LX-810/850
TECHNICAL MANUAL

EPSON

NOTICE

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) personal injury, and 2) damage to equipment:

DANGER   Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by a DANGER headings.

WARNING   Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND THE HOST COMPUTER BEFORE PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURE.

2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.

3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.

2. MAKE CERTAIN THAT THE SOURCE VOLTAGE IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY-AC RATING DIFFERENT FROM THE AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.

3. ALWAYS VERIFY THAT THE EP'SON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.

4. IN ORDER TO PROTECT SENSITIVE μP CHIPS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS RECOMMENDED BY THE MANUFACTURER; INTRODUCTION OF SECOND-SOURCE ICS OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of the LX-8 10/850.

The instructions and procedures included herein are intended for the experienced repair technician, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

Chapter 1 - Provides a general product overview, lists specifications, and illustrates the main components of the printer.

Chapter 2 - Describes the theory of printer operation.

Chapter 3 - Discusses the options

Chapter 4 - Includes a step-by-step guide for product disassembly, assembly, and adjustment.

Chapter 5 - Provides Epson-approved techniques for troubleshooting.

Chapter 6 - Describes preventive maintenance techniques and lists lubricants and adhesives required to service the equipment.

●The contents of this manual are subject to change without notice.

REVISION TABLE

REVISION	DATE ISSUED	CHANGE DOCUMENT
A	Mar 27, 1989	1st issue

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CHAPTER 1
GENERAL DESCRIPTION

LIST OF FIGURES

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1.1 FEATURES

The LX-8 10/850 is a small, light-weight, low-cost, advanced paper handling printer comparable to the LX-800. Its main features are:

1. Advanced paper handling: Auto backout and cut sheet loading
2. Expanded ESC/P-code printing, implemented as a standard feature
3. Printing speeds: 200 cps (high speed draft)
                  150 cps (draft 10 cpi)
                  180 cps (draft 12 cpi)
4. Optional 8100 series interface
5. Clear, easy-to-read printing with a standard EPSON font
6. Two built-in NLQ (Near Letter Quality) fonts (Roman and Saris Serif)
7. Control panel switch selection of Draft, Roman, or Saris Serif font
8. Control panel switch selection of normal or condensed printing
9. Control panel mode settingd are saved in non-volatile memory
10. Easy handling of cut sheets with the optional cut-sheet feeder (CSF)

The LX-8 10/850 is equipped with the standard EPSON 8-bit parallel interface. Various interface options enable users to print data from a variety of computers. Table 1-1 lists the interface options, Table 1-2 lists the optional units available for the LX-8 10/850, and Figure 1-1 shows an exterior view of the LX-8 10/850.

Table 1-1. Interface Options

Model	Description
8143	New serial inter face board
8148	Intelligent serial interface board
8165	Intelligent IEEE-488 interface board

NOTE: Refer to the "Optional Interface Technical Manual" for details.

Table 1-2. Optional Units

Model	Description
C8061 2*	Single bin cut sheet feeder
C80006*	Pull tractor unit
8310	Roll paper holder
8750	Ribbon cartridge (Black)
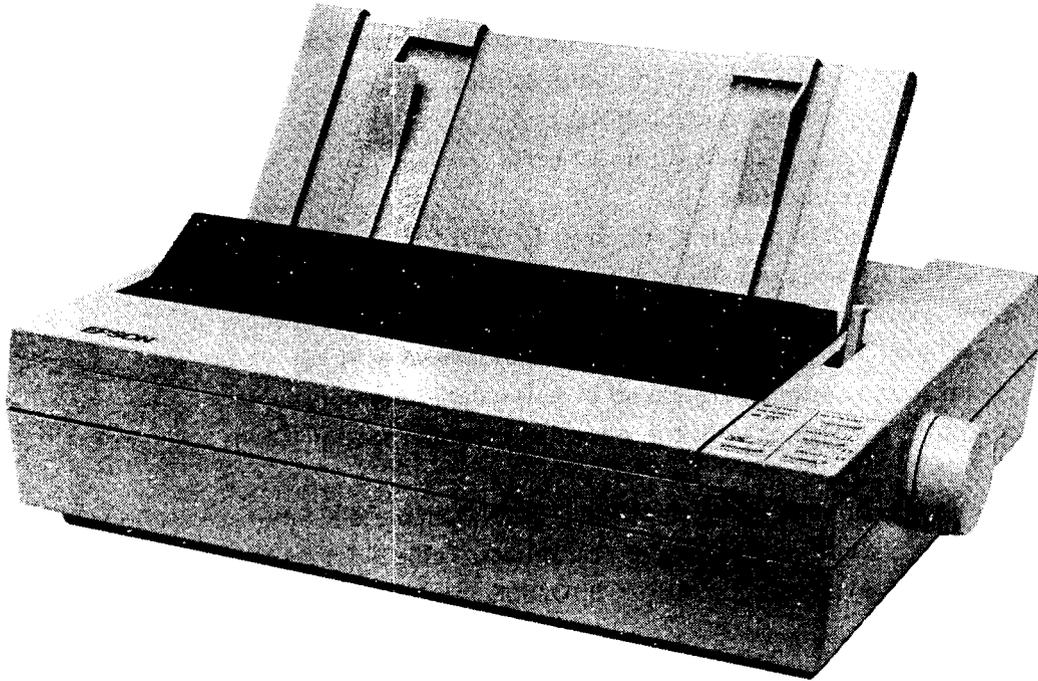
Figure 1-1. Exterior View of the LX-81 0/850

1.2 SPECIFICATIONS

This section describes LX-8 10/850 printer specifications.

