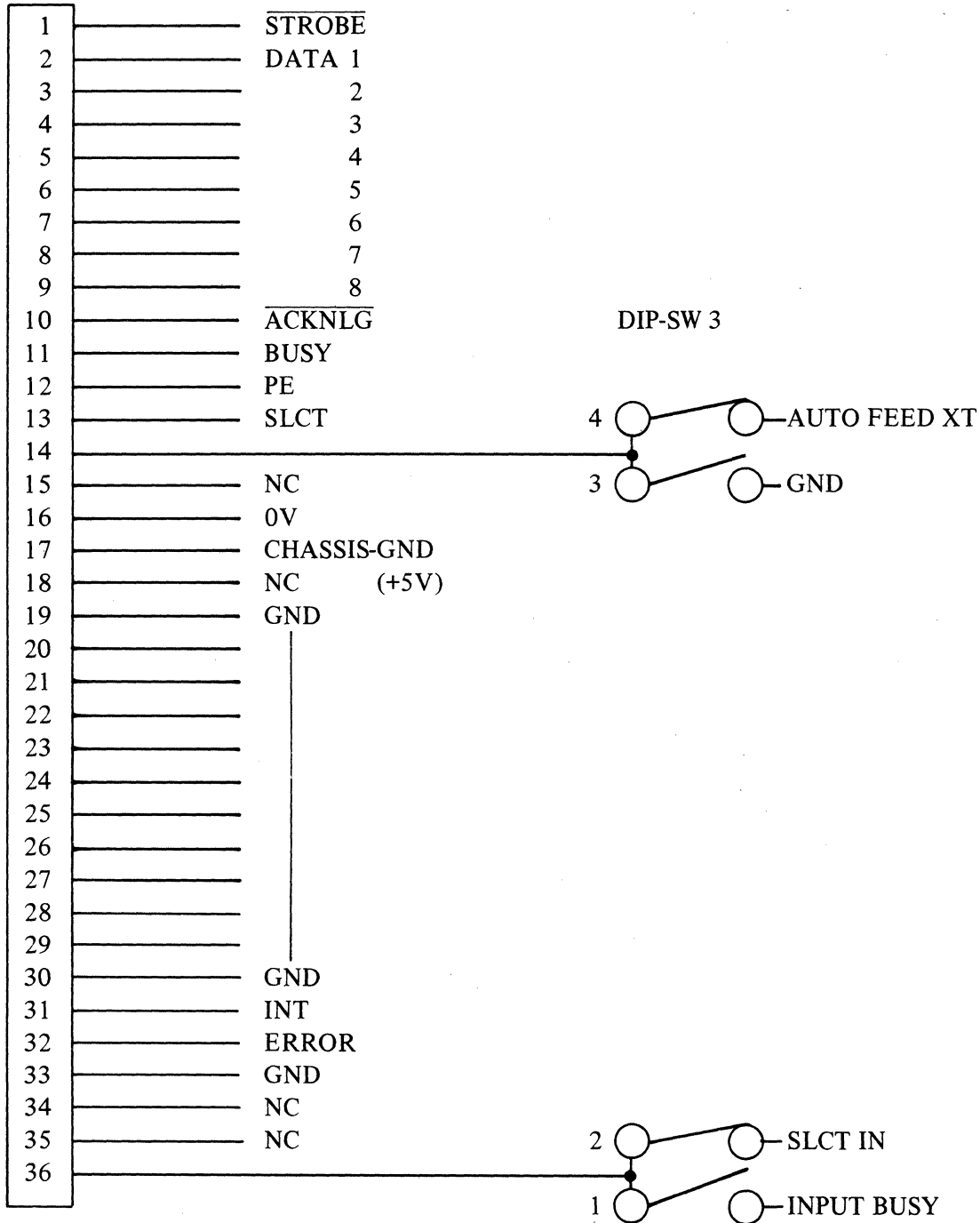


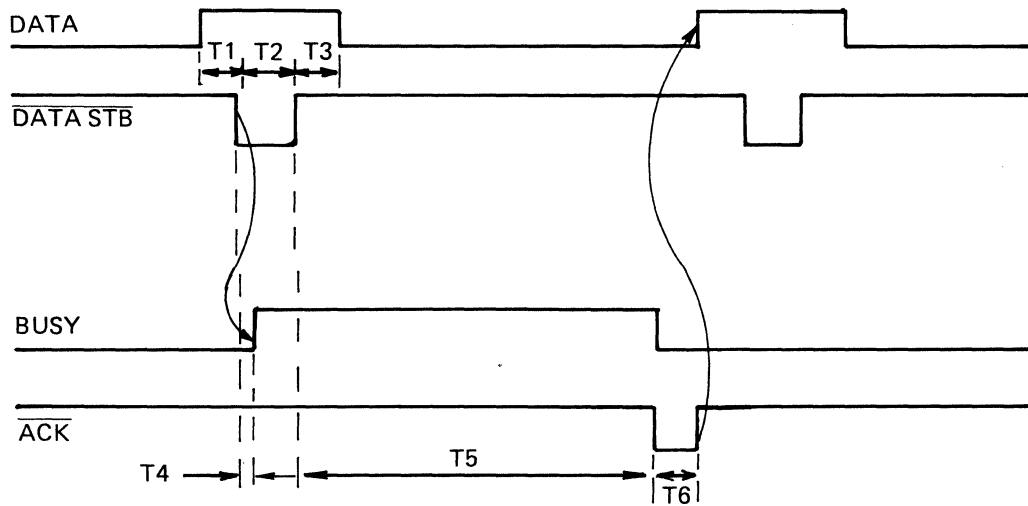
Fig. 22 Connector Pin Assignment and DIP-SW3

3.9 Specification of Parallel Interface

- * Data transfer rate of 1,000 CPS is maximum.
- * Synchronized with externally supplied STROBE pulses.
- * Handshaking ACKNLG or BUSY signals.
- * All of the input data and interface control signals are TTL compatible.
- * Connector: Amphenol 57-30360
- * The connector pin assignment and the descriptions of related interface signals are shown in the subsequent pages.

