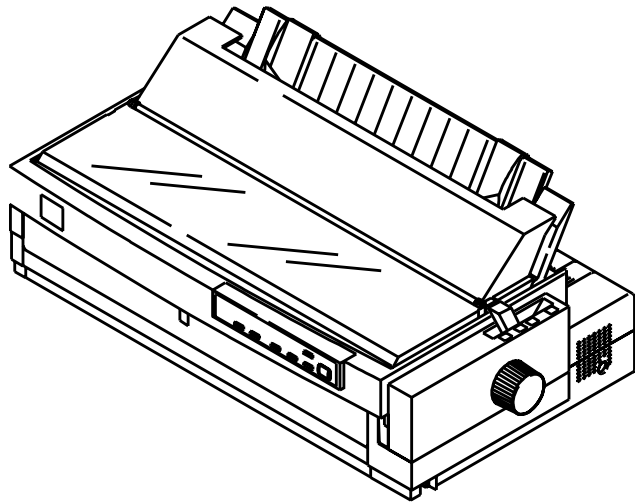


SERVICE MANUAL



Impact Serial Dot Matrix Printer
EPSON LQ-2080



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 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 procedures of EPSON LQ-2080. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on 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 product.

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the 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-approved lubricants and adhesives required for servicing the product.

APPENDIX

Provides the following additional information for reference:

- *EEPROM Address Map*
- *Connector Pin Assignments*
- *C273 Main Board Component Layout*
- *C273 Main Board Circuit Diagram*

Revision Status

Revision	Issued Date	Description
A	March 08, 1999	First release

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Specifications

The LQ-2080 is the revised model of the already existing LQ-2070. Since the specifications for the both products are mostly common, the information included in this section is limited to the items that are specific to LQ-2080. For the rest of the information, refer to the LQ-2070 Service Manual.

1.1.1 Features

- Print speed: High speed draft: 400 cps
Draft: 300 cps
LQ: 100 cps at 10 cpi
- Character tables: Standard version: 13 tables
NLSP version: 38 tables
- Input data buffer: 0 Kbyte or 64 Kbyte
(depend on the default setting)
- Acoustic noise: 50 dB (A) (ISO 7779 pattern)
- Reliability: MVBF*: 19 million lines
(except printhead)
MTBF: 10,000 power on hours (POH)
- Control codes: ESC/P2 and IBM 2391 Plus emulation
- Copy capability: 1 original + 4 copies
- Control panel functions: Font, Pause, Condensed Pause, Tear off, Bin, LF/FF, Load/Eject, Micro Adjust, Self-Test, Data Dump, and the Default Setting

*: Mean print volume between failure (MTBF 25% duty cycle)

1.1.2 Accessories

Table 1-1. Items Included with the Printer

Enclosed Items	Quantity
User's manual	1
Driver diskette	1
Ribbon cartridge	1
Power supply cable (230 V Version)	1

Table 1-2. Consumables and Optional Units

Unit	Description ^{*1}
Ribbon cartridge	S015086
Ribbon pack	S010033
High-capacity cut sheet feeder (bin 1)	C80673*
Second bin cut sheet feeder (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*
IEEE-1284 parallel I/F card	C82345*
Ethernet I/F card	C82357*, C82362*, C82363**2, C82364*

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

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

1.2 Hardware Specifications

This section also contains information specific to the LQ-2080. For other information, refer to the LQ-2070 Service Manual.

1.2.1 Printing Method

See the LQ-2070 Service Manual.

1.2.2 Printing Specifications

- Copy capability: 1 original + 4 copies
- Print speed and printable columns

Table 1-3. Print Speed and Printable Columns

Print Mode	Character Pitch	Printable Columns	Print Speed (cps)	
			Normal	Copy
High-speed draft	10 cpi	136	400	266
Draft	10 cpi	136	300	200
	12 cpi	163	360	240
	15 cpi	204	450	300
Draft Condensed	17 cpi	233	257	171
	20 cpi	272	300	200
LQ	10 cpi	136	100	66
	12 cpi	163	120	80
	15 cpi	204	150	100
LQ Condensed	17 cpi	233	171	114
	20 cpi	272	200	133

NOTE:

1. When the power supply voltage drops to the lower limit, the printer stops printing and then starts printing on that line again more slowly than before.
2. When the head temperature rises to the upper limit, the printer stops printing. When the head temperature falls to the normal level, the printer start printing again more slowly than before.

1.2.3 Paper Handling

- 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: 1/6 inch feed : 45 msec
Continuous feed : 0.127 MPS (m/second)
5.0 IPS (inchs /second)
 - Copy mode: 1/6 inch feed : 66 msec
Continuous feed : 0.092 MPS (m/second)
3.6 IPS (inches/second)

Release lever: See the following table.

Table 1-4. 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

Paper thickness lever: See the following table.

Table 1-5. Adjust Lever Setting Position

Setting Position	Paper Thickness (inch)		Paper Thickness (mm)
	Minimum	Maximum	
0	0.0024	0.0047	over 0.06 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

1.2.4 Paper Specifications

- Cut Sheet (Single sheet, Multipart)

	Front Entry	Rear Entry
Width	<Minimum> 3.9 inch 100 mm	<Minimum> 3.9 inch 100 mm

- Card

	Front Entry		Rear Entry	
	<Minimum>	<Maximum>	<Minimum>	<Maximum>
Width	3.9 inch 100 mm	7.8 inch 200 mm	3.9 inch 100 mm	7.8 inch 200 mm
Length	<Minimum> 5.8 inch 148 mm	<Maximum> 7.8 inch 200 mm	<Minimum> 3.9 inch 100 mm	<Maximum> 7.8 inch 200 mm

1.2.5 Ribbon Specificatio

- Ribbon life: Approximately 8 million characters
(LQ 10 cpi, 48 dots / character)

1.2.6 Electrical Specifications

- 120 V Version
 - Input voltage range: AC 99 to 132 V
 - Rated current: 1.0 A (max. 3.2 A)
 - Power consumption: Approximately 35 W
(ISO/IEC10561 Letter pattern)
Energy Star Compliant
- 230 V version
 - Rated current: 0.5 A (max. 1.6 A)
 - Power consumption: Approximately 37 W
(ISO/IEC10561 Letter pattern)
Energy Star Compliant

1.2.7 Environtal Conditions

See the LQ-2070 Service Manual.

1.2.8 Reliability

- MVBF *: 19 million lines (except printhead)
- MTBF: 10000 POH
- Printhead life: 200 million strokes/wire

*: Mean print volume between failure

1.2.9 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

1.2.10 CE Marking

- 230 V version
 - Low voltage directive 73/23/EEC:EN60950
 - EMC Directive 89/336/EEC: EN55022 class B
EN61000-3-2
EN61000-3-3
EN50082-1
IEC801-2
IEC801-3
IEC801-4
- Acoustic noise: Approximately 50 db(A)
(ISO 7779 pattern)

1.2.11 Physical Specifications

- Without options:
 - Dimensions: 639 mm(W) x 402 mm(D) x 268 mm(H)
 - Weight: Approximately 13 kg
- Including CSF bin 1
 - Dimensions: 639 mm(W) x 469 mm(D) x 380 mm(H)
 - Weight: Approximately 16.3 kg
- Including CSF bin 1 & bin 2
 - Dimensions: 639 mm(W) x 598 mm(D) x 411 mm(H)
 - Weight: Approximately 17.2 kg

1.3 Firmware Specifications

This section describes the firmware specifications for the LQ-2080.

1.3.1 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
BRASCI	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)	ISO 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	
BRASCI	Roman 8	ISO Latin 1
Hebrew7*	Hebrew8*	PC862 (Hebrew)*
PC 858	ISO 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 1-6. 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 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 ISOLatin1 ISO 8859-15	PC 437(US, Standard Europe)* ¹ PC 860(Portuguese)* ¹ PC863 (Canadian-French)* ¹ BRASCII* ¹ Roman8 PC 858	EPSON Script EPSON OCR-B EPSON Orator EPSON Orator-S EPSON Script C	
	PC 864 (Arabic)		EPSON Draft EPSON Roman	(Not supported)
	PC437Greek PC 853 (Turkish) PC 857 (Turkish) PC 869 (Greek) Code MJK (CSFR) ISO 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) ISO 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.

