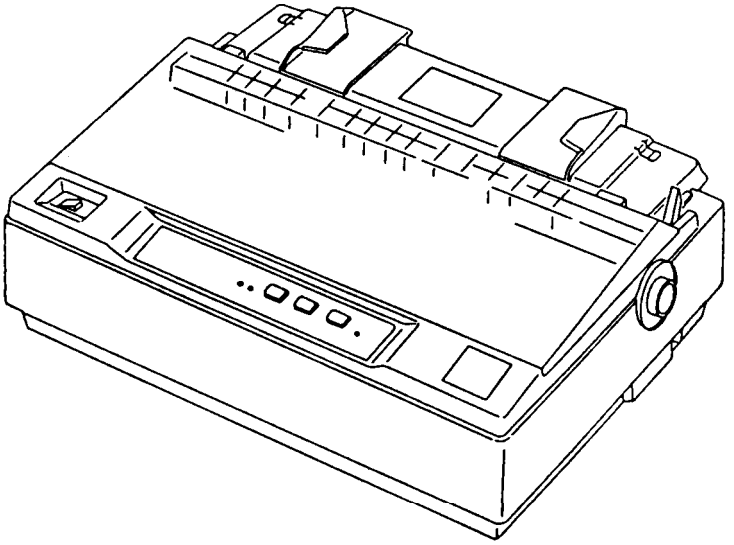
EPSON TERMINAL PRINTER

LX-300

SERVICE MANUAL



EPSON

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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 DANGER Headings.

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

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

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND PERIPHERAL DEVICES 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 AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.

3. ALWAYS VERIFY THAT THE EPSON 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 MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; 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 LX-300.
The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

CHAPTER 1. PRODUCT DESCRIPTION

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

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of printer operation.

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Includes a step-by-step guide for product disassembly and assembly.

CHAPTER 4. ADJUSTMENTS

Includes a step-by-step guide for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides Epson-approved techniques for adjustment.

CHAPTER 6. MAINTENANCE

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

APPENDIX

Describes connector pin assignments, circuit diagrams, circuit board component layout and exploded diagram.

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

REVISION SHEET

Revision	Issue Date	Revision Page
Rev. A	April 6, 1994	1st issue

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CHAPTER 1 Product Description

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1.1 FEATURES

The LX-300 is a small, light-weight, 9-pin serial impact dot-matrix color printer suitable for personal use. The major features of this printer areas follows:

- ❑ Fast printing of 10-cpi draft characters at 220 cps
- ❑ Compact design saves precious workspace
- ❑ Easy-to-operate panel
- ❑ Quiet printing
- ❑ Standard 8-bit parallel interface and EIA-232D serial interface
- ❑ Printing of up to 66 lines on A4-size or 62 lines on letter-size paper
- ❑ Optional color printing usinga color ribbon (black, magenta, cyan, yellow)
- ❑ Detachable push and pull tractor

Figure 1-1 shows an exterior view of the LX-300 and Table 1-1 lists the optional units available for the LX-300.

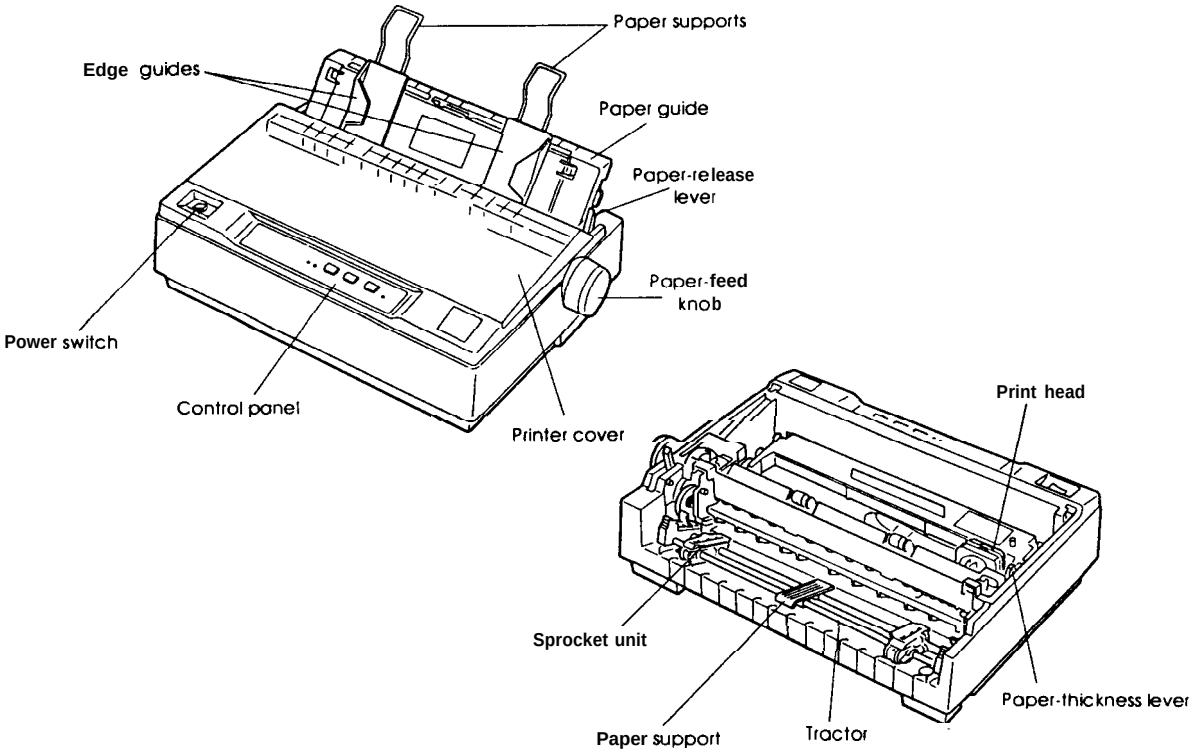


Figure 1-1. Exterior"View of the LX-300

Table 1-1. Optional Units

Model	Description
#8750	Ribbon cartridge (monochrome)
#8758	Ribbon cartridge (monochrome, sub-cartridge)
S015073	Ribbon cartridge (color)
C80837*	Single-bin cut sheet feeder
C83208*	Color upgrade kit
C80030*	Pull tractor unit
#8310	Roil paper holder

1.2 SPECIFICATIONS

This section provides detailed information about the LX-300.