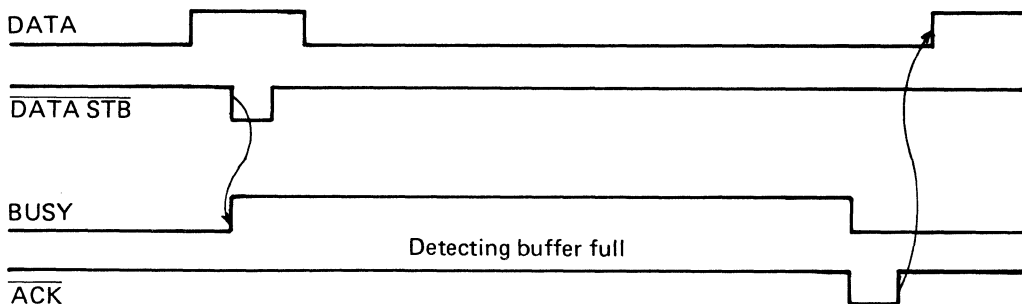
3.10 Parallel Interface Timing Chart

(1) When data are being received



- T1 ~ T3 = MIN 1 μ s
- T4 = MAX 400 ns
- T5 = MAX 2 ms
- T6 = 5.5 μ s

(2) When the DATA BUFFER is full



3.11 Connector Pin Assignment and Descriptions

Signal Pin No.	Return Pin No.	Signal	Direction	Description
1	19	STROBE	In	STROBE signal reads data signal in. Pulse width must be more than 1 μ s at receiving terminal. The signal level is normally "high". Data signal is read in when STROBE is "low".
2	20	DATA 1	In	Each of Data 1 to 8 signals represents the 1st to 8th bits of parallel data respectively. Signal is "high" when the data is logical "1", and "low" when logical "0".
3	21	DATA 2	In	
4	22	DATA 3	In	
5	23	DATA 4	In	
6	24	DATA 5	In	
7	25	DATA 6	In	
8	26	DATA 7	In	
9	27	DATA 8	In	
10	28	ACKNLG	Out	Nominal pulse width is approximately 5.5 μ s. Its "low" state indicates that data has been received and the printer is ready to accept additional data.
11	29	BUSY	Out	A "high" state of this signal indicates that the printer cannot receive data. The signal is "high" under any of the following conditions: <ol style="list-style-type: none"> 1. During data entry. 2. During printing operation. 3. In "off-line" state. 4. During printer error status.

Connector Pin Assignment and Descriptions of Interface Signals (Part 1 of 3)

Signal Pin No.	Return Pin No.	Signal	Direction	Description
12	30	PE	Out	A "high" state of this signal indicates that the paper end is near, or no paper is present.
13	—	SLCT	Out	A "high" state of this signal indicates that the printer is in a SELECT state.
14 *	—	AUTO FEED XT	In	A "low" state of this signal causes the paper to automatically advance one line after printing. (The signal level can be fixed to "low" with DIP SW2-3 provided on the control circuit board.)
15	—	NC	—	Not used.
16	—	0V	—	Logic GND level.
17	—	CHASSIS- GND	—	Printer chassis GND. In the printer, the chassis GND and logic GND are connected.
18	—	+5V	—	
19-30	—	GND	—	"Twisted-Pair Return" signal: GND level.
31	—	INT	In	When the level of this signal becomes "low" the printer controller is reset to its initial state and the print buffer is cleared. This signal is normally at "high" level, and its pulse width must be more than 1 μ s at the receiving terminal. After received this pulse it takes 5 seconds till next action.

Connector Pin Assignment and Descriptions of Interface Signals (Part 2 of 3)

Remarks: *DIP SW3-3 must be set "OFF", and DIP SW3-4 must be set "ON".

Signal Pin No.	Return Pin No.	Signal	Direction	Description
32		ERROR	Out	The level of this signal becomes "low" when the printer is in "Paper End" state or "Error" state.
33	—	GND	—	Same as pins 19 to 30.
34	—	NC	—	Not used.
35	—	NC		
36 *	—	SLCTIN	In	Data entry to the printer is possible only when the level of this signal is "low". (DIP SW1-8 is factory-set "ON" for signal "low")

- Notes:
1. "Direction" refers to the direction of signal flow as viewed from the printer.
 2. "Return" denotes "Twisted-Pair Return" and is to be connected to signal-ground. Be sure to use a twisted-pair cable for each signal and never fail to make connection to the return terminal. To prevent noise effectively, these cables should be shielded and connected to the chassis of the host computer and that of the printer.
 3. All interface signals are TTL compatibles. Rise or fall time period of the signal must be less than 0.2 μ s.
 4. Data transfer must not be carried out by ignoring the ACKNLG or BUSY signal. (Data transfer to this printer can be carried out only after confirming the ACKNLG signal or when the level of the BUSY signal is "low")

Connector Pin Assignment and Descriptions of Interface Signals (Part 3 of 3)

Remarks: *DIP SW3-1 must be set "OFF", and DIP SW3-2 must be set "ON".

3.12 Print Modes

The Model 1550S/SC EP printer permits combined use of several print modes as shown in the table. The print mode located in a line, can be changed at any place within the line. Each group of "X" marks in the same column represents a combination of simultaneously allowable print modes.

Printer Modes										
Draft	X									
Normal	X	X	X							
Compressed					X	X	X			
Emphasized									X	X
Double Strike	X				X				X	
Subscript		X				X				X
Superscript			X				X			X
Double Width	X	X	X		X	X	X		X	X
Underline	X	X	X		X	X	X		X	X

Draft print mode will only be effective under the following conditions.

- (a) Draft print mode should have been selected previously.
- (b) All data within a line should be composed of character data with Pica Pitch.
- (c) Left Margin set and Horizontal Tab set should have been issued on Pica Pitch mode.
- (d) Double-size characters are excluded from Draft Print Mode.

3.13 Control Codes for Printing

The Codes for Print Characters, Controls, and Graphics are listed in the subsequent pages, in the following manner:

- (i) The Printer Codes are listed in ASCII decimal numeric order (from NUL which is 0 to DEL, which is 127).
- (ii) ASCII decimal value for the Printer Control Codes can be found under "Printer Character Sets".
- (iii) The descriptions are provided on the assumption that the factory DIP Switch Settings have not been changed.

Printer Operation Control Codes			
Code	Code		Function
	Hex.	Dec.	
NUL	00	0	Null Used with ESC D as a list terminator. NUL is also used with other printer control codes to select optional functions (for example; ESC U)
HT	09	9	Horizontal Tab Moves the print position to the next horizontal tab stop. Tab stops are set with ESC D. Tab stops are set at every 8 columns when the printer is powered on.
LF	0A	10	Line Feed Advances the paper one line. The amount of the line spacing is determined by DIP SW2-2, unless resetting is effected by ESC A, ESC 0, ESC 1, ESC 2 or ESC 3.
VT	0B	11	Vertical Tab The VT code is treated as LF.
FF	0C	12	Form Feed Advances the paper to the next top of form (TOF). The position of the paper, when the printer is powered on, determines the top of form. The next top of form is 11 inches or 12 inches (depends on DIP SW 2-1) from that position. ESC C can be used to change the length to the subsequent top of form.
CR	0D	13	Carriage Return After the data in the printer buffer has been printed out, the carriage returns to the home position. (No Line Feed operation takes place.)
SO	0E	14	Shift Out (Double Width) Effects Double Width print mode. A Carriage Return, Line Feed or DC4 cancels Double Width print mode.
SI	0F	15	Shift In (Compressed) Effects Compressed Character print mode.
DC2	12	18	Device Control 2 (Compressed Off) Cancels Compressed print mode.
DC4	14	20	Device Control 4 (Double Width Off) Cancels Double Width print mode.
CAN	18	24	Cancel Clears the printer buffer. All control codes, except S0, remain effective.
ESC	1B	27	Escape Precedes printer command codes to produce a variety of commands. (See the list of ESC commands)