1.3.2 Interface Specifications

This section only provides information which is specific to the LQ-2080. For other information, refer to the LQ-2070 Service Manual.

1.3.2.1 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-2070 except for the function of the pin below:

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

1.3.2.2 Parallel Interface (Reverse Channel)

- Transmission mode: 8 bit parallel, 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-2080;
CLS: PRINTER;
DES: EPSON[SP]LQ-2080;
```

- Pin assignment: The pin assignment (reverse channel) is the same as for the LQ-2070 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.

1.4 Operation Instruction

This section provides information on the LQ-2080 control panel buttons, LED, and operations. Since the layout and functions of the control panel are mostly common to those of LQ-2070, this section only provides the information that is specific to LQ-2080. For other information, see LQ-2070 Service Manual.

□ Operations at power on

Turning on the printer while pressing panel buttons executes the functions shown in the following table.

Table 1-7. Operations at Power On

No.		Function
1	Load / Eject	LQ self test
2	LF / FF	Draft self test
3	Condensed	Default setting (See the following table for the setting menu.)
4	Load / Eject & LF / FF	Data dump
5	Font & Tear Off / Bin	EEPROM clear
6	Tear Off / Bin & Load / Eject	Clear EEPROM for Driving Line count for ribbon change timing
7	Pause	Bi-d adjustment
8	The others	Not available.

NOTE: Unlike the LQ-2070, the LQ-2080 does not support the quiet mode.

Table 1-8. Default Setting Menu

Item	Setting / Value ^{*1}
Page length for front tractor	3 inch, 3.5 inch, 4 inch, 5.5 inch, 6 inch, 7 inch, 8 inch,
Page length for rear tractor	8.5 inch, 11 inch , 70/6 inch, 12 inch, 14 inch, 17 inch
Skip over perforation	On, Off
Auto tear off	On, Off
Auto line feed	On, Off
Print direction	Auto, Bi-d. , Uni-d.
I/F mode	Auto , Parallel, Optional
Auto I/F wait time	10 sec. , 30 sec.
Software	ESC-P2 , IBM 2391 Plus
Character table	Standard version / NLSP version: See Section 1.2 for the character tables available. PC437
International character set for Italic table	Italic U.S.A. , Italic France, Italic Germany, Italic U.K., Italic Denmark 1, Italic Sweden, Italic Italy, Italic Spain 1
0 slash	On, Off
High speed draft	On , Off
Input buffer	On , Off
Buzzer	On , Off
Auto CR (IBM 2391 Plus)	On, Off
A. G. M. (IBM 2391 Plus)	On, Off
Font ^{*2}	OCR-B, Orator, Orator-S, Script C, Roman T , Sans serif H
Roll paper	On, Off

*1: Settings with bold weight means the standard factory settings.

*2: One of the fonts selected in the default setting is corresponding to others (=other font) on the control panel. Following fonts are not selected in the default setting mode; Draft, Roman, Sans serif, Courier, Prestige, and Script

- Status code indicated by the LEDs

Table 1-9. Status Code Indicated by the LEDs

	Pause	Paper Out	Tear Off / Bin	Condensed	Font
Pause	On	---	---	---	---
Paper out error	On	On	---	---	---
Paper eject warning	On	Blink	---	---	---
Head hot warning	Blink	---	---	---	---
Micro Adjust	Blink	---	---	---	---
Tear off	---	---	---	---	---
Bin selection	---	---	---	---	---