1.2.1 Hardware Specifications

Printing method: Serial impact dot matrix

Pin configuration: 9 wires

Pin diameter: 0.29 **mm**

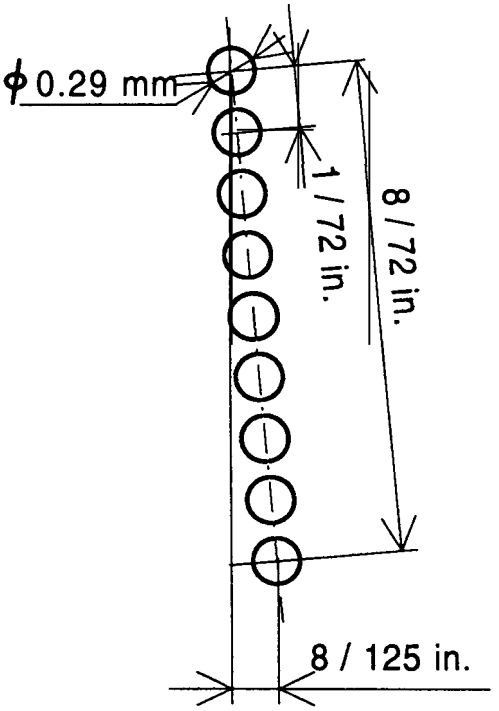


Figure 1-2. Pin Configuration

Printing direction: Bidirectional with logic seeking for draft text with monochrome printing.
Unidirectional printing for graphics, NLQ text, bit image, and color printing.

1.2.1.1 Paper Handling Specifications

Feeding system: Friction feed or tractor (push and pull) feed

Feeding method
- Cut sheets: Manual insertion (top entry) and feeding with the optional cut sheet feeder (CSF)
- Continuous paper: Push and pull tractor feeding

Feeding pitch: 1/6 inch, 1/8 inch, or programmable feeding in increments of %16 inch, minimum

Paper paths
- Cut sheet path: Top entry (manual insertion or the optional CSF)
- Continuous paper paths: Rear entry (push tractor feed)
  Rear entry (pull tractor feed)
- Continuous paper parking: Possible, using push tractor
- CSF: Single bin, manual insertion using optional CSF (top entry)

Paper-feeding speed: See Table 1-2.

Table 1-2. Feeding Speed

Feeding	I/G inch Line Feed	Continuous Feed
Friction	79 ms/line	2.78 inches/second
Tractor (single)		
Tractor (double)	96 redline	2.08 inches/second

Friction feed

- Set the release lever to the friction position.
- When a sheet is inserted into the top slot, place its left edge at the marked position.
- Do not perform reverse feeds greater than 0.27 inch (6.8 mm).

Push tractor feed

- Set the release lever to the tractor position.
- Do not perform reverse feeds greater than O.27 inch (6.8 mm).
- During printing ofiabels, never perforrnreverse feeding.
- After printing labels, do not eject them from the rear.

Pull tractor feed

0 Remove the tractor unit from the push position and mount it in the pull position.
- Do not perform reverse feeding.

The adjust lever must be set to proper position for the paper thickness, as shown below.

Table 1-3. Adjust Lever Settings

Lever Position	Paper Thickness
0	0.065 mm -0.16 mm (0.0026 in. -0.0063 in.)
1	0.16 mm -0.25 mm (0.0063 in. -0.0098 in.)
2	0.25 mm -0.48 mm (0.0098 in. -0.0189 in.)

1.2.1.2 Paper Specifications

Table 1-4. Specifications for Cut Sheet Paper (Manual Insertion)

Width	182 mm -257 mm (7.2 in. -10.1 in.)
Length	182 mm -364 mm (7.2 in. -14.3 in.)
Thickness	0.065 mm -0.14 mm (0.0025 in. -0.0055 in.)
Weight	52.3-90 g/m^2 (14 -24 lb.)
Quality	Plain paper, recycled paper

Table 1-5. Specifications for Cut Sheet Paper (CSF)

Size	A4 (W x L: 210 mm (8.3 in.) x 297 mm (11.7 in.)) Letter ('W x L: 216 mm (8.5 in.) x 279 mm (11.0 m.))
Thickness	0.065 mm -0.14 mm (0.0025 in. -0.0055 in.)
Weight	64-90 g/m^2 (17 -24 lb.)
QuaMy	Plain paper, recycled paper

Table 1-6. Envelope Specifications

Size	NO.6 Width 166 mm x Length 92 mm (6.5 in. x 3.6 in.) No.1O Width 240 mm x Length 104 mm (9.5 in. x 4.1 in.)
Thickness	0.16 mm - 0.48 mm (0.0063 in. -0.019 in.)
Weight	45-90 g/m^2 (12 1-24 lb.)
Quality	Bond paper (not curled, folded, or crumpled), plain paper, airmail paper

Notes: . Printing of envelopes is guaranteed only when the temperature is room temperature and humidity is normal (15 - 25° C (59 - 77″ F), 20- 60% RH).

- Variations in envelope thickness must be less than 0.25 mm (0.0098 in.).
- When inserting envelopes, keep the longer side horizontal.

Table 1-7. Specifications for Continuous Paper (Single Sheet and Multi-Part)

Width	101.6 mm - 254 mm (4.0 in. - 10.0 in.)
Total thickness	0.065 mm- 0.25 mm (0.0025 in. - 0.0098 in.)
Weights	52.3- 82 g/m^2 (14-22 lb. —) not multi-part 40- 58.2 g/m^2 (12 - 15 lb. —) multi-part
copies	3 sheets (1 original + 2 copies)
Quality	Plain paper, recycled paper, carbonless multi-part paper

Table 1-8. Specifications for Continuous Paper with a Label

Label size (W x L)	63.5 mm (min.) x 23.8 mm (min.) [2.5 in. (min.) x 15/16 in. (min.)]
Width of base paper	101.6 mm -254 mm (4.0 in. x 10.0 in.)
Thickness of base paper	0.07 mm - 0.09 mm (0.0028 in. - 0.0035 in.)
Total thickness	0.16 mm - 0.19 mm (0.0063 in. -0.0075 in.)
Weight	64g/m2(17 lb.)
Quality	Plain paper

Notes:
- Use only continuous-type labels and use them only with the tractor.
- Example of labels — Avery Continuous Form Labels
  — Avery Mini-Line Labels
- Printing of envelopes is guaranteed only when the temperature is room temperature and humidity is normal (15 - 25° C (59 - 77° F), 20- 60% RI-I).