No.	Item	Command	Hex. Codes Decimal Codes	Function
1	Character Set Select	ESC 6	1B 36 27 54	Select Character Set 2
		ESC 7	1B 37 27 55	Select Character Set 1
2	Direction Select	ESC U 0	1B 55 00 27 85 0	Bidirectional Printing
		ESC U 1	1B 55 01 27 85 1	Unidirectional Printing
3	Home Head	ESC <	1B 3C 27 60	Home Head
4	Print Type	ESC E	1B 45 27 69	Emphasized
		ESC F	1B 46 27 70	Emphasized Off
		ESC G	1B 47 27 71	Double Strike
		ESC H	1B 48 27 72	Double Strike Off
		ESC W 0	1B 57 00 27 87 0	Double Width Off
		ESC W 1	1B 57 01 27 87 1	Double Width
5	Underline	ESC - 0	1B 2D 00 27 45 0	Underline Off
		ESC - 1	1B 2D 01 27 45 1	Underline
6	Script Print	ESC S 0	1B 53 00 27 83 0	Super Script
		ESC S 1	1B 53 01 27 83 1	Sub Script
		ESC T	1B 54 27 84	Super/Sub Script Off
7	Line Feed	ESC 0	1B 30 27 48	1/8 Inch Line Feeding
		ESC 1	1B 31 27 49	7/72 Inch Line Feeding
		ESC 2	1B 32 27 50	1/6 Inch Line Feeding
		ESC 3 n	1B 33 n 27 51 n	n/216 Inch Line Feeding *
		ESC J n	1B 4A n 27 74 n	n/216 Inch Line Feeding *

Remarks: *This command is simulated. The ACTUAL is n/144 LF.

No.	Item	Command	Hex. Codes Decimal Codes	Function
		ESC A n	1B 41 n 27 65 n	m/72 Inch
8	Form Length Set	ESC C n	1B 43 n 27 67 n	Set Lines per Page Form
		ESC C 0 m	1B 43 00 m 27 67 00 m	Set Inches per Page Form
9	HT Set	ESC D	1B 44 27 68	Set Horizontal Tab Stops
		n ₁ n ₂ ... n _k NUL	n ₁ n ₂ ... n _k 00	
10	BIT Image Print	ESC K n ₁ n ₂ v ₁ v ₂ ... v _k	1B 4B 27 75 n ₁ n ₂ v ₁ v ₂ ... v _k	792 Bit-Image Graphics Mode
		ESC L n ₁ n ₂ v ₁ v ₂ ... v _k	1B 4C 27 76 n ₁ n ₂ v ₁ v ₂ ... v _k	1584 Bit-Image Graphics Mode
		ESC Y n ₁ n ₂ v ₁ v ₂ ... v _k	1B 59 27 89 n ₁ n ₂ v ₁ v ₂ ... v _k	1584 Bit-Image Graphics Mode
		ESC Z n ₁ n ₂ v ₁ v ₂ ... v _k	1B 5A 27 90 n ₁ n ₂ v ₁ v ₂ ... v _k	3168 Bit-Image Graphics Mode
				*
11	Paper End	ESC 8	1B 38 27 56	Ignore Paper End
		ESC 9	1B 39 27 57	Cancel Ignore Paper End
12	Skip	ESC N n	1B 4E n 27 78	Set Skip Perforation
		ESC O	1B 4F 27 79	Cancel Skip Perforation

Remarks: *This command is simulated. It is actually 2176 Bit-Image.

2. Print Direction Selection

ESC U 0 Bi-Directional Printing

The Printer will print bi-directionally by receiving ESC U 0.

ESC U 1 Uni-Directional Printing

The Printer will print uni-directionally by receiving ESC U 1.

3. Print Head Home

ESC < Print Head Home

The print head will return to the left margin to print the line by receiving ESC <. This will occur for one line only.

4. Print Type

ESC E Emphasized

Effects Emphasized print mode. The print speed of the printer is reduced to a half during Emphasized print mode.

ESC F Emphasized Off

Cancels Emphasized print mode.

```
10 LPRINT CHR$(&H1B); "E"; "EMPHASIZED";  
20 LPRINT CHR$(&H1B); "F"; "      NORMAL"  
30 END
```

EMPHASIZED **NORMAL**

ESC G Double Strike

Effects Double Strike print mode. The paper advances 1/144 of an inch before the second pass of the printing.

ESC H Double Strike Off

Cancels Double Strike mode.

```
10 LPRINT CHR$(&H1B); "G"; "DOUBLE STRIKE";  
20 LPRINT CHR$(&H1B); "H"; "      NORMAL"  
30 END
```

DOUBLE STRIKE **NORMAL**

ESC W 0 Double Width Off

Cancels Double Width print mode.

ESC W 1 Double Width

Effects Double Width mode which is not canceled by a line-feed operation.

```
10 LPRINT CHR$(&H1B); "W"; CHR$(1); "DOUBLE WIDTH";  
20 LPRINT CHR$(&H1B); "W"; CHR$(0); "      NORMAL"  
30 END
```

DOUBLE WIDTH **NORMAL**

5. Underline

ESC _ 0 Underline Off

ESC followed by a "0" cancels the Underline print mode.

ESC _ 1 Underline

ESC followed by a "1" causes to print all of the succeeding characters underlined.

```
10 LPRINT CHR$(&H1B); "-" ; CHR$(1); "UNDER LINE";  
20 LPRINT CHR$(&H1B); "-" ; CHR$(0); "      NORMAL"  
30 END
```

```
UNDER LINE      NORMAL
```

6. Script Print

ESC S 0 Superscript

When ESC S is followed by a "0", the printer will operate in Superscript print mode.

ESC S 1 Subscript

Subscript print mode is effected by ESC S 1.

ESC T

Subscript or Superscript print mode is canceled by ESC T.

```
10 LPRINT CHR$(&H1B); "S"; CHR$(0); "SUPER SCRIPT";  
20 LPRINT CHR$(&H1B); "T"; "      NORMAL"  
30 LPRINT CHR$(&H1B); "S"; CHR$(1); "SUB SCRIPT";  
40 LPRINT CHR$(&H1B); "T"; "      NORMAL"  
50 END
```

```
SUPER SCRIPT      NORMAL  
SUB SCRIPT      NORMAL
```

7. Line Spacing

ESC 0 1/8-Inch Line Spacing

1/8-inch line spacing mode is effected.

ESC 1 7/72-Inch Line Spacing

7/72 inch line spacing mode is effective.

ESC 2 Starts Variable Line Spacing

ESC 2 is an execution command for ESC A. If no ESC A command has been given, the standard 1/6 inch line spacing takes place.

ESC 3 n Variable Line Spacing

Line spacing is set to $n/216$ inch. ($n = 1, 2, \dots 255$).

ESC J n Set Variable Line Spacing

After ESC J n is entered, the paper will advance in an increment of $n/216$ of an inch ($n = 1, 2, \dots 255$). ESC J n is canceled after a line feed takes place.

```

10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 LPRINT CHR$(&H1B);"0";"1/8          INCH LINE SPACING"
40 LPRINT CHR$(&H1B);"1";"7/72       INCH LINE SPACING"
50 LPRINT CHR$(&H1B);"A";CHR$(24);"24/72     INCH LINE SPACING";CHR$(&HD);
60 LPRINT CHR$(&H1B);"2";
70 LPRINT CHR$(&H1B);"3";CHR$(216);"216/216   INCH LINE SPACING"
80 LPRINT CHR$(&H1B);"3";CHR$(108);"108/216   INCH LINE SPACING"
90 PRINT #1,"18/216     INCH LINE SPACING";CHR$(&HD); CHR$(&H1B);"J";CHR$(18);
100 PRINT #1,"36/216     INCH LINE SPACING";CHR$(&HD);CHR$(&H1B);"J";CHR$(36);
110 LPRINT "END"
120 END

```

```

1/8          INCH LINE SPACING
24/72       INCH LINE SPACING
216/216     INCH LINE SPACING

```

```

108/216     INCH LINE SPACING

```

```

18/216     INCH LINE SPACING
END

```

ESC A n Variable Line Spacing

ESC A n sets the line spacing to n/72 inch. ESC 2 must be entered before the line spacing is effected. For example, if ESC A 24 (text) ESC 2 (text) have been entered, the text following ESC A 24 will be printed with new line-feed increments of 24/72 inch. Any increment from 1/72 to 85/72 inches may be used.