Condensed selection	---	---	---	---	---
Font selection	---	---	---	---	---
Fatal error	Blink	Blink	Blink	Blink	Blink

- Buzzer

Paper out error: Beeper sounds (...) *

Release lever operation error: Beeper sounds (- - - -) *

Illegal panel operation: Beeper sounds (.) *

* The description (.) and (-) shows how the beeper sounds.

(.): Beeper sounds approx. 100 ms and interval is approx. 100 ms.

(-): Beeper sounds approx. 500 ms and interval is approx. 100 ms.

1.4.1 Errors

- Paper out:
When printer fails to feed a sheet, it goes paper out error
- Release lever error:
When release lever position is wrong, it goes release lever error.
- Fatal error:
Carriage control error and Power supply voltage error

1.4.2 EEPROM Initialization

Areas reset by EEPROM clear operation are as shown in the following tables:

Table 1-10. 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	Condensed	Off
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 1-11. 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

1.5 Main Components

The main components for the LQ-2080 are as follows. They are designed for easy disassembly and repair work.

- C273 Main Board
- C166 PSB/PSE Board
- C165 PNL Board
- Printer Mechanism
- Housing (upper and lower cases)

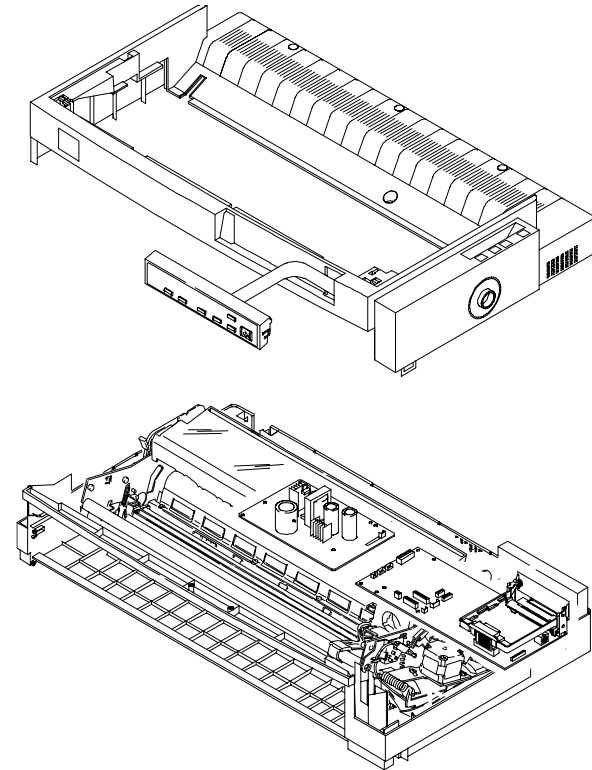


Figure 1-1. Main Components for LQ-2080

1.5.1 C273 Main Board

Table 1-12. Relationship between Program ROM and CG

Destination	Program ROM(IC10)	CG ROM(IC6)	Comments
Standard	8 M bit TDD21	None	Standard Character is stored in the Program ROM.
Europe	8 M bit TDD25	None	Standard Character is stored in the Program ROM.
TAIWAN	4 M bit TDD27	32 M bit M320A19 □ A	Program ROM and CG-ROM are completely independent.
Korea	4 M bit TDD30	8 M bit M80C00 □ A	Program ROM and CG-ROM are completely independent.
China	4 M bit TDD29	16 M bit M160B11 □ A	Program ROM and CG-ROM are completely independent.

NOTE: "□" represents the version information.

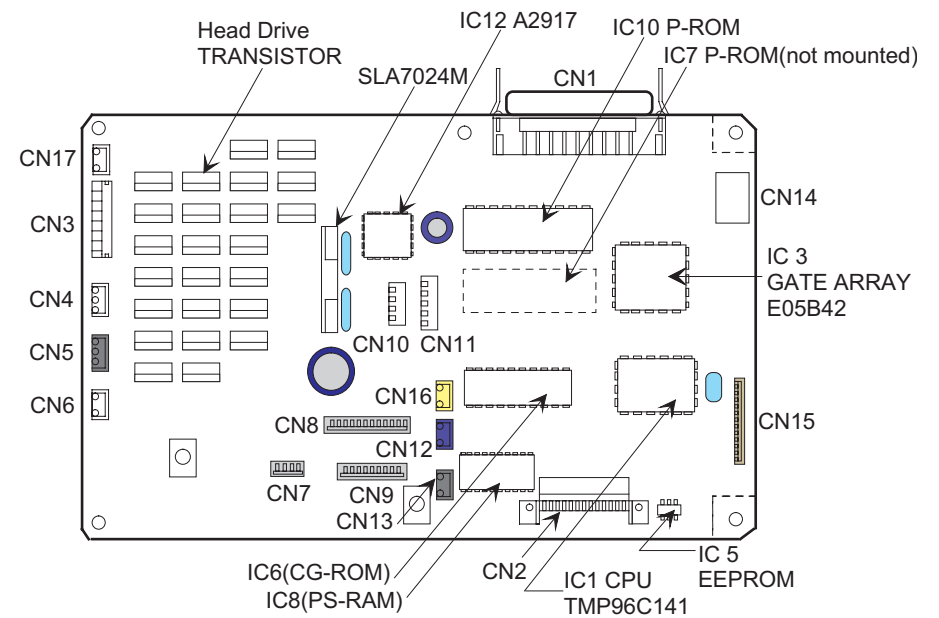


Figure 1-2. C273 Main Board

CHAPTER

2

OPERATING PRINCIPLES

2.1 Printer Mechanism Operations

See the LQ-2070 Service Manual.

2.2 Power Supply Operation

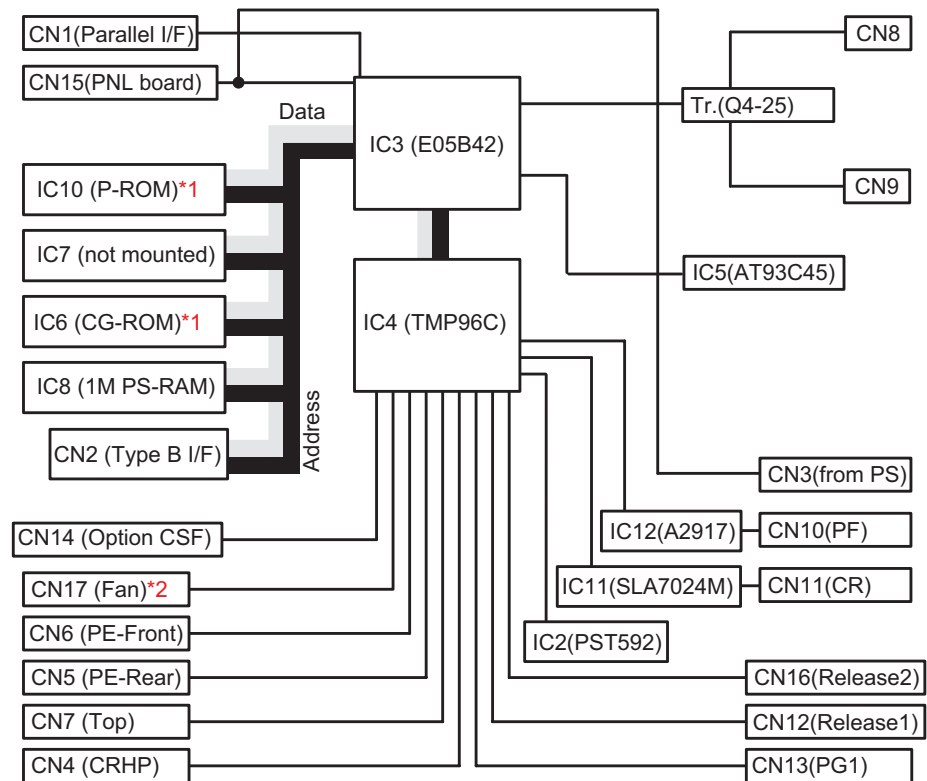
See the LQ-2070 Service Manual.

2.3 Control Circuit

The control circuit consists of the C273 Main Board assembly and C165 PNL board. This section describes the major components and explains how the boards work.

2.3.1 Overview of Control Circuit Operation

The printer's control circuit includes a TMP96C041BF CPU that runs at 19.66 MHz, an E05B24YB gate array, a 1M bit PS-RAM (8-bit bus, less than 100ns), a bit PROM (8-bit bus, less than 100ns), CG (Standard Version) or CG (NLSP Version). It oversees control of all the components in the printer. The following chart shows you a block diagram of the control circuit.



*1: Refer to the Chapter 1 / Main Component / Table "Relationship between the Program ROM and CG".

*2: CN17 on the main board is not used because power for driving the Cooling Fan is supplied from the power supply board. Therefore, CN17 is not used.

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.

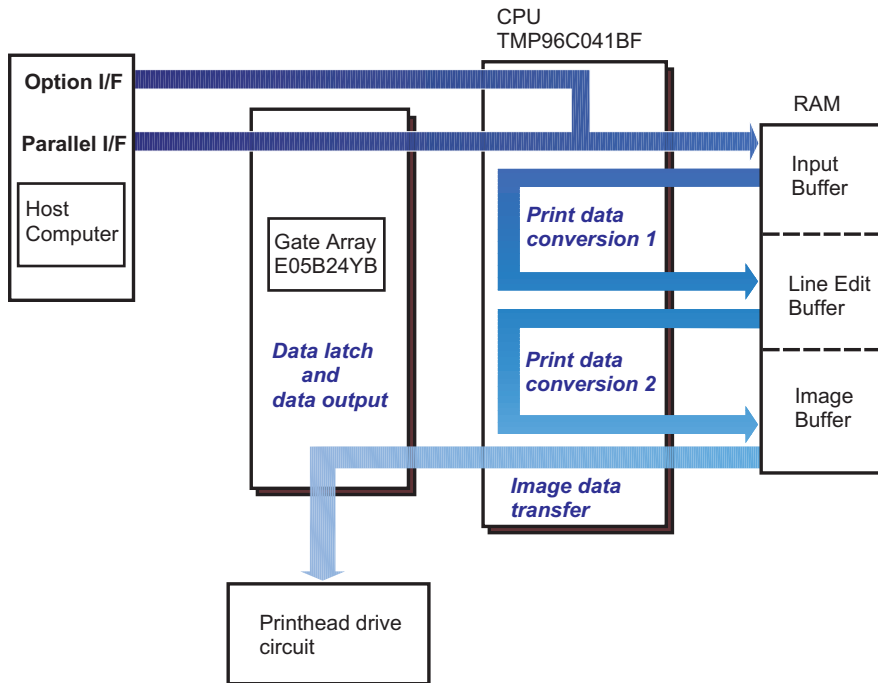


Figure 2-2. Data Flow

The table below lists the each function of the main components of the C273 Main Board.