1.2.1 Hardware Specifications

Printing Method   **Serial, impact, dot matrix**

Pin Configuration   **9 wires (diameter 0.29mm)**
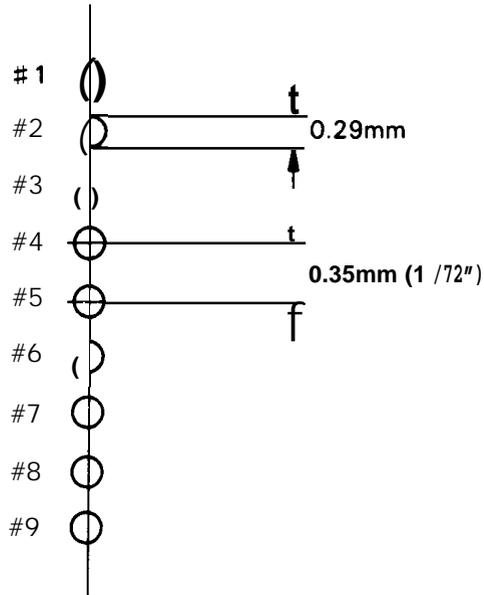
Figure 1-2. Pin Configuration

Feeding Method   **Friction feed, tractor feed (push tractor: standard, pull tractor: optional)**

When handling paper, note the following precautions described below

Friction Feed Precautions:

1. Do not use continuous paper.
2. Do not use a single sheet shorter than 182mm or longer than **364mm.**
3. **Do not perform any reverse paper feed within 8.5mm from the top, or 22mm from the bottom.**
4. **Do not perform reverse feed greater than 1/6 inch after the paper end is detected.**
5. **Use the pull-out unit.**
6. **Do not use multi-part single sheet forms.**

Tractor Feed Precautions:

1. **Release the friction feed mechanism.**
2. **Joining of copying paper must be by line or dotted pasting.**
3. **Copy paper must be a carbon-less, multi-part paper.**

a. Push Tractor Feed

1. Use the pull-out unit.
2. Do not perform reverse feeding greater than 1/6 inch.
3. After paper end detection, accuracy of paper feed cannot be assured and reverse feeding cannot be performed.

b. Push Pull Feed

1. Remove the pull-out unit and attach the pull tractor unit.
2. Do not loosen the paper between the platen and pull tractor unit.
3. Adjust precisely the horizontal position of the pull and push tractor.
4. Do not perform reverse feeding greater than 1/6 inch.
5. Do not perform reverse feeding after the paper end is detected.

c. Pull Tractor Feed

1. Remove the pull-out unit and attach the pull tractor unit.

Line Spacing	1/6 inch, 1/'8 inch, or programmable in units of 1/216 inch
Paper Insertion	From rear
Paper-Feed Speed	Approximately 95 ins/line (1/6 inch line feeding)
	Approximately 75 ins/line (1/6 inch in page feed)

Paper Specifications See Table 1-3 through 1-6

Table 1-3. Cut-Sheet Specifications

Width	182 mm to 257 mm (7.15 in. to 10.1 in.)
Length	182 mm to 364 mm (7.15 in. to 14.3 in.)
Thickness	0.065 mm to 0.14 mm (0.0025 in. to 0.0055 in.)
Weight	14 lb. to 24 lb. (52.3 g/m² to 90 g/m²)
Quality	Plain paper
Copies	Not available

Table 1-4. Continuous Paper Specifications

Width	101 mm to 254 mm (4.0 in. to 10.0 in.)
Copies	3 sheets (1 original and 2 copies)
Quality	Plain paper
Total Thickness	0.065 mm to 0.25 mm (0.0025 in. to 0.01 in.)
Weight	1 sheet - 14 lb. to 22 lb., (52.3 g/m² to 82 g/m²)
	3 sheets -- 12 lb. to 15 lb., (40 g/m² to 58.2 g/m²) each

Table 1-5. Roll Paper Specifications

Width	216 mm ± 3 mm (8.5 in. ± 0.12 in.)
Weight	14 lb. to 17 lb. (45 kg to 55 kg)
Quality	Plain paper
Thickness	0.07 mm to 0.09 mm (0.0028 in. to 0.0035 in.)

Table 1-6. Envelope Specifications

Size	No.6 (166 mm x 92 mm), No. 10 (240 mm x 104 mm)
Quality	Bond paper, Plain paper, Air mail
Thickness	0.16 mm to 0.52 mm (0.0063 in. to 0.0197 in.)
	Difference of thickness within printing area must be less than 0.25 rnm (0.0098 in.).
Weight	12 lb. to 24 lb. (45 g/m² to 91 g/m²)

NOTES: " Envelope printing is only available at normal temperature.
* Keep the *long* side of the envelope horizontal at setting.
* Set the left of a No.6 envelope at the setting mark of the sheet guide.

Table 1-7. Label Specifications

Size	2 1/2 in. X 15/16 in. (63.5 mm X 23.8 mm)
Weight	55Kg (68 g/m²)
Thickness	O.19 mm (0.0075 in.) max.
	Thickness excluding the base paper must be equal to or less than 0.12 mm (0.0075 in.).

NOTES: * Label printing is only available at normal temperature.
• Labels must be a fanfold type.
• For printing labels on pressure sensitive paper, the following conditions must be met: (1) jointed by dotted or line pasting. (2) total thickness is equal to or less than 0.3mm (0.01 18 inch). (3) 5 degree C to 35 degree C and 10% to 80% RH.

Printing Area

The figures **below show the printing area for cut sheets.**

182-257 mm(7. 2-10.1 ")