Table 1-9. Roll Paper Specifications

Width	213 mm -219 mm (8.38 in. -8.62 in.)
Diameter	127 mm (5.0 in.)
Thickness	0.070 mm -0.090 mm (0.0028 in. - 0.0035 in.)
Weight	52- 64 g/m^2 (14 -17 lb.)

1.2.1.3 Printable Area

Cut sheets using manual insertion

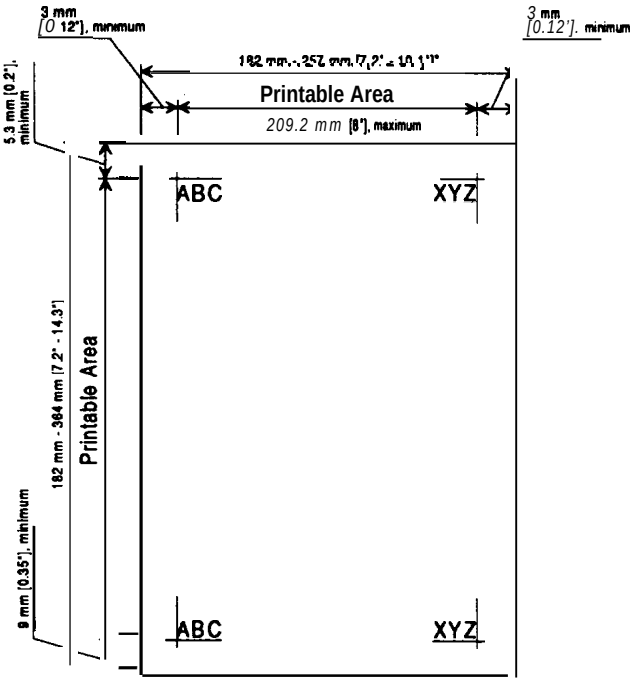


Figure 1-3. Printable Area for Cut Sheets Using Manual Insertion

Cut Sheets Using the CSF

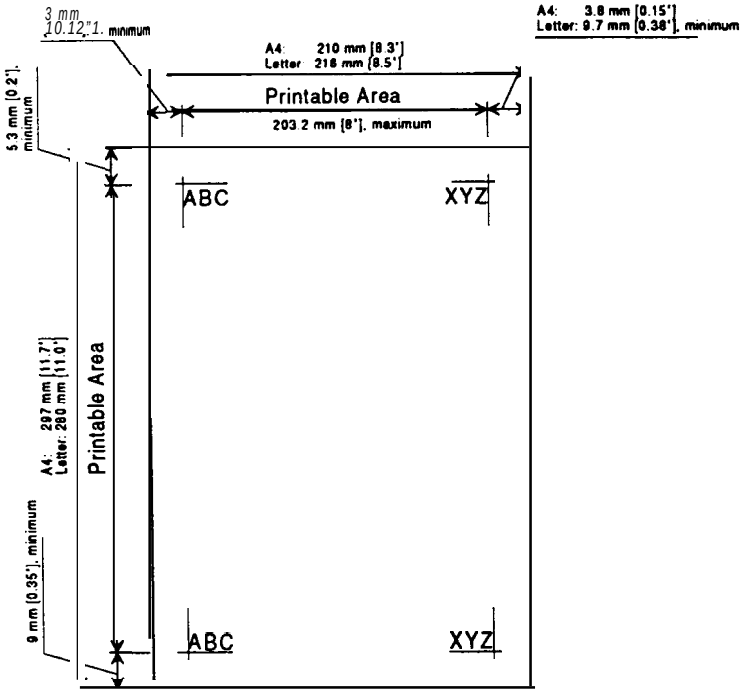
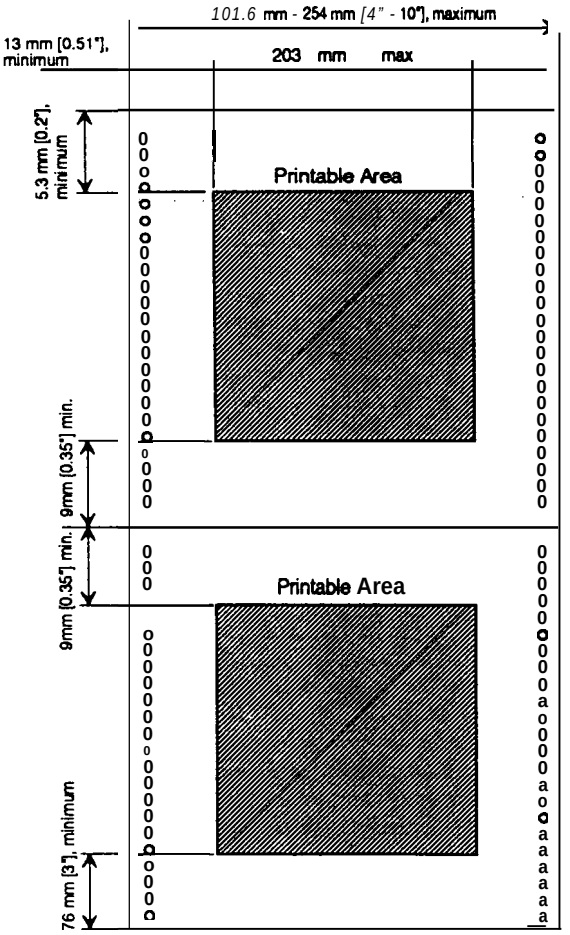