Table 2-1. Functions of the Main Board

IC	Location	Function
CPU	IC 4	Receives data from the host computer and sends it to the input buffer in RAM (under interrupt processing control). Extends the input data held in the buffer to create image data. Loads this image data to the image buffer in RAM. Transfers the image data to the printhead driver circuit.
Gate Array	IC 3	Controls the functions below: <ul style="list-style-type: none"> • Controls output data from the internal block • Memory management • Address latch of the address/data bus from the CPU • Clock control unit • Bit manipulation • Interface control • Expanded parallel port • Printhead control • Motor control
EEPROM	IC 5	An electrically writable and erasable ROM used to hold information such as the TOF position and bidirectional adjustment value.
ROM	IC 10	The ROM contains the program that runs the CPU and holds the character design (also called the character generator).
RAM	IC 8	The RAM contains the CPU working area and the buffers.
CG	IC 6	The CG contains the bitmap fonts for each character table.
SLA7024M	IC 11	Driver circuit for the CR motor.
A2917SEB	IC 12	Driver circuit for the PF motor.

2.3.1 System Reset Circuit

Control circuits IC3 and IC4 are initialized when a /RESET signal (LOW level) is output from port 1 (VOUT) of IC2. IC2 monitors the +5 V line on port 3, and resets under the following conditions:

1. When the power supply is turned on, a /RESET signal is output. /RESET is canceled when the +5 V line goes up to 4.2 V, and then 100 ms passes.
2. When the +5 V line goes below +4.2 V, a /RESET signal is output. /RESET is canceled when the +5 V line goes back up to 4.2 V and then 100 ms passes.

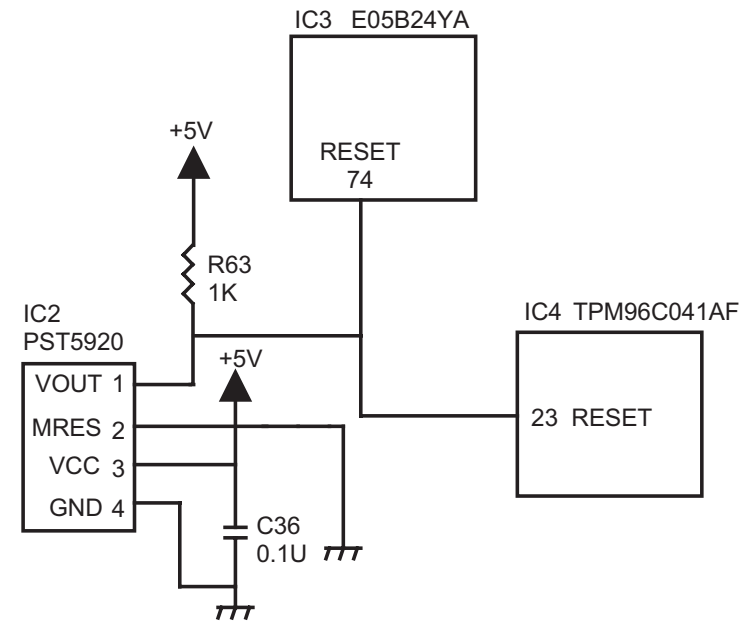


Figure 2-3. Reset Circuit

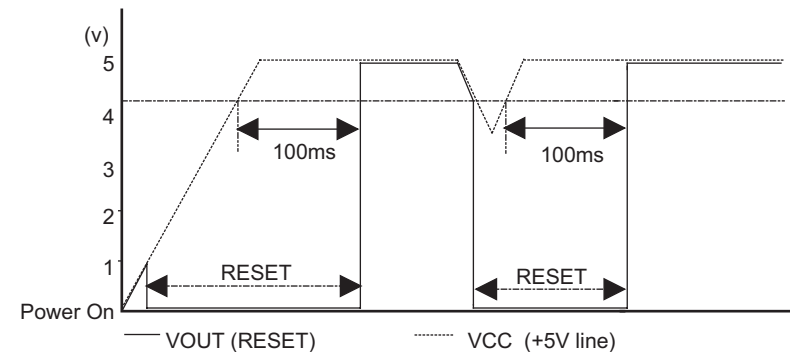


Figure 2-4. Reset Signal Output Timing

2.3.2 Printhead Driver Circuit

The standard voltage for the A/D converter is made in ZD1 and input to CPU port 78. Based on this standard voltage, the A/D converter in the CPU operates. Port 74 monitors the +35 V line between R139 and R140 to determine the printhead driver pulse width. Using the monitored voltage, the CPU converts the voltage to a digital value and decides the printhead driver pulse width, and then transports the data to the gate array via CPU port 15. Based on the monitored voltage, the CPU decides the printing interval. Port 73 monitors the printhead temperature to protect the printhead. If the temperature exceeds 95° C (213° F), printing is stopped.

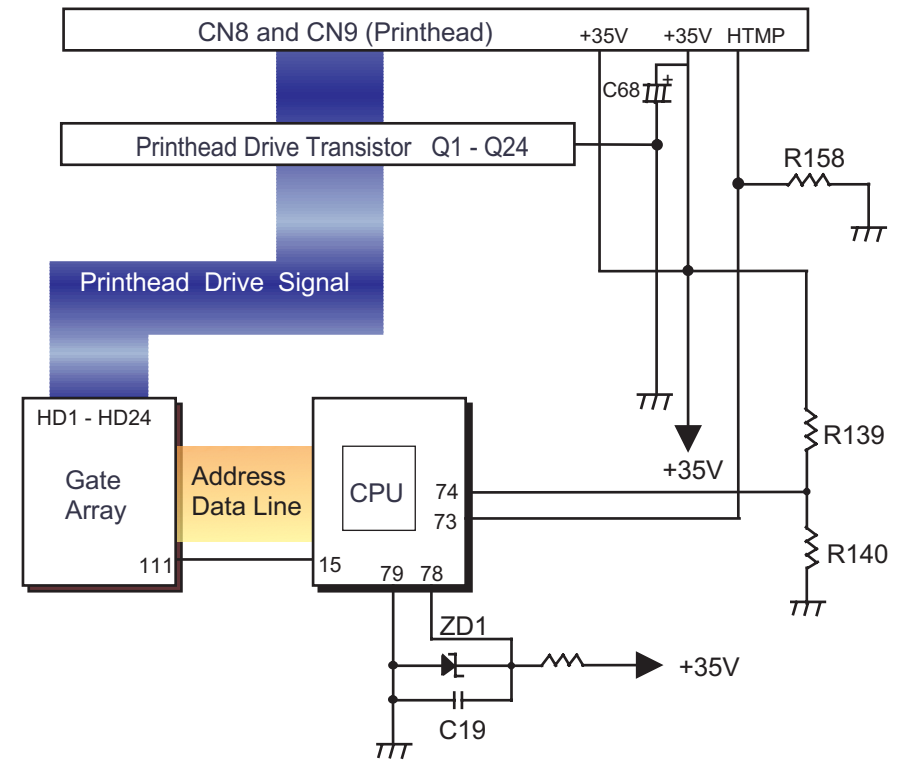


Figure 2-5. Printhead Drive Circuit

2.3.3 CR Motor Driver Circuit

The CR motor driver circuit is shown below.

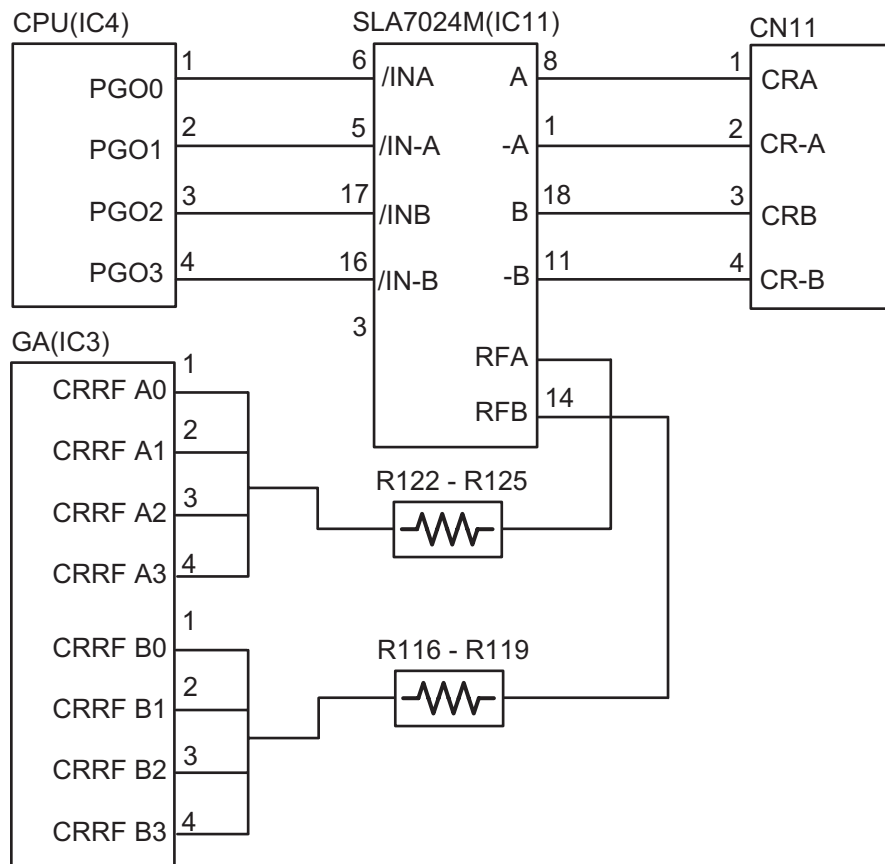


Figure 2-6. CR Motor Driver Circuit

The carriage motor driver circuit controls the CR motor, using an open-loop, constant drive arrangement. 2-2, 1-2, and W1-2 phases excite the motor. A 2-2 phase step is equivalent to a 1-2 phase step doubled. Ports 1, 8, 11, and 18 of the SLA7024M are used to change the excitation phase, depending on the selected print mode. Table 2-2 in the following page describes the motor driver modes.

