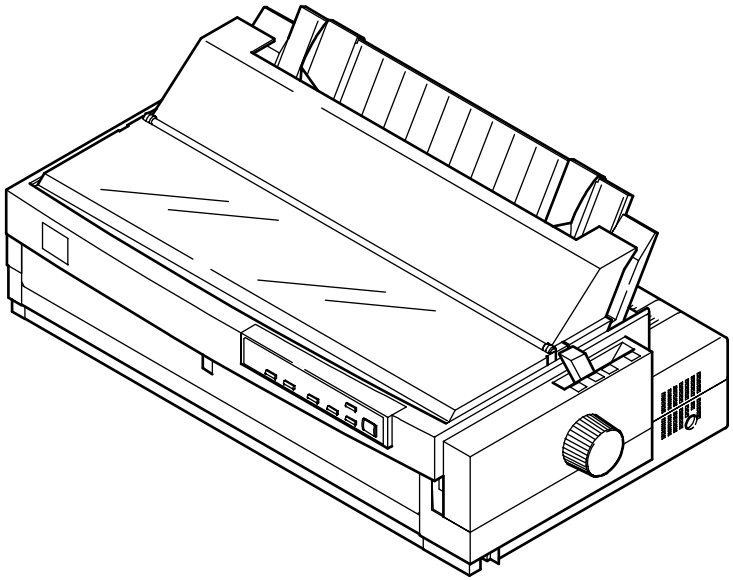
SERVICE MANUAL



Impact Serial Dot Matrix Printer

EPSON LQ-2180

COLOR IMAGING EPSON

EPSON®

SEDM98001

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

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NOWORK 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 VOLTAGES 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 basic functions, theory of electrical and mechanical operations, maintenance and repair instructions and procedures included herein are intended for the experienced repair technicians, and attention the preceding page. The chapters are organized as follows:

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the produ

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling th product.

CHAPTER 4. ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides the step-by-step procedures for troubleshooting.

CHAPTER 6. MAINTENANCE

Provides preventive maintenance procedures and the lists of Epson-appro lubricants and adhesives required for servicing the product.

APPENDIX

Provides the following additional information for reference:

- ***EEPROM Address Map***
- ***Connector Pin Assignments***
- ***C272 Main Board Component Layout***
- ***C272 Main Board Circuit Diagram***

Revision Status

Revision	Issued Date	Description
A	February 3, 1999	First Release

Contents

Product Description

Operating Principles

Disassembly and Assembly

Adjustment

Troubleshooting

Maintenance

Appendix

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Specifications

The LQ-2180 is a revised model of the already existing LQ-2170. Since the specifications for the both products are mostly common except for the LQ-2180's improved features such as printing speed and copy capability, the information included in this section is limited to the items that are specific to LQ-2180. For the rest of the information, refer to the LQ-2170 Service Manual.

1.1.1 Features

- Printing speed
  - High speed draft: 480 cps
  - Draft: 360 cps
  - LQ: 120 cps (at 10 cpi)
- Character tables
  - Standard version: 13 tables
  - NLSP version: 38 tables
- Reliability
  - Mean print volume between failure: 23 million lines (except printhead)
- Bi-directional Interface
  - Optional Type-B I/F Level 2 supported
- Copy capability
  - 1 original + 5 copies

1.1.2 Accessories

- Items included in the printer carton

Table 1-1. Items Included in the Printer

Items	Quantity
User's manual	1
Driver disk	1
Ribbon cartridge	1
Power supply cable (230 V version)	1

- Consumable items

Table 1-2. Items Included in the Printer

Items	Part Number
Ribbon cartridge	S015086
Ribbon pack	S010033

- Optional items: Additional items are shown in the table below:

Table 1-3. Items Included in the Printer

Items	Part Number
IEEE-1284 parallel I/F card	C82345*
Ethernet I/F card	C82357* / C82362* / C82363* / C82363* (See NOTE below.) / C82364*

NOTE: *When you use Ethernet interface card C82363*, you need to attach the optional interface adapter (C82525*) to the interface card.*

1.1.3 Printing Specifications

- Copy capability: 1 original + 5 copies
- Printing speed and printable column (See the table below.)

Table 1-4.
Print Speed and Corresponding Printable Columns

Printing mode	Character pitch	Printable columns	Printing speed (cps)	
			Normal	Copy
High speed draft	10 cpi	136	480	320
Draft	10 cpi	136	360	240
	12 cpi	163	431	286
	15 cpi	204	539	358
Draft condensed	17 cpi	233	308	205
	20 cpi	272	359	239
LQ	10 cpi	136	120	80
	12 cpi	163	143	96
	15 cpi	204	179	120
LQ condensed	17 cpi	233	204	137
	20 cpi	272	238	159

NOTE: *When the power supply voltage drops to the lower limit, the printer stops printing and then resumes printing remaining on that line more slowly than before.*

NOTE: *When the head temperature rises to the upper limit, the printer stops printing. When the head temperature falls to the normal level, the printer starts printing again more slowly than before.*

NOTE: *The maximum printable width is 13.6 inch (345.44 mm).*

1.1.4 Paper Handling

This section only describes the release lever setting, adjust lever setting, and some other specifications which are specific to LQ-2180. For the rest of the specifications, see the LQ-2170 Service Manual.

- Feeding method
  - Friction feed (front, rear)
  - Push tractor feed (front lever)
  - Push & Pull tractor feed (front, rear)
  - Pull tractor feed (front, rear, bottom)
- Feed speed
  - Normal mode: Same as for LQ-2180
  - Copy mode: 1/6 inch feed = 45 m sec
    Continuous feed =0.092 MPW (m/second)
    3.6 IPS (inches/second)

☐ Release lever: See the following table.

☐ Adjust lever: See the following table.

Table 1-5. Release Lever Settings

Lever Position	Paper path / Feeder	Paper / Media
Friction	Manual insertion (front)	Cut sheet (Single sheet & Multi part), Card
	Manual insertion (rear)	Cut sheet (Single sheet & Multi part), Card, Envelope
	CSF Bin 1	Cut sheet (Single sheet & Multi part), Card, Envelops
	CSF Bin 2	Cut sheet (Single sheet)
	Roll paper holder	Roll paper
Front tractor	Push tractor feed (front)	Continuous paper (Single sheet & Multi part), Continuous paper with labels
	Push & Pull tractor feed (front)	Continuous paper (Single sheet & Multi part), Continuous paper with labels
Rear tractor	Push tractor feed (rear)	Continuous paper (Single sheet & Multi part)
	Push & Pull tractor feed (rear)	Continuous paper (Single sheet & Multi part)
Full release	Pull tractor feed (front)	Continuous paper (Single sheet & Multi part), Continuous paper with labels
	Pull tractor feed (rear)	Continuous paper (Single sheet & Multi part)
	Pull tractor feed (bottom)	Continuous paper (Single sheet & Multi part), Continuous paper with labels

Table 1-6. Adjust Lever Setting Position

Setting Position	Paper Thickness (inch)		Paper Thickness (mm)
	Minimum	Maximum	
0	0.0024	0.0047	over 0.006 up to 0.12
1	0.0047	0.0074	over 0.12 up to 0.19
2	0.0074	0.0102	over 0.19 up to 0.26
3	0.0102	0.0126	over 0.26 up to 0.32
4	0.0126	0.0141	over 0.32 up to 0.36
5	0.0141	0.0157	over 0.36 up to 0.40
6	0.0157	0.0173	over 0.40 up to 0.44
7	0.0173	0.0181	over 0.44 up to 0.46

1.1.5 Paper Specifications

This section provides paper specifications for the LQ-2180.

Table 1-7. Cut Sheet

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
Width	(inch) (mm)	3.9 100	16.5 420	3.9 100	16.5 420
Length	(inch) (mm)	5.8 148	16.5 420	3.9 100	16.5 420
Thickness	(inch) (mm)	0.0025 0.065	0.0055 0.14	0.0025 0.065	0.0055 0.14
Weight	(g/m^2) (lb.)	52 14	90 24	52 14	90 24
Quality		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.	

NOTE: *Printing on recycled paper is available only under normal temperature and humidity conditions.*

Table 1-8. Cut Sheet (Multi Part)

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
Width	(inch) (mm)	3.9 100	16.5 420	3.9 100	16.5 420
Length	(inch) (mm)	5.8 148	16.5 420	3.9 100	16.5 420
Copies		1 original + 5 copies		1 original + 5 copies	
Total Thickness	(inch) (mm)	0.0047 0.12	0.018 0.46	0.0047 0.12	0.018 0.46
Weight (one sheet of multi part)	(g/m^2) (lb.)	40 12	58 15	40 12	58 15
Quality		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.			
Jointing		Line glue at the top or one side of form.		Line glue at the top of form.	

Table 1-9. Card

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
Width	(inch) (mm)	3.9 100	7.8 200	3.9 100	7.8 200
Length	(inch) (mm)	5.8 148	7.8 200	5.8 148	7.8 200
Thickness	(inch) (mm)	0.0087 0.22		0.0087 0.22	
Weight	(g/m^2) (lb.)	192 51		192 51	
Quality		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.	

NOTE: *Printing on recycled paper is available only under normal temperature and humidity conditions.*

NOTE: *When the longer side of A6 card is horizontally, it should be inserted from the rear entrance.*

Table 1-10. Envelope

			Front Entry		Rear Entry	
			Minimum	Maximum	Minimum	Maximum
Envelop (No. 6)	Width	(inch) (mm)	- - -		6.5 165	
	Length	(inch) (mm)	- - -		3.6 92	
Envelop (No. 10)	Width	(inch) (mm)	- - -		9.5 241	
	Length	(inch) (mm)	- - -		4.1 105	
Total Thickness		(inch) (mm)	- - -	- - -	0.0063 0.16	0.020 0.52
			- - -		The difference of thickness at the printable area is within 0.0098 inch (0.25mm).	
Weight		(g/m^2) (lb.)	- - -	- - -	45 12	90 24
Quality			- - -		BOND paper, plain paper or AIRMAIL No glue at a flap Not curled, not folded, not crumpled	

NOTE: *Printing on envelope is available only under normal temperature and humidity conditions.*

NOTE: *Envelopes should be inserted from rear entrance only.*

NOTE: *Set the longer side of envelope horizontally.*

Table 1-11. Continuous Paper (Single sheet and Multi Part)

		Front Entry		Rear Entry		Bottom Entry	
		Min.	Max.	Min.	Max.	Min.	Max.
Width	(inch) (mm)	4 101.6	16 406.4	4 101.6	16 406.4	4 101.6	16 406.4
Length (one page)	(inch) (mm)	4 101.6	22 558.8	4 101.6	22 558.8	4 101.6	22 558.8
Copies		1 original + 5 copies		1 original + 5 copies		1 original + 5 copies	
Total Thickness	(inch) (mm)	0.0025 0.065	0.018 0.46	0.0025 0.065	0.018 0.46	0.0025 0.065	0.018 0.46
Weight (not multi part)	(g/m^2) (lb.)	52 14	82 22	52 14	82 22	52 14	82 22
Weight (one sheet of multi part)	(g/m^2) (lb.)	40 12	58 15	40 12	58 15	40 12	58 15
Quality		Plain paper, Recycled paper, Carbonless multi part paper					
Jointing		Point glue or paper staple (both side)					

Table 1-12. Continuous Paper with Labels

		Front Entry		Bottom Entry		Rear Entry	
		Min.	Max.	Min.	Max.	Min.	Max.
Label size		See the figure below		See the figure below		- - -	
Base sheet width	(inch) (mm)	4 101.6	16 406.4	4 101.6	16 406.4	---	---
Base sheet length (one page)	(inch) (mm)	4 101.6	22 558.8	4 101.6	22 558.8	---	---
Base sheet thickness	(inch) (mm)	0.0028 0.07	0.0035 0.09	0.0028 0.07	0.0035 0.09	---	---
Total thickness	(inch) (mm)	0.0063 0.16	0.0075 0.19	0.0063 0.16	0.0075 0.19		
Label weight	(g/m^2) (lb.)	68 17		68 17		- - -	
Quality		AVERY CONTINUOUS FORM LABELS, AVERY MINI-LINE LABELS or the same quality labels					

NOTE: *Printing on labels si available only under normal temperature and humidity condition.*

NOTE: *The base sheet of labels must be continuous paper.*

NOTE: *Continuous paper with labels should be inserted from the front or bottom entrance.*

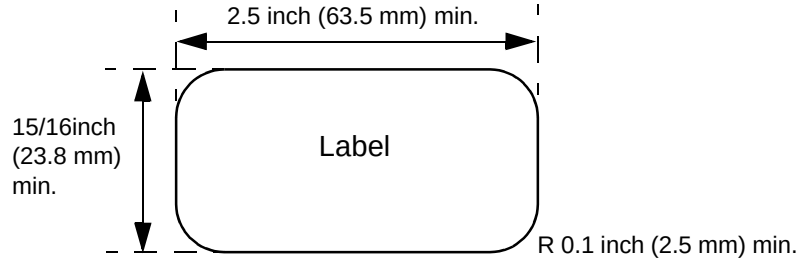


Figure 1-1. Printable Area - Label

Table 1-13. Roll Paper

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
Width	(inch) (mm)	- - -		8.5 216	
Length	(inch) (mm)	- - -		- - -	
Thickness	(inch) (mm)	- - -	- - -	0.0028 0.07	0.0035 0.09
Weight	(g/m^2) (lb.)	- - -	- - -	52.3 14	82 22
Quality		- - -		Plain paper, Recycled paper, Paper that is not curled, folded, or crumpled.	