*1)   **Printable area**   ***1)**

8 . 5 m m
0.33 " or m('e

P
r
l
n
t
a
364mm max. **b**
14.3 " max. **l**
e

a
r
e
a

ABC   XYZ

ABC   XYZ
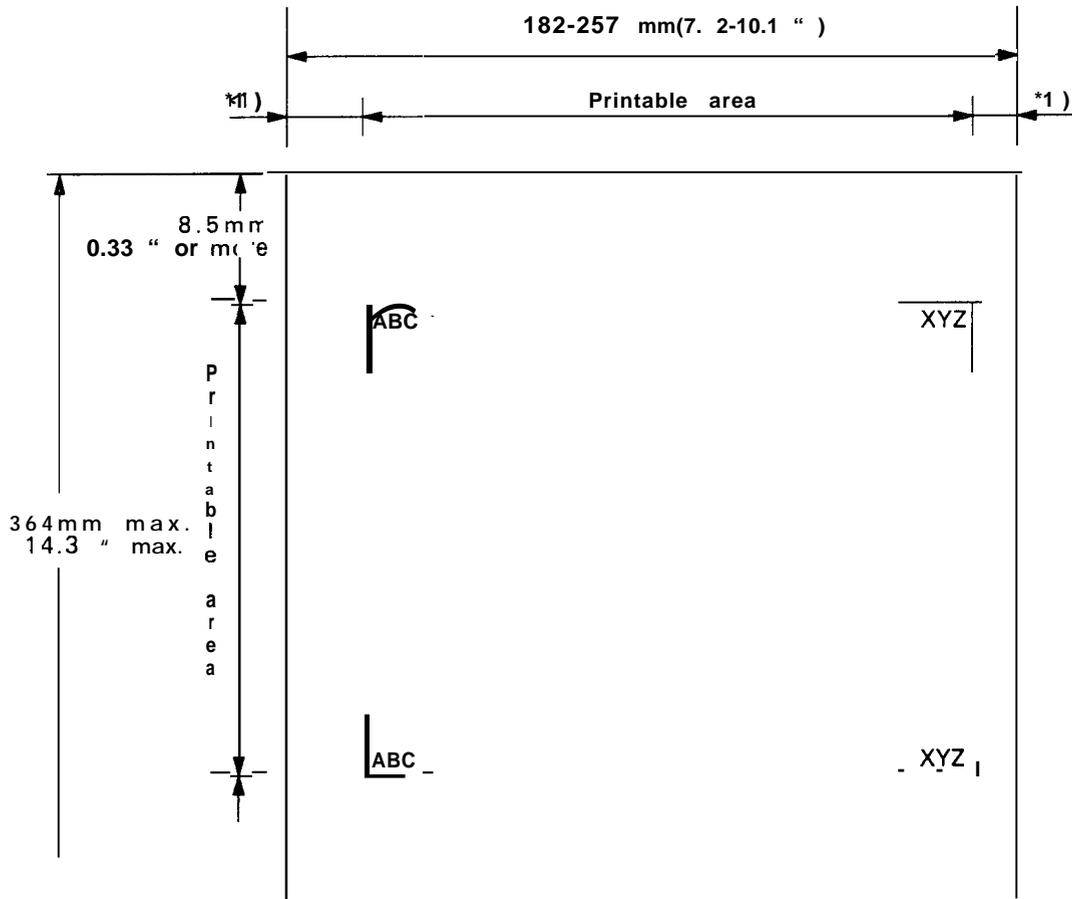
●**1) At least 3.0 mm (O. 12 in.) when the paper width is less than 229 mm (9 in.); at least 24 mm (0.9 in.) when the paper width is 257 mm (10.1 in.)**

●   **Printing is possible approx. 28 mm from the paper's detected bottom edge; the 13.5 mm value (lowest print position) is for reference only. Paper feed accuracy can not be assured within 22 mm (0.87 in.) of either the top or bottom edge.**

Figure 1 -3. Cut-Sheet Printing Area

4.0 " -10.0 " ,101 mm-254mm

Figure 1-4. Printing Area for Continuous Paper

● 1) 13 mm or greater for paper widths of 101 - 242 mm (4 - 9.5. in.)
   26 mm or greater for paper widths of 254 mm (10 in.)

*2) 13 mm or greater for paper widths of 101 - 242 mm (4 -9.5 in.)
   24 mm or greater for paper widths of 254 mm (1 O in.)

2'1 6mm(8.5 ")* 3mm(0. 12 ")

3rnm min.   3mm min.
'1   203.2mm
        (printable area)

50m
min
ABC

XYZ

60m
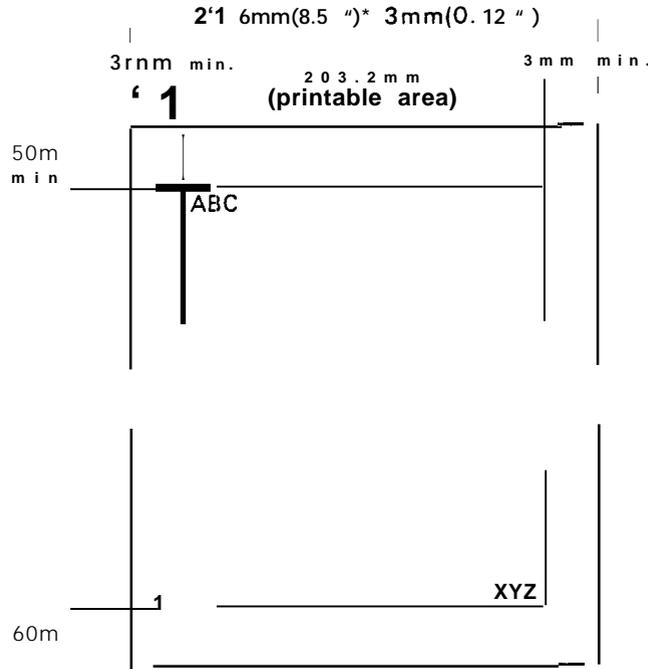
Figure 1-5. Roll Paper Printing Area

Ink Ribbon
  Type: **8750 Ribbon Cartridge**
  Color: **Black**
  Reliability: **3 million characters at 14 dots/character**

Reliability
  Mean Cycles Between   3 **million lines (excluding printhead)**
    Failure (MCBF):
  Mean Time Between   **4000 POH (25% duty)**
    Failure (MTBF):

Life of Printhead   **200 million strokes/wire**

Safety Approval
  Safety Standards   UL478 **(U.S. version)**
                               CSA22.2 #220 (Canada version)
                               VDE0806 (TUV) (European version)
  Radio Frequency   **FCC class B (U.S. version)**
    Interference (RFI)   **VDE 0871** (Self-certification)(European version)

Electrical Specifications

Power Conditions   120 VAC± 10% (120V version)