The SLA7024M (IC11) CR motor driver circuit detects and regulates the amount of current flowing in the carriage motor coil. The current flowing through the coil varies, depending on the speed of the CR motor. The CPU sets the amount of current and signals are sent via ports 32 to port 35. The SLA7024M sets the coil current, depending on the CR speed.

Table 2-2. CR Motor Driver Modes

Speed Mode	Print Speed (CPS)	Drive Frequency (PPS)	Excitation Phase	Applications
4	400	4800	2-2	High speed draft
3	300	7200	1-2	Draft, Bit image
8/3	267	6400	1-2	High speed draft copy
2	200	4800	1-2	High speed draft power down, Draft copy, Bit image copy, Bit image
3/2	150	3600	1-2	High speed draft power down, Draft power down, Bit image power down, Bit image
1 (Normal)	100	4800	W1-2	Draft power down 2, Bit image power down, LQ, Bit image, Raster graphics
1 (copy)	100	2400	1-2	High speed copy power down, Draft copy power down, Bit image copy power down, Bit image copy
3/4	75	1800	1-2	Bit image power down, Bit image power down 2
2/3	67	1600	1-2	Bit image copy power down, LQ Copy, Raster graphics copy
1/2	50	2400	W1-2	Bit image copy power down, Bit image copy power down 2, LQ power down, Bit image power down, Raster graphics power down
1/3	33	1600	W1-2	LQ copy power down, Bit image copy power down, Raster graphics copy power down
1/4	25	1200	W1-2	Raster graphics, Raster graphics copy
1/6	17	800	W1-2	Raster graphics power down Raster graphics copy power down

2.3.4 PF Motor Driver Circuit

The figure below shows the PF motor driver circuit.

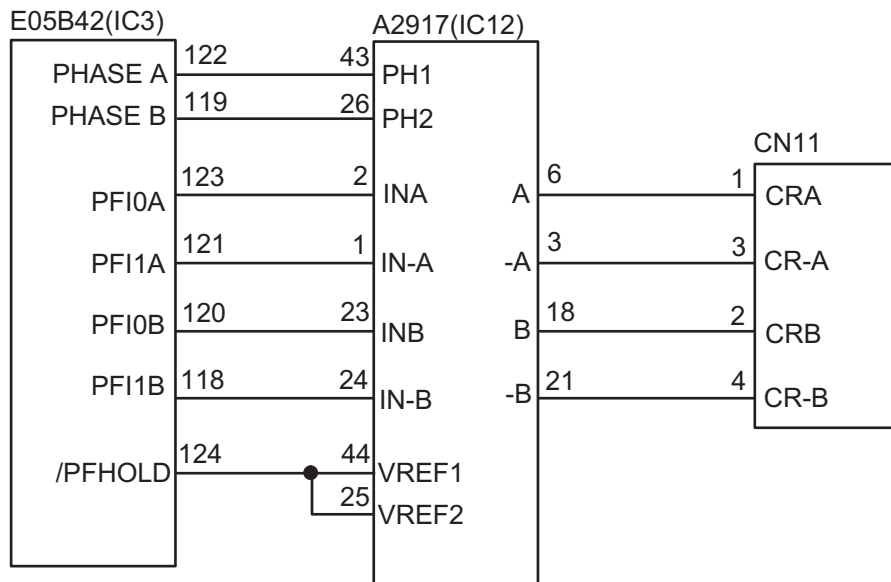


Figure 2-7. PF Motor Driver Circuit

The PF driver current is controlled on the Gate Array and the signals are output via port 123 (PFI0A), port 121 (PFI1A), port 120 (PFI0B), and port 118 (PFI1B).

2.3.5 EEPROM Control Circuit

The EEPROM is nonvolatile memory that stores information even if the printer power is off. The figure below shows the EEPROM control circuit.

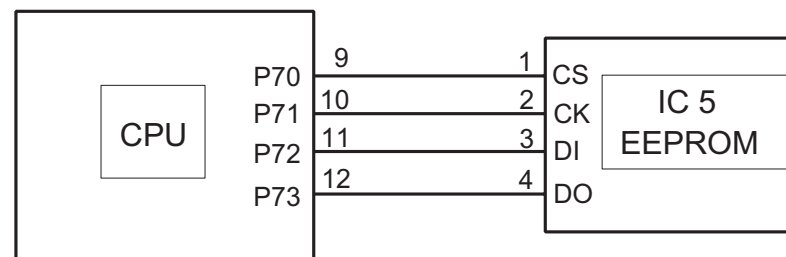


Figure 2-8. EEPROM Control Circuit

The EEPROM is controlled by CPU ports 9 (P70), 10 (P71), 11 (P72), and 12 (P73). Port 11 is the data output line used to save the information to the EEPROM, and port 12 is the data input line used to read the saved data from the EEPROM. Port 70 is the chip select line, and port 71 is the clock timing line. When the PWDN signal (power down) is detected on port 20 (INTO), the CPU writes the necessary data to the EEPROM before the +5 V line drops to 4.75 V.

2.3.6 Sensor Circuits

The CPU detects conditions of the following sensors: home position (HP) sensor, release sensors 1 and 2, platen gap (PG) sensor, rear and front paper end (PE) sensors, paper width (PW) sensor.

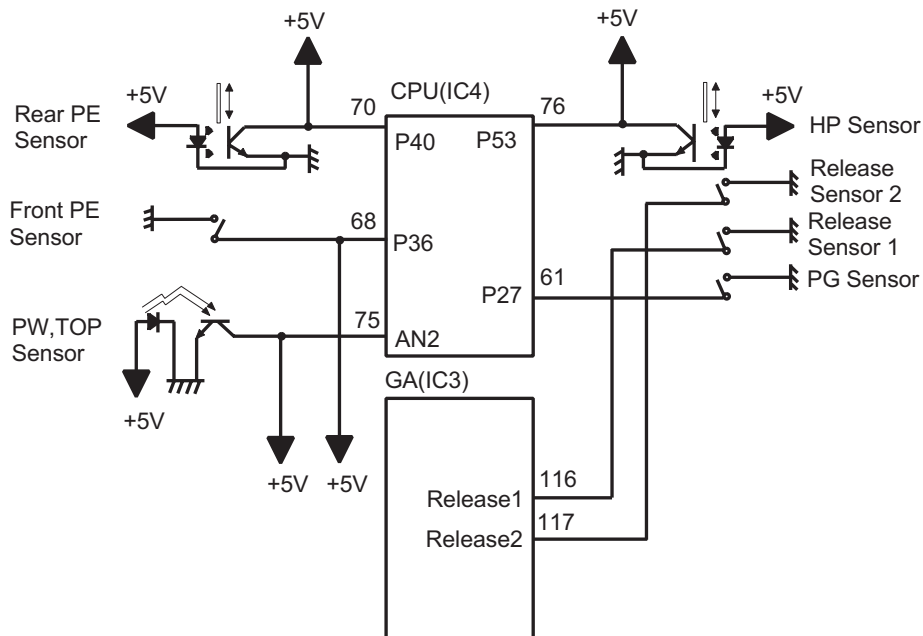


Figure 2-9. Sensor Circuit

Two types of sensors are used in this printer. Release sensors 1 and 2, the PG sensors, and the front PE sensor are momentary switches.

The HP sensor, rear PE sensor, and PW sensor are photo diode switches. The HP sensor detects CR home position when the photo diode rays are cut off by the printhead. The rear PE sensor detects that paper has been loaded when the photo diode rays are cut off by the sensor plate, which is included in the rear PE sensor. The PW sensor, used for paper width measurement and paper loading positioning, detects the paper edge by comparing the measured voltage with standard voltage, which was measured during the power on sequence.