1.1.6 Electrical Specifications

The electrical specifications for the LQ-2180 is the same as for the LQ-2170 except for the items below. For information on other items, see the LQ-2170 Service Manual.

- Input voltage range
  - 120 V version: AC 99 to 132 V
  - 230 V version: AC 198 to 264 V (same as for the LQ-2170
- Rated current
  - 120 V version: 1.0 A (maximum = 4.0 A)
  - 230 V version: 0.5 A (maximum = 2.0 A)
- Power consumption (for 120 V and 230 V versions)
  - Approximately 52 W (ISO/IEC10561 Letter pattern) (Energy Star compliant)

1.1.7 Reliability

- MVBF *1: 24 million lines (except print data)
- MTBF: 10000 POH
- Printhead life: 400 million strokes/wire

**1: Mean print volume between failure*

1.1.8 Safety Approvals

- 120 V version
  - Safety standards: UL1950, CSA C22.2 No. 950
  - EMI: FCC part15 subpart B class B
CSA C108.8 class B
- 230 V version
  - Safety standards: EN60950 (TUV)
  - EMI: EN55022 (CISPR pub.22) class B
AS/NZS 3548 class B

1.1.9 CE Marking

- 230 V version
  - Low voltage directive 73/23/EEC: EN60950
  - EMD Directive 89/336/EEC: EN55022 class B
EN61000-3-2
EN61000-3-3
EN50082-1
IEC801-2
IEC801-3
IEC801-4
- Acoustic noise: Approximately 54 db(A) (ISO 7779 pattern)

1.2 Firmware Specifications

This section describes the firmware specifications for the LQ-2180.

1.2.1 Control Codes and Fonts

- ☐ Control codes: ESC/P2 and IBM 2391 Plus Emulation
- ☐ Character tables:

Standard version (13 character tables)

Italic table	PC 860 (Portuguese)
PC 850 (Multilingual)	PC 437 (US, Standard Europe)
PC 861 (Icelandic)	PC 863 (Canadian-French)
PC 865 (Nordic)	Abicomp
BRASCII	Roman 8
ISO Latin 1	PC 858
ISO 8859-15	

NLSP version (38 character tables)

Italic table	PC437 (US, Standard Europe)	
PC437 Greek	PC850 (Multilingual)	
PC852 (East Europe)	PC853 (Turkish)	PC855 (Cyrillic)
PC857 (Turkish)	PC864 (Arabic)	PC866 (Russian)
PC869(Greek)	MAZOWIA (Poland)	Code MJK (CSFR)
ISO 8859-7 (Latin/Greek)	lSO Latin 1T (Turkish)	
Bulgaria (Bulgarian)	PC774 (LST 1283:1993)	
Estonia (Estonia)	ISO 8859-2	PC866 LAT. (Latvian)
PC866 UKR (Ukraina)	PC860 (Portuguese)	
PC861 (Icelandic)	PC865 (Nordic)	PC APTEC(Arabic)
PC708 (Arabic)	PC720 (Arabic)	PCAR864 (Arabic)
PC863 (Canadian-French)		Abicomp
BRASCII	Roman 8	ISO Latin 1
Hebrew7*	Hebrew8*	PC862 (Hebrew)*
PC 858	lSO 8859-15	

** Not displayed in the Default setting mode.*

International character set (14 countries and legal)

U.S.A.	France	Germany
U.K.	Denmark 1	Sweden
Italy	Spain 1	Japan
Norway	Denmark 2	Spain 2
Latin America	Korea	Legal

* The international and legal characters are these 12 codes:
23H, 24H, 40H, 5BH, 5CH, 5DH,
5EH, 60H, 7BH, 7CH, 7DH, 7EH

- ☐ Typeface

Bit map fonts

EPSON Draft	10 CPI, 12 CPI, 15CPI
EPSON Roman	10 CPI, 12 CPI, 15CPI, Proportional
EPSON Sans Serif	10 CPI, 12 CPI, 15CPI, Proportional
EPSON Courier	10 CPI, 12 CPI, 15CPI
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 fonts

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

Bar codes

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

Table 1-14. Character Tables and Available Typefaces

Character Tables			Bit map font	Scaleable font
Standard version	Italic table*1 PC 850 (Multilingual)*1 PC 861 (Icelandic)*1 PC 863(Canadian-French)*1 Abicomp*1 Roman 8 PC 858	PC 437 (US, Standard Europe)*1 PC 860 (Portuguese)*1 PC 865 (Nordic)*1 BRASCII*1 ISO Latin 1 ISO 8859-15	EPSON Draft EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script EPSON OCR-B EPSON Orator EPSON Orator-S EPSON Script C	EPSON Roman EPSON Sans Serif EPSON Roman T EPSON Sans Serif H
NLSP version	Italic table*1 PC 850 (Multilingual)*1 PC 861 (Icelandic)*1 PC 865(Nordic)*1 Abicomp*1 lSOLatin1 ISO 8859-15	PC 437(US, Standard Europe)*1 PC 860(Portuguese)*1 PC863 (Canadian-French)*1 BRASCII*1 Roman8 PC 858		
	PC 864 (Arabic)		EPSON Draft EPSON Roman	(Not supported)
	PC437Greek PC 853 (Turkish) PC 857 (Turkish) PC 869 (Greek) Code MJK (CSFR) lSO Latin 1T (Turkish) PC774 (LST 1283: 1993) 1SO 8859-2 PC 866 UKR (Ukraina)	PC 852 (East Europe) PC 855 (Cyrillic) PC 866 (Russian) MAZOWIA (Poland) lSO 8859-7 (Latin/Greek) Bulgaria (Bulgarian) Estonia (Estonia) PC 866 LAT. (Latvian)	EPSON Draft EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	(Not supported)
	PC APTEC (Arabic) PC 720 (Arabic)	PC 708 (Arabic) PCAR864 (Arabic)	EPSON Draft (Arabic) EPSON Roman EPSON Sans Serif	(Not supported)
	Hebrew7*2 Hebrew 8*2 PC862 (Hebrew)*2		EPSON Draft (Hebrew) EPSON Roman EPSON Courier	(Not supported)

**1: ESC R command is effective on these character tables.*
**2 Not displayed in the default setting mode.*

1.2.2 Interface Specifications

This section only provides information which is specific to the LQ-2180. For other information, refer to the LQ-2170 Service Manual.

1.2.2.1 Parallel Interface (Forward Channel)

- ☐ Transmission mode: IEEE-1284 compatibility mode
- ☐ Signal level: TTL compatible (IEEE-1284 level 1 device)
- ☐ Pin assignment: The pin assignment (forward channel) is the same as for the LQ-2170 except for the functions of the pins below:

Pin No.	Function
18	This line is pulled up to +5 V through 3.9 k Ω resistor.
35	This line is pulled up to +5 V through 1.0 k Ω resistor.

1.2.2.2 Parallel Interface (Reverse Channel)

- ☐ Transmission mode: IEEE-1284 nibble mode
- ☐ Synchronization: Refer to the IEEE-1284 specification
- ☐ Handshaking: Refer to the IEEE-1284 specification
- ☐ Signal level: IEEE-1284 level 1 device
- ☐ Data transmission timing: Refer to the IEEE-1284 specification
- ☐ Device ID:

```
[00H][4DH]
MFG: EPSON;
CMD: ESCPL2,PRPXL24,BDC;
MDL: LQ-2180;
CLS: PRINTER;
DES: EPSON[SP]LQ-2180;
```

- ☐ Pin assignment: The pin assignment (reverse channel) is the same as for the LQ-2170 except for the functions of the pins below:

Pin No.	Function
18	This line is pulled up to +5 V through 3.9 k Ω resistor.
35	This line is pulled up to +5 V through 1.0 k Ω resistor.

1.3 Operation Instruction

This section provides information on the LQ-2180 control panel buttons, LED, and operations. Since the layout and functions of the control panel are mostly common to those of LQ-2170, this section only shows the information that is specific to LQ-2180. For other information, see LQ-2170 Service Manual.

1.3.1 Control Panel

The control panel of this printer consists of the power switch, 6 non-lock type buttons, and 10 LEDs. The appearance of the control panel is shown in the figure below.

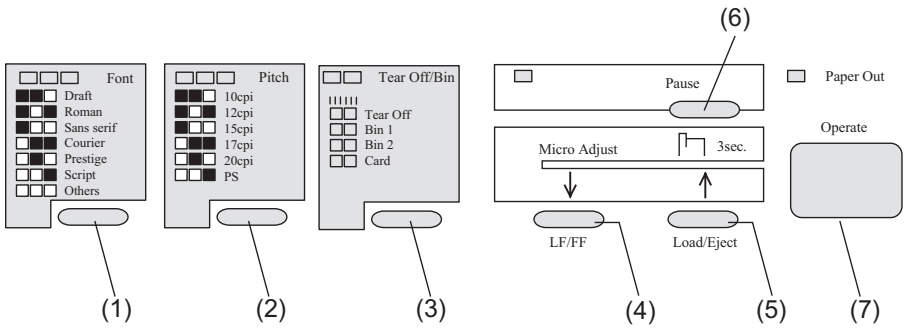


Figure 1-2. Control Panel

☐ Operation at power on

Turning on the printer while pressing panel buttons executes the functions below:

Table 1-15. Operations at Power On

No.	Buttons	Function
1	(5)	LQ self test
2	(4)	Draft self test
3	(2)	Default setting
4	(4) + (5)	Data dump
5	(1) + (3)	EEPROM clear
6	(3) + (5)	Clear EEPROM for Driving Line count for ribbon change timing
7	(6)	Bi-d adjustment

NOTE: *The area reset by the EEPROM clear is as shown in the next section. This operation, however, does not affect such adjustment values as Bi-d adjustment and TOP PE sensor adjustment.*

1.3.2 Bi-directional Adjustment Function

In this mode, you can adjust the bidirectional alignment for the following three modes:

1. Bi-directional adjustment for draft mode
2. Bi-directional adjustment for draft copy mode
3. Bi-directional adjustment for LQ mode

1.3.3 EEPROM Initialization

Areas reset by EEPROM clear operation (described in Section 1.3.1) are as shown in the following tables:

Table 1-16. Initialization Area for EEPROM (1/2)

No.	Item	Factory setting
1	Character table selection	PC437
2	Page length (rear tractor)	11 inch
3	Page length (front tractor)	11 inch
4	Page length (CSF Bin 1)	22 inch
5	Page length (CSF Bin 2)	22 inch
6	TOF adjustment value (rear tractor)	8.5 mm
7	TOF adjustment value (front tractor)	8.5 mm
8	TOF adjustment value (CSF Bin 1)	8.5 mm
9	TOF adjustment value (CSF Bin 2)	8.5 mm
10	TOF adjustment value (rear manual insertion)	8.5 mm
11	TOF adjustment value (front manual insertion)	8.5 mm
12	Bottom margin (rear tractor)	11 inch
13	Bottom margin (front tractor)	11 inch
14	Font selection	Roman
15	Pitch selection	10 cpi
16	Print direction setting	Bi-D
17	I/F mode selection	Auto
18	Auto I/F wait time setting	10 sec
19	Auto line feed	Off
20	Auto tear off	Off

Table 1-17. Initialization Area for EERPOM (2/2)

No.	Item	Factory setting
21	Skip over perforation	Off
22	High speed draft	On
23	Input buffer	On
24	Software	ESC/P2
25	0 slash	Off
26	Buzzer	On
27	Roll paper	Off
28	Auto CR (IBM)	Off
29	A. G. M. (IBM)	Off
30	Tear-off adjustment value	0 clear
31	Other font selection	Roman T
32	Bin select	Friction Bin 1 or Tractor not Tear off
33	Manual insertion wait time	2 or 3 sec.
34	Tear-off wait time	3 sec.
35	Copy mode	Off
36	Black paper mode	Off
37	Paper width measure	On
38	TOF minimum value	4.2 mm
39	I/F timing data	BUSY
40	Paper edge length	0 clear
41	Page length (rear manual insertion)	22 inch
42	Page length (front manual insertion)	22 inch

1.4 Main Components

The main components for the LQ-2180 are as follows. They are designed for easy disassembly and repair work.