8. Form Length Set

ESC C n Lines per Form

Sets the form length. The ESC C command must be succeeded by an integer which represents the number of lines of 1/6 inch spacing to determine a form length (Maximum form length is 127 lines). The printer is set to 66 lines per form when powered on or reset.

ESC C 0 m Sets Inches per Form

ESC C 0 m sets the length of the form in inch (m = 1, 2, ... 22).

```

10 LPRINT "_____TOP OF FORM POSITION_____";
20 LPRINT CHR$(&H1B);"C";CHR$(10);
30 LPRINT CHR$(&HC);
40 LPRINT "_____TOP OF FORM POSITION_____";
50 LPRINT CHR$(&H1B);"C";CHR$(0);CHR$(1);
60 LPRINT CHR$(&HC);
70 LPRINT "_____TOP OF FORM POSITION_____";
80 LPRINT CHR$(&H1B);"C";CHR$(0);CHR$(11)
90 END

```

_____TOP OF FORM POSITION_____

_____TOP OF FORM POSITION_____

_____TOP OF FORM POSITION_____

9. HT Set

ESC D n_1, n_2, \dots, n_k NUL

Horizontal Tab Stops

Sets horizontal tab stop positions.

They are followed by NUL code. They must also be in ascending numeric order as shown. Tab stops can be set for any character positions between the 1st and 80th characters. In the Compressed print mode, tab stops can be set up to the 218th character. A maximum number of 112 tabs may be entered. The HT is used to execute a tab operation.

```

10 LPRINT "TAB SET 5,10,15,20,25,30,35,40"
20 LPRINT CHR$(&H1B);"D";CHR$(5);CHR$(10);CHR$(15);CHR$(20);CHR$(25);CHR$(30);CHR$(35);CHR$(40);CHR$(0);
30 LPRINT "12345678901234567890123456789012345678901234567890"
40 FOR N=1 TO 9
50     LPRINT STRING$(N,9);"*"
60 NEXT N
70 END
    
```

```

TAB SET 5,10,15,20,25,30,35,40
1234567890123456789012345678901234567890
*
*
*
*
*
*
*
*
*
*
    
```

10. Bit Image Print

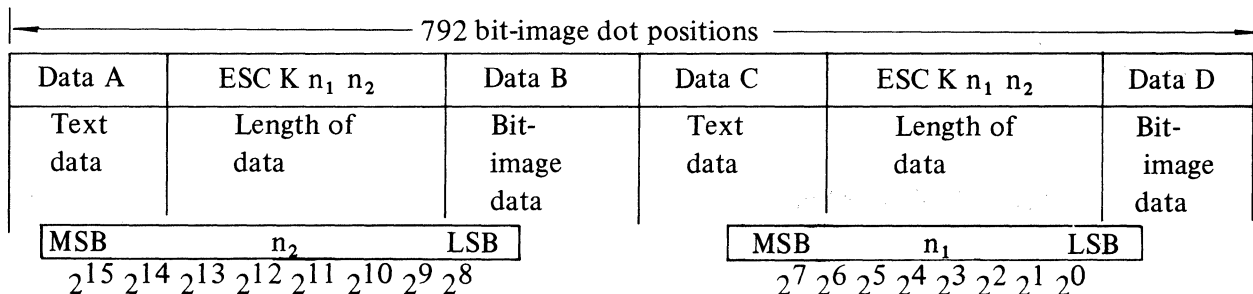
ESC K $n_1, n_2, v_1, v_2, \dots, v_k$

792 Bit-Image Graphics Mode

Causes to change the print mode from text mode to 792 Bit-Image Graphics mode. n_1 and n_2 are one byte, which specify the number of bit-image data byte to be transferred. v_1 through v_k are the bytes of the bit-image data. The number of bit-image data bytes(k) is equal to $n_1 + 256n_2$ and can not exceed 792 bytes. At every horizontal position, each byte can print up to 8 vertical dots. Bit-image data may be mixed with text data on the same line.

Assign values to n_1 and n_2 as follows:

- n_1 represents values from 0 to 255;
- n_2 represents values from 0 or 1 x 256.



MSB: Most significant bit
 LSB: Least significant bit

```

10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 LPRINT CHR$(&H1B);"K";CHR$(0);CHR$(1);
40 FOR I=0 TO 255
50     PRINT #1,CHR$(I);
60 NEXT I
70 LPRINT
80 END

```



ESC L $n_1 n_2 v_1 v_2 \dots v_k$

1584 Bit-Image Graphics Mode

Causes to change the print mode from text mode to 1584 Bit-Image mode. The input is similar to the case of ESC K. 1584 Bit-Image mode effects printing at lower speed than that of 792 Bit-Image Graphics mode, but can produce a denser graphic image. The number of bytes of bit-image data (k) is $n_1 + 256n_2$ but can not exceed 1584. n_1 is in the range of 0 to 255.

```

10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 LPRINT CHR$(&H1B);"L";CHR$(0);CHR$(1);
40 FOR I=0 TO 255
50     PRINT #1,CHR$(I);
60 NEXT I
70 LPRINT
80 END

```



ESC Y $n_1 n_2 v_1 v_2 \dots v_k$

1584 Bit-Image Graphics Mode

Causes to change the print mode from text mode to 1584 Bit-Image Graphics mode.
ESC Y is the same as ESC L.

```

10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 LPRINT CHR$(&H1B);"Y";CHR$(0);CHR$(1);
40 FOR I=0 TO 255
50     PRINT #1,CHR$(I);
60 NEXT I
70 LPRINT
80 END

```



ESC Z $n_1 n_2 v_1 v_2 \dots v_k$

3168 Bit-Image Graphics Mode

Causes to change the print mode from text mode to 3168 Bit-Image Graphics mode. The input is similar to the case of other Bit-Image Graphics Modes.

```
10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 LPRINT CHR$(&H1B);"Z";CHR$(0);CHR$(1);
40 FOR I=0 TO 255
50     PRINT #1,CHR$(I);
60 NEXT I
70 LPRINT
80 END
```



11. Paper End Condition

ESC 8 Ignore Paper End

The printer ignores the paper End Switch.

ESC 9 Cancel Ignore Paper End

Cancels ESC 8. ESC 9 is selected when the printer is powered on or reset.

12. Skip Perforation

ESC N n Set Skip Perforation

Sets the Skip Perforation. The value of n is the number of lines of Skip Perforation. n=1, 2, ..., 127.

ESC N must be reset anytime the page length is changed. (ESC C)

If ESC N 10 have been entered. This will print 56 lines and feed the paper 10 lines.

