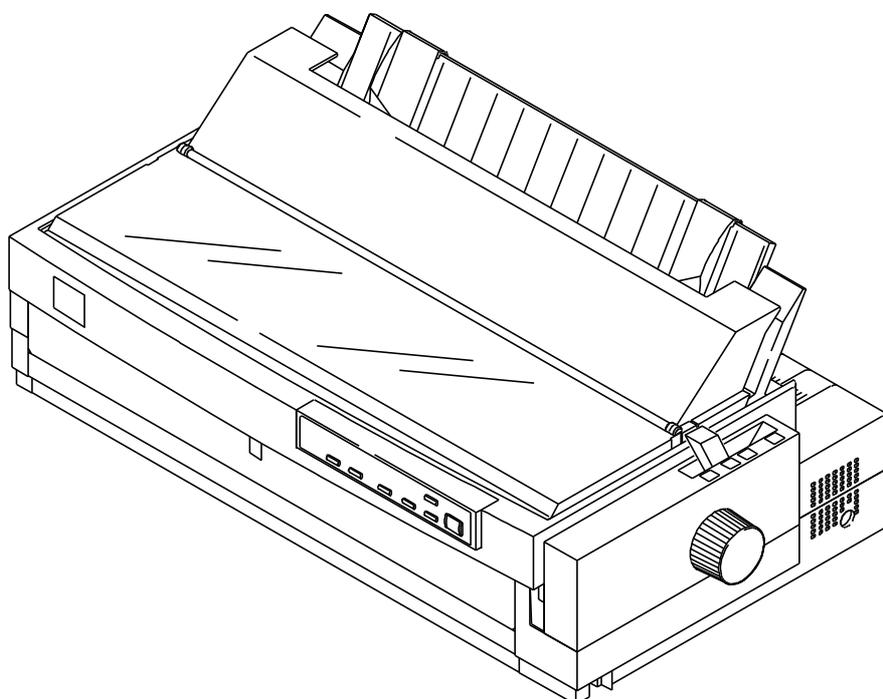


EPSON TERMINAL PRINTER

LQ-2170

SERVICE MANUAL



EPSON

4005735

Product: 1995 EPSON LQ-2170 Terminal Printer Service Repair Workshop Manual
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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 a DANGER heading.

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 DISCUSSED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNIT 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 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 IC 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 FX-2170. 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 - Includes a step-by-step guide for product disassembly and assembly.
- Chapter 4 - Includes a step-by step guide for addjustement.
- Chapter 5 - Provides Epson-approved techniques for troubleshooting.
- Chapter 6 - Describes prevetive maintenance techniques.

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

REVISION SHEET

Revision	Issued Date	Revision Page
Rev. A	December 5, 1995	1st issued

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CHAPTER 1 Product Description

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1.1 Specifications

These specifications provide statistical information for the the LQ-2170 serial impact dot matrix printer.

1.1.1. Features

The LQ-2170 is a 24pin serial impact dot-matrix printer suitable for the VAR (value added reseller) market. The major features of this printer are:

Print speed	High speed draft	440 characters per second (cps)
	Draft	330 cps
	LQ	110 cps at 10 characters per inch (cpi)
Feeding method	Friction feed	(front, rear)
	Push tractor feed	(front, rear)
	Push and pull tractor feed	(front, rear)
	Pull tractor feed	(front, rear, bottom)
Feeder	Front push tractor, rear push tractor, CSF bin 1 / bin 2 (optional)	
	Pull tractor (optional) , roll paper * holder (optional)	
Paper/media labels, roll paper	Single sheets, continuous paper, multipart paper, envelopes, card	stock
Fonts	9 LQ and 1 draft bitmap typefaces	
	8 barcode fonts	
Character tables	Standard version	11 tables
	NLSP version	20 tables
Input buffer	64KB	
Acoustic noise	53 dB (A), ISO 7779 pattern	
Reliability	Total print volume 7.5 million lines, except printhead	
	MTBF	6000 power on hours (POH)
	Printhead life	400 million strokes/wire
	Ribbon life	8 million characters
Interfaces	Bidirectional parallel interface (IEEE-P1284 nibble mode supported)	
	Type B I /F Level 2 (option)	
Control codes	ESC/P2 and IBM 2390/2391 plus emulation	
Copy capability	1 original + 4 copies	
Control panel functions	Font, Pitch, Pause, Tear off, Bin, LF/FF, Load/Eject, Micro Adjust, Default setting	

Refer to Figure 1-1 on the next page for an exterior view of the FX-2170.

* Roll paper is not available on all models, and not available in the U.S.