- ☐ C272MAIN Board
- ☐ C165 PSB/PSE Board
- ☐ C165 PNL Board
- ☐ Printer Mechanism
- ☐ Housing (upper and lower cases)

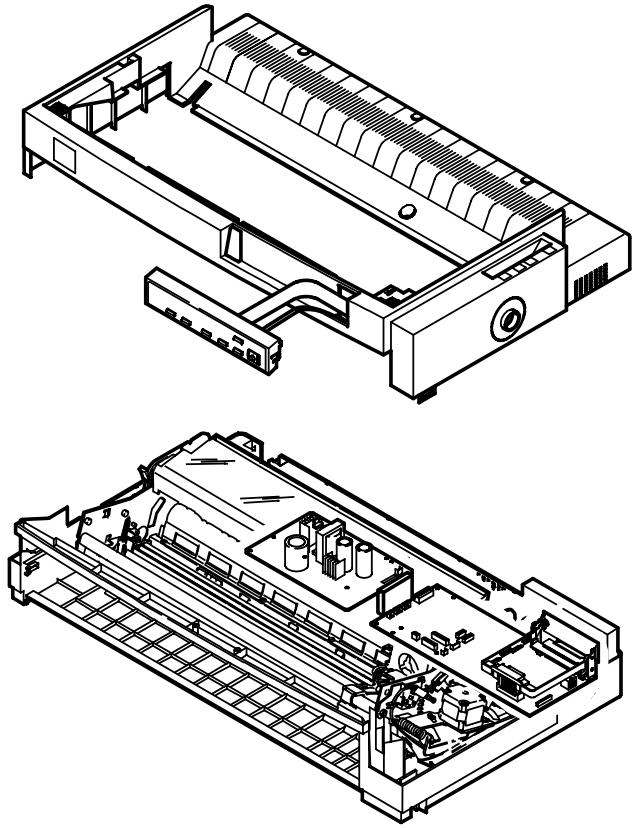


Figure 1-3. Main Components for LQ-2180

1.4.1 C272MAIN Board

The C272MAIN Board is composed of the CPU (TMP96C141), gate array (E05B42), program ROM that integrates the CG, EEPROM, and 24 transistors used to drive the printhead.

Note the C272MAIN Board has the following 4 versions; 1) Standard version, 2) NLSP version, 3) Korean version, and 4) Thai version. However, ICs are attached in two different ways, which varies depending on the version, as shown in the red boxes in the figure below.

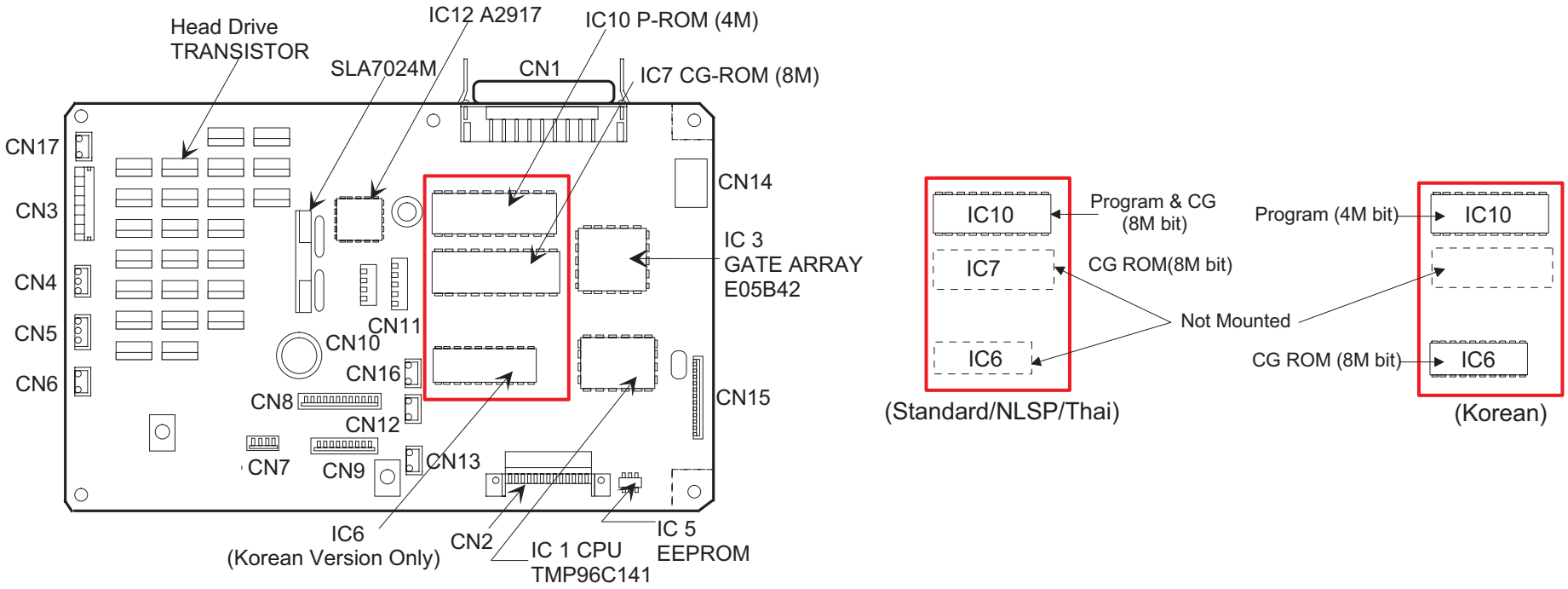


Figure 1-4. C272MAIN Board

1.4.2 Printer Mechanism

Appearance of the printer mechanism for the LQ-2180 is the same as for the LQ-2170. However, please be aware of the printhead's incompatibility with the LQ-2180.

CHAPTER

2

OPERATING PRINCIPLES

2.1 Control Circuit

The control circuit of the LQ-2180 is composed of the C272MAIN board and the C165PNL board. This section describes the operations of the major components in the circuit.

2.1.1 Overview of the Control Circuit Operation

The printer's control circuit includes a CPU (TMP96C141AF/IC4) that runs at 19.66 MHz, a gate array (E05B42/IC3), a 1M bit PS-RAM (IC8), a 8M bit CG-ROM (IC6), and so on. The figure below shows the block diagram for the control circuit.

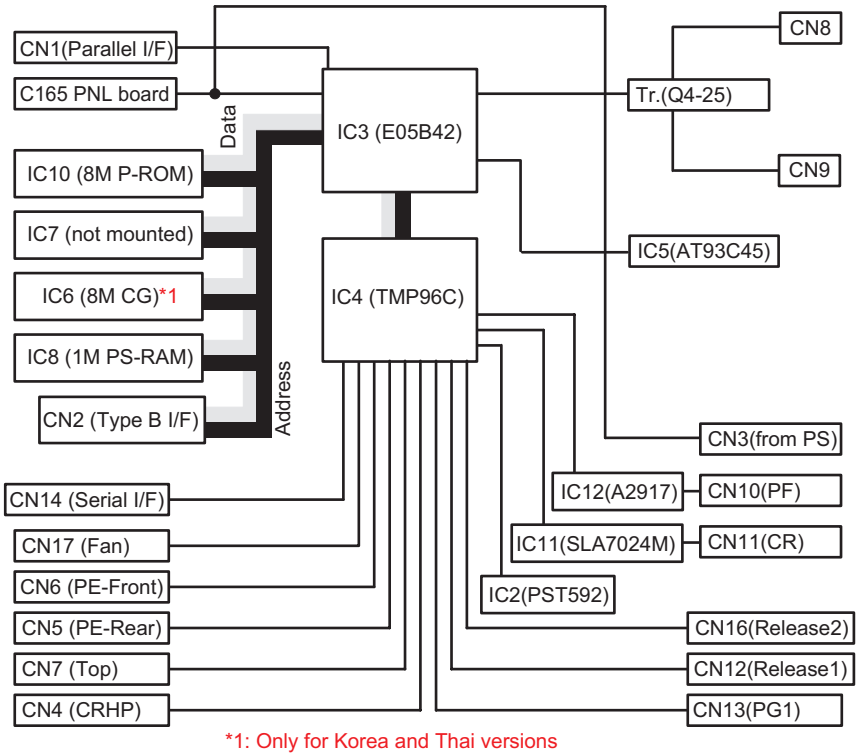


Figure 2-1. Control Circuit Block Diagram

The following figure shows the data flow from the host computer to the printhead. Data sent from the host computer is converted to image data and transmitted to the printhead through the gate array.

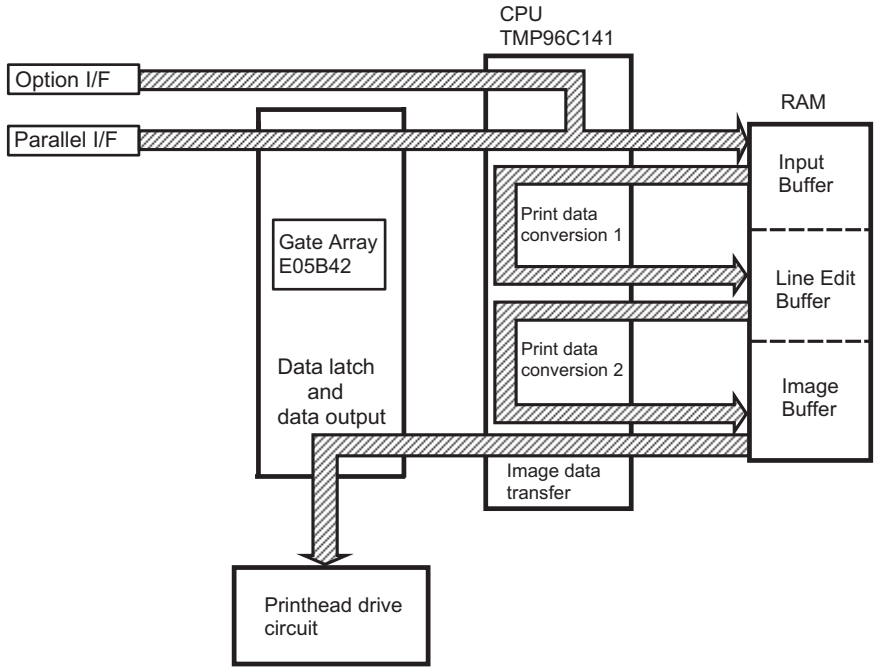


Figure 2-2. Data Flow

The following table lists the each function of the main components of the C272 MAIN board.

Table 2-1. Functions of the Main Board

IC Name	Location	Function
CPU	IC4	Detects conditions of various sensors and controls phase change for the CR motor.
Gate Array	IC3	Control the functions below: • Memory management • Printhead drive • Phase change for the PF motor
EEPROM	IC5	Contains such information as the factory setting values for the various adjustments and the operational record of the printer.
ROM	IC10	Contains the control program.
RAM	IC8	Manages the following functions: • Buffer used to receive data • Data Extension • CPU working area
CG-ROM	IC7	Contains font data.
SLA7024M	IC11	Constant current drive IC for CR Motor
A2917	IC12	Constant current drive IC for PF Motor

2.1.2 System Reset Circuit

The reset IC (IC2) outputs a reset signal under the conditions below to feed back the status to the CPU and the gate array:

- ☐ The printer is turned on or off.
- ☐ The voltage level drops due to abnormal condition.

Receiving the signal, the CPU and the gate array immediately shut off the operation of each IC to prevent the printer from falling into abnormal status caused by unstable power supply.