ESC O Cancel Skip Perforation

Cancel the Skip Perforation function.

Type 2 (Normal)

0	1	2	3	4	5	6	7	8	9
NUL							BEL		HT
10	11	12	13	14	15	16	17	18	19
LF		FF	CR	SO	SI			DC2	
20	21	22	23	24	25	26	27	28	29
DC4				CAN			ESC		
30	31	32	33	34	35	36	37	38	39
		SP	!	''	#	\$	%	&	'
40	41	42	43	44	45	46	47	48	49
(	)	*	+	,	-	.	/	0	1
50	51	52	53	54	55	56	57	58	59
2	3	4	5	6	7	8	9	:	;
60	61	62	63	64	65	66	67	68	69
<	=	>	?	@	A	B	C	D	E
70	71	72	73	74	75	76	77	78	79
F	G	H	I	J	K	L	M	N	O
80	81	82	83	84	85	86	87	88	89
P	Q	R	S	T	U	V	W	X	Y
90	91	92	93	94	95	96	97	98	99
Z	[	\	\]	^	_	`	a	b	c
100	101	102	103	104	105	106	107	108	109
d	e	f	g	h	i	j	k	l	m
110	111	112	113	114	115	116	117	118	119
n	o	p	q	r	s	t	u	v	w
120	121	122	123	124	125	126	127	128	129
x	y	z	{	|	}	~		NUL	

130	131	132	133	134	135	136	137	138	139	
					BEL		HT	LF		
140	141	142	143	144	145	146	147	148	149	
FF	CR	SO	SI			DC2		DC4		
150	151	152	153	154	155	156	157	158	159	
		CAN			ESC					
160	161	162	163	164	165	166	167	168	169	
á	í	ó	ú	ñ	Ñ	ä	ö	¿	¬	
170	171	172	173	174	175	176	177	178	179	
¬	½	¼	¡	<<	>>	••••	••••	••••	|	
180	181	182	183	184	185	186	187	188	189	
†	†	†	†	†	†	†	†	†	†	
190	191	192	193	194	195	196	197	198	199	
†	†	†	†	†	†	†	†	†	†	
200	201	202	203	204	205	206	207	208	209	
†	†	†	†	†	†	†	†	†	†	
210	211	212	213	214	215	216	217	218	219	
†	†	†	†	†	†	†	†	†	†	
220	221	222	223	224	225	226	227	228	229	
■	■	■	■	■	α	β	Γ	Π	Σ	σ
230	231	232	233	234	235	236	237	238	239	
μ	τ	ϕ	θ	Ω	δ	∞	∅	ε	∩	
240	241	242	243	244	245	246	247	248	249	
≡	±	≥	≤	∫	∫	÷	≈	°	■	
250	251	252	253	254	255					
-	√	∩	2	■	SP					

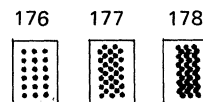
Graphics Printer Character Set 1 (Part 1 of 2)

Graphics Printer Character Set 1 (Part 2 of 2)

Fig. 23

Type 1 (Draft)

Note: Font 176 ~ 223, 244 and 245 are the same as Type 2.



Type 2 (Normal)

0	1	2	3	4	5	6	7	8	9
NUL			♥	♦	♣	♠	BEL		HT
10	11	12	13	14	15	16	17	18	19
LF		FF	CR	SO	SI			DC2	
20	21	22	23	24	25	26	27	28	29
DC4	§			CAN			ESC		
30	31	32	33	34	35	36	37	38	39
		SP	!	”	#	\$	%	&	'
40	41	42	43	44	45	46	47	48	49
(	)	*	+	,	—	.	/	0	1
50	51	52	53	54	55	56	57	58	59
2	3	4	5	6	7	8	9	:	;
60	61	62	63	64	65	66	67	68	69
<	=	>	?	⊙	A	B	C	D	E
70	71	72	73	74	75	76	77	78	79
F	G	H	I	J	K	L	M	N	O
80	81	82	83	84	85	86	87	88	89
P	Q	R	S	T	U	V	W	X	Y
90	91	92	93	94	95	96	97	98	99
Z	[	\	\]	^	_	`	a	b	c
100	101	102	103	104	105	106	107	108	109
d	e	f	g	h	i	j	k	l	m
110	111	112	113	114	115	116	117	118	119
n	o	p	q	r	s	t	u	v	w
120	121	122	123	124	125	126	127	128	129
x	y	z	{	|	}	~		Ç	ü

Graphics Printer Character Set 2 (Part 1 of 2)

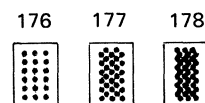
130	131	132	133	134	135	136	137	138	139	
é	â	ä	à	å	ç	ê	ë	è	ï	
140	141	142	143	144	145	146	147	148	149	
î	ì	Ä	Å	É	æ	Æ	ô	ö	ò	
150	151	152	153	154	155	156	157	158	159	
û	ù	ÿ	ö	ü	ç	£	¥	₤	₯	
160	161	162	163	164	165	166	167	168	169	
á	í	ó	ú	ñ	Ñ	à	o	¿	⌞	
170	171	172	173	174	175	176	177	178	179	
⌞	½	¼	¡	«	»	••••	••••	••••	••••	
180	181	182	183	184	185	186	187	188	189	
⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	
190	191	192	193	194	195	196	197	198	199	
⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	
200	201	202	203	204	205	206	207	208	209	
⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	
210	211	212	213	214	215	216	217	218	219	
⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	⌞	
220	221	222	223	224	225	226	227	228	229	
■	■	■	■	■	α	β	Γ	Π	Σ	σ
230	231	232	233	234	235	236	237	238	239	
μ	τ	ϕ	θ	Ω	δ	∞	∅	ε	∩	
240	241	242	243	244	245	246	247	248	249	
≡	±	≥	≤	∫	J	÷	≈	°	■	
250	251	252	253	254	255					
-	√	∩	2	■	SP					

Graphics Printer Character Set 2 (Part 2 of 2)

Fig. 24

Type 1 (Draft)

Note: Font 176 ~ 223, 244 and 245 are the same as Type 2.



3.15 General Operating Notes

- (1) DO NOT print without a ribbon. This can damage the head pins.
- (2) Use only the recommended ribbon. The use of other ribbons can damage the head.
- (3) The ribbon should be replaced whenever worn due to excessive use. Ribbon life is approximately 1,500,000 characters.
- (4) Use the recommended paper.
- (5) Remove any foreign material dropped into the printer before applying power.

3.16 Periodic Maintenance

It is important to perform the following periodic maintenance to ensure proper printer operation.

(1) Lubrication

(a) Lubrication Method

Prior to application of any lubrication, remove all accumulated dirt and old lubrication from the carrier shaft and the carrier shaft guide with a lintless cloth. Then apply a small amount of Launa oil to the lubrication ring.