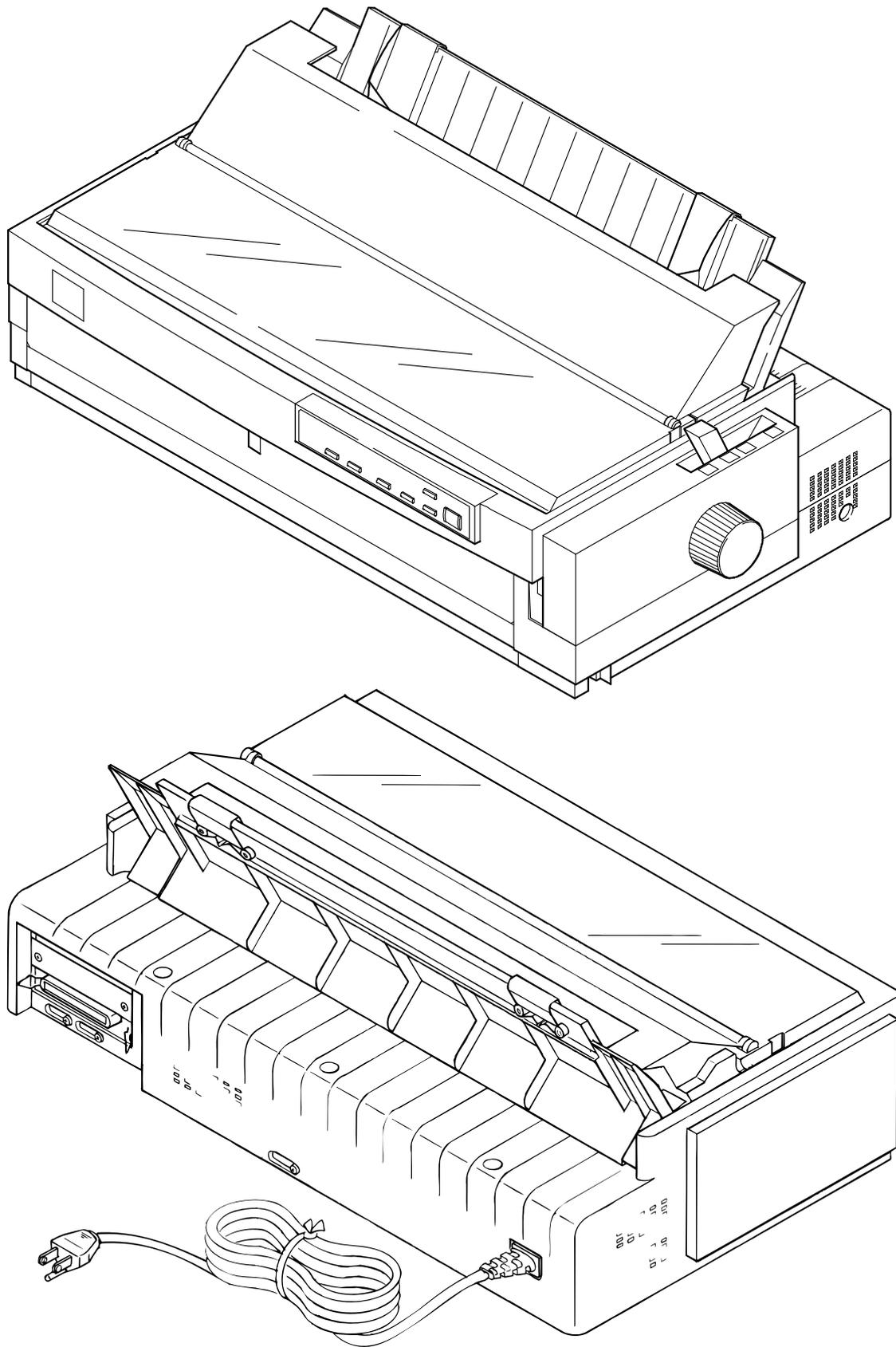


Figure 1-1 Exterior View of the LQ-2170

1.1.2. Accessories

- Items included in the printer carton

Table 1-1 Items Included with the Printer

Enclosed Items	Quantity
User's guide	1
Driver diskette	1
Ribbon cartridge	1
Power cord	1

- Consumables

Table 1-2 Consumables

Consumable Item	Part Number
Ribbon cartridge	S015083
Ribbon pack	S010031

- Options

Table 1-3 Optional Units

Unit	Description
High-capacity cut sheet feeder 1 (bin 1)	C80673*
Second bin cut sheet feeder 2 (bin 2)	C80674*
Pull tractor unit	C80032*
Roll paper holder	#8310
Serial I/F card	C82305* / C82306*
32KB intelligent serial I/F card	C82307* / C82308*
32KB intelligent parallel I/F card	C82310* / C82311*
Local Talk I/F card	C82312*
32KB IEEE-488 I/F card	C82313*
Coax I/F card	C82314*
Twinax I/F card	C82315*
Ethernet I/F card	C82331*

* The number represented by an asterisk varies, depending on the country.

1.2 Hardware Specifications

This section provides detailed hardware specifications for the LQ-2170.

1.2.1 Printing Method

Printing method	Impact dot matrix
Color	Black
Number of pins	24 pins
Pin arrangement	12 × 2 staggered
Pin diameter	0.21 mm (0.00083 inch)

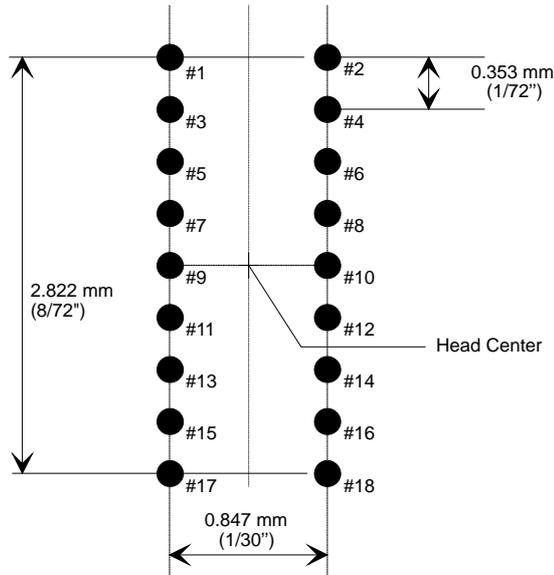


Figure 1-2. Pin Configuration

* The figure above shows the configuration of pins on the paper.

Print direction	Bidirectional, with logic seeking for text, and unidirectional for graphics. (Bidirectional printing of graphics can be selected with a printer setting or software command.)
------------------------	---

1.2.2 Printing Specifications

Copy capability

1 original + 4 copies

Print speed and printable columns

Table 1-4 Print Speed and Printable Columns

Print Mode	Character Pitch	Printable Columns	Print Speed (cps)	
			Normal	Multipart
High-speed draft	10 cpi	136	440	293
Draft	10 cpi	136	330	220
	12 cpi	163	396	264
	15 cpi	204	495	330
Draft condensed	17 cpi	233	283	189
	20 cpi	272	330	220
NLQ	10 cpi	136	110	73
	12 cpi	163	132	88
	15 cpi	204	165	110
LQ Condensed	17 cpi	233	189	126
	20 cpi	272	220	147

Resolution

Table 1-5 Print Resolution

Print Mode	Horizontal Density	Vertical Density	Adjacent Dot Printed?
High-speed draft	90 dpi	180 dpi	No
Draft	120 dpi	180 dpi	No
Draft condensed	240 dpi	180 dpi	No
NLQ	360 dpi	180 dpi	No
8 pin bit image	60, 80, 90, or 120 dpi	60 dpi	Yes
	120 or 240 dpi	60 dpi	No
24 pin bit image	60, 90, 120, or 180 dpi	180 dpi	Yes
	360 dpi	180 dpi	No
Raster graphics	180 or 360 dpi	180 or 360 dpi	Yes

Acoustic noise

53 dB (A), ISO 7779 pattern

1.2.3 Paper Handling Specifications

Feeding method	Friction feed	(front, rear)	
	Push tractor feed	(front, rear)	
	Push and pull feed	(front, rear, bottom)	
Feeder tractor (optional) and roll paper holder (optional)	Front push tractor, rear push tractor, CSF bin 1 /bin 2 (optional)		Pull
Paper path	Manual insertion	Front or rear in, top out	
	CSF	Rear in, top out	
	Tractor	Front, rear, or bottom in, top out	
Line spacing	1/6 inch or programmable in increments of 1/360 inch.		
Feed speed	1/6 inch feed	45 msec	
Continuous feed	0.127 m /sec (5.0 inches/sec)		
Release lever	Set the release lever, using the following table.		