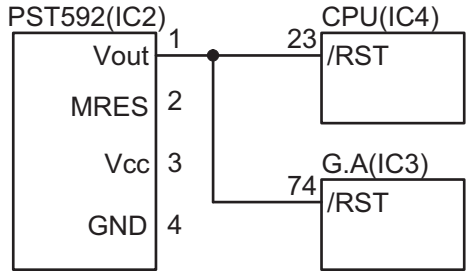


Figure 2-3. Reset Circuit

2.1.3 Printhead Driver Circuit

Printhead drive begins with monitoring the 35 V line currently applied. This function enables the printer to change the period of time for applying current to the printhead slightly depending on the condition. As a result, the printer can output image at a constant density. The Pin 74 (AN1) on the CPU monitors the 35 V line's condition.

Also, when a high-duty job is in process, the temperature inside the printhead will rise, and if the job is continued at a high temperature, it may damage the coil. Therefore, the Pin 73 (AN0) on the CPU monitors the temperature inside the printhead. With this operation called protection operation for hot head, printing is stopped when the temperature reaches the standard level 1. As the temperature drops to the standard level 2, printing begins again at a lower speed, and then at a normal speed when the temperature lowers to the standard level 3.

Once the current flows into the head drive resistor, the coil for the corresponding pin is activated with the current. The current flown into the coil is converted into energy used to rush the pin. Note there is possibility that some unused energy returns to the board, which may damage the head driver transistor. For this reason, a zener diode is attached for each transistor to ground the current so the voltage over the standard level (15 V) does not directly return to the transistor.

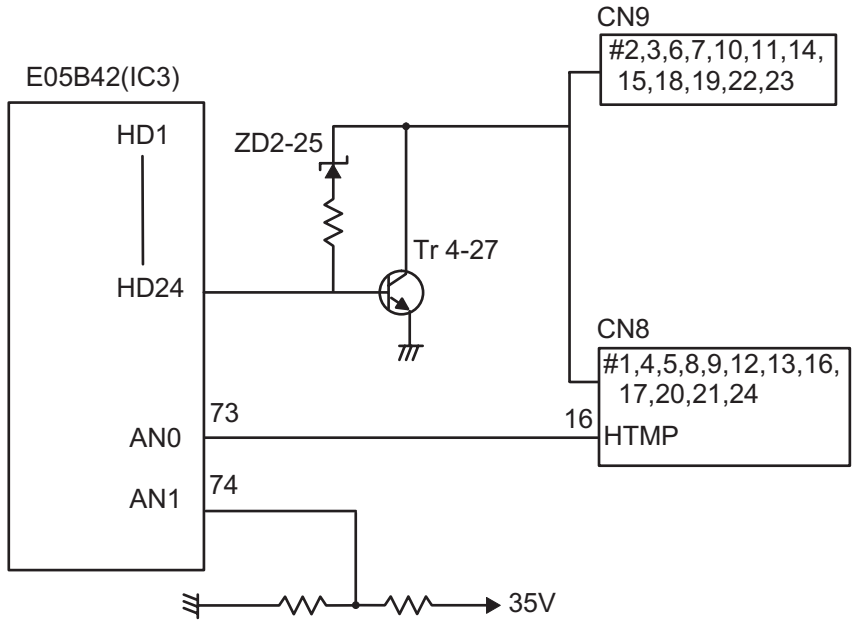


Figure 2-4. Printhead Drive Circuit

2.1.4 CR Motor Driver Circuit

The CPU (IC4) directly controls the phase change of the CR motor. SLA7024M (IC11), the driver IC for the CR motor, performs bi-polar constant current drive to detects the amount of current flowing into the motor and chops the current supplied. With this operation, current flowing into the motor coil is regulated.

The CR motor driver circuit is as shown below:

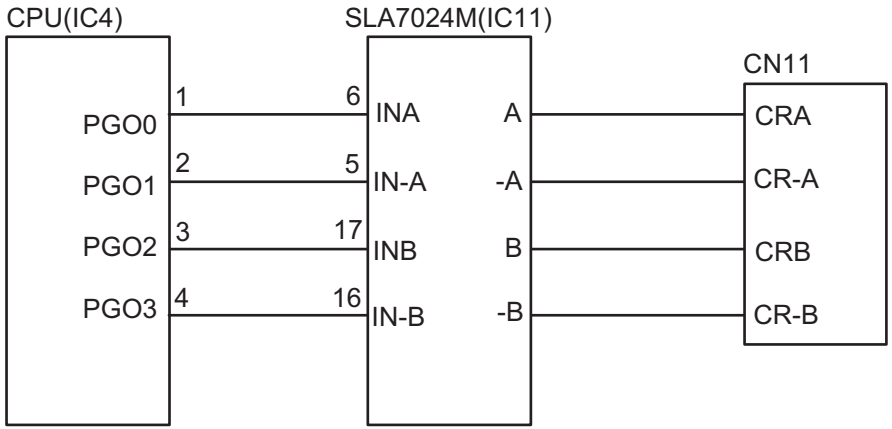


Figure 2-5. CR Motor Driver Circuit

2.1.5 PF Motor Driver Circuit

The gate array (IC3) manages the PF motor control. The driver IC for the PF motor, which enables the constant current drive, receives the phase change signal directly from the gate array and determines the phase to which current flows.

The PF motor driver circuit is as shown below:

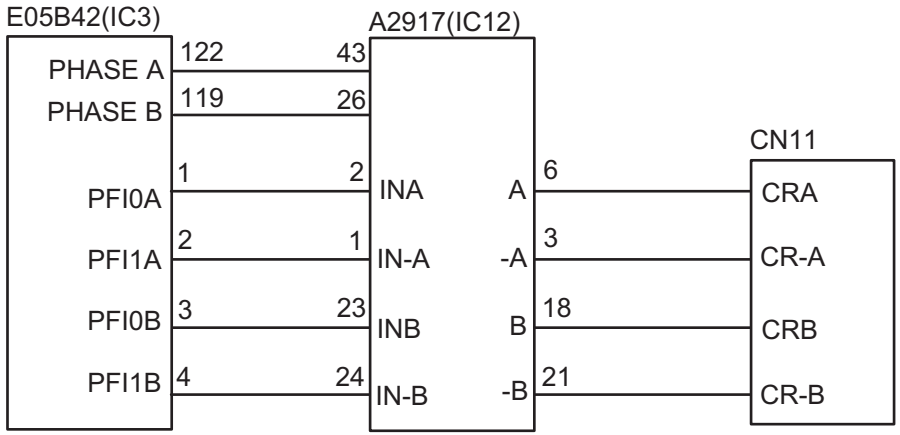


Figure 2-6. PF Motor Driver Circuit

2.1.6 EEPROM Control Circuit

When the printer power is turned off, the EEPROM stores the factory settings and values in the areas that are not cleared in the user setting mode and also writes those values in the RAM. This sequence is managed by the CPU (IC4), which transmits data in the serial format.

The EEPROM control circuit is as shown below:

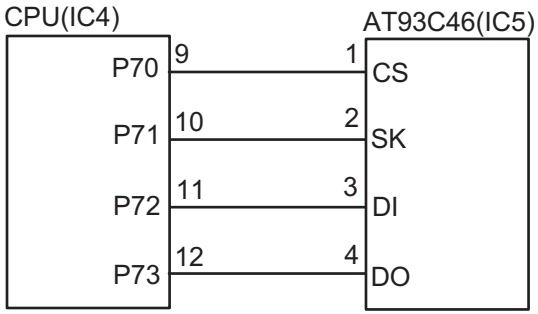


Figure 2-7. EEPROM Control Circuit

2.1.7 Sensor Circuit

Unlike the LQ-2170, both the CPU and the gate array monitor and control the corresponding sensors' conditions. Note analog voltages are all monitored by the CPU ports.

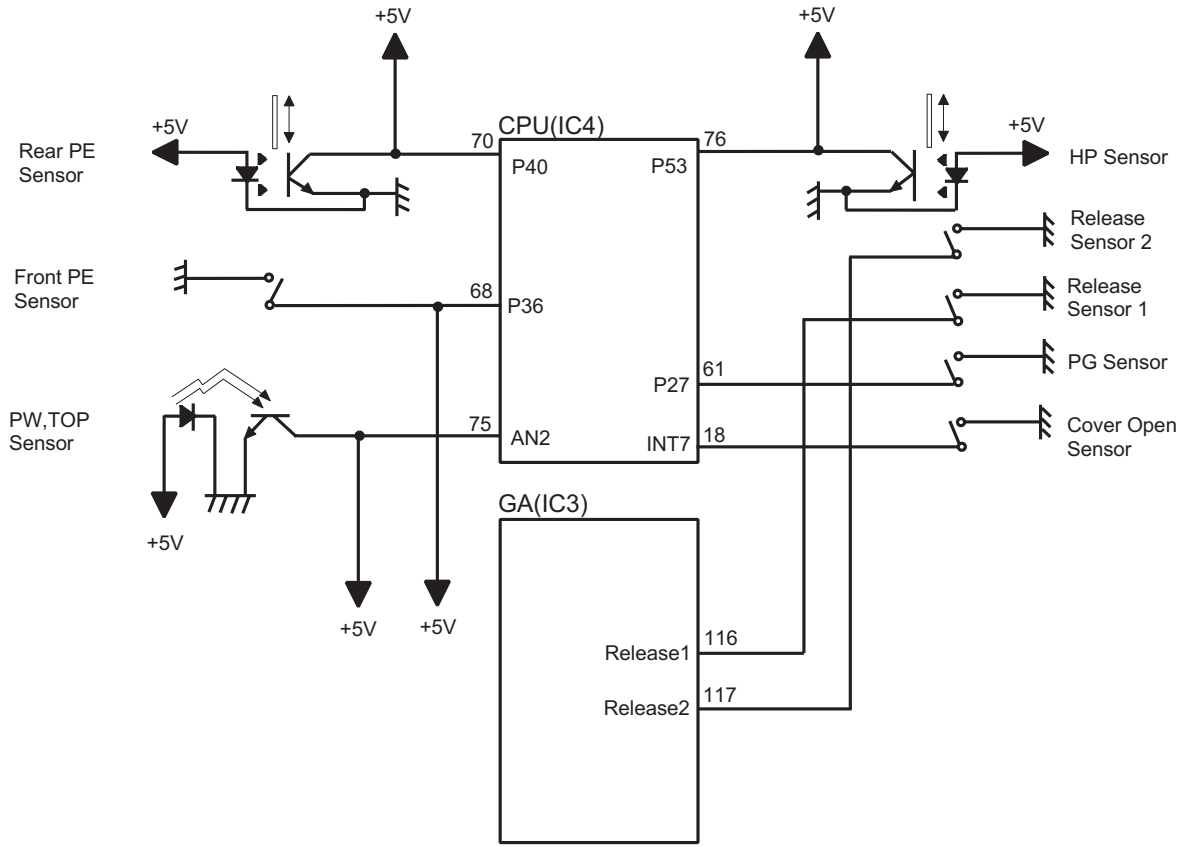


Figure 2-8. Sensor Circuit

CHAPTER

3

DISASSEMBLY AND ASSEMBLY

The contents of the chapter “Disassembly and Assembly” is the same as for the LQ-2170 Service Manual.

CHAPTER

4

ADJUSTMENT

4.1 Overview

The adjustment items required for the LQ-2180 are the same as for the LQ-2170. Therefore, see Table 4-1 in the LQ-2170 Service Manual and perform any necessary adjustment after disassembling/assembling the printer.

CAUTION

Though the conditions for each adjustment are the same as for the LQ-2170, the adjustment program used for the LQ-2180 is different. Therefore, observe the instructions given in the following sections.

4.1.1 Pre-operation for the Adjustment Program

1. Get a continuous paper. (136-column paper should be used to avoid printing on the platen.)

CAUTION

- **Do not use cut sheet for the Bi-D adjustment. Since the Bi-D adjustment has to be performed with the top and bottom edges of the sheet firmly set in the paper path, use of cut sheet will not provide accurate adjustment.**
- **Use single continuous paper.**
- **Adjustment program for serial dot matrix printer does not run without any paper loaded. So, be sure to turn the printer on first and then load paper.**

2. Set the release lever to the continuous paper position.
3. Connect the printer and the PC and turn the printer on.
4. Press the Load/Eject button to send the paper to the stand-by position. Then press the LF/FF button more than 10 times until the leading edge of the paper is completely out of the printer.