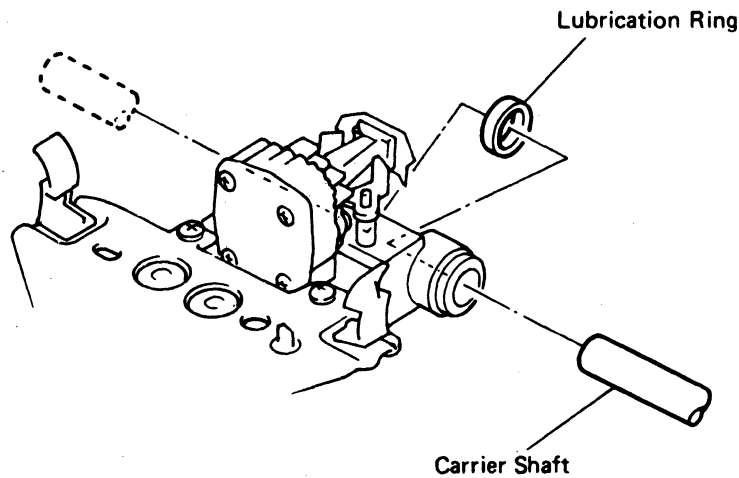


Fig. 25 Lubrication Points

(b) Lubrication Period

Oil should be applied yearly or every 500,000 lines of printing.

(c) Notes on Lubrication

Use only Launa oil. Lubricate only the lubrication ring as shown above.

(2) Cleaning

(a) Cleaning Points and Method

1) Detector

Brush off any paper dust on and around the detector. (Refer to Fig. 26)

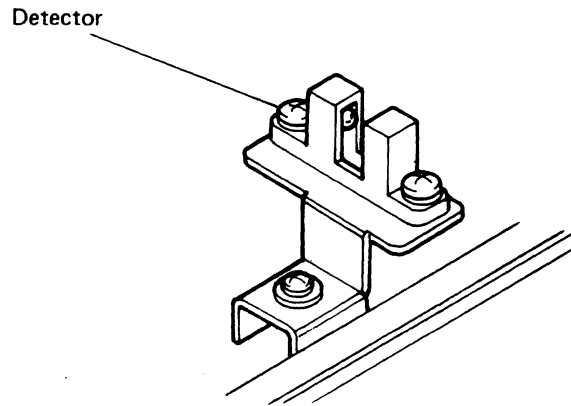


Fig. 26 Home (left-most carriage) Position Sensor

2) The Head Top

Detach the ribbon, and remove the head as described later. Next, remove ribbon blocks and paper particles from the head top with the bush (option).

- **Head removal**

When removing the head, follow the procedure described below:

- 1) Remove the carrier cover, and move the head to a position where no PH roller is fitted. (See Fig. 27 below)
- 2) Insert a coin between the head and the right and left head securing levers. Turn the right coin clockwise and left coin counterclockwise to open the levers.
- 3) Pull the PH shaft toward the front, and lift the head straight up. The head male connector then parts from the female connector attached to the printer. Next, push the PH shaft toward the rear, and lift the head again to complete removal. Be careful not to bend the ribbon guide plate while removing or replacing the head.

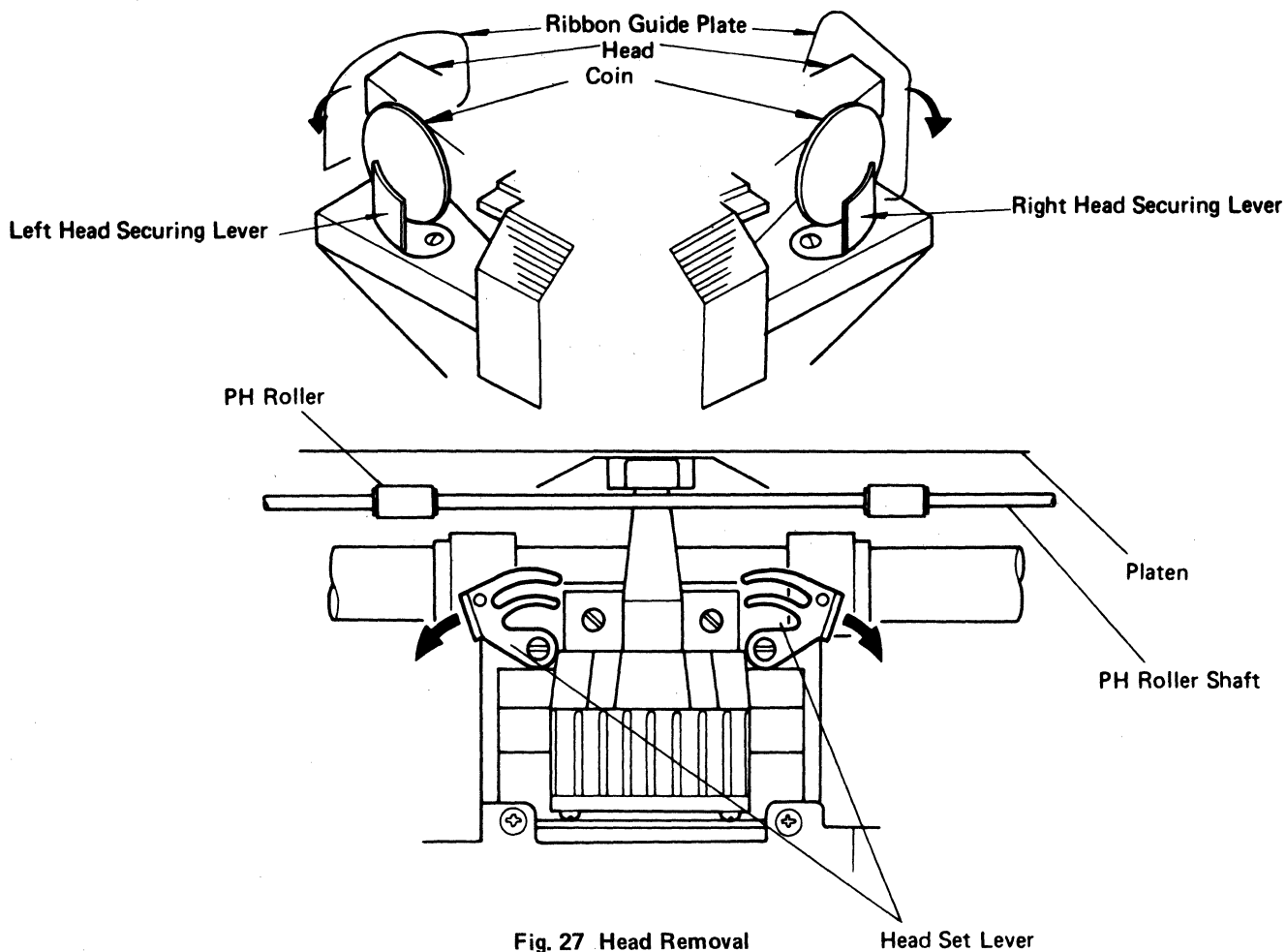


Fig. 27 Head Removal

Head Set Lever

(b) **Cleaning Period**

- 1) Whenever ribbon chips or dust accumulate on the detector or the end of the print head.
- 2) Every 500,000 lines of printing or every year.

(c) **Notes on Cleaning**

- 1) To avoid disturbing delicate mechanical adjustment made during assembly, do not remove parts other than the ribbon when cleaning.
- 2) Do not use detergents or solvents such as benzine when cleaning.
- 3) To clean the cover, use cloth with water or weak soap solution.

3.17 Print Paper Specifications

The model 1550S/SC EP Printer is designed to provide excellent print quality with the recommended paper. If use of other paper is considered, be sure that it meets all specifications in order to avoid problems.