Additionally, the +35 V line and head temperatures are monitored to set the pulse length of the head driver signal.

CHAPTER

3

DISASSEMBLY AND ASSEMBLY

See the LQ-2070 Service Manual.

CHAPTER

4

ADJUSTMENT

4.1 Overview

The adjustment items required for the LQ-2080 are the same as for the LQ-2070. 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-2070, the adjustment program used for the LQ-2080 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.

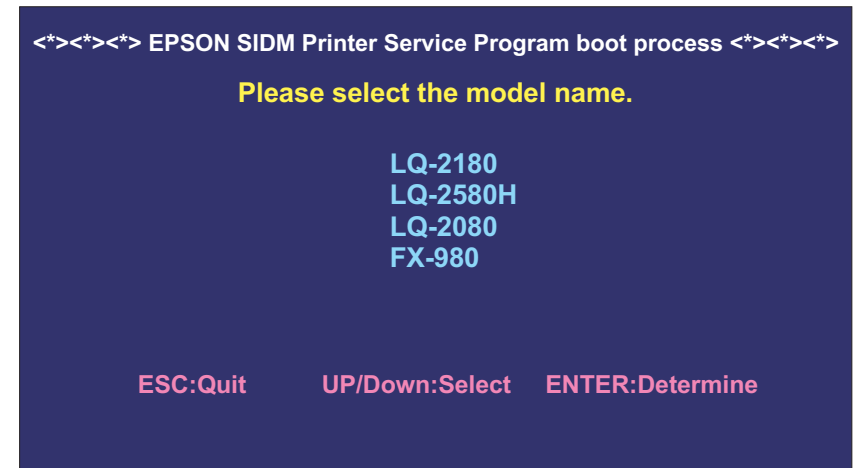


Figure 4-1. LQSERIES.EXE Initial Screen

6. Move the cursor to "LQ-2080" and press the Enter key.
7. The following screen appears.

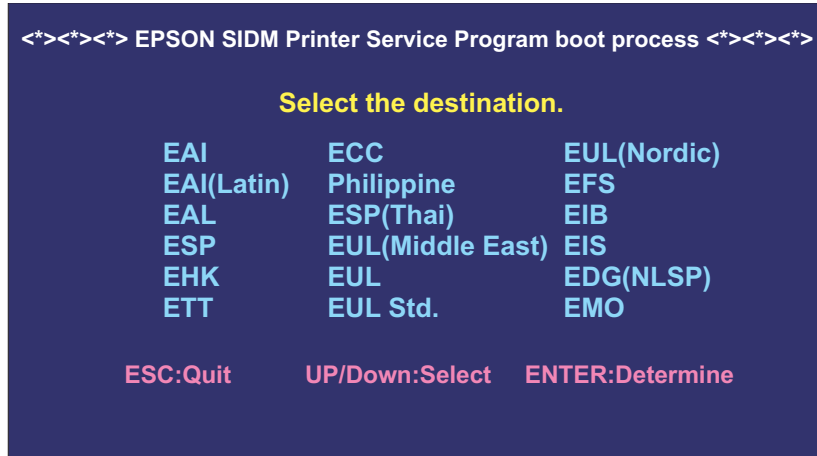


Figure 4-2. Destination Selection Screen

8. Check the printer to be adjusted for the destination and press the Enter key.



Be sure to select a proper destination. If you select a wrong destination, the printer may not print desirable characters.

9. The following screen appears.

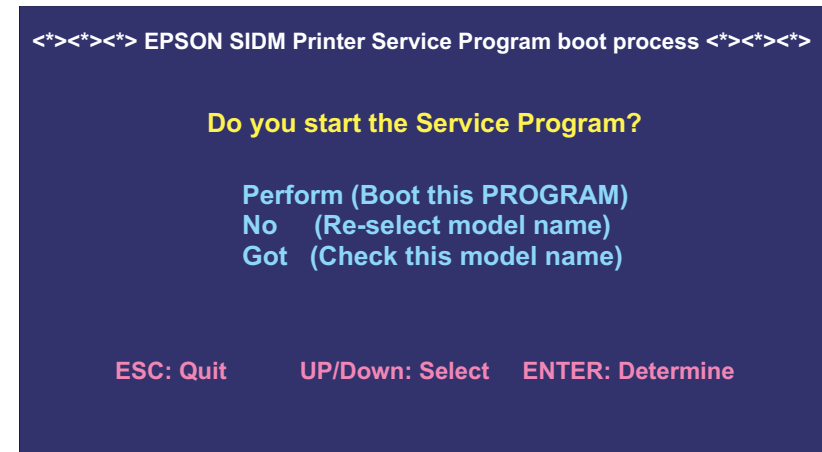


Figure 4-3. Main Menu Selection Screen

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



- 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.

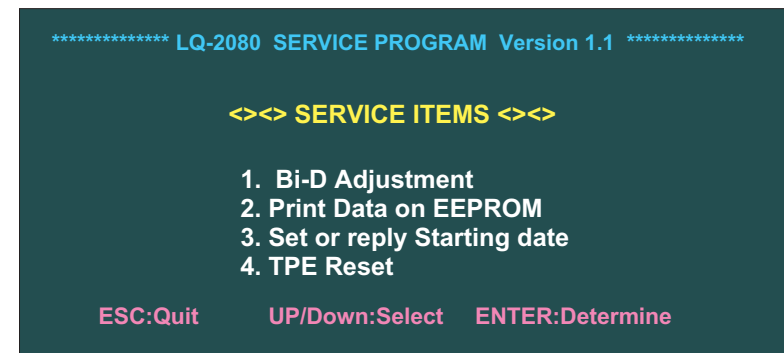


Figure 4-4. Main Menu Screen

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.

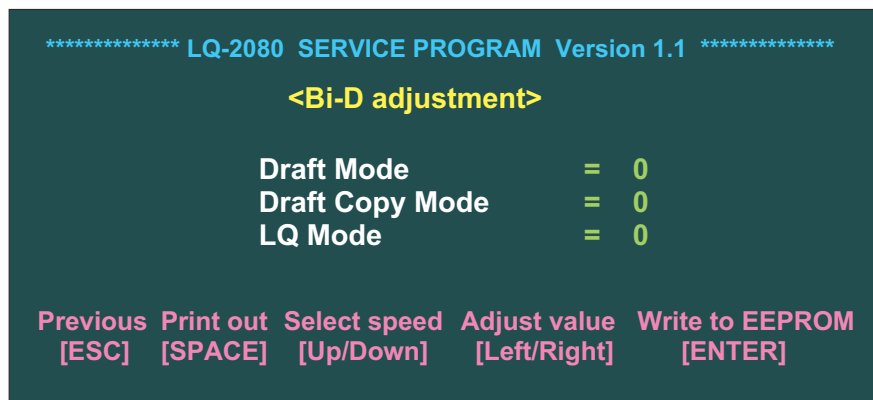


Figure 4-5. Initial Menu of the Bi-D Adjustment

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



- 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.

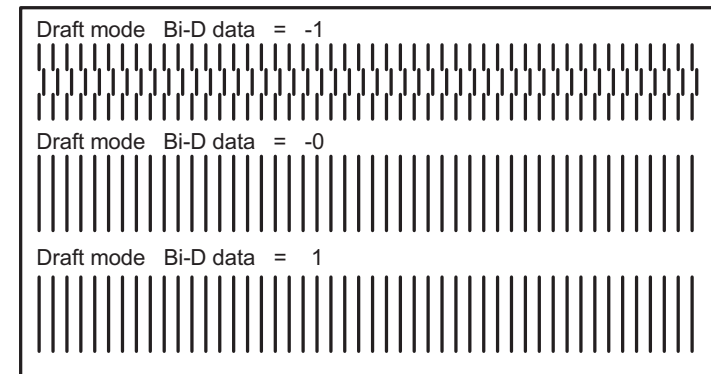


Figure 4-6. Bi-D Pattern Sample

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.

- 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.

- Perform the pre-operation. (See Section 4.1.1.)
- Select “TPE Reset” in the main menu screen (Figure 4-4) and press the Enter key. The screen below appears.

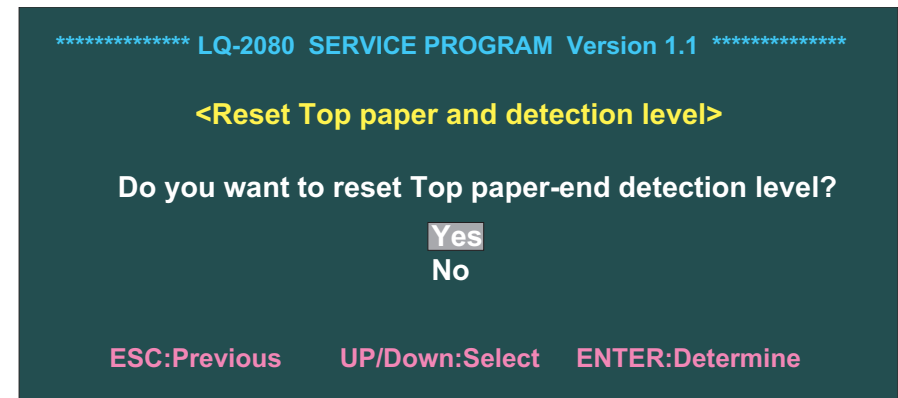


Figure 4-7. Screen - TPE Reset

- 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.

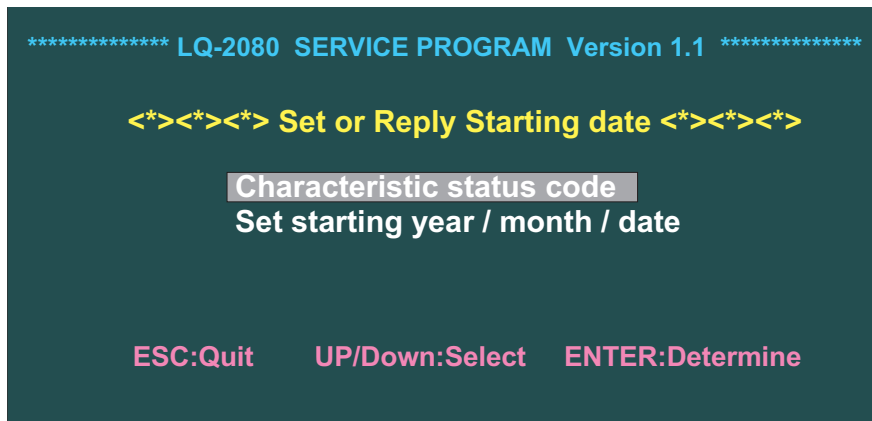


Figure 4-8. Screen - Set or Reply Starting Date

[To check the current status]

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

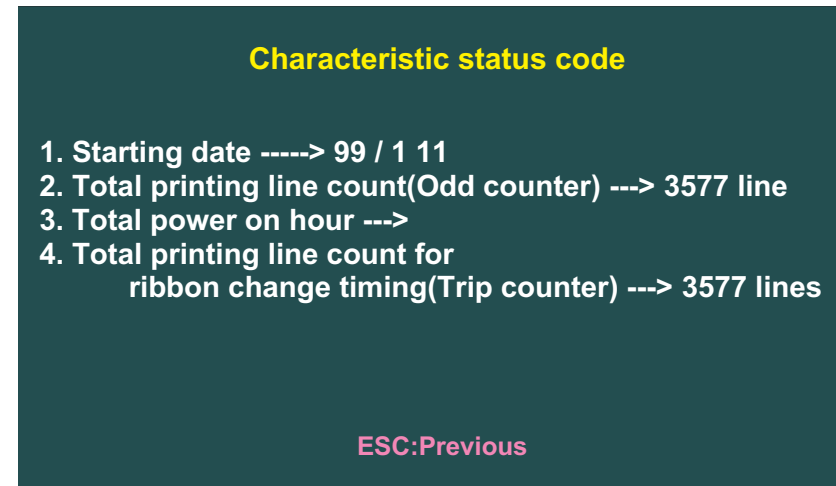


Figure 4-9. Screen - Characteristic Status Code

[To renew the Starting Year / Month / Date]

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

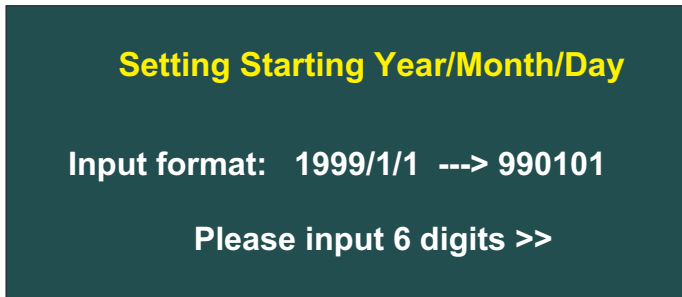


Figure 4-10. Screen - Setting Starting Year / Month / Date

5. Input a 6-digit data. Be sure to input it correctly since this program 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 information necessary for troubleshooting. Like other chapters, this chapter does not include the information common to the LQ-2070.

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-2070 except for the point below:

- Point: Table 5-1 (LQ-2070 Service Manual)

Meter Reading	
<LQ-2070> 39.3 ± 10% Ω	→ <LQ-2080> 29.6 ± 10% Ω

5.2.2 Sensors

See the LQ-2070 Service Manual.

5.2.3 Motors

See the LQ-2070 Service Manual.

5.2.4 The Error codes with Indicators and Buzzer