Figure 1-4. Printable Area for Cut Sheets Using the CSF

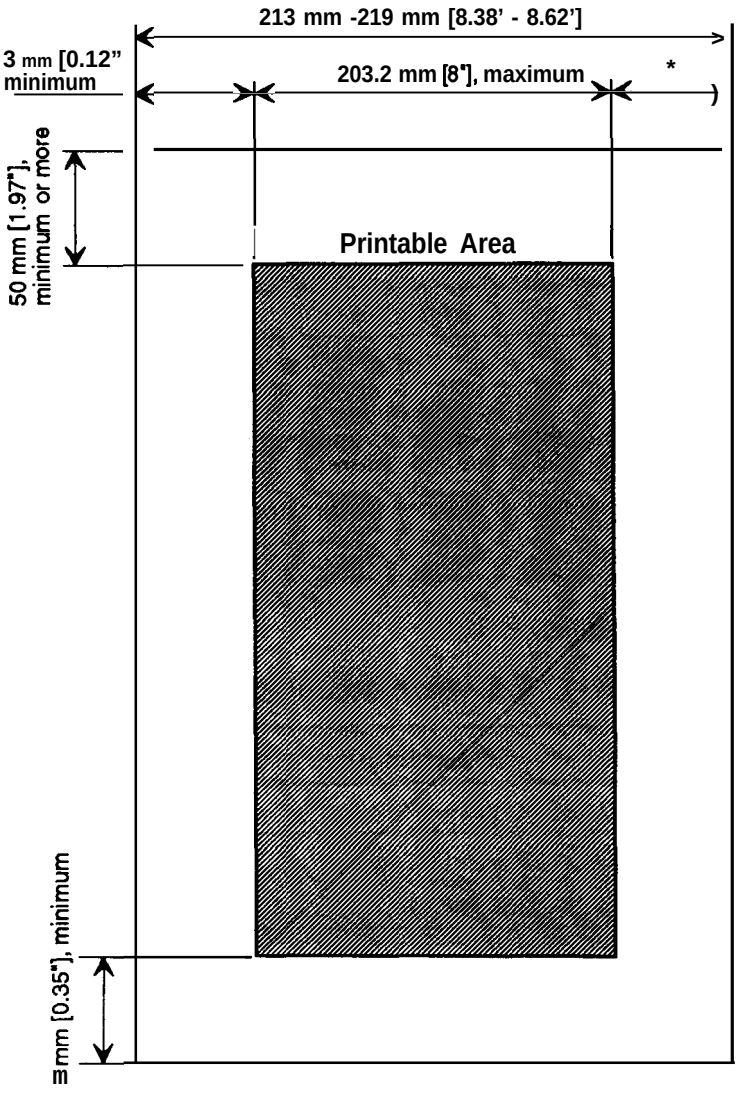
Continuous paper



" 13 mm (0.51") or more when paper width of 101.6 mm (4-) to 241.3 mm (9.5-) is used
30 mm (1. W) or more when paper width of 254 mm (10") is used.

Figure 1-5. Printable Area for Continuous Paper

Roll paper



' 9.8 mm (0.39") or more when a paper widthof216 ± 3 mm is used.

Figure 1-6. Printable Area for Roll Paper

1.2.1.4 Ribbon Specifications

Ribbon cartridge (mono):	*#8750* *#8758* (sub-cartridge)
Ribbon cartridge (color):	S015073
Ribbon color:	Black, magenta, cyan, yellow
Black ribbon life:	3 million characters (14 dots/character)
Color ribbon life	
Black:	1 million characters (14 dots/character)
Magenta:	0.7 million characters (14 dots/character)
Cyan:	0.7 million characters (14 dots/character)
Yellow:	0.5 million characters (14 dots/character)

1.2.1.5 Electrical Specifications

Table 1-10. Electrical Specifications

Description	120 V Version	220-240 V Version
Rated voltage	120 VAC	220-240 VAC
Input voltage range	103.5-132 VAC	198-264 VAC
Rated frequency range	50-60 Hz	
Input frequency range	49.5 -60.5 Hz	
Rated current	1.0 A	0.5 A
Power mnsumption	30 W (self-test in 10 cpi draft)	
Insulation resistance	10 MΩ, minimum (applying 500 VDC between AC line and chassis)	10 MΩ, minimum (applying 500 VDC between AC line and chassis)
Dielectric strength	1000 VAC ma for 1 minute or 1200 VAC rms for 1 second (between AC line and chassis)	1500 VAC rms for 1 minute (between AC line and chassis)

1.2.1.6 Environmental Conditions

Table 1-11. Environmental Conditions

Description	Operating	Storage
Temperature	5to 35° C (41 - 95° F) (*1)	–20to 55° c (-4 - 131° F) (*2)
Humidity	30 to 80% RH (*1,*3)	5 to 85% RH (*2,*3)
Resistance to vibration	0.25 G, 55 Hz (*1)	0.50 G, 55 Hz (*2)

*1= Operating conditions must be within this range.
*2= When the printer is in the shipping container.
*3 = Without condensation.

1.2.1.7 Reliability

MTBF: 4000 power on hours (POH)

Printhead life: 200 million strokes/wire (with monochrome ribbon)
100 million strokes/wire (with color ribbon)

1.2.1.8 Safety Approvals

Safety standards:	U.S. version:	UL1950 with D3, CSA22.2 #950 with D3
	European version:	EN 60950 (TÜV) IEC950 (SEMKO, DEMKO, NEMKO, SETI)
Radio frequency interference: (RFI)	U.S. version:	FCC part 15 subpart B class B
	European version:	Vfg.243 (VDE0878 part 3, part 30) EN55022 (CISPR PUB. 22) class B

1.2.1.9 Physical Specifications

Dimensions (W x D x H): 366 x 275 x 132 (mm) (14.4 x 10.8 x 5.20 (inches)
(without pull tractor)

Weight: 4 kg (8.8 lb.) without pull tractor

1.2.2 Firmware Specifications

Control codes: EsC/r

Input data buffer: 4KB

Character sets: 13 international character sets

Character tables: See the table below.

Table 1-12. Character Tables

Character Table	Standard Model	NLSP* Model
ITALIC	o	0
PC437 (US, Standard Europe)	o	0
PC850 (Multilingual)	o	0
PC860 (Portuguese)	o	x
PC861 (Icelandic)	o	x
PC863 (Canadian-French)	o	x
PC865 (Norwegian)	o	x
BRASCII	o	x
Abicomp	o	x
PC852 (East Europe)	x	o
PC853 (Turkish)	x	o
PC855 (Cyrillic)	x	o
PC857 (Turkish)	x	o
PC866 (Russian)	x	o
PC869 (Greek)	x	o
PC437 Greek	x	o
ISO Latin IT (Turkish)	x	o
ISO 8859-7 (Greek)	x	o
Code MJK (Czecho, Slovakia)	x	o
MAZOWIA (Polland)	x	o
Bulgaria (Bulgaria)	x	o

0 Supported x Not supported
** NSLP = National Language Support*

Bitmap fonts: EPSON NLQ Roman
EPSON NLQ Saris Serif
EPSON DRAFT

Character size: 10.5 points

Character matrix: Draft 10 cpi; 11 horizontal dots, 9 vertical dots
NLQ 10 cpi; 23 horizontal dots, 18 vertical dots

Print mode

Draft mode:	Double-width	Condensed	Emphasized
	Double-strike	Underlined	Italics
	Super/subscript		
NLQ mode:	Double-width	Emphasized	Underlined
	Italics	Super/subscript	

Printing speed: See Table 1-13.

Printable columns: See Table 1-13.