3.17.1 Fanfold Computer Forms

3.17.1.1 Print location and form sizes

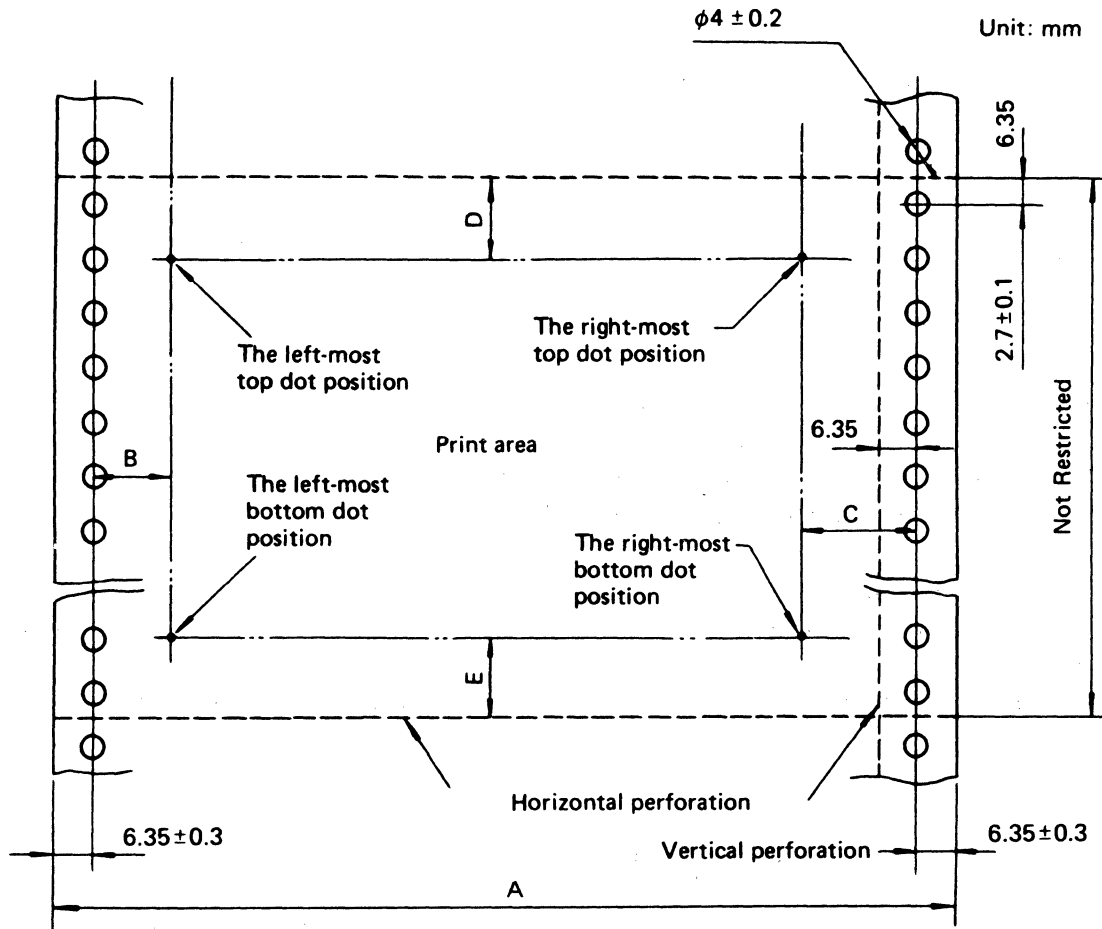


Fig. 28 Fanfold Paper Dimension Specifications

Dimension	Size	Remarks
A	4.25" – 15"	Width of a Paper Form
B	.236" (6 mm)	The distance from the center of a sprocket hole to the end of print area is 6.0 mm min.
C	> .472" (> 12 mm)	Recommended to allow the distance to be more than 12 mm in actual operation.
D	1" (25.4 mm)	The area should not be printed to avoid print blurs.
E	1" (25.4 mm)	Same as D, but the area in the last paper form is susceptible to print pitch disorder and print blurs.

3.17.1.2 Recommendations for paper types and number of copies

Paper Form	Total Weight of Paper* (kg)	Number of Copies**	Glued or Dotted on both sides	Paper Crimped on both sides	Free on Both Sides
Fine quality paper with no carbon	55 – 70	1	–	–	–
Paper with carbon	45	3	0	x	x
	45 – 55	2	0	0	x
Impact paper	30 – 43	4	0	x	x
	34 – 45	3	0	x	x
	43 – 55	2	0	0	x
Carbon backed paper	34 – 45	3	0	x	x
	43 – 55	2	0	0	x

Remarks:

- *1. The total weight of paper forms per 1000 sheets.
Paper size (788 mm x 1098 mm)
- **2. Always include the original page in determining the number of copies.
Never use paper with a thickness exceeding .28 mm.

3.17.1.3 Glued and crimped form

- (1) The paper carbon is attached to the vertical edges of the original and duplicate forms by a thin line of glue.
- (2) The paper crimped portion should be bent to the back side of the last duplicate.

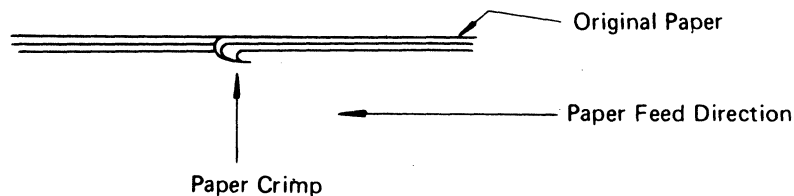


Fig. 29 Paper Crimp Method

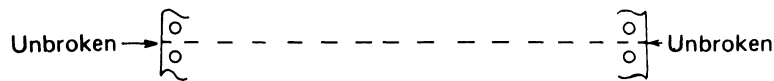
- (3) No more than 3 paper crimps should be used with multi-part paper in order to avoid gaps in printing.
- (4) Multipart forms should be meshed or glued together on both sides of the sprocket holes within 1/2" from the edges of the paper.
- (5) Multipart forms should be meshed or glued together on both sides. Other paper types such as loose sheets (not held together at all) should not be used for making duplicates.
- (6) To avoid damage to printer do not use any staples in any printer paper.
- (7) The meshed or glued portion of any printer paper should be clean and free from folds.

3.17.1.4 Perforation

- (1) The perforated peak of the opened paper when laid flat should be no higher than 0.5 mm from the resting edges.



- (2) The perforations cause the paper to fold in an accordion-like fashion.
- (3) Perforated line ends should not be torn.



- (4) There should be no break in the perforations.
- (5) Vertical perforations should be located within 1/2" of the paper edges and should be clean with no tears or folds.

Note: Reverse feed should be performed within each horizontal perforation.