- Error codes indicated by the LEDs

Table 5-1. Error Code Indicated by the LEDs

	Pause	Paper Out	Tear Off / Bin	Condensed	Font
Paper out error	On	On	---	---	---
Paper eject warning	On	Blink	---	---	---
Head hot warning	Blink	---	---	---	---
Fatal error	Blink	Blink	Blink	Blink	Blink

- Buzzer

- Paper out error:Beeper sounds (...) *
- Release lever operation error:Beeper sounds (- - - -)*
- Illegal panel operation:Beeper sounds (.)*

* The description (.) and (-) shows how the beeper sounds.
 (.): Beeper sounds approx.100 ms and interval is approx. 100 ms.
 (-): Beeper sounds approx.500 ms and interval is approx. 100 ms.

5.3 Unit Level Troubleshooting

The information for this section is the same as for the LQ-2070 except for the point below:

- Point: Main board number

<LQ-2070>	<LQ-2080>
C186 Main Board	→ C273 Main Board

5.4 Repairing the C166 PSB/PSE Board

See LQ-2070 Service Manual.

5.5 Repairing the C273 Main Board

This section provides instructions to repair the C273 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 C273 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)

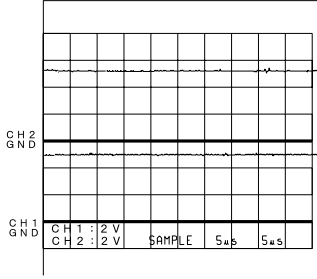
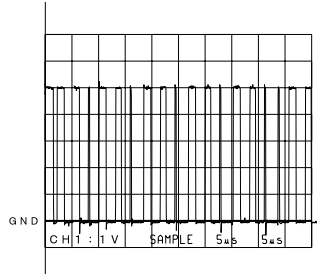
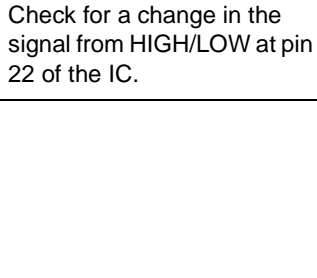
Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	Reset IC2 is defective.	Check the voltage waveforms of the VCC signal (CH1: IC2 pin 3) and VOUT signal (CH2: IC2 pin 1) when power is turned on. 	Replace IC2.
	The PROM (IC10) is not selected.	Check for a change in the signal from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

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

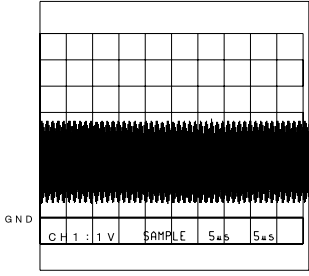
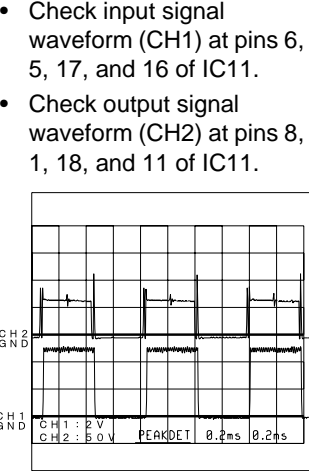
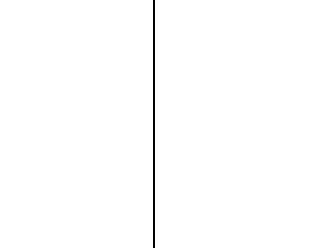
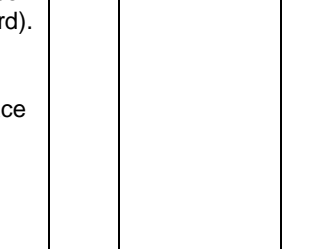
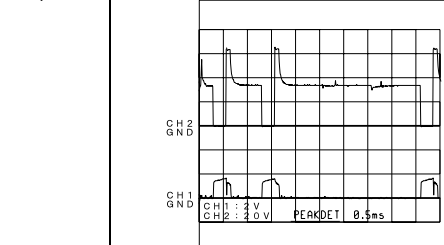
Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	CR1 is defective.	Check the oscillator signal at pins 26 or 27 of the CPU. 	If the signal is not correct, replace IC4 (or replace the main board). Otherwise, replace CR1.
Carriage operation is abnormal.	IC11 or IC4 is defective.	<ul style="list-style-type: none"> Check input signal waveform (CH1) at pins 6, 5, 17, and 16 of IC11. Check output signal waveform (CH2) 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.
	IC4 is defective.	Check the output signal at pins 1 to 4 of IC4.	If there is no output signal, replace IC4 (or replace the main board).

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

Problem	Cause	Checkpoint	Solution
Paper feed is abnormal.	IC3 is defective or IC12 is defective.	<ul style="list-style-type: none"> Check input signal waveform at pin 8 of IC12. Check output signal waveform at pins 1, 2, 23, and 24 of IC12. 	If the input signal is not correct, replace IC1 or IC2 (or replace the main board). If the input signal is correct and the output signal is not correct, replace the IC11.
No data is printed.	IC4 is defective.	Check the output signal waveform at pin 15 of IC4. 	If this signal is not output, replace IC4 (or replace the main board).