Table 1-13. Printing Speed

Printing Mode	Character Pitch	Printable Columns	Maximum Print Speed [cps]	
			Monochrome	Color
Draft	10 cpi	80	220 (165)	165 (1 65)
Draft	12 cpi	96	264 (198)	198 (198)
Draft condensed	17.1 cpi	137	188 (141)	
Draft condensed	20 cpi	160	220 (165)	
Draft emphasized	10 cpi	80	110 (83)	
Draft double width	5 cpi	40	110 (83)	
NLQ	10 cpi	80	44 (33)	
NLQ	12 cpi	96	53 (40)	
NLQ double width	5 cpi	40	22 (16)	

Notes: Data in parentheses indicates the speed on a line containing at least one of the following:

- A line containing a userdefined character.
- A line containing one of the 50 characters corresponding to hex codes BO to DF and F4 and F5.
- A line that is printing when printhead driving voltage drops from over-duty printing. (When voltage drops below the lower limit, the printer stops printing in the middle of the line, and then prints the rest of the line at a slower speed.)

Table 1-14. Resolution

Printing Mode	Horizontal Density	Vertical Density	Adjacent Dot Print
Draft	120 dpi	72 dpi	No
Draft condensed	240 dpi	72 dpi	No
Draft emphasized	120 dpi	72 dpi	Yes
NLQ	240 dpi	144 dpi	No
Bit image	60 dpi	72 dpi	Yes
	72 dpi	72 dpi	Yes
	80 dpi	72 dpi	Yes
	90 dpi	72 dpi	Yes
	120 dpi	72 dpi	Yes
	120 dpi	72 dpi	No
	240 dpi	72 dpi	No

1.3 INTERFACE SPECIFICATIONS

LX-300 has parallel interface and serial interface, one of which can be selected in default setting mode. Auto selection is also available.

1.3.1 Parallel Interface Specifications

The LX-300 is equipped with an 8-bit parallel interface, standard.

Data format:	8-bit parallel
Synchronization:	By $\overline{\text{STROBE}}$ pulse synchronization
Handshaking:	By BUSY and $\overline{\text{ACKNLG}}$ signals
Signal level:	TTL-compatible level
Adaptable connector:	%-pm 57-30360 (Amphenol) or equivalent
Data transmission timing:	See Figure 1-7.

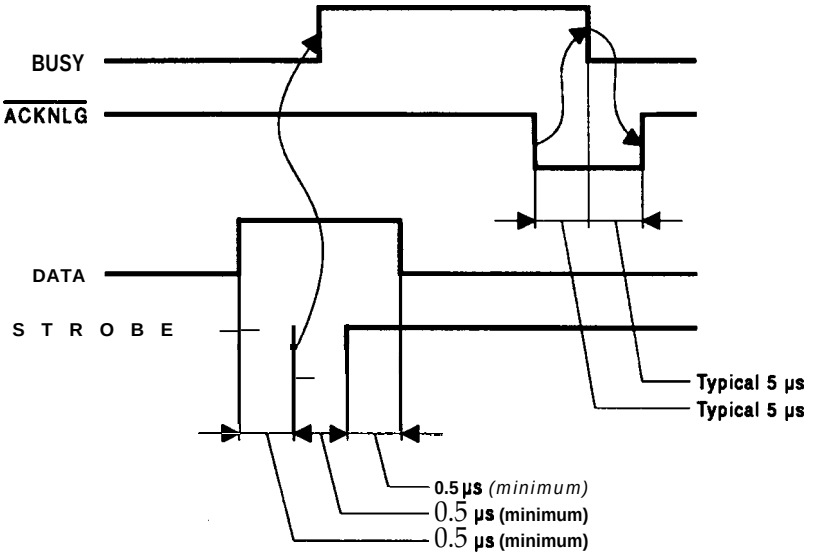


Figure 1-7. Data Transmission Timing

Note: Transition time (rise time and fall time) of every input signal must be less than 0.2 µs.

The Busy signal is active (HIGH) under the following conditions:

- During data reception (See Figure 1-7.)
- When the input buffer is full
- When the INIT input signal is active
- During initialization
- When the ERROR signal is active
- During the self-test mode
- During the default-setting mode

The $\overline{\text{ERROR}}$ signal is active (LOW) under the following conditions:

- When a paper-out error occurs
- When a release lever operation error occurs
- When a fatal error occurs

The PE signal is active (HIGH) under the following conditions:

- When a paper-out error occurs

1...

...s and signal functions for the 8-bit parallel interface.

Pin Assignments for Parallel Interface

Description
The $\overline{\text{STROBE}}$ pulse is used to read the input data. The pulse width must be more than 0.5 p.s. Input data is latched after the falling edge of this signal.
Parallel input data to the printer. A HIGH level means data 1. A LOW level means data O.
This pulse indicates data has been received and the printer is ready to accept more data. The pulse width is approximately 12 pa.
HIGH indicates the printer cannot accept more data.
HIGH indicates paper-out. This signal is effective only when the ERROR signal is LOW.
Always HIGH output. (Pulled up to +5V through 3.3 KΩ resistor.)
If the signal is LOW when the printer is initialized a line feed is automatically performed upon receipt of the CR code (auto LF).
Not used.
Signal ground.
Chassis ground. In the printer, chassis ground and signal ground are short-circuited.
A HIGH level means that printer power is on.
Signal ground.
Input for printer initialization. Pulse width 50 µs minimum, active LOW.
LOW indicates that some error has occurred in the printer.
Signal ground.
Pulled up to +5V through 1 KΩ resistor.
Ignored.

...the signal as viewed from the printer.

1.3.2 Serial Interface Specifications

The LX-300 is equipped with an 8-bit serial interface, standard.