Table 1-6 Paper Path and Paper Types

Lever Position	Paper Entrance	Paper Types				
		Single Sheet	Labels	Card Stock / Envelopes	Multipart	Roll Paper
Friction	Front insertion	OK	NO	OK *	OK	NO
	Rear insertion	OK	NO	OK	OK	NO
	CSF bin 1	OK	NO	OK	OK	NO
	CSF bin 2	OK	NO	NO	NO	NO
	Roll paper holder	NO	NO	NO	NO	OK
Front tractor	Push	OK	OK *	NO	OK	NO
	Push-pull	OK	OK *	NO	OK	NO
Rear tractor	Push	OK	OK *	NO	OK	NO
	Push-pull	OK	OK *	NO	OK	NO
Full release	Pull (front bottom)	OK	OK	NO	OK	NO
	Pull (rear)	OK	OK *	NO	OK	NO

* This symbol after "OK" means you need to check the paper type before using it with this paper path.

Paper thickness lever

Set the paper thickness lever to the appropriate position, as indicated in the following table.

Table 1-7 Paper Thickness Lever Positions

Lever Position	Paper Thickness (inches)		Paper Thickness (mm)	
	Minimum	Maximum	Minimum	Maximum
0	0.0024	0.0043	0.06	0.11
1	0.0047	0.0067	0.12	0.18
2	0.0075	0.0098	0.19	0.25
3	0.0102	0.0122	0.26	0.31
4	0.0126	0.0138	0.32	0.35
5	0.0142	0.0154	0.36	0.39
6	0.0157	0.0205	0.40	0.52

————— **Precautions for Handling Paper** —————

1. Friction feed

Set the release lever to the FRICTION position and install the paper eject assembly.
 Load paper from the front or top entrance.
 not use continuous paper.
 perform any reverse paper feeds within the top 8.5 mm (0.33 inch) and bottom 22 mm (0.87 inch) area.
 Do not perform reverse feeds greater than 1/6 inch after the paper end has been detected.
 Use the paper-tension unit.
 Insert the multipart cut sheet forms only from the front.

Do
Do not

2. Push tractor feed

Set the release lever to the REAR PUSH/FRONT PUSH position and install the paper eject assembly.
 Load paper from the rear or front entrance.
 Release the friction feed mechanism.
 Multipart paper must be carbonless.
 the paper-tension unit.
 perform reverse feeds greater than 1/6 inch.
 perform reverse feeds after the paper end has been detected, because accuracy of paper feeding cannot be assured.

Use
Do not
Do not

3. Pull tractor feed

Set the release lever to the PULL position.
 Load paper from the front, rear, or bottom entrance.
 front or bottom entrance is recommended for thick paper or labels.)
 Remove the paper eject assembly and attach the pull tractor unit.
 Insert paper from either from the front or bottom.
 Multipart paper must be carbonless.
 not perform reverse feeds.

(The
Do

4. Push-pull tractor feed

Set the release lever to the REAR PUSH/FRONT PUSH position.
 Load paper from the front or rear entrance.
 the paper eject assembly and attach the pull tractor unit.
 any slack in the paper between the platen and pull tractor.
 horizontal position of the pull tractor and push tractor.
 carbonless.
 greater than 1/6 inch.
 after the paper end has been detected.

Remove
 Remove
 Precisely adjust the
 Multipart paper must be
 Do not perform reverse feeds
 Do not perform reverse feeds

1.2.4 Paper Specifications

This section describes the printable area and types of paper that can be used in this printer.

Cut Sheets

Paper/ media specifications The following table shows specifications for cut sheets.

Table 1-8 Specifications for Cut Sheets (Single Sheet, Not Multipart)

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width	101 mm (4.0")	420 mm (16.5")	101 mm (4.0")	420 mm (16.5")
Length	147 mm (5.8")	420 mm (16.5")	101 mm (4.0")	420 mm (16.5")
Thickness	0.065 mm(0.0025")	0.14 mm (0.0055")	0.065 mm(0.0025")	0.14 mm (0.0055")
Weight	52.3 g/m ² (14 lb)	90 g/m ² (24 lb)	52.3 g/m ² (14 lb)	90 g/m ² (24 lb)
Quality	Plain paper, recycled paper. Not curled, folded, or crumpled.		Plain paper, recycled paper. Not curled, folded, or crumpled.	

Table 1-9 Specifications for Cut Sheets (Multipart)

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width	101 mm (4.0")	420 mm (16.5")	101 mm (4.0")	420 mm (16.5")
Length	147 mm (5.8")	420 mm (16.5")	101 mm(4.0")	420 mm (16.5")
Copies	1 original + 4 copies		1 original + 4 copies	
Total thickness	0.12 mm (0.0047")	0.39 mm (0.015")	0.12 mm (0.0047")	0.39 mm (0.015")
Weight *	40 g/m ² (12 lb)	58 g/m ² (15 lb)	40 g/m ² (12 lb)	58 g/m ² (15 lb)
Quality	Plain paper, recycled paper. Not curled, folded, or crumpled.		Plain paper, recycled paper. Not curled, folded, or crumpled.	
Binding	A line of glue at the top or one side of the form.		A line of glue at the top of the form.	

* This weight is for one sheet of the multipart form.

Printable area

Figure 1-3 shows the printable area for cut sheets. The table below defines the abbreviations used in the figure.