220/240 VAC± 10% (220/240V version)

Frequency Range   49.5 to 60.5 Hz

Power Consumption   28W (Draft self-test)

insulation Resistance   10 Mgohms min. (Between AC Line and Chassis)

Dielectric Strength   (At 50 or 60 Hz, between the AC line and chassis)

120V Version   1 KV AC (rms/minute) or 1250V AC (rms/second)

220/240V Version   1.5KV AC (rms/1 O minutes) or 1250V AC (rms/second)

Environmental Conditions

Temperature   5 to 35 degrees C (41 to 95 degrees F) -operating

–30 to 60 degrees C (-22 to 149 degrees F) -storage

Humidity   10 to 80 % RH (no condensation) –operating

5 to 85 % RH (no condensation) -storage

Resistance to Shock   1 G, within 1 mS -operating

2 G, within 1 mS -storage

Resistance to Vibration   0.25 G, 55 Hz max. -operating

0.50 G, 55 Hz max. -storage

Physical Specifications

Weight   5.75 Kg

Dimensions   418 mm (Width) X 339 mm (Depth) X 141 mm(Height),

excluding knobs and paper guides

1.2.2 Firmware Specifications (ESC/P)

Control Code	ESC/P™level ESC/P-81
	(EPSON Standard Code for Printers)
Printing Direction	Bi-directional printing with logic seeking (text)
	Uni-directional (left to right) printing (Bit-image)
Input data buffer	**4 K bytes**
Character Set	**96 ASCII characters**
	96 Italic characters
	32 International characters (13 countries)
	32 International Italic characters
	96 IBM Graphics characters
Font	**EPSON NLQ Roman**
	EPSON NLQ Saris Serif
	EPSON Draft
Printing Speed	**See Table 1-8**

Table 1-8. Printing Speed

Type of Letters	Print Speed (cps)
High Speed Draft	200
Pica	150
Elite	180
Double-Width	75
Emphasized	75
Double-Width Emphasized	37
Condensed	128
Double-Width condensed	64
Double-Width Elite	90
Condensed Elite	150
NLQ Pica	25
NLQ Elite	30

Dot-matrix Format	9×9 Text mode (Draft)
	18 X 20 Text mode (NLQ)
Character Size	**See Table 1-9**

Table 1-9. Character Size

Type of Letters	Width (mm)	Height (mm)
Pica	2.1	3.1
Elite	1.7	3.1
Condensed	1.05	3.1
Double-Width Pica	4.2	3.1
Double-Width Elite	3.4	3.1
Double-Width Condensed	2.1	3.1
Condensed Elite	0.85	3.1
Emphasized	2.1	3.1
Double-Width Emphasized	4.2	3.1
Super/Subscript	Depends On Pitch	1.6

Printing Columns   See Table 1-10

Table 1-10. Column Width (maximum characters/line)

Type of Letters	Column Width (CPL)	Column/inch (cpi)
Pica	80	10
Elite	96	12
Condensed	137	17
Double-Width Pica	40	5
Double-Width emphasized	40	5
Double-Width Elite	48	6
Double-Width Condensed	68	8.5
Condensed Elite	160	20
Emphasized	80	10

1.3 INTERFACE OVERVIEW

The standard 8-bit parallel interface provided with this printer meets the specifications described below.

Data Format   8-bit parallel

Synchronization   By $\overline{\text{STROBE}}$ pulse

Handshaking   By BUSY and $\overline{\text{ACKNLG}}$ signal

Signal Level   TTL-compatible

Adaptable Connector   57-30360 (amphanol) or equivalent

Data Transmission Timing See Figure 1-6
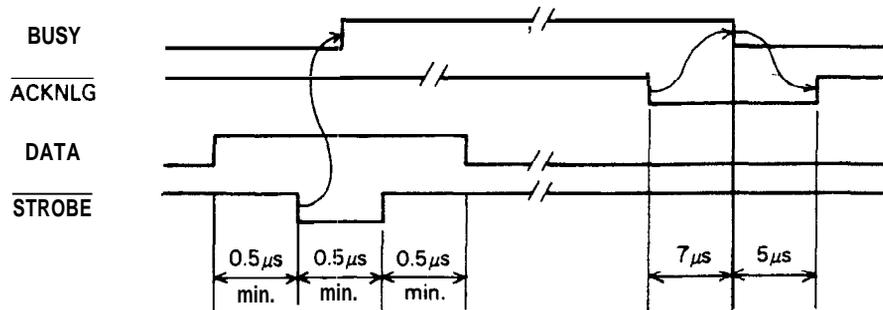
Figure 1-6. Data Transmission Timing

Table 1-11 shows the connector pin assignments and signal functions of the 8-bit parallel interface.

Table 1-11. Connector Pin Assignments and Signal Functions

Pin No.	Signal Name	Return Pin No.	DIR	Functional Description
1	$\overline{\text{STRORE}}$	19	In	Strobe pulse to read the input data. Pulse width must be more than $0.5\,\mu s$. Input data is latched at falling edge of this signal.
2	DATA 1	20	In	Parallel input data to the printer.
3	DATA 2	21	In	"HIGH" level means data " 1".
4	DATA 3	22	In	"LOW" level means data "O".
5	DATA 4	23	In	
6	DATA 5	24	In	
7	DATA 6	25	In	
8	DATA 7	26	In	
9	DATA 8	27	In	
10	$\overline{\text{ACKNLG}}$	28	out	This pulse indicates data is received and ready to accept next data. Pulse width is $12\,\mu s$ approx.
11	BUSY	29	out	"HIGH" indecates printer cannot accept next data.
12	PE	30	out	"HIGH" indicates paper-out. This signal is effective only when $\overline{\text{ERROR}}$ signal is "LOW".
13	SLCT	—	Out	Always "HIGH" output. (Pulled up to $+5V$ through 3.3kohms register.)

Table 1-11. Connector Pin Assignments and Signal Functions (Cont.)