Data format: EIA-232D serial

Synchronization: Asynchronous

Handshaking: By DTR signal and X-ON/X-OFF protocol

DTR and X-ON/X-OFF Protocol

State	Buffer Space	DTR	X-ON/X-OFF
Busy	Less than 256 bytes	off	X-OFF
Ready	More than 512 bytes	On	X-ON

ETX/ACK Protocol

State	Buffer Space	Response Code
Busy	Less than 256 bytes	NAK
Ready	256 bytes or more	ACK

Word length
- Start bits: 1 bit
- Data bits: 7 or 8 bit (selectable)
- Parity bit: O or 1 bit (selectable)
- Stop bits: 1 bit (transmitting)
  1 bit or more (receiving)

Bit rate: 300, 600, 1200,2400,4800,9600, 19200 bps (selectable)

Logic level
- MARK (logical 1): –3 V to –25 V
- SPACE (logical O): +3 v to +25 v

Parity check: Odd, even, or no parity bit (selectable)

Connector: EIA standard 25-pin D-SUB female comector

Table 1-16. Signal and Connector Pin Assignments for Serial Interface

Pin No.	Signal Name	110*	Description
1	FG	—	Chassis ground.
2	TXD/SD	out	Transmit serial data.
3	RXD/RD	In	Receive serial data.
4	RTS/RS	out	*This signal is* always at the positive EIA level.
5	CTS/CS	In	Ignored.
7	SG	—	Return path for data and control signals.
11,20	DTR/ER	out	This signal is at the positive EIA level when the printer is ready to accept data entry and at the negative EIA level when the printer is not ready to accept data entry.
6,8-10,12-19,21-25	NC	—	No connection (not used).

* *The I/O column indicates the direction of the signal as viewed from the printer.*

1.4 OPERATING INSTRUCTIONS

This section describes control panel operation functions, self-test, hexadecimal dump, demonstration functions, and printer initialization methods.

1.4.1 Control Panel Operation

The printer control panel contains three non-lock-type push buttons and three LED indicators for easy operation of the various printer functions.

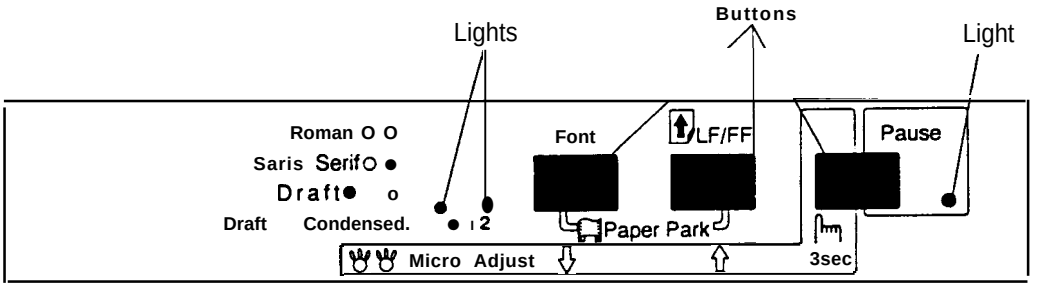


Figure 1-8. Panel Apperance

Paper Feeding	
Load:	Press the LF/FF button.
Load (manual insertion):	Press the LF/FF button or the printer waits 2 seconds after insertion of a cut sheet to load paper automatically.
Line feed:	Press the LF/FF button once.
Eject cut sheet:	Hold down the LF/FF button continuously.
Form feed (continuous):	Hold down the LF/FF button continuously.
Paper park (continuous):	Press the FONT and LF/FF buttons at the same time.
Tear-off (continuous):	Only uses auto tear-off function.
Character Selection	
Font selection:	Press the FONT button.
Pitch selection:	Selectable indefault-setting mode: 10 cpi. or 12 cpi.
Condensed selection:	Press the FONT button. Only draft condensed is selectable.
Enter Special Mode	
Self-test mode:	Hold down the LF/FF button and turn on the printer.
Default-setting mode:	Hold down the FONT button and turn on the printer.
Hex dump mode:	Hold down the LF/FF and FONT button and turn on the printer.
Demonstration mode:	Not available.

1.4.2 Self-test Function

This section explain how to run the self-test.

1. Hold down the LF/FF button and turn on the printer to start the self-test.
2. If paper is not loaded, the printer attempts to load it.
3. If the printer cannot load paper, it indicates this by turning on the PAUSE light. In this case, insert paper again and press the LF/FF button.
4. The printer prints alphanumeric characters continuously.
5. Quit self-test mode printing by pressing the PAUSE button and turning the printer off.

1.4.3 Hexadecimal Dump Function

The hexadecimal dump is a useful tool for troubleshooting data control problems. This section describes how to run a hex dump.

1. Turn on the printer while holding down the LF/FF and FONT buttons.
2. If paper is not loaded, the printer attempts it (either single sheet or continuous paper).
3. If the printer cannot load the paper, it indicates a paper-out error. In this case, insert paper again, and press the PAUSE button.
4. The printer waits for data after printing the message "Hex dump."
5. Received data is printed as both hexadecimal codes and ASCII characters. If a corresponding printable character does not exist, the printer outputs a period (.).
6. Quit hexadecimal dump printing by pressing the PAUSE button and tumingtheprinter off.

Note: *In* hex dump mode, the character table depends on the default setting, and 10 cpi draft is selected automatically.

1.4.4 Printer Status Indication

It describes how this printer indicates status and error conditions using LEDs and the beeper.

The symbols below describe the frequency of beeper sounds.

(●): The beeper sounds for 100 rns with an interval of 100 ms between beeps.
(—): The beeper sounds for 500 ms with an interval of 100 ms between beeps.

While initialize signal is active:	PAUSE light is on.
During initialization:	PAUSE light blinks and beeper sounds
Ready to print or printing:	PAUSE light is off
Paper-out error:	Beeper sounds (●●.) and PAUSE light blinks. (light on:off ratio= 6:1)
Tear-off:	PAUSE light blinks (light on:off ratio= 1:6)
Operating error, fatal error:	Beeper sounds (————) and PAUSE light is on.

1.4.5 Selected Font

The combination of two FONT LEDs (1 and 2) is used to indicate the selected font.

Table 1-17. Font Selection

Selected Font	FONT 1	FONT 2
Roman	ON	ON
Saris Serif	ON	OFF
Draft	OFF	ON
Draft condensed	OFF	OFF

1.4.6 Paper Position Adjustments

To enter adjustment mode, press the PAUSE button for three seconds, until the printer beeps once and the FONT lights blink to indicate that the adjustment operation is available. If the printer state is not one of the conditions shown below, this operation is ignored.

. TOF position adjustment:
The position can be adjusted just after the paper is loaded.
. Tear-off position adjustment:
The position can be adjusted when paper is actually located at the tear-off position.

In the adjustment mode, press the LF/FF button to feed paper forward and the FONT button to feed paper backward. You can cancel adjustment mode bypressingthe PAUSE button or inputting a print command. The adjusted position is stored in non-volatile memory.

1.4.7 Printer Initialization

There are two types of initialization: hardware initialization and software initialization.