Table 1-10 Printable Area for Cut Sheets

Abbreviations	Single Sheet	Multipart
PW (width)	Refer to Table 1-8.	Refer to Table 1-9.
PL (length)	Refer to Table 1-8.	Refer to Table 1-9.
LM (left margin)	3 mm (0.12") or more (PW ≤ 364 mm (14.33")) 25 mm (0.98") or more (PW = 420 mm (16.5"))	3 mm (0.12") or more (PW ≤ 364 mm (14.33")) 25 mm (0.98") or more (PW = 420 mm (16.5"))
RM (right margin)	3 mm or more (PW ≤ 364 mm (14.33")) 25 mm (0.98") or more (PW = 420 mm (16.5"))	3 mm or more (PW ≤ 364 mm (14.33")) 25 mm (0.98") or more (PW = 420 mm (16.5"))
TM (top margin)	4.2 mm (0.17") or more	4.2 mm (0.17") or more
BM (bottom margin)	4.2 mm (0.17") or more	4.2 mm (0.17") or more

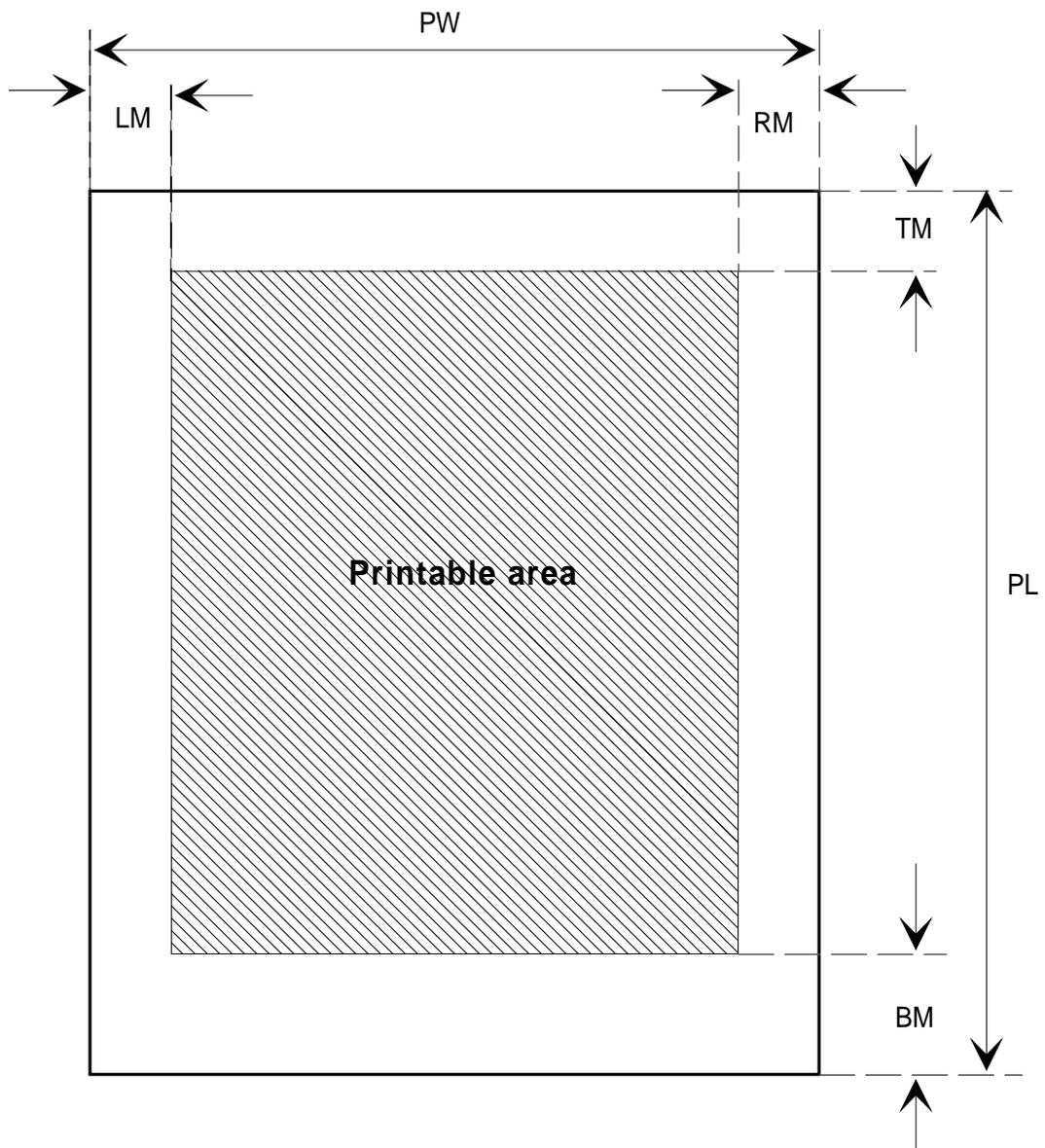


Figure 1-3 Printable Area for Cut Sheets

Envelopes and Card Stock

Paper/media specifications The following tables gives specifications for envelopes and card stock.

Table 1-11 Specifications for Envelopes

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
No. 6 envelopes	Width	---		166 mm (6.5")	
	Length	---		92 mm (3.6")	
No. 10 envelopes	Width	---		240 mm (9.5")	
	Length	---		104 mm (4.1")	
Total thickness		---	---	0.16 mm (0.0063")	0.52 mm (0.020")
		---		Differences in thickness in the printable area must be within 0.25 mm (0.0098").	
Weight		---	---	45 g/m ² (12 lb)	91 g/m ² (24 lb)
Quality		---		Bond paper, plain paper, or airmail. No glue at the flap. Not curled, folded, or crumpled.	

- * Printing on envelopes is available only at normal temperatures and humidity.
- * Insert envelopes from the rear entrance only.
- * Insert the longer side of the envelope horizontally.

Table 1-12 Specifications for Card Stock

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width	105 mm (4.13")	148 mm (5.83")	105 mm (4.13")	148 mm (5.83")
Length	148 mm (5.83")	148 mm (5.83")	105 mm (4.13")	148 mm (5.83")
Thickness	0.22 mm (0.0087")		0.22 mm (0.0087")	
Weight	192 g/m ² (51 lb)		192 g/m ² (51 lb)	
Quality	Plain paper, recycled paper. Not curled, folded, or crumpled.		Plain paper, recycled paper. Not curled, folded, or crumpled.	

- * Printing on card stock is available only at normal temperatures and humidity.
- * When the longer side of an A6 card is to be inserted horizontally, insert it from the rear entrance.

Printable area

The figure below shows the printable area for envelopes and card stock.
Each abbreviation is defined in the following table.