A particular dot fails to print.	IC3 is defective or one of the head drive transistors is defective (Q1 - Q24).	<ul style="list-style-type: none"> Check the voltage waveform (CH1) at port HD1 - HD24 of IC3. Check the voltage waveform (CH2) for each transistor. 	If the head drive signal is not output, replace IC3 (or replace the main board). If the head drive signal is output from the head drive transistors, replace the head drive transistor.

5.6 Repairing the Printer Mechanism

The information for this section is also the same as for the LQ-2070 except for the point below.

- Point: Table 5-8 (LQ-2070 Service Manual)

<LQ-2070>		<LQ-2080>
39.3 ohms	→	29.6 ohms

CHAPTER

6

MAINTENANCE

See the LQ-2070 Service Manual.

CHAPTER

7

APPENDIX

7.1 EEPROM Address Map

NOTE: The data of two or more bytes are assigned in such way 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 19:ISO 8859-7 1: PC850 20:MAZOWIA 2: PC860 21:Code MJK 3: PC863 22:Bulgaria 4: PC865 23:Estonia 5: PC861 24:PC774 6: BRASCII 25:ISO 8859-2 7: Abicomp 26:PC866 LAT 8: ISO Latin 1 27:PC866 UKR 9: Roman 8 28:Hebrew 7 10:PC437 Greek 29:Hebrew 8 11:PC852 30:PC862 12:PC853 31:PCAPTEC 13:PC855 32:PC708 14:PC857 33:PC720 15:PC864 34:PCAR864 16:PC866 35:PC858 17:PC869 36:ISO 8859-15 18:ISO Latin 1T 37:Italic U.S.A. 41:Italic Denmark 38:Italic France 42:Italic Sweden 39:Italic Germany I 43:Italic Italy 40:Italic U.K. 44:Italic Spain	0000H	0000H (PC437)

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 (default)	0000H (11 inch)	0000H (11 inch)
06H, 07H	Page length for front tractor	1 to 22x360 (by 1/360 inch) 0000H: 11 inch (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 (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 (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 (default)	0000H (11 inch)	0000H (11 inch)
1AH, 1BH	Bottom margin for front tractor	1 to 22x360 (by 1/360 inch), 0000H: 11inch (default)	0000H (11 inch)	0000H (11 inch)
1CH	Font selection	0: Roman 4: Prestige 1: Draft 5: Script 2: Sans serif 6: Others 3: Courier (default)	00H (Roman)	00H (Roman)

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

Address	Data	Data Format	Q-pit data	Factory setting
1DH	Condensed	0: Off 1: On	00H (Off)	00H (Off)
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. (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 T 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: CONDENSED 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. (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 - 0FFFFFFFH (count)	000000 00H	000000 00H
34H-37H	Driving Hour	0 - 0FFFFFFFH (minutes)	000000 00H	000000 00H
38H-3BH	Driving Line Count	0 - 0FFFFFFFH (count)	000000 00H	000000 00H

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 to b7: (reserved)	00H	00H
40H to 41H	TOF Minimum value	-120 to -60, 0: -60 (4.2 mm) In case it is bigger than -60, the value 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 (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 (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 information in this section is common to the LQ-2070 Service Manual except for the point below:

- Point: Figure A-1 (LQ-2070 Service Manual)

<LQ-2070>	<LQ-2080>
C186 Main Board	→ C273 Main Board

7.3 Component Layout

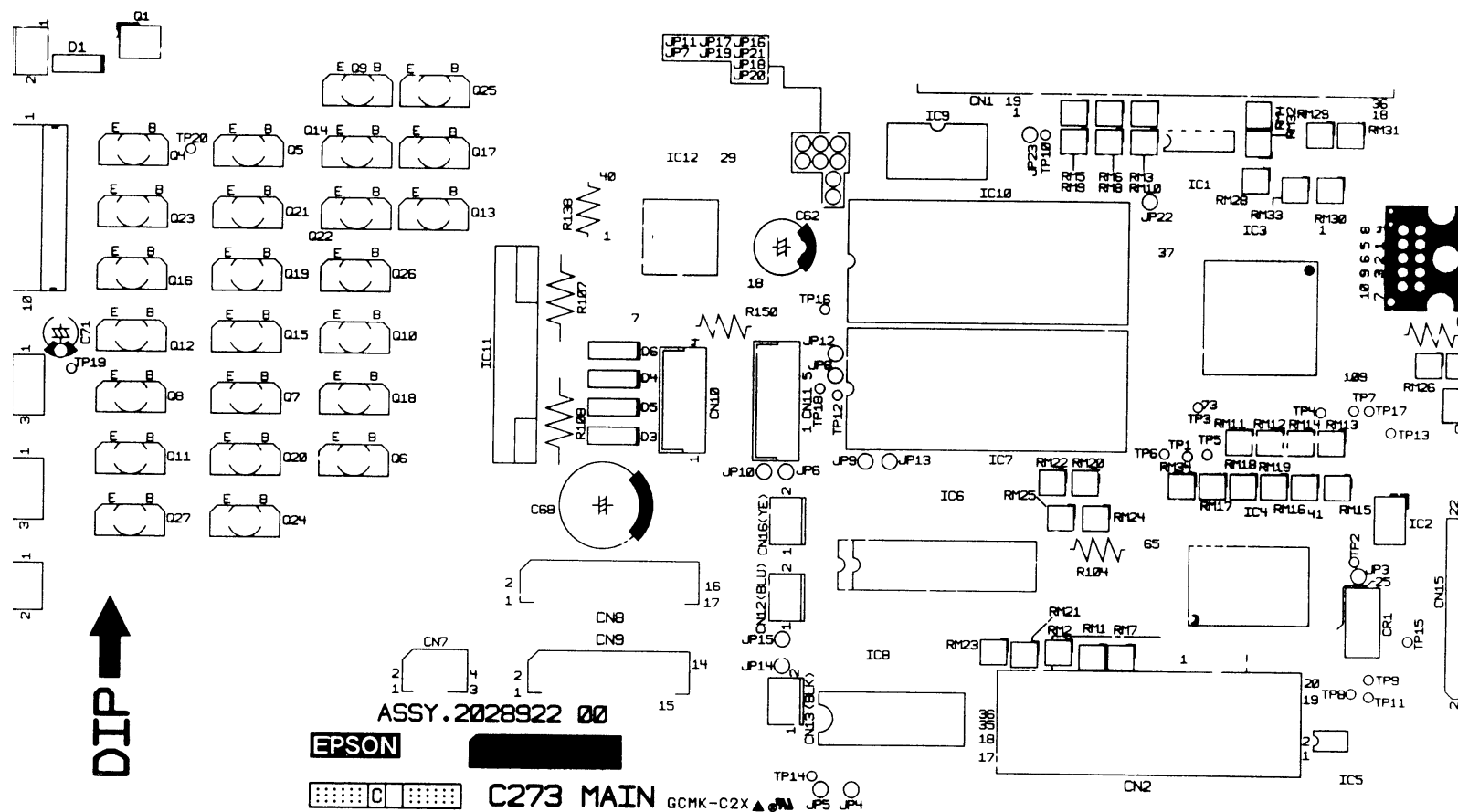


Figure 7-1. C273 Main Board Component Layout - Component Side