1.4.7.1 Hardware Initialization

Hardware initialization is performed by:
. Turning on the printer.
. Sending the parallel interface the INIT signal.
(If the INIT signal is active when the printer is turned on, hardware initialization is started when the INIT signal becomes inactive.)

When hardware initialization is performed:
. The printer mechanism is initialized.
. Print data in the input buffer is cleared.
. Download character definitions are cleared.
. The printer's settings are returned to the defaults.
. The printer is set to the standby condition, if no fatal error occurs.
. Continuous paper home-seeking is performed.

In continuous paper home-seeking:
. The printer feeds continuous paper to the paper park position.
• The printer then loads the paper again.
• If ejection to the paper park position cannot be completed within 16 inches, paper is returned to its previous position.

1.4.7.2 Software Initialization

Software initialization is performed upon receipt of the control code ESC @. When software initialization is performed:

. Print characters in the buffer are not cleared.
. The printer setting is changed to the default, but the download character definition is not cleared.

1.4.8 Printer Settings

1.4.8.1 Selectable Printer Settings

The following printer settings can be changed by users in default-setting mode:

Character spacing:	10 cpi / 12cpi
Shape of zero:	Slashed / Not slashed
1 inch skip-over-perforation:	On / Off
Auto line feed:	On / Off
Character table (Standard):	Italic (USA/France/Germany/UK/Denmark 1/Sweden/Italy/ Spain 1)/PC437/850/860 /861/863 /865/BRASCII/Abicomp
Character table (NLSP):	Italic (USA/France/Germany/UK/Denmark 1/Sweden/Italy/ Spain 1)/PC437/850/852/853/855 /857/=/869/07 Greek/ISO Latin IT /1S0 8859-7/Code MJK/Mazowia/Bulgaria
Page length:	11/ 12/ 8.5 / 70/6 inches
Auto tear off:	On / Off
Tractor:	Single / Double
interface:	~/ Auto selection (30 sec wait) / Parallel / Serial
Bit rate (serial I/F):	300 / 600/ 12(MI / 2400 / 4800 / 9600 / 19200 bps
Parity bit (serial I/F):	None / Odd / Even
Data length (serial I/F):	7 bits / 8 bits
ETX/ACK (serial I/F):	Disabled / Enabled

Note: Underlines show factory setting.

1.4.8.2 Changing the Default Settings

You can change some parameters that the printer refers to at printer initialization.

1. To enter the default setting mode, turn on the printer while holding down the FONT button. The printer prints out the firmware version. If paper is not loaded, insert a sheet of paper.
2. The printer automatically loads the paper and prints a table of languages to choose *from:* English, French, German, Italian, and Spanish. The Footlights indicate the currently selected language, as shown in the table below.

Table 1-18. Font Lights and Language Selection

FONT Light 1	FONT Light 2	Language
OFF	ON	English
OFF	Blinks	French
ON	OFF	German
ON	ON	Italian
ON	Blinks	Spanish

3. Press the FONT button to change the language, and press the LF/FFbutton to select.
4. Press the FONT button again after selecting a language. The printer prints help text to guide you in setting defaults. The printed instructions include submenu tables listing all the settings you can change and showing you how the control panel lights appear for each selection.
5. To change the settings, press the FONT button to move down and press the LF/FF button to move up in the menu of options shown below. The printer beeps once each time you press the FONT button while you are in this menu.

Table 1-19. Default Options

FONT Light 1	FONT Light 2	PAUSE Light	Setting	Submenu
Blinks	OFF	OFF	Character spacing	Table 1-20
Blinks	ON	OFF	Shape of zero	Table 1-21
OFF	Blinks	OFF	Skip over perforation	Table 1-22
ON	Blinks	OFF	Character table	Table 1-23
Blinks	Blinks	OFF	Auto line feed	Table 1-24
Blinks	OFF	ON	Page length	Table 1-25
Blinks	ON	ON	Auto tear off	Table 1-26
OFF	Blinks	ON	Tractor	Table 1-27
ON	Blinks	ON	Interface	Table 1-28
Blinks	Blinks	ON	Bit rate	Table 1-29
OFF	OFF	Blinks	Parity	Table 1-30
Blinks	OFF	Blinks	Data length	Table 1-31
ON	OFF	Blinks	ETX/ACK	Table 1-32

6. When you reach the setting you want to change, press the PAUSE button once. The printer automatically enters the submenu for that setting.
7. Press the FONT button to move the through the settings in the submenu. The printer beeps twice each time you press the FONT button while in a submenu.
8. When the lights match your desired setting, press the PAUSE button to make your selection. The printer saves the new setting and returns to the menu shown above.
9. Repeat steps 5 through 8 for each additional setting you want to change, or skip to step 10 to exit the printer's default setting mode.
10. When you are finished, turn the printer off. Any settings you have made remain in effect until you change them again.

Table 1-20. Character Spacing

FONT Light 1	FONT Light 2	PAUSE Light	Character Spacing
OFF	OFF	OFF	10 cpi
ON	ON	ON	12 cpi

Table 1-21. Shape of Zero

FONT Light 1	FONT Light 2	PAUSE Light	Space of Zero
OFF	OFF	OFF	0
ON	ON	ON	0

Table 1-22. Skip Over Perforation

FONT Light 1	FONT Light 2	PAUSE Light	Skip-Over-Perforation
OFF	OFF	OFF	No skip
ON	ON	ON	skip

Table 1-23. Character Table

FONT Light 1	FONT Light 2	PAUSE Light	Standard Table	NLSP Table
OFF	OFF	OFF	Italic — US	Italic — US
ON	OFF	OFF	Italic — France	Italic — France
Blinks	OFF	OFF	Italic — Germany	Italic — Germany
OFF	ON	OFF	Italic — UK	Italic — UK
ON	ON	OFF	Italic — Denmark 1	Italic — Denmark 1
Blinks	ON	OFF	Italic — Sweden	Italic — Sweden
OFF	Blinks	OFF	Italic — Italy	Italic — Italy
Blinks	Blinks	OFF	Italic — Spain 1	Italic — Spain 1
OFF	OFF	ON	Pc 437	PC 437
ON	OFF	ON	PC 850	PC 850
Blinks	OFF	ON	PC 860	PC 852
OFF	ON	ON	Pc 861	PC 853
ON	ON	ON	PC 863	Pc 855
Blinks	ON	ON	PC 865	PC 857
OFF	Blinks	ON	BRASCII	PC 866
ON	Blinks	ON	Abicomp	PC 869
Blinks	Blinks	ON	—	PC 437 Greek
OFF	OFF	Blinks	—	ISO Latin IT
ON	OFF	Blinks	—	1s0 8859-7
Blinks	OFF	Blinks	—	Code MJK
OFF	ON	Blinks	—	Mazowia
ON	OFF	Blinks	—	Bulgaria