Table 1-13 Printable Area for Envelopes and Card Stock

Abbreviations	Envelopes	Card Stock
PW (width)	Refer to Table 1-11.	Refer to Table 1-12.
PL (length)	Refer to Table 1-11.	Refer to Table 1-12.
LM (left margin)	3 mm (0.12") or more	3 mm (0.12") or more
RM (right margin)	3 mm (0.12") or more	3 mm (0.12") or more
TM (top margin)	4.2 mm (0.17") or more	4.2 mm (0.17") or more
BM (bottom margin)	4.2 mm (0.17") or more	4.2 mm (0.17") or more

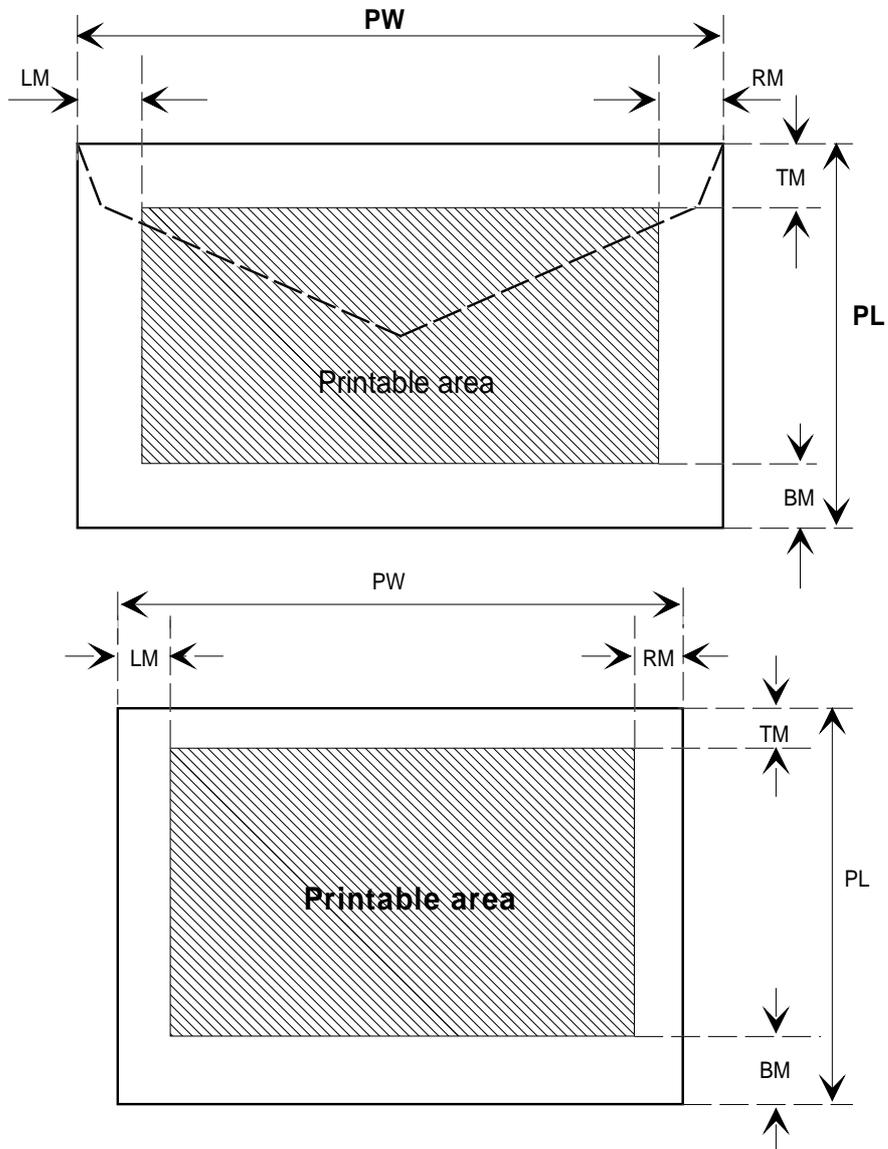


Figure 1-4 Printable Area for Envelopes and Card Stock

Continuous Paper

Paper/media specifications The following table gives specifications continuous paper.

Table 1-14 Specifications for Continuous Paper (Single Sheet and Multipart)

	Front Entry		Rear Entry		Bottom Entry	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Width	101 mm (4.0")	406 mm (16")	101 mm (4.0")	406 mm (16")	101 mm (4.0")	406 mm (16")
Length	101 mm (4.0")	559 mm (22")	101 mm (4.0")	559 mm (22")	101 mm (4.0")	559 mm (22")
Copies	1 original + 4 copies		1 original + 4 copies		1 original + 4 copies	
Total thickness	0.065 mm (0.0025")	0.39 mm (0.015")	0.065 mm (0.0025")	0.39 mm (0.015")	0.065 mm (0.0025")	0.39 mm (0.015")
Weight (not multipart)	52.3 g/m ² (14 lb)	82 g/m ² (22 lb)	52.3 g/m ² (14 lb)	82 g/m ² (22 lb)	52.3 g/m ² (14 lb)	82 g/m ² (22 lb)
Weight (one sheet of a multipart form)	40 g/m ² (12 lb)	58 g/m ² (15 lb)	40 g/m ² (12 lb)	58 g/m ² (15 lb)	40 g/m ² (12 lb)	58 g/m ² (15 lb)
Types of paper	Plain paper. Recycled paper. Carbonless multipart.		Plain paper. Recycled paper. Carbonless multipart.		Plain paper. Recycled paper. Carbonless multipart.	
Binding	Dots of glue or paper staples (both sides).		Dots of glue or paper staples (both sides).		Dots of glue or paper staples (both sides).	

Printable area

The figure below shows the printable area for continuous paper.
Each abbreviation is defined in the following table.