3.17.2 Single Sheet Paper

3.17.2.1 Print location and form size

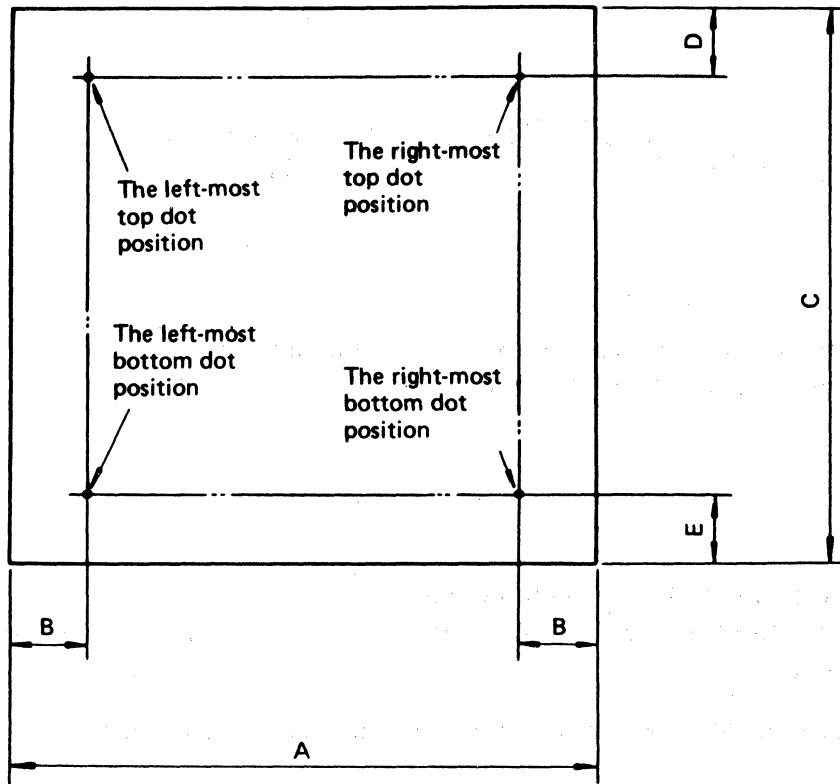


Fig. 30 Sheet Paper Dimension Specifications

Dimension	Size	Remarks
A	4.25" – 15"	Paper width
B	1/2" min.	The distance from the sides of papers to the most right and left dot position
C	5" – 12"	Length of a paper form.
D, E	1" min.	These areas at the top and bottom of a page should not be printed.

3.17.2.2 Form types and copy quantities

Paper Form	Total Weight of Forms	Number of Copies
Fine quality paper form	30 – 55 kg.	1
Fine quality paper with carbon	30 – 45 43 – 55	3 2
Carbonless paper and carbon backed paper	30 – 45 43 – 55	3 2

3.17.3 Roll Paper

3.17.3.1 Roll measurements

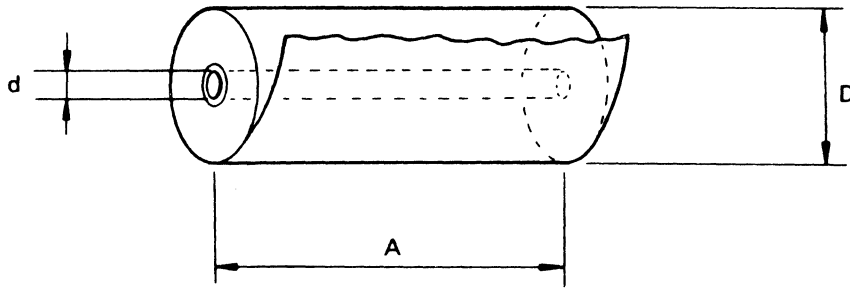


Fig. 31 Roll Paper Dimension Specifications

Dimension	Size	Remarks
A	4.25" – 15"	Paper width
d	More than 1"	Roller hole diameter
D	Less than 5"	Paper roll diameter

3.17.3.2 Type of forms

- (1) 1 ply paper
- (2) Total weight is 40 ~ 55 kg.

3.17.3.3 Roll paper recommendation

- (1) Use the recommended roll paper holder for any roll paper.
- (2) Roll paper with sprocket holes may be used.
- (3) The printing area is the same as described in section 3.17.1 and 3.17.2.
- (4) Horizontally perforated forms are not recommended.

Appendix 1

Specification of Color Print

1. Mechanism

The mechanism of "Color Board" and "Color Ribbon" being attached, makes M1550SEP performable in Color Print Mode.

And accordingly, the Color Print Commands are provided, in addition to the general specification of M1550SEP.

(1) Color Ribbon

Both "Standard (Black) Ribbon" for M1550 Series, and "3-Color Ribbon" specialized for the use of M1550SC EP are applicable. Once a ribbon is attached to the ribbon deck, the functioning of mechanism concerned will automatically distinguish whether the standard one or the colored one being equipped.

As for the features of color ribbon, they may consist of:

- (a) Dimensions: 13 mm (W) × 13,000 mm (L)
- (b) Materials: 66 Nylon, 40/34 Denier
- (c) Colors: According to the vertical arrangement from the upper to low;
 Yellow Red Blue
- (d) Durability: One million characters. (The 95 ASCII characters, in 7 colors at one line intervals)
- (e) Ribbon Unit: TEC CLABK-19101

(2) Printing

- (a) Use only single sheet paper for color printing. Irregular color printing may occur if 2 or more sheets are used.
- (b) When the Color Print Mode is selected, a finer print will be produced if only the unidirectional or quasidirectional printing mode is used. (Refer to 3 for Change Over of Print Direction)
- (c) For Standard Ribbon equipped
The Color Designation Command (ESC r N) will be ignored.
- (d) For Color Ribbon equipped
The color print will be operated, according to the Color Designation Command (ESC r N). In this case, it is carried out with 3-pass print is maximum, and the print-order adopts:
 Yellow Red Blue
Furthermore, when Power switch is turned on, "Blue Print" will be prevailed.

2. Commands

Command	Hex. Code	Dec. Code	Function
ESC r N	1B 72 N	27 114 N	Designating one of 7-Colors N = 0 to 6

(1) Color Designation

Command	Decimal Data	Hex. Code
ESC C N	27 67 N	1B 43 N

*Provided that: N = 0 ~ 6

- (a) Printing is able to perform with the color being designated, by receiving this code.
- (b) If the color designation is renewed, the old one will be released.
- (c) The color designation should refer to the following regulations:

Parameter "N"	Corresponding Color (s)
0	Black (Yellow + Magenta + Cyan)
1	Magenta
2	Cyan
3	Violet (Magenta + Cyan)
4	Yellow
5	Orange (Yellow + Magenta)
6	Green (Yellow + Cyan)

- (d) When standard (black) ribbon is equipped, this code will be ignored.

3. Change over of Print Direction VS DIP Switch

Direction for Bit-Image Printing

Command	SW 2-5	SW 25-1	Print Direction
*ESC U ₀	open	—	Unidirection
	closed	open	Bidirection
	closed	closed	Quasidirection
ESC U ₁	—	—	Unidirection

Direction for Text and CG Graphic Printing

Command	SW 2-5	SW 25-1	Print Direction
*ESC U ₀	—	open	Bidirection
	—	closed	Quasidirection
ESC U ₁	—	—	Unidirection

— = Don't Care

* = Default Condition

- (a) When Unidirection is chosen by ESC Command, then "Unidirection print" will be prevailed, regardless of the state of DIP SW 25-1.
- (b) On Text mode the state of DIP SW 2-5 is regardless.
- (c) SW 25-2 is not used.