Pin No.	Signal Name	Return Pin No.	DIR	Functional Description
14	AUTOFEED-XT	—	In	if "LOW" when the printer is initialized, a line feed is automatically performed by input of "CR" code. (Auto LF)
15				Not used
16	GND			Ground for twisted-pair grounding
17	Chassis GND	—	—	Chassis ground level of printer
18				Not used
9 to 30	GND			Grounds for twisted-pair grounding
31	I NIT	16	In	Pulse (Width: $50\mu s$ min., active "LOW") input for printer initialization.
32	ERROR		out	"LOW" indicates some error is occurred in the printer.
33	GND	—	—	Ground for twisted-pair grounding
34		—	—	Not used
35		—	Out	Always "HIGH". (Pulled up to $+5V$ through 3.3 Kohms register.)
36	SLCT-IN	—	In	If "LOW" when prinater is initialized, the DC1/DC3 control is disabled.

NOTES: 1. "DIR" refers to the direction of the signal flow as viewed from the printer.

2. "Return" denotes a twisted-pair return line.

3. The cable used must be shielded to prevent noise.

4. All interface conditions are based on TTL levels. Both the rise and fall times of all signals must be less than 0.2 us.

5. The AUTO FEED-XT signal can be set LOW by DIP switch 2-4.

6. The SELECT-IN signal can be set LOW by jumper 1.

7. Printing tests, including interface circuit tests, can be performed without using external equipment by setting DATA 1-8 of the interface connector to certain codes and connecting the ACKNLG signal to the STROBE signal.

Table 1-12 shows Printer Select/Deselect (DC1/DC3) control, including relations among ON-LINE, SELECT-IN input, DC 1/DC3 and interface signals.

Table 1-12. Printer Select/Deselect Control

ON-LINE SW	SLCT-IN	DC1/DC3	ERROR	BUSY	ACKNLG	DATA ENTRY
OFF-LINE	HIGH/LOW	DC1/DC3	LOW	HIGH	No pulse	Disable
ON-LINE	HIGH	DC 1	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable(Normal Process)
		DC3	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable (Waits DC 1. See Note 2)
	LOW	DC 1	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable (Normal process)
		DC3	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	

NOTES: 1. In Table 1-12, it is assumed that no ERROR status exists other than that attributable to the OFF-LINE mode.

2. Once the printer has been put in the deselected state by the DC3 code, the printer will not revert to the selected state unless the DC 1 code is input again. (In the deselected state, the printer ignores input data until the DC 1 code is received.)

3. The DC 1 and DC3 codes are enabled only when the SLCT-IN signal (Input Connector No.36 for the parallel interface unit) is HIGH and printer power is initialized.

4. if the SLCT-IN signal is LOW when the printer is initialized, DC1/DC3 printer select/deselect control is invalidated, and these control codes are ignored.

5. If the SLCT-IN signal is HIGH and is not set to LOW by jumper 1 when the printer is initialized, the printer starts from the selected (DC 1) state.

1.4 DIP SWITCH AND JUNIPER SETTINGS

This section describes DIP switch settings for the LX-8 10/850 printer.

1.4.1 DIP Switch Settings

The two DIP switches are located on the side of the printer and function as shown in Tables 1-13 through 1-15. Note that the status of the DIP switches is read only at power on or upon receipt of the I NIT signal.

Table 1-13. Settings for DIP Switch 1 (SW1)

No.	Description	ON	OFF	Fectory Setting
1	Character Pitch	12 cpi	10 cpi	OFF
2	Shape of Zero	0	0	OFF
3	Table Selection (note)	Graphics	Italics	OFF
4	Tear Off	Invalid	Valid	OFF
5	Draft Mode	Normal	High	OFF
6	International			ON
7	Character Set	See Table 1-15		ON
8	Selection			ON

NOTE: When the DIP switch is set for the Italic table, at power on printer defaults to ESC 7 table. When the switch is set for the Graphic table, at power on it defaults to ESC 6 table.

Table 1-14. Settings for DIP Switch 2 (SW2)

No.	Description	ON	OFF	Factory Setting
1	Page length	12 in.	11 in.	OFF
2	Cut-Sheet Feeder (CSF) Mode	On	off	OFF
3	I-inch skip	On	off	OFF
4	AUTO FEED XT Signal Internally Fixed or Not	Fixed to LOW	Depends On External Signal	OFF

Table 1-15. International Character Set Selection

1-6	1-7	1-8	Country	1-6	1-7	1-8	Country
On	On	On	U.S.A	Off	On	On	Denmark 1
On	On	Off	France	Off	On	Off	Sweden
On	Off	On	Germany	Off	Off	On	Italy
On	Off	Off	U.K.	Off	Off	Off	Spain 1

1.4.2 Jumper Setting

Jumper 1 (user-selectable) is located on the TAMA board. If the jumper is connected, the $\overline{\text{SLCT-IN}}$ signal is fixed to LOW, and DC 1 /DC3 printer select control is ignored.

1.5 SELECTYPE FUNCTION

SelecType **allows the user to choose fonts and the printing mode easily.** This function provides for selection of Draft, Roman, or Saris Serif fonts and selection of normal printing or condensed printing **modes.** SelecType **is effective only when the printer is ON** LINE **and not printing.**

To select Roman or Saris Serif, press the NLQ **button. A buzzer sounds when the** NLQ **button is pressed. When it sounds twice, the Roman font is selected. When it sounds three times, the Saris Serif font is selected.**

To select the Draft font, press the DRAFT button. The buzzer will sound once, indicating that the DRAFT font is selected.

To set for condensed printing when the printer is in the print mode, press the CONDENSED button once (the buzzer will sound once), and the printer will enter the condensed print mode.

To cancel **condensed printing, press the CONDENSED button again. After** you **press the button, the buzzer sounds twice to tell you that condensed printing is** cancelled.

1.6 SHEET LOADING AND SHEET EJECTION

The release lever enables disengaging of the push tractor unit drive mechanism. The printer therefore provides some improved paper-handling functions through combination of the release-lever and LOAD/EJECT control panel switch.