Table 1- 15 Printable Area for Continuous Paper

Abbreviations	Continuous Paper
PW (width)	Refer to Table 1-14.
PL (length)	Refer to Table 1-14.
LM (left margin)	13 mm (0.51") or more
RM (right margin)	13 mm (0.51") or more
TM (top margin)	4.2 mm (0.17") or more
BM (bottom margin)	4.2 mm (0.17") or more

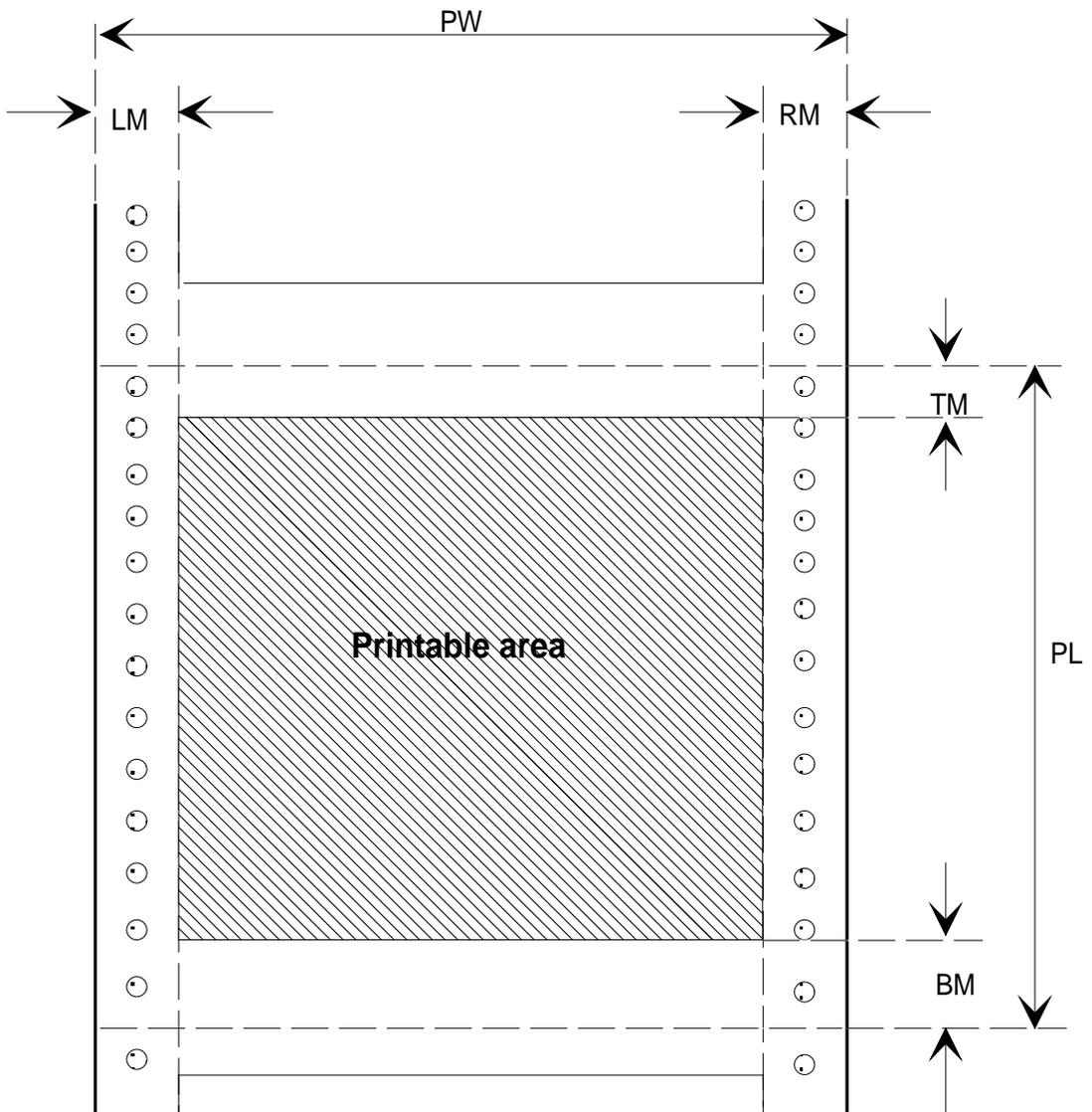


Figure 1-5 Printable Area for Continuous Paper

Continuous Paper with Labels

Paper/media specifications The following table gives the specifications for continuous paper with labels.

Table 1-16 Specifications for Continuous Paper with Labels

	Front Entry		Rear Entry		Bottom Entry	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Label size	See the figure below		---		See the figure below	
Base sheet width	101 mm (4.0")	406 mm (16")	---	---	101 mm (4.0")	406 mm (16")
Base sheet length (one page)	101 mm (4.0")	559 mm (22")	---	---	101 mm (4.0")	559 mm (22")
Base sheet thickness	0.07 mm (0.0028")	0.09 mm (0.00352)	---	---	0.16 mm (0.0063")	0.19 mm (0.0075")
Total thickness	0.16 mm (0.0063")	0.19 mm (0.0075")	---	---	0.16 mm (0.0063")	0.19 mm (0.0075")
Label weight	68 g/m ² (17 lb)		---		68 g/m ² (17 lb)	
Quality	Avery continuous form labels Avery mini-line or equivalent quality labels		---		Avery continuous form labels Avery mini-line or equivalent quality labels	

- * Printing on labels is available only at normal temperatures and humidity.
- * The base sheet for the labels must be continuous paper.
- * Continuous paper with labels should be inserted from the front or bottom entrance.



Figure 1-6 Label Size

Printable size and area

The figure above is the printable size for the labels.

The printable area for the base sheet containing the labels depends on conditions in Figure 1-5 and Table 1-15.

Roll Paper

Note: Roll paper is not available in all models, and not available in the U.S.

Paper/media specifications The following table shows specifications for roll paper.

Table 1-17 Specifications for Roll Paper

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width	—		216 mm (8.5")	
Length	—		—	
Thickness	—	—	0.07 mm (0.0028")	0.09 mm (0.0035")
Weight	—	—	52.3 g/m ² (14 lb)	82 g/m ² (22 lb)
Quality	—		Plain paper, recycled paper. Not curled, folded, or crumpled.	

Printable area

Figure 1-7 gives the printable area for roll paper.
Each abbreviation is defined in the following table.