NOTE: *If you omit this operation, the printer will perform Uni-D print instead of Bi-D.*

5. Double-click “LQSERIES.EXE”. The program starts up and the screen below appears.

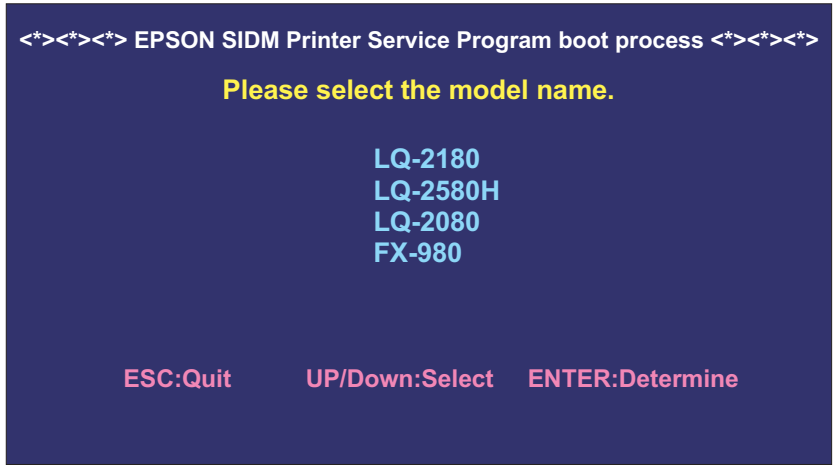


Figure 4-1. LQSERIES.EXE Initial Screen

6. Move the cursor to “LQ-2180” and press the Enter key.
7. The following screen appears.

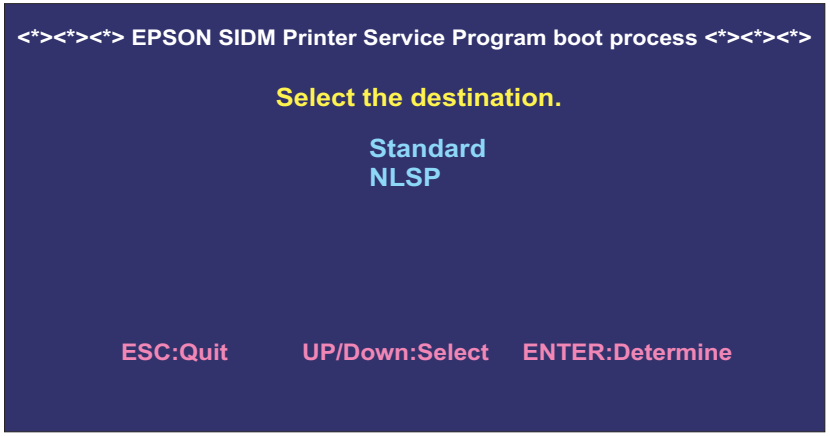


Figure 4-2. Destination Selection Screen

8. Check the printer to be adjusted for the destination; NLSP or Standard, then select the destination and press the Enter key.

CAUTION

Be sure to select the proper destination. If you select "Standard" despite you printer is NLSP version, the printer may not print NLSP characters.

9. The following screen appears.

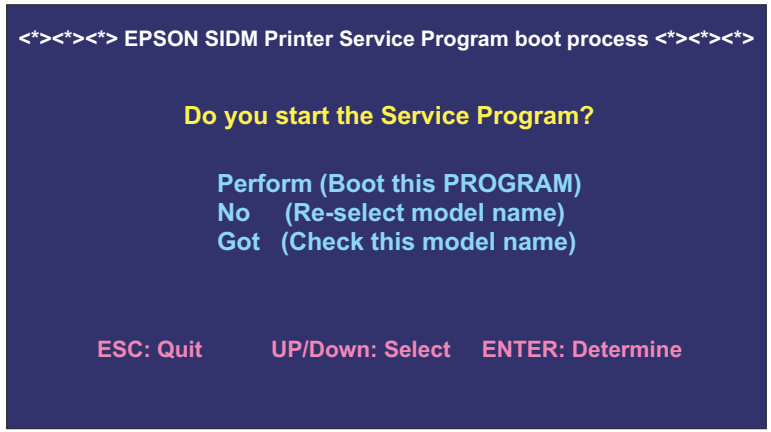


Figure 4-3. Main Menu Selection Screen

10. Select "Perform". The following screen appears.

CAUTION

- **Select "No" if you have input a wrong model name in the screen shown in Figure 4-1.**
- **If you select "Got", the printer flashes the model name stored in the RAM to the EEPROM once and reads it again.**

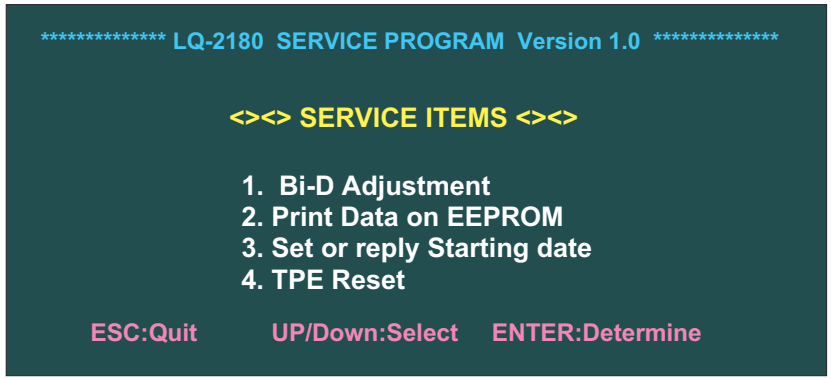


Figure 4-4. Main Menu Screen

4.1.2 Bi-D Adjustment

This adjustment is made after the main board or the CR motor has been replaced. The purpose of this adjustment is to electrically correct the head wire's point of impact during Bi-D printing. The adjusted value is stored in the specific address in the EEPROM. Once the value is stored, it will not be erased if the printer is turned off or the EEPROM is reset.

CAUTION

If the printer is in the emulation mode, characters output for the Bi-D adjustment will be garbled. If so, turn ESC/P2 on using the EEPROM Initialization mode.

1. Perform the pre-operation. (See Section 4.1.1.)
2. Select "1. Bi-D Adjustment". The following screen appears.

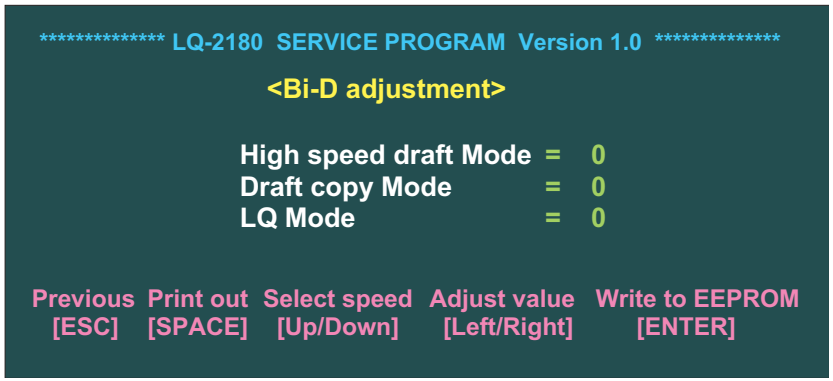


Figure 4-5. Initial Menu of the Bi-D Adjustment

3. Press the Space key to check the current Bi-D setting condition for the High speed draft mode. The printer prints the following pattern.

CAUTION

- **The value "0" shown in the screen shown in Figure 4-5 is the initial value used in the program, which varies from the one stored in the EEPROM. However, if the main board has been replaced, the value in the EEPROM is replaced with "0"as the initial value.**
- **The printing pattern below is a sample for the high speed mode. Be sure to perform the adjustment in draft copy mode and LQ mode as well.**

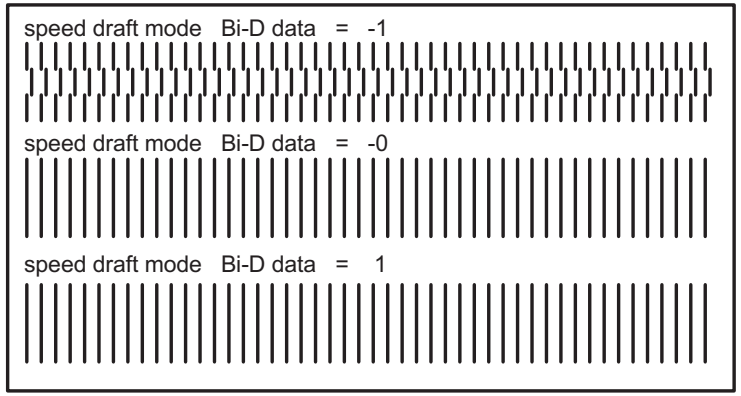


Figure 4-6. Bi-D Pattern Sample

4. Output the patterns for the Draft Copy Mode and the LQ Mode, the rest of the three modes in the screen (Figure 4-5**)**. Then check that the vertical lines in the middle row for each mode are aligned. (If no adjustment is needed, you can turn the printer off, not continuing to the next step.)
5. Examine the patterns for the three modes output in the previous steps, and correct the value in the screen shown in Figure 4-5 until the vertical lines for the center value (Data = 0 in Figure 4-6) are aligned.

6. When this adjustment is completed, if you need to perform another adjustment using this program, you can continue without turning off the printer.

4.1.3 TPE Level Reset

Make this adjustment when the main board or Top PE Sensor has been replaced. Generally, light level emitted from the photo diode in a photo sensor lowers with age. For this reason, the printer renews the current paper remaining level by detecting the black level of the platen each time the printer is turned on or paper is fed. When the TPE level is reset, FF is written and it approaches 00 as the time goes by. If this operation is not performed, paper out condition may be detected despite paper is set.

1. Perform the pre-operation. (See Section 4.1.1.)

2. Select “TPE Reset” in the main menu screen (Figure 4-4) and press the Enter key. The screen below appears.

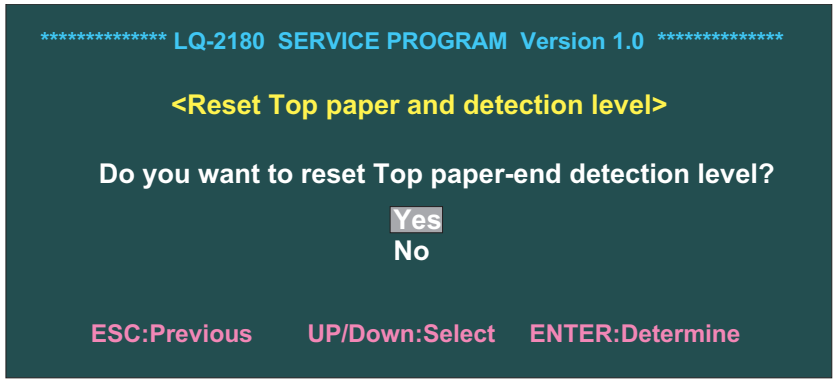


Figure 4-7. Screen - TPE Reset

3. Select “Yes” and press the Enter key. FF is written in EEPROM when the printer power is turned off.

4.1.4 Writing the User-characteristic Data

Use this function to check the specific records of the printer used by your customer. Also, you can renew the starting date using this program. Since there is no standardized service operation using this function, you can use it whenever necessary.

1. Perform the pre-operation. (See Section 4.1.1.)
2. Select “Set or Reply Starting Date” and press the Enter key. The screen below appears.

CAUTION

When using this function, the printer must be in the normally operative condition. Make sure the printer is free from any error conditions such as paper out, fatal error, and so on. Otherwise, the function is not effective.