Cut Sheet Loading And Ejection

To load a sheet of paper, position the paper release lever back, place the sheet along the paper guide, and press the LOAD/EJECT switch. This loads the paper to the top-of-form position.
Pressing the LOAD/EJECT switch after the paper has been loaded will cause the paper to be ejected.

Continuous Paper Loading And Ejection (Back-out)

To load fanfold paper, move the paper release lever forward, and insert the paper into the push tractor. Pressing the LOAD/EJECT switch will then cause paper to be automatically loaded to the top-of-form position. Pressing the LOAD/EJECT switch after the fanfold paper has been loaded will cause the printer to eject the paper backward from the push tractor. To back out several pages, press the LOAD/EJECT switch several times (reverse feed is performed on a page-by-page basis).

The ON-LINE LED will **flash only when the paper is loaded and the ON-LINE switch pressed. This indicates that the printer has entered "Top-of-form adjust" mode, and that the user may adjust the top-of-form position, as well as the loading positions for subsequent forms. Adjustment is made using the FORM FEED button,**
which will increment the paper forward, and the LINE FEED switch, which will increment the paper in reverse. (The minimum feed amount is 2/216 inch).
When cut sheet is used, the adjusted Top-of-form position will be lost when the printer is re-initialized, and the Top-of from will be reset to the default value. When continuous paper is used, however, the memory of the adjusted Top-of-form position will be retained even after printer initialization.

1.7 TEAR-OFF FUNCTION

The Tear-Off function can be enabled by making the appropriate DIP switch setting, and will operate when the release-lever is set to the tractor position. In such a case, if the input data buffer is empty and the printer is ON-LINE, the paper will automatically be fed to the tear-off position, and the ON-LINE LED will flash to indicate that the FORM FEED and LINE FEED switches are now available to perform micro-adjustment. The user may then adjust the paper to the tear-off position. This position becomes the new tear-off position default, and will remain valid even if the printer is reset and reinitialized, and regardless of whether the main power has been interrupted. When new data are input to the printer, the paper will automatically be returned to its original position, and printing will then start. Paper having been advanced to the tear-off position will also be returned to its original position if the ON-LINE switch is pressed (switching the printer from ON-LINE to OFF-LINE).

1.8 OPERATING INSTRUCTIONS

This section describes the self-test, hexadecimal **dump** functions, error states, printer initialization, and buzzer operation.

1.8.1 **Self-Test**

To begin printing the self-test in the Draft mode, turn the printer ON while pressing the LIN E-FEED button. **To** begin printing the self-test using the NLQ **mode (Near Letter Quality),** press FORM FEED and hold **it down, then turn the printer power ON.**

Self-test printing can be stopped or started by pressing ON-LINE (ON-LINE indicator is not lit). To finish the self-test, stop the printing by pressing the ON-LINE switch then turn OFF the printer power.

The firmware revision number is printed as the first line of the self-test, and subsequently, current DIP switch settings are printed.

```
Xxxxxxxx

Character Spacing      10 CPI              1-1 OFF
Shape of Zero          O (Unslashed )      1-2 OFF
CG Table               Italics             1-3 oFF
Short  Tear-off        Valid               1-4 oFF
Draft  Print  Speed    High                1-5 oFF
Country                U.S.A.              1-6 ON  1-7 ON  1-6 ON
Page  Length           11 inch             2-1 OFF
CSF Mode               Invalid             2-2 OFF
Skip  Perforation      None                2-3 OFF
Auto  LF               Depend on I/F       2-4 OFF
```


Figure I-7. Self-Test Printout

1.8.2 Hexadecimal Dump Function

The printer enters the HEX-DUMP mode when it is powered on while the LINE-FEED and FORM-FEED buttons are pressed down.