Table 1-18 Printable Area for Roll Paper

Abbreviations	Roll Paper
PW (width)	See Table 1-17.
PL (length)	See Table 1-17.
LM	3 mm (0.12") or more
RM	3 mm (0.12") or more
TM	4.2 mm (0.17") or more
BM	4.2 mm (0.17") or more

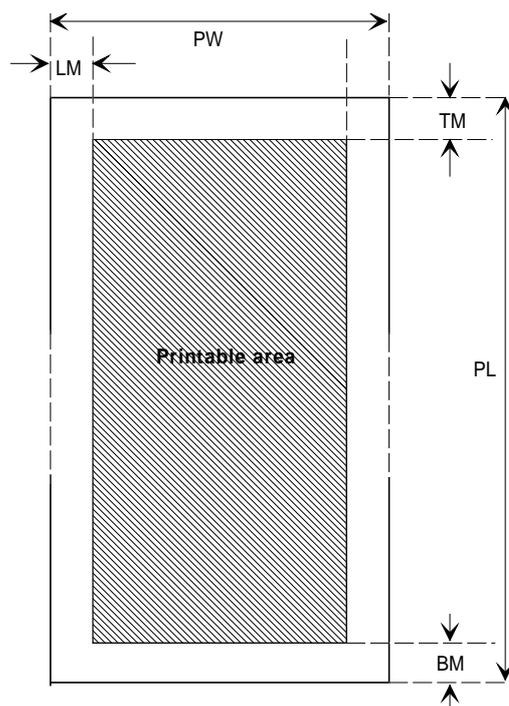


Figure 1-7 Printable Area for Roll Paper

1.2.5 Ribbon Specifications

Table 1-19 Statistics on the Ribbon

Item	Specification
Type	Fabric
Color	Black
Ribbon life	8 million characters (draft, 10 cpi, 48 dots/ character)
Dimension	506.0 mm (W) × 123.5 mm (D) × 23.0 mm (H) 19.92" (W) x 4.86" (D) x .91" (H)

1.2.6 Electrical Specifications

Tables 1-20 and 1-21 provide statistics on electrical ratings and consumption.

Table 1-20 Electrical Specifications for the 120 V Version

Item	Specifications
Rated voltage	120 VAC
Input voltage range	103.5 to 132 VAC
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	1.0 A (max. 2.6 A)
Power consumption	Approx. 62 W (self-test in draft mode at 10 cpi)
Insulation resistance	10 MΩ min. (between AC line and chassis, 500 VDC)
Dielectric strength	1000 VAC rms. 1 min. or 1200 VAC rms. 1 sec. (between AC line and chassis)

Table 1-21 Electrical Specifications for the 220/240 V Version

Item	Specifications
Rated voltage	220 to 240 VAC
Input voltage range	198 to 264 VAC
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.5 A (maximum 1.3 A)
Power consumption	Approx. 62 W (self-test in draft mode at 10 cpi)
Insulation resistance	10 MΩ min. (between AC line and chassis, 500 VDC)
Dielectric strength	1500 VAC rms. 1 min. (between AC line and chassis)

1.2.7 Environmental Conditions

Table 1-22 explains the conditions the printer requires during operation and when not operating.

Table 1-22 Environmental Requirements

Item	Specifications
Temperature	5 to 35° C/41 to 95° F (operating * 1) 15 to 25° C/59 to 77° F (operating * 1, * 2) -30 to 60° C/-22 to 140° F (non-operating)
Humidity	10 to 80 % RH (operating * 1) 30 to 60 % RH (operating * 1, * 2) 0 to 85 % RH (non-operating * 1)
Resistance to shock	1 G, within 1 ms (operating) 2 G, within 2 ms (non-operating * 3)
Resistance to vibration	0.25 G, 10 to 55 Hz (operating) 0.50 G, 10 to 55 Hz (non-operating * 3)

* 1: Without condensation.

* 2: During printing on multipart paper, envelopes, card stock, or labels.

* 3: In shipment container.

1.2.8 Reliability

Table 1-23 gives maximum life and usage specifications.

Table 1-23 Reliability Statistics

Item	Specification
Total print volume	7.5 million lines (except printhead)
MTBF	6000 power on hours (POH)
Printhead life	400 million strokes / wire
Ribbon life	8 million characters

1.2.9 Safety Approvals

Table 1-24 provides information about the safety approvals the printer has met.

Table 1-24 Safety Information for Printer Models

	120 V	230 V
Safety Standards	UL1950 with D3 CSA C22.2 No.950 with D3	EN60950 (TüV. SEMKO, DEMKO, NEMKO, FIMKO)
EMI	FCC part 15 subpart B class B CSA C108.8	EN55022 (CISPR pub.22) class B

1.2.10 CE Marking

The following table lists CE marking information.

Table 1-25 CE Marking

Low Voltage Directive 73/23 / EEC	EN60950
EMC Directive 89/336 / EEC	EN55022 class B EN50082-1 , IEC801-2 IEC801-3 , IEC801-4
Non-Automatic Weighing Instruments Directive 90/384/EEC	EN45501

1.2.11 Physical Specifications

Table 1-26 provides printer dimensions and weight.

Table 1-26 Physical Specifications

Dimensions	639 mm (W) × 410 mm (D) × 257 mm (H) 25.16" (W) x 16.14" (D) x 10.12" (H)
Weight	Approx. 13 kg (28.66 lb)

1.2.12 Cut Sheet Feeder Specifications

This printer has two CSF options: a high-capacity CSF and a 2nd bin CSF. The high-capacity CSF has special a paper-feed motor to load the paper quickly. The 2nd bin CSF can be connected to the high-capacity CSF to allow them to be used as a double bin CSF. The following table provides the specifications for these CSF options.

Hopper capacity

Table 1-27 Hopper Capacity

	CSF Bin 1	CSF Bin 2
Single sheets	150 sheets (※ 1) / 110 sheets (※ 2) 185 sheets (※ 3) / 135 sheets (※ 4)	50 sheets (※ 1) / 50 sheets (※ 2) 60 sheets (※ 3) / 60 sheets (※ 4)
Envelopes	25 sheets (※ 5) 30 sheets (※ 6)	---
Card stock	50 sheets (※ 7)	---
Multipart paper	40 sheets (※ 8)	---

※ 1 : Plain paper (weight: 82 g/m², 22 lb) or recycled paper, except for A3-size paper.

※ 2 : Plain paper (weight: 82 g/m², 22 lb) or recycled paper, A3 paper.

※ 3 : Plain paper (weight: 64 g/m², 17 lb) , except for A3 paper.

※ 4 : Plain paper (weight: 64 g/m², 17 lb), A3 paper.