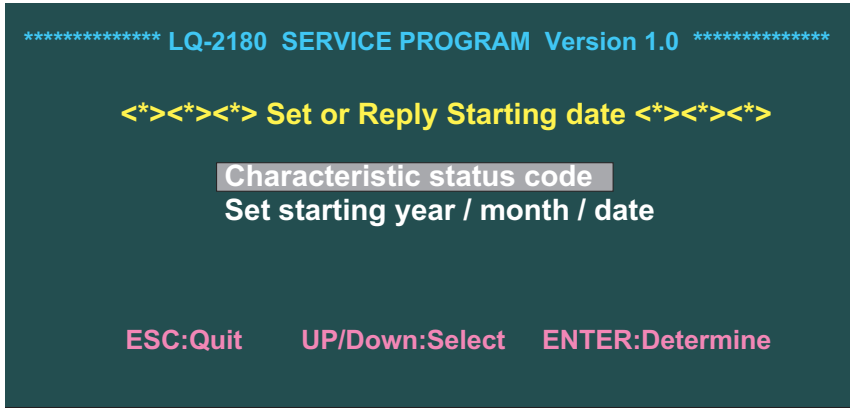


Figure 4-8. Screen - Set or Reply Starting Date

[To check the current status]

3. Select “Characteristic Status Code” and press the Enter key. The following screen appears.

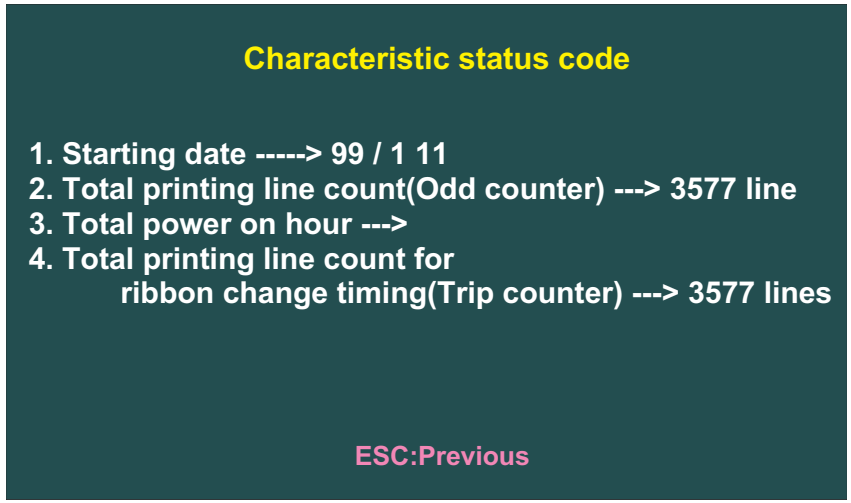


Figure 4-9. Screen - Characteristic Status Code

[To renew the Starting Year / Month / Date]

4. Select “Set Starting year / month / date” and press the Enter key. The following screen appears.

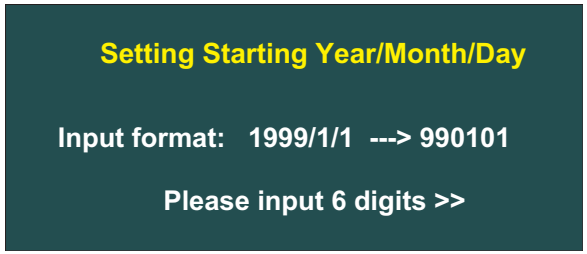


Figure 4-10. Screen - Setting Starting Year / Month / Date

5. Input a 6-digit data. Be sure to input it correctly since this programs does not perform comparison check with the system timer. If you input a wrong data, start from the beginning.

CHAPTER

5

TROUBLESHOOTING

5.1 Overview

This chapter contains flowcharts and checkpoint tables to help you troubleshoot the printer. The checkpoint tables let you identify the faulty part or unit by checking the values or ranges listed for each component.

5.2 Troubleshooting Information

This section gives you troubleshooting information to let you test points for replaceable units.

5.2.1 Printhead

The information in this section is the same as for the LQ-2170.

5.2.2 Sensors

The check method, including test pin number and meter reading, for each sensor is the same as for the LQ-2170. However, be careful of the CN 12 and 16 that are not common to the LQ-2170. The change made for LQ-2180 is as shown below.

Table 5-1. Sensor Test Points

Sensor Connector Number	Test Pin Number	Test method	Meter reading
CN12 (Release sensor 1)	1: Release 1 2: GND	Place one lead on Pin 1 and the other lead on Pin 2 and check the voltage while toggling the sensor lever.	See the LQ-2170 Service Manual.
CN16 (Release sensor 2)	1: Release 2 2: GND	Same as for CN12	See the LQ-2170 Service Manual.
Other sensors	See the LQ-2170 Service Manual.		

5.2.3 Motors

The motor test points are the same as for the LQ-2170.

5.2.4 Error Codes with Indicators and Buzzer

The Error codes with Indicators and buzzer are the same as for the LQ-2170.

5.3 Unit Level Troubleshooting

The information for this section is the same as for the LQ-2170 except for some points. The points to be changed are as follows:

- Point: All flowcharts provided in this section

C165 MAIN Board	→	272MAIN Board

- Point: Flowchart 2-1

CN12	→	CN12 or CN16

5.4 Repairing the C165 PSB/PSE Board

The entire information for this section is the same as for the LQ-2170.

5.5 Repairing the C272MAIN Board

This section provides instructions to repair the C272 MAIN board assembly. It describes various problems, symptoms, likely causes, and solutions. The checkpoint column provides proper waveforms, resistance values, and other information for each component of C272 MAIN Board.

NOTE: *This information is necessary only for servicers who repair to the component level. Servicers who repair to the unit level (including all servicers in the U.S.) can ignore this section.*

Table 5-2. Repairing the C272MAIN Board (1/3)

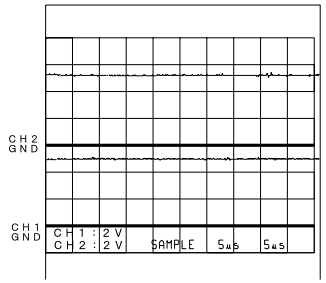
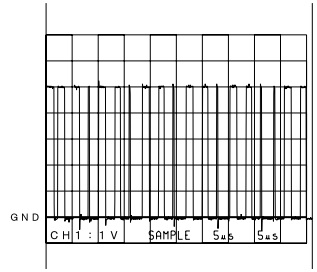
Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	Reset IC2 is defective.	Check the voltage waveforms of the VCC signal (CH1: IC2 pin 3) and VOUT signal (CH2: IC2 pin 2) when power is turned on. 	Replace IC2.
	The PROM (IC10) is not selected.	Check for a change in the signal from HIGH/LOW at pin 22 of IC10. 	Replace IC10 (or replace the main board).
	The PSRAM (IC8)	Check for a change in the signal from HIGH/LOW at pin 1 of the IC8.	Replace IC8 (or replace the main board).

Table 5-3. Repairing the C272MAIN Board (2/3)

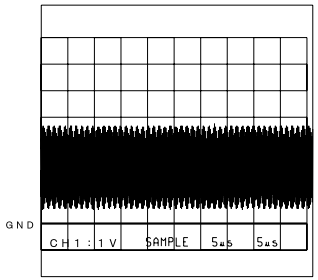
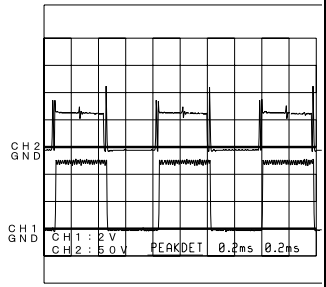
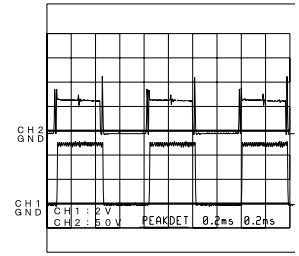
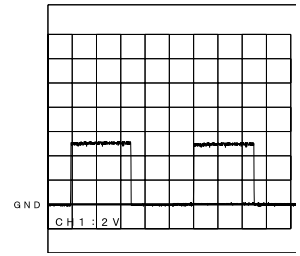
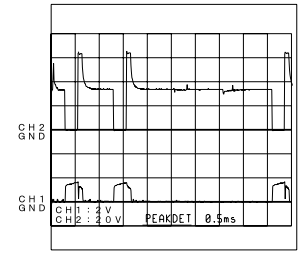
Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	CRU1 is defective.	Check the oscillator signal at pins 26 or 27 of the CRU1. 	If the signal is not correct, replace IC4 (or replace the main board). Otherwise, replace CRU1.
Carriage operation is abnormal.	IC11 or IC4 is defective.	Check input signal waveform (CH1) at pins 1, 2, 3, and 4 of IC4. Check output signal waveform at pins 8, 1, 18, and 11 of IC11. 	If the input signal is not correct, replace IC4 (or replace the main board). If the output signal is not correct, replace IC11.
	IC3 is defective.	Check the output signal at pins 68, 69, 70, and 71 of IC3.	If there is no output signal, replace IC3.

Table 5-4. Repairing the C272MAIN Board (3/3)

Problem	Cause	Checkpoint	Solution
Paper feed is abnormal.	IC1 is defective. IC3 is defective. IC2 is defective.	• Check input signal waveform at pins 1, 2, 23, and 24 of IC2. • Check output signal waveform at pins 6, 3, 18, and 21 of IC12. 	If the input signal is not correct, replace IC3. If the input signal is correct and the output signal is not correct, replace the IC12.
No data is printed.,	IC3 is defective.,	• Check the output signal waveform at pin 111 of IC3. 	If this signal is not output, replace IC3.
A particular dot fails to print.,	IC3 is defective or one of the head drive transistors is defective (Q4 - Q27).	• Check the voltage waveform at pin HD1 - HD24 of IC3. • Check the voltage waveform (CH2) for each transistor. 	If the head drive signal is not output, replace IC3. If the head drive signal is output, replace the head drive transistor.

5.6 Repairing the Printer Mechanism

The information for this section is also the same as for the LQ-2170 except for the point below.

- Point: Table 5-8

CN12	→	CN12 or CN16

CHAPTER

6

MAINTENANCE

The contents of the chapter “Maintenance” is the same as for the LQ-2170 Service Manual.

CHAPTER

7

APPENDIX

7.1 EEPROM Address Map

This chapter provides EEPROM Address Map for LQ-2180 and component layouts and circuit diagram for the C272 Main Board.

NOTE: *The data of two or more bytes are assigned in such was as lower byte to lower address, higher byte to higher address.*

Table 7-1. EEPROM Address Map (1/7)

Address	Data	Data Format		Q-pit data	Factory setting
00H, 01H	(reserved)			0000H	0000H
Area 1					
02H, 03H	Character table selection	0: PC437 1: PC850 2: PC860 3: PC863 4: PC865 5: PC861 6: BRASCII 7: Abicomp 8: ISO Latin 1 9: Roman 8 10:PC437 Greek 11:PC852 12:PC853 13:PC855 14:PC857 15:PC864 16:PC866 17:PC869 18:ISO Latin 1T	19:ISO 8859-7 20:MAZOWIA 21:Code MJK 22:Bulgaria 23:Estonia 24:PC774 25:ISO 8859-2 26:PC866 LAT 27:PC866 UKR 28:Hebrew 7 29:Hebrew 8 30:PC862 31:PCAPTEC 32:PC708 33:PC720 34:PCAR864 35:PC858 36:ISO 8859-15	0000H	0000H (PC437)
		37:Italic U.S.A. 38:Italic France 39:Italic Germany I 40:Italic U.K.	41:Italic Denmark 42:Italic Sweden 43:Italic Italy 44:Italic Spain	0000H	0000H

Table 7-2. EEPROM Address Map (2/7)

Address	Data	Data Format	Q-pit data	Factory setting
04H, 05H	Page length for rear tractor	1 to 22x360 (by 1/360 inch) 0000H: 11 inch (the default)	0000H (11 inch)	0000H (11 inch)
06H, 07H	Page length for front tractor	1 to 22x360 (by 1/360 inch) 0000H: 11 inch (the default)	0000H (11 inch)	0000H (11 inch)
08H, 09H	Page length for CSF bin 1	1 to 22x360 (by 1/360 inch) 0000H: 22 inch (the default)	0000H (22 inch)	0000H (22 inch)
0AH, 0BH	Page length for CSF bin 2	1 to 22x360 (by 1/360 inch) 0000H: 22 inch (the default)	0000H (22 inch)	0000H (22 inch)
0CH, 0DH	TOF adjustment value for rear tractor	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
0EH, 0FH	TOF adjustment value for front tractor	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
10H, 11H	TOF adjustment value for CSF bin 1	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
12H, 13H	TOF adjustment value for CSF bin 2	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
14H, 15H	TOF adjustment value for rear manual insertion	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
16H, 17H	TOF adjustment value for front manual insertion	-60 to 360 (4.2 mm to 8.5 mm + 1 inch, by 1/360 inch)	0000H (8.5 mm)	0000H (8.5 mm)
18H, 19H	Bottom margin for rear tractor	1 to 22x360 (by 1/360 inch), 0000H: 11inch (the default)	0000H (11 inch)	0000H (11 inch)
1AH, 1BH	Bottom margin for front tractor	1 to 22x360 (by 1/360 inch), 0000H: 11inch (the default)	0000H (11 inch)	0000H (11 inch)
1CH	Font selection	0: Roman 1: Draft 2: Sans serif 3: Courier 4: Prestige 5: Script 6: Others (the default)	00H (Roman)	00H (Roman)