In the HEX-DUMP mode, the hexadecimal representation of the input data is printed out, along with corresponding ASCII characters. This function is valuable for checking the data the printer has received from the host. If input data is a control code rather than a character code, a period (.) is printed in the ASCII column.

```
Data Dump Mode

0000  1B 40 0D 1B 55 00 1B 33 1F 00 0D 0A 0D 0A 0D 0A   .@..U.3.........
0010  12 1B 70 00 1B 73 01 1B 57 00 1B 4D 20 20 20 20   ..p..s..W..M
0020  43 48 41 50 54 45 52 20 31 0D 0A 20 20 20 20 47   CHAPTER 1 .    G
0030  45 4E 45 52 41 4C 20 44 45 53 43 52 49 50 54 49   ENERAL DESCRIPTI
0040  4F 4E 0D 0A 0D 0A 20 20 20 20 31 2E 31 20 46 45   ON....    1.1 FE
0050  41 54 55 52 45 0D 0A 20 20 20 20 31 2E 32 20 53   ATURE..    1.2 S
0060  50 45 43 49 46 49 43 41 54 49 4F 4E 53 0D 0A 20   PECIFICATIONS..
0070  20 20 20 20 20 20 20 31 2E 32 2E 31 20 48 61 72          1.2.1 Har
0080  64 77 61 72 65 20 53 70 65 63 69 66 69 63 61 74   dware Specificat
0090  69 6F 6E 73 0D 0A 20 20 20 20 20 20 20 20 31 2E   ions..        1.
00A0  32 2E 32 20 46 69 72 6D 77 61 72 65 20 53 70 65   2.2 Firmware Spe
00B0  63 69 66 69 63 61 74 69 6F 6E 73 20 28 45 53 43   cifications (ESC
00C0  2F 50 29 0D 0A 20 20 20 20 31 2E 33 20 49 4E 54   /P)..    1.3 INT
00D0  45 52 46 41 43 45 20 4F 56 45 52 56 49 45 57 0D   ERFACE OVERVIEW.
00E0  0A 20 20 20 20 20 31 2E 34 20 44 49 50 20 41 4E 44   .    1.4 DIP AND
00F0  20 4A 55 4D 50 45 52 20 53 45 54 54 49 4E 47 53    JUMPER SETTINGS
0100  0D 0A 20 20 20 20 20 20 20 20 31 2E 34 2E 31 20   ..        1.4.1
0110  44 49 50 20 53 77 69 74 63 68 20 53 65 74 74 69   DIP Switch Setti
0120  6E 67 73 0D 0A 20 20 20 20 20 20 20 20 31 2E 34   ngs..        1.4
0130  2E 32 20 4A 75 6D 70 65 72 20 53 65 74 74 69 6E   .2 Jumper Settin
0140  67 0D 0A 20 20 20 20 31 2E 35 20 53 45 4C 45 43   g..    1.5 SELEC
0150  54 59 50 45 20 46 55 4E 43 54 49 4F 4E 0D 0A 20   TYPE FUNCTION..
0160  20 20 20 31 2E 35 20 53 48 45 45 54 20 4C 4F 41      1.6 SHEET LOA
0170  44 49 4E 47 20 41 4E 44 20 53 48 45 45 54 20 45   DING AND SHEET E
0180  4A 45 43 54 49 4F 4E 0D 0A 20 20 20 20 31 2E 32   JECTI()11..    1.7
0190  20 54 45 41 52 2D 4F 46 46 20 46 55 4E 43 54 49    TEAR-OFFFUNCTI
01A0  4F 4E 0D 0A 20 20 20 31 2E 38 20 4F 50 45 52   ON...    1.8 OPER
01B0  41 54 49 4E 47 20 49 4E 53 54 52 55 43 54 49 4F   ATING INSTRUCTIO
01C0  4E 53 0D 0A 20 20 20 20 20 20 31 2E 38 2E   NS...    1.8.
01D0  31 20 53 65 6C 66 2D 54 65 73 74 0D 0A 20 20 20   1 Self-Test..
01E0  20 20 20 20 20 20 31 2E 38 2E 32 20 48 65 78 61 64    1.8.2 Hexad
01F0  65 63 69 6D 61 6C 20 44 75 6D 70 20 46 75 6E 63   ecimal Dump Func
0200  74 69 6F 6E 0D 0A 20 20 20 20 20 20 20 20 31 2E   tion..        1.
0210  38 2E 33 20 42 75 7A 7A 65 72 20 4F 70 65 72 61   8.3 Buzzer Opera
0220  74 69 6F 6E 0D 0A 20 20 20 20 20 20 20 31 2E   tion..       1.
0230  38 2E 34 20 50 72 69 6E 74 65 72 20 49 6E 69 74   8.4 Printer Init
0240  69 61 6C 69 7A 61 74 69 6F 6F 0D 0A 20 20 20 20   ialization..
0250  20 20 20 20 31 2E 38 2E 35 20 41 64 6A 75 73 74          1.8.5 Adjust
0260  20 4C 65 76 65 72 20 4F 70 65 72 61 74 69 6F 6E    Lever Operation
0270  0D 0A 20 20 20 20 31 2E 36 20 4D 41 49 4E 20 43   ..    1.6 MAIN C
0280  4F 4D 50 4F 4E 45 4E 54 53 0D 0A 20 20 20 20 20   OMPONENTS..
0290  20 20 20 31 2E 36 2E 31 20 54 41 4D 41 20 42 6F      1.6.1 TAMA Bo
02A0  61 72 64 0D 0A 20 20 20 20 20 20 20 31 2E 36   ard..        1.6
02B0  2F 32 20 54 41 50 4E 4C 2D 57 20 43 6F 6E 74 72   .2 TAPNL-W Contr
02C0  6F 6C 20 50 61 6E 65 6C 0D 0A 20 20 20 20 20 20   ol Panel..
02D0  20 20 31 2E 36 2E 33 20 54 41 20 46 69 6C 74 65     1.6.3 TA Filte
02E0  72 20 55 6E 69 74 0D 0A 20 20 20 20 20 20 20 20   r Unit..
02F0  31 2E 36 2E 35 20 50 72 69 6E 74 65 72 20 4D 65   1.6.5 Printer Me
0300  63 68 61 6E 69 73 6D 20 28 4D 2D 33 44 31 30 29   chanism (M-3D10)
0310  0D 0A 20 20 20 20 20 20 20 20 31 2E 36 2E 36 20   ..        1.6.6
0320  48 6F 75 73 69 6E 67 0D 0A 20 20 20 20 20 20 31   Housing.....    1
0330  2E 31 20 46 45 41 54 55 52 45 53 0D 0A 0D 0A 20   .1 FEATURES....
0340  20 20 20 54 68 65 20 4C 2D 38 31 30 2F 38 35      The LX-810/85
0350  30 20 69 73 20 61 20 73 6D 61 6C 6C 2C 20 6C 69   0 is a small, li
0360  67 68 74 2D 77 65 69 67 68 74 20 27 20 6C 6F 77 2D   ght-weight, low-
0370  63 6F 73 74 2C 20 61 64 76 61 6E 63 65 64 0D 0A   cost, advanced..
0380  20 20 20 20 70 61 70 65 72 20 68 61 6E 64 6C 69         paper handli
0390  6E 67 20 70 72 69 6E 74 65 72 20 63 6F 6D 70 61   ng printer compa
03A0  72 61 62 6C 65 20 74 6F 20 74 68 65 20 4C 58 2D   rable to the LX-
03B0  38 30 30 2E 20 49 74 73 20 6D 61 69 6E 0D 0A 20   800. Its main..
03C0  20 20 20 66 65 61 74 75 72 65 73 20 61 72 65 3A      features are:
03D0  0D 0A 0D 0A 20 20 20 20 31 2E 20 20 20 41 64 76   ....    1.  Adv
03E0  61 6E 63 65 64 20 70 61 70 65 72 20 68 61 6E 64   anced paper hand
03F0  6C 69 6E 67 3A 20 41 75 74 6F 20 62 61 63 6B 6F   ling: Auto backo
0400  75 74 20 61 6E 64 20 63 75 74 20 73 68 65 65 74   ut and cut sheet
```

Figure 1-8. Hexadecimal Dump Function

1.8.3 Buzzer Operation

The buzzer sounds under the following conditions:

BEL **code:**   **The buzzer sounds for 0.1 second when a** BEL **code is input.**

Carriage trouble: **Beeps 6 times, pausing briefly after 3rd beep.**

Paper-out: **Beeps 20 times, pausing briefly after every 4 beeps.**

Abnormal voltage: **Beeps 5 times, pausing after every beep.**

Incorrect RAM: (SRAM) **Beeps 8 times, pausing briefly** after every 2 beeps. (Inside CPU)
                                         Beeps indefinitely until **power OFF.**

Recognition of panel operation:
                                         Beeps 1 or 2 or 3 times in setting print mode.