※ 5 : Envelopes (weight: 91 g/m², 24 lb)

※ 6 : Envelopes (weight: 45 g/m², 12 lb)

※ 7 : Card stock (weight: 192 g/m², 51 lb; thickness: 0.22 mm, 0.0087")

※ 8 : 1 original + 5 copies (thickness: 0.36 mm, 0.0142")

Stacker capacity

Table 1-28 Capacity of the Stacker

	CSF Bin 1	CSF Bin 2
Single sheets	140 sheets (* 1) 100 sheets (* 2)	—
Envelopes	15 sheets (* 3) 28 sheets (* 4)	—
Card stock	30 sheets (* 5)	—
Multipart	36 sheets (* 6)	—

- * 1: Single sheets (weight: 82 g/m², 22 lb), except for A3 paper
- * 2: Single sheets (weight: 82 g/m², 22 lb), A3 paper
- * 3: Envelopes (weight: 91 g/m², 24 lb)
- * 4: Envelopes (weight: 45 g/m², 12 lb)
- * 5: Card stock (weight : 192 g/m², 51 lb; thickness: 0.22 mm, 0.0087")
- * 6: 1 original + 5 copies (thickness: 0.36 mm, 0.0142")

Reliability

MCBF: 2×10^5 cycles

Environmental conditions

Table 1-29 Environmental Conditions

	Operating	Non Operating
Temperature	5 to 35° C (41 to 95° F)	-30 to 60° C (-22 to 140° F)
Humidity	15 to 80% RH (* 1, * 3) 30 to 60% RH (* 2, * 4)	5 to 85% RH (* 3)

- * 1: Single sheets (plain, 64 g/m² < weight < 82 g/m²; 17 lb < weight < 22 lb)
- * 2: Single sheets (plain, weight < 64 g/m², 82 g/m² < weight/weight < 17 lb, 22 lb < weight)
Single sheets (recycled), multipart, envelopes, and card stock
- * 3: Without condensation

1.3 Firmware Specifications

This section provides detailed information about LQ-2170 firmware.

1.3.1 Control Codes and Fonts

Control codes ESC/P2 and IBM 2390/2391 plus emulations.

Typefaces

Bitmap fonts

EPSON Draft	10 cpi, 12 cpi, 15 cpi
EPSON Roman	10 cpi, 12 cpi, 15 cpi, proportional
EPSON Sans Serif	10 cpi, 12 cpi, 15 cpi, proportional
EPSON Courier	10 cpi, 12 cpi, 15 cpi,
EPSON Prestige	10 cpi, 12 cpi
EPSON Script	10 cpi
EPSON OCR-B	10 cpi
EPSON Orator	10 cpi
EPSON Orator-S	10 cpi
EPSON Script C	Proportional

Scalable font

EPSON Roman	10.5pt., 8pt.-32pt. (every 2 pt.)
EPSON Sans Serif	10.5pt., 8pt.-32pt. (every 2pt.)
EPSON Roman T	10.5pt., 8pt.-32pt. (every 2pt.)
EPSON Sans Serif H	10.5pt., 8pt.-32pt. (every 2pt.)

Bar code fonts

EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39
Code 128, POSTNET

International character sets 13 countries

U.S.A., France, Germany, U.K., Denmark 1, Sweden, Italy,
Spain 1, Japan, Norway, Denmark2, Spain2, Latin America

Character tables The standard version has 11 character tables and the NLSP version has 20
character tables, as shown in the following table.

Table 1-30 Character Tables

Version	Character Tables		
Standard Version	Italic	PC-437 (U.S., Standard Eur.)	PC-850 (Multilingual)
	PC-860 (Portuguese)	PC-861 (Icelandic)	PC- 863 (Canadian-French)
	PC-865 (Nordic)	Abicomp	BRASCI
	Roman 8	ISO Latin 1	
NLSP Version	Italic	PC- 437 (US, Standard Eur.)	PC-850 (Multilingual)
	PC-437 Greek	PC-852 (East Europe)	PC-853 (Turkish)
	PC-855 (Cyrillic)	PC-857 (Turkish)	PC-866 (Russian)
	PC-869 (Greek)	MAZOWAI (Poland)	Code MJK (CSFR)
	ISO 8859-7 (Latin/Greek)	ISO Latin 1T (Turkish)	Bulgaria (Bulgarian)
	Estonia (Estonia)	PC-744(LST 1283:1993)	ISO Latin 2
	PC-866 LAT (Latvia)	PC-864 (Arabic)	

1.3.2 Interface Specifications

This printer provides a bidirectional 8-bit parallel interface and a Type B optional interface slot, standard.

1.3.2.1 Parallel Interface (Forward Channel)

Transmission mode	8-bit parallel, IEEE-P1284, compatibility mode
Adaptable connector	57-30360 (Amphenol) or equivalent
Synchronization	<u>STROBE</u> pulse
Handshaking	BUSY and <u>ACKNLG</u> signals
Signal level	TTL compatible (IEEE-P1284 level 1 device)

Table 1-31 Pin Assignments for Forward Channel

Pin No.	Signal Name	Return GND pin	In /Out	Function Description
1	<u>STROBE</u>	19	In	Strobe pulse. Input data is latched at falling edge of the signal
2	DATA1	20	In	Parallel input data to the printer bit 0: LSB
3	DATA2	21	In	bit 1
4	DATA3	22	In	bit 2
5	DATA4	23	In	bit 3
6	DATA5	24	In	bit 4
7	DATA6	25	In	bit 5
8	DATA7	26	In	bit 6
9	DATA8	27	In	bit 7: MSB
10	<u>ACKNLG</u>	28	Out	This signal (negative pulse) indicates the printer has received data and is ready to accept more data.
11	BUSY	29	Out	This signal's HIGH level means the printer is not ready to accept data.
12	PE	28	Out	This signal's HIGH level means the printer has a paper-out error.
13	SLCT	28	Out	Always HIGH when the printer is powered on.
14	<u>AFXT</u>	30	In	Not used.
31	<u>INIT</u>	30	In	This signal's negative pulse initializes printer.
32	<u>ERROR</u>	29	Out	This signal's LOW level means the printer is in an error state.
36	<u>SLIN</u>	30	In	Not used.
18	Logic H	—	Out	This line is pulled up to + 5 V through 3.3KΩ resistor.
35	+5V	—	Out	This line is pulled up to +5 V through 3.3KΩ resistor.
17	Chassis	—	—	Chassis GND.
16, 33, 19-30	GND	—	—	Signal GND.
15, 34	NC	—	—	Not connected.

Sample of manual. Download All 175 pages at:

<https://www.aresairmanual.com/downloads/1995-epson-lq-2170-terminal-printer-service-repair-workshop-manual/>