Table 7-3. EEPROM Address Map (3/7)

Address	Data	Data Format	Q-pit data	Factory setting
1DH	Pitch selection	0: 10 cpi 3: 17 cpi 1: 12 cpi 4: 20 cpi 2: 15 cpi 5: Proportional	00H (10 cpi)	00H (10 cpi)
1EH	(reserved)		00H	00H
1FH	Print direction setting	0: Bi-d. 1: Uni-d. 2: Auto	00H (Bi-d.)	00H (Bi-d.)
20H	I/F mode selection	0: Auto I/F selection 1: Parallel I/F 2: Type-B I/F	00H (Auto)	00H (Auto)
21H	Auto I/F wait time setting	10:10 sec. 30:30 sec. 00:10 sec. (the default)	0AH (10 sec.)	0AH (10 sec.)
22H	Auto line feed Auto tear off Skip over perforations High speed draft Input buffer --- --- ---	b0: Auto line feed 0: Off, 1: On b1: Auto tear off 0: Off, 1: On b2: Skip over perforation 0: Off, 1: On b3: High speed draft 0: On, 1: Off b4: Input buffer 0: On, 1: Off b5: (reserved) b6: (reserved) b7: (reserved)	00H	00H

Table 7-4. EEPROM Address Map (4/7)

Address	Data	Data Format	Q-pit data	Factory setting
23H	Software 0 slash Buzzer Roll paper Auto CR A. G. M. --- ---	b0: Software 0: ESC/P2, 1: IBM 2391 Plus b1: 0 slash, 0: Off, 1: On b2: Buzzer 0: On, 1: Off b3: Roll paper 0: Off, 1: On b4: Auto CR (IBM) 0: Off, 1: On b5: A. G. M. (IBM) 0: Off, 1: On b6: (reserved) b7: (reserved)	00H	00H
24H, 25H	Tear-off adjustment value	-128 to +127 (by 1/360 inch)	0000H	0000H
26H	Other font selection	0: Roman 3: Orator 1: Sans Serif H 4: Orator-S 2: OCR-B 5: Script C	00H	00H
27H	Backup flags 1 Copy mode		00H	00H
28H	Backup flags 2 In tear-off state Bin select	0: Friction Bin 1 or Tractor not Tear off 1: Friction Bin 1 2: Friction Bin 2 3: Friction Card 4: Tractor & Tear off	00H	00H

Table 7-5. EEPROM Address Map (5/7)

Address	Data	Data Format	Q-pit data	Factory setting
29H	Panel mask pattern 1	b0: LOAD function b1: EJECT function b2: FONT selection b3: PITCH selection b4: TEAR OFF function b5: BIN selection b6: Draft self test b7: LQ self test	00H	00H
2AH	Panel mask pattern 2	b0: LF function b1: FF function b2: Micro Adjust function b3: Pause function b4: Data dump b5: Default setting b6: Bi-d. adjustment b7: (reserved)	00H	00H
2BH	Manual insertion wait time	3 to 30 (by 0.1 sec.), 00H: 2 sec when Normal mode. (same as 3 sec when copy mode. default)	00H (2or3 sec.)	00H (2or3 sec.)
2CH	Tear-off wait time	3 to 30 (by 0.1 sec.), 00H: 3 sec. (the default)	00H (3 sec.)	00H (3 sec.)
2DH to 2EH	(reserved)		00H	00H
2FH	Copy mode	0: Off 1: On	00H	00H
30H-33H	Driving line count for ribbon change timing	0 - 0FFFFFFFFH (count)	00000000H	00000000H
34H-37H	Driving Hour	0 - 0FFFFFFFFH (minutes)	00000000H	00000000H
38H-3BH	Driving Line Count	0 - 0FFFFFFFFH (count)	00000000H	00000000H

Table 7-6. EEPROM Address Map (6/7)

Address	Data	Data Format	Q-pit data	Factory setting
3CH	Starting Year	0 - 99 (the last two figures of Anno Domini)	00H	00H
3DH	Starting Month	1 - 12	00H	00H
3EH	Starting Date	1 - 31	00H	00H
3FH	Black paper mode paper width measure	b0: black paper mode 0: Off, 1: On b1: paper width measure 0: On, 1: Off b2: b2 to b7: (reserved)	00H	00H
40H to 41H	TOF Minimum value	-120 to -60, 0: -60 (4.2 mm) Value out of the range above is considered -60.	00H	00H
42H	I/F timing data	bit0-3: BUSY timing data bit4-7: XAACK timing data	00H	00H
43H	(complement of 42H)		FFH	FFH
44H to 5DH	(reserved)		00H	00H
5EH, 5FH	Paper edge length		0000H	0000H
60H, 61H	Page length for rear manual insertion	1 to 22x360 (by 1/360 inch), 0000H: 22 inch (the default)	0000H (22 inch)	0000H (22 inch)
62H, 63H	Page length for front manual insertion	1 to 22x360 (by 1/360 inch), 0000H: 22 inch (the default)	0000H (22 inch)	0000H (22 inch)
64H to 66H	Sub-number for customization	00H to 09H	000000H (Standard)	000000H (Standard)
67H	(reserved)		00H	00H

Table 7-7. EEPROM Address Map (7/7)

Address	Data	Data Format	Q-pit data	Factory setting
Area 2				
68H	Market	0: Standard version 1: NLSP version	00H	00H
69H	IBM character table	0: Table2 1: Table1	00H	00H
70H	(reserved)		00H	00H
71H	Check sum of Area 2		00H	00H
Area 3				
72H	Vp adjustment value		80H	*a)
73H	Vp adjustment value (complement of 72H)		7FH	*a)
74H	Bi-d adjustment value for high speed draft / draft mode	-12 to +12 (by 1/720 inch)	00H	*a)
75H	Bi-d adjustment value for draft copy mode	-12 to +12 (by 1/720 inch)	00H	*a)
76H	Bi-d adjustment value for LQ mode	-12 to +12 (by 1/720 inch)	00H	*a)
77H	(reserved)		00H	00H
78H	TPE level		FFH	FFH
79H	TPE adjustment position	-10 to +10 (by 1/180 inch)	00H	00H
7AH to 7FH	(reserved)		00H	00H

**a) These data are fixed by each printer hardware in the factory. They should not be changed afterwards.*

7.2 Connector Summary

The following figure shows how primary components are connected.

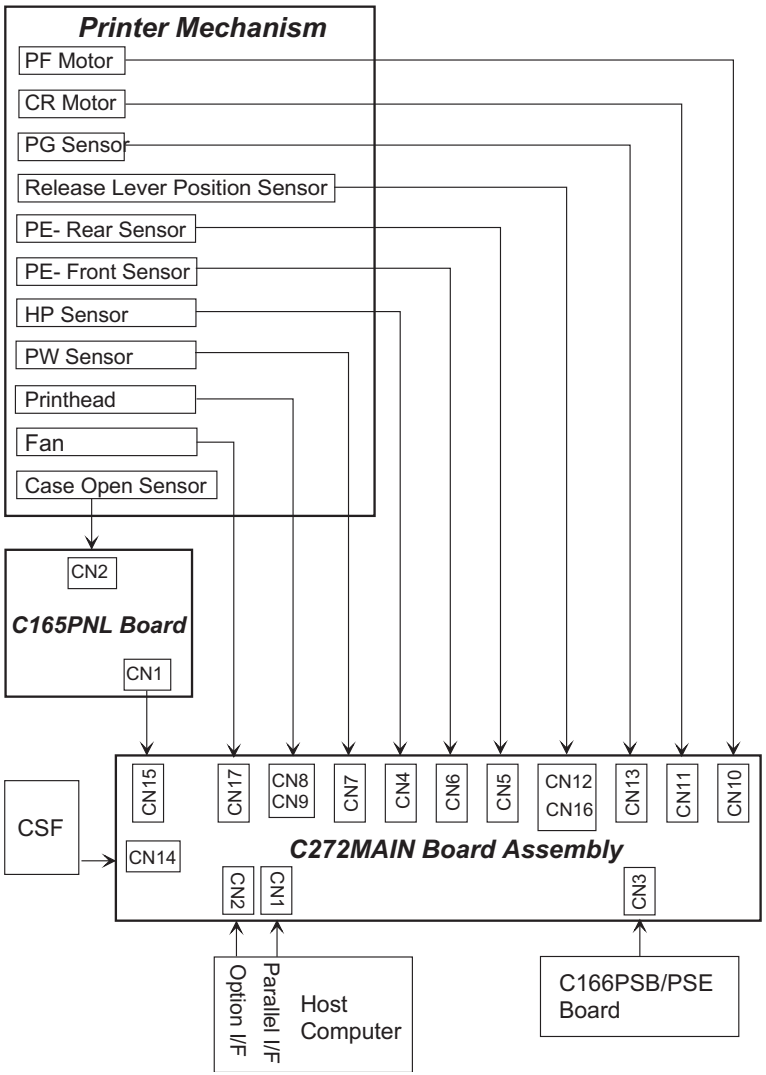


Figure 7-1. Cable Connections

The table below shows the cable alignment of the C272 Main Board.

Table 7-8. C272 Main Board Connection

Board	Connector	Function	Pins
C272 MAIN Board	CN1	Parallel interface	36
	CN2	Type B interface	36
	CN3	C165 PSB/PSE board assembly	12
	CN4	HP sensor	3
	CN5	Rear PE sensor	3
	CN6	Front PE sensor	2
	CN7	TOP sensor	4
	CN8	Printhead (F)	18
	CN9	Printhead (R)	16
	CN10	PF motor	4
	CN11	CR motor	5
	CN12	Release lever position sensor 1	2
	CN13	PG sensor	2
	CN14	CSF	10
	CN15	PNL board assembly	22
	CN16	Release lever position sensor 2	2
	CN17	Fan	2

NOTE: *The table below provides information of the connector that vary from C165 Main Board used in LQ-2170.*

Figure 7-2. Connector Pin Assignment (Changed/new items only)

	LQ-2170 (C165MAIN)			LQ-2180 (C272MAIN)		
	Connector	**Function**	**Pin alignment**	**Connector**	**Function**	**Pin alignment**
1	CN14	CSF	1: A 2: B 3: -A 4: -B 5: HOLD 6: +5V 7: GND 8: GND 9: +35V 10:+35V	CN14	CSF	1: +35V 2: +5V 3: HOLD 4: +35V 5: -A 6: B 7: GND 8: GND 9: A 10:-B
2	CN12	Release lever position	1: RELEASE 1 2: GND 3: RELEASE 2 4: GND	CN12	Release lever position	1: RELEASE 1 2: GND
				CN16	Release lever position	1: RELEASE 2 2: GND
3	---	---	---	CN17	Fan	1: PE 2: GND