Factory setting: **Beeps once when the value under micro-adjusting is equal to the factory-set value.**

Sheet ejection failure (in CSF mode):
                                         Beeps 20 times, pausing briefly after every 4 beeps.

Illegal paper *release/unrelease*:
                                         Beeps continuously when the paper release lever is changed when the paper is in the paper path. Beeps until the lever is changed again or the paper is completely out of the path.

1.8.4 Printer Initialization

The printer is initialized when:

1) AC power is turned on

2) The INIT signal is input

Here is a brief summary of the initialization sequence.

a) Return the printhead to the leftmost position.

b) Set ON LINE mode.

c) Clear the print buffer and input buffer.

d) Set the line spacing to 1/6 inches.

e) Set the page length to 11 or 12 inches according to the DIP switch setting.

f) Clear all vertical tab positions.

9) Set the horizontal tab position at 13-column intervals.

h) Set the print mode according to tlhe DIP switch setting and the non-volatile memory setting of the control panel.

1.8.5 Adjust Lever Operation

The adjust lever must be set to the proper position according to the paper of paper you are using. Refer to Table 1-16 and Figure 1-9 below.

Table 1-16. Lever Position

Lever Position	Paper
2nd step	Cut sheet, continuous paper (non copy, 1 + 1 copy)
3rd step	Continuous paper (1 +2 copies)
4th step	Label
4th to 7th step	Envelope

• If printing density becomes lighter, set the adjust lever position one step narrower.
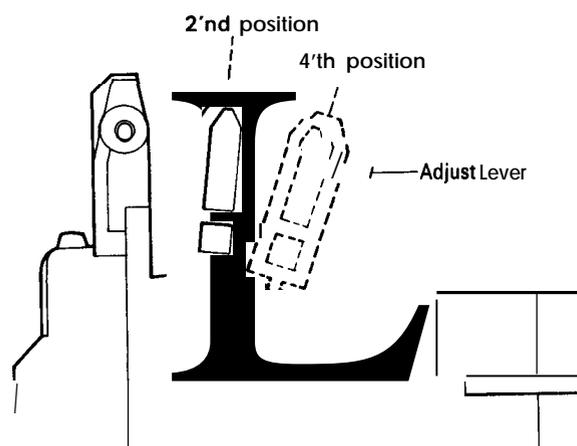

Figure 1-9. Lever Position

REV.-A

1.6 MAIN COMPONENTS

The main components of the LX-8 10/850 printer are designed for easy removal and replacement to maintain/repair the printer.

The main components are:

1) TAMA board: Main control board. The CPU on this board controls all main functions.

2) TAPNL-W control panel: Control panel.

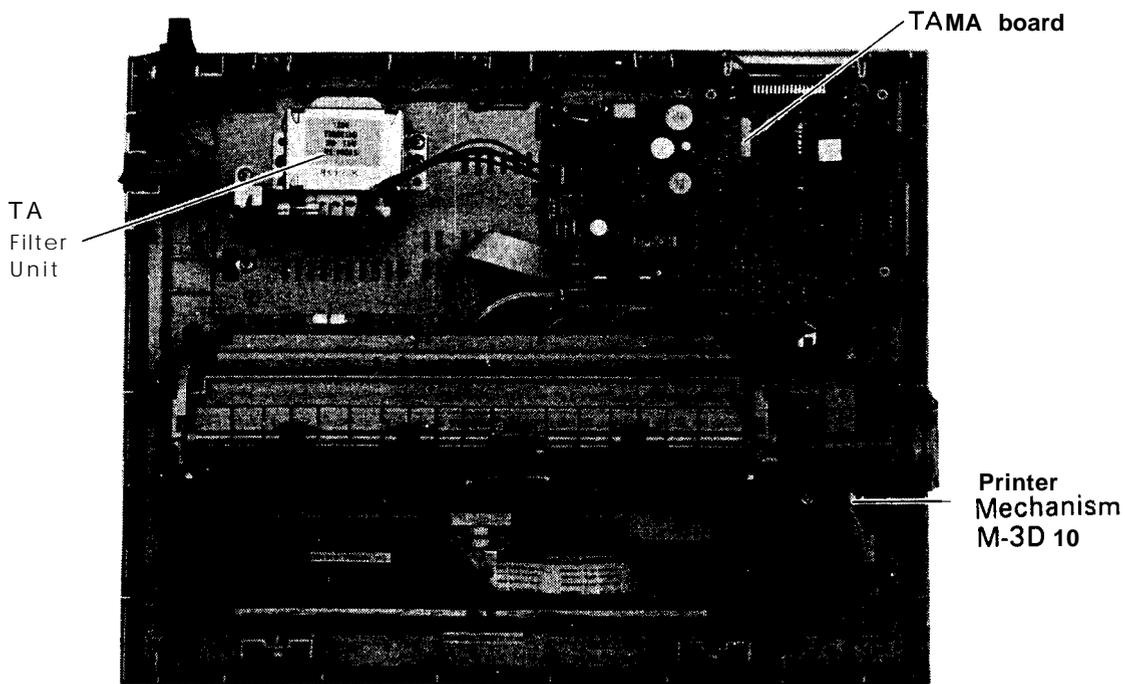3) TA filter unit: Transformer and filter board.

4) M-3D 10: Printer mechanism.

Figure 1-10. 1.X-81 0/850 Component Layout