Table 1-24. Auto Line Feed

FONT Light 1	FONT Light 2	PAUSE Light	Auto Line Feed
OFF	OFF	OFF	off
ON	ON	ON	On

Table 1-25. Page Length

FONT Light 1	FONT Light 2	PAUSE Light	Page Length
ON	OFF	OFF	11 inches
OFF	ON	OFF	12 inches
ON	ON	OFF	8.5 inches
OFF	OFF	ON	70/6 inches

Table 1-26. Auto Tear Off

FONT Light 1	FONT Light 2	PAUSE Light	Auto Tear Off
OFF	OFF	OFF	off
ON	ON	ON	On

Table 1-27. Tractor

FONT Light 1	FONT Light 2	PAUSE Light	Tractor
OFF	OFF	OFF	Single
ON	ON	ON	Double

Table 1-28. Interface

FONT Light 1	FONT Light 2	PAUSE Light	Interface
ON	OFF	OFF	Auto selection (10 me wait)
OFF	ON	OFF	Auto selection (30 rns wait)
ON	ON	OFF	Parallel
OFF	OFF	ON	Serial

Table 1-29. Bit Rate

FONT Light 1	FONT Light 2	PAUSE Light	Bit Rate
ON	OFF	OFF	300 bps
ON	ON	OFF	600 bps
ON	ON	OFF	1200 bps
OFF	OFF	ON	2400 bps
ON	OFF	ON	4800 bps
OFF	ON	ON	9600 bps
ON	ON	ON	19200 bps

Table 1-30. Parity Bit

FONT Light 1	FONT Light 2	PAUSE Light	Parity Bit
ON	OFF	OFF	None
ON	ON	OFF	Odd
ON	ON	OFF	Even

Table 1-31. Data Length

FONT Light 1	FONT Light 2	PAUSE Light	Data Length
OFF	OFF	OFF	7 bits
ON	ON	ON	8 bits

Table 1-32. ETX/ACK

FONT Light 1	FONT Light 2	PAUSE Light	ETX/ACK
OFF	OFF	OFF	off
ON	ON	ON	On

1.5 MAIN COMPONENTS

The main components of the LX-300 is designed for easy removal and repair. The main components are;

- **C130** MAIN BOARD: Control board
- **C130 PSB/PSE (120V / 220-240V)** BOARD: Power supply board
- M-3G1O: Printer mechanism
- Housing

1.5.1 C130 MAIN Board

The **C130** MAINboard consists of an **E01A09** (CPU), a **Program/CG** ROM, a RAM, an EEPROM, etc.

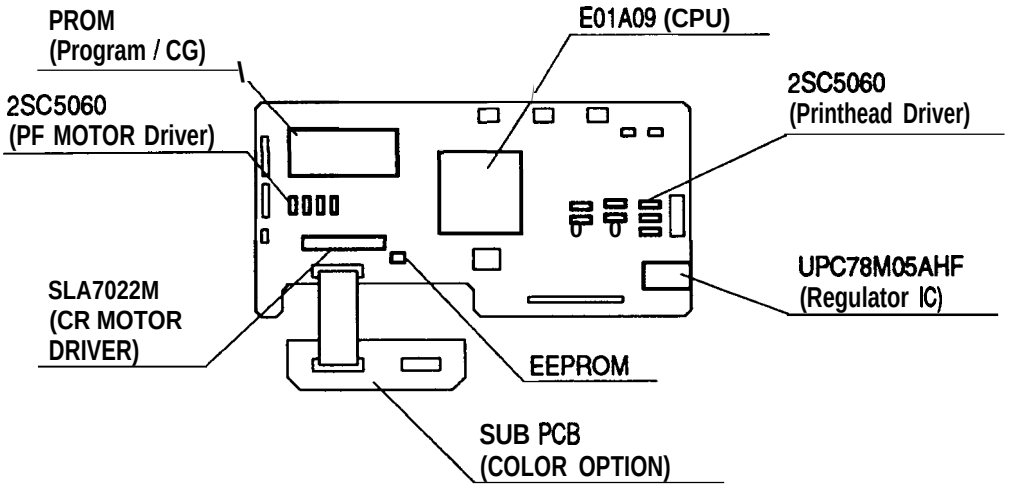


Figure 1-9. C130 MAIN Board Component Layout

1.5.2 C130 PSB/PSE Board

The **C130 PSB/PSE** power supply board consists of a transformer, switching **FETs,** regulate **IC,** diode bridge, etc. This board has two ratings for input AC voltages.

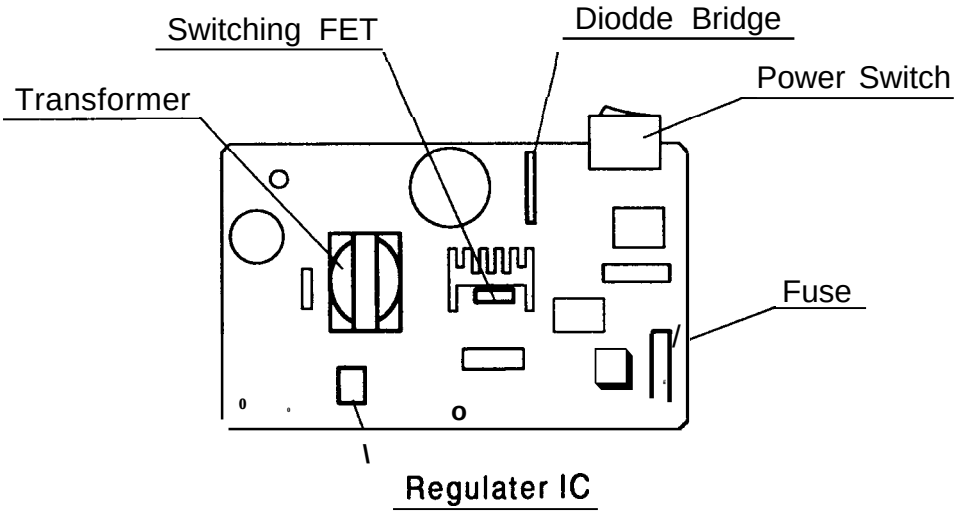


Figure 1-10. C130 PSB/PSE Board Component Layout

CHAPTER 2 Operating Principles

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