7.3 Component Layout

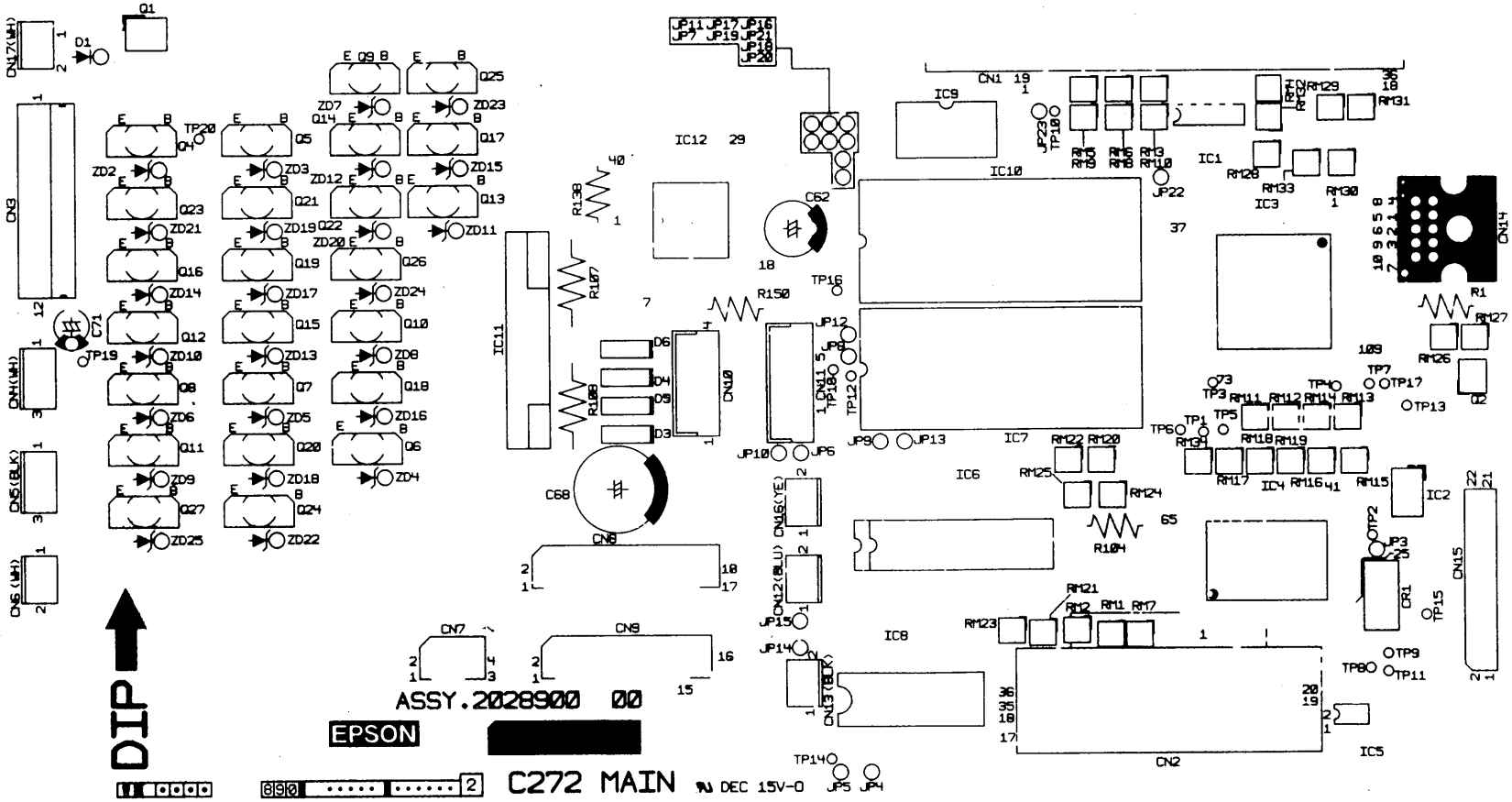


Figure 7-3. C272Main Component Layout - Component Side

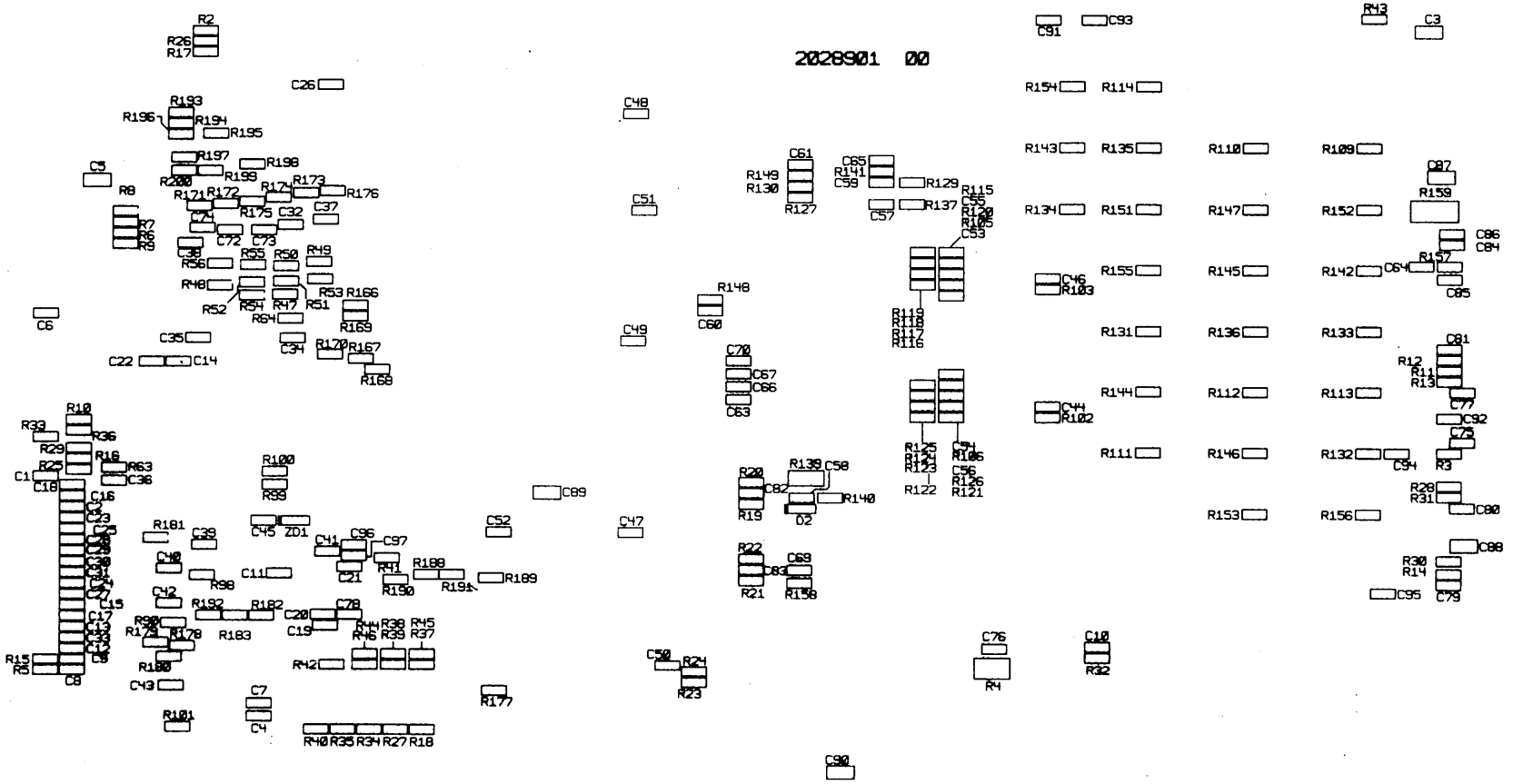
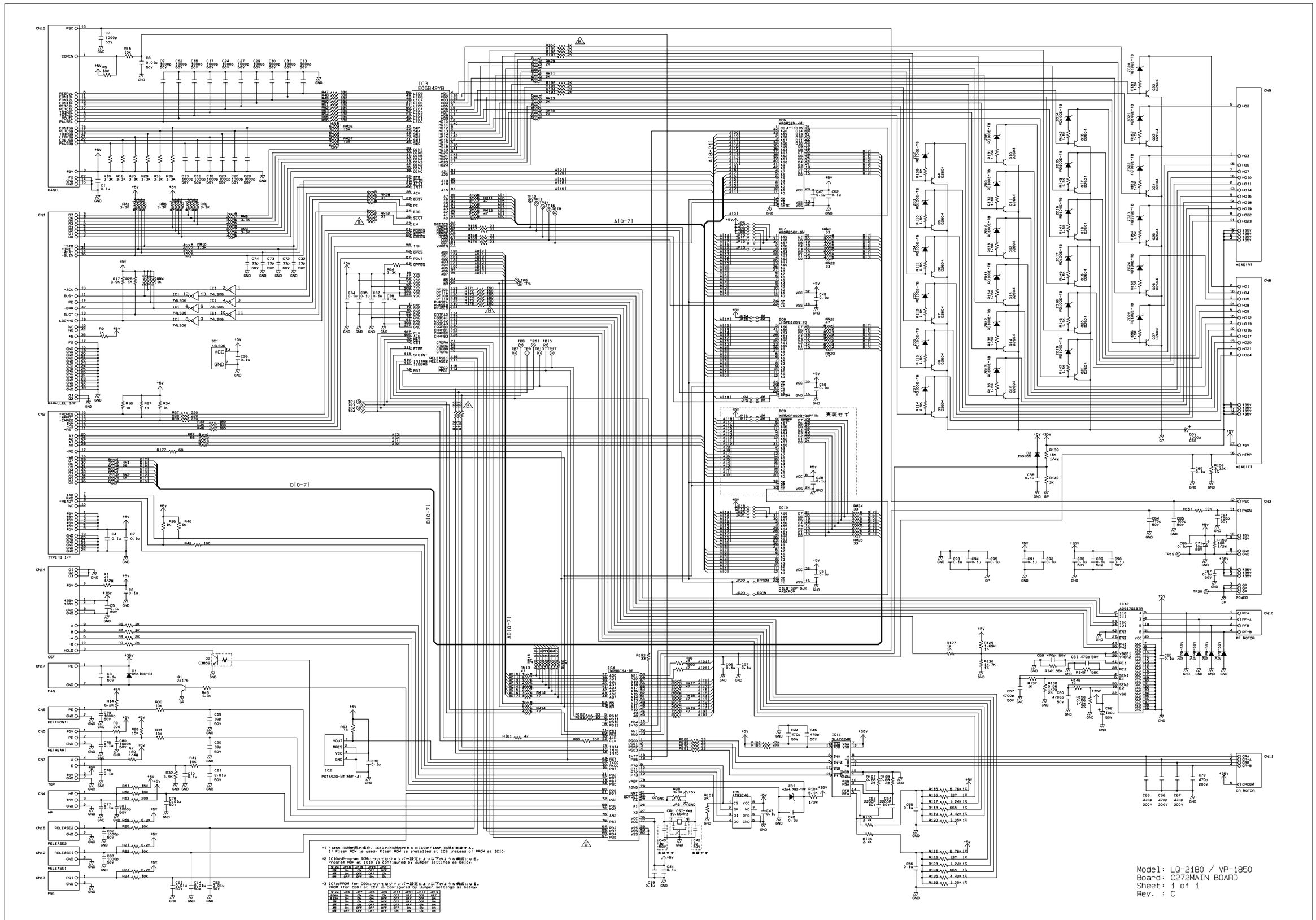


Figure 7-4. C272Main Component Layout - Soldering Side

7.4 Circuit Diagram

See the following page for the dircuit digram of the C272 Main Board.


IC3 E05B42YB
IC4 M66514FP
IC5 M66514FP
IC6 M66514FP
IC7 M5M29GB/66K-8M
IC8 M5M29GB128N-70
IC9 M5M29FB002B-90PFTN
IC10 M5M29FB/K-8M
IC11 BA7024M
IC12 A2917SEB1R
IC1 74LS06
IC2 PST5920-MT1WMP-41
CN1 PARALLEL I/F
CN2 TYPE-B I/F
CN3 POWER
CN4 HP
CN5 REAR
CN6 FRONT
CN7 TOP
CN8 HEAD(R)
CN9 HEAD(F)
CN10 PF MOTOR
CN11 CR MOTOR
CN12 RELEASE1
CN13 PG
CN14 CSF
CN15 PANEL
CN16 RELEASE2
CN17 FAN
D0-7
D10-71
A0-7
A8-21
実装せず
*1 Flash ROM使用の場合、IC10のPROMの代わりにIC9のFlash ROMを実装する。
If Flash ROM is used, Flash ROM is installed at IC9 instead of PROM at IC10.
*2 IC10のProgram ROMについてはジャンパー設定により以下のような構成になる。
Program ROM at IC10 is configured by Jumper settings as below.
Size JP24 JP25 JP26 JP27
2M ON ON OFF OFF
4M ON OFF ON ON
8M OFF OFF ON ON
*3 IC7のPROM (or CG)については、ジャンパー設定により以下のような構成になる。
PROM (or CG) at IC7 is configured by Jumper settings as below.
Size JP28 JP29 JP30 JP31 JP32 JP33
2M ON ON OFF OFF OFF OFF
4M ON ON ON OFF OFF OFF
8M ON ON OFF ON OFF OFF
16M ON ON OFF OFF ON OFF
32M ON ON OFF OFF OFF ON
64M OFF OFF OFF OFF ON ON
Model: LQ-2180 / VP-1850
Board: C27ZMAIN BOARD
Sheet: 1 of 1
Rev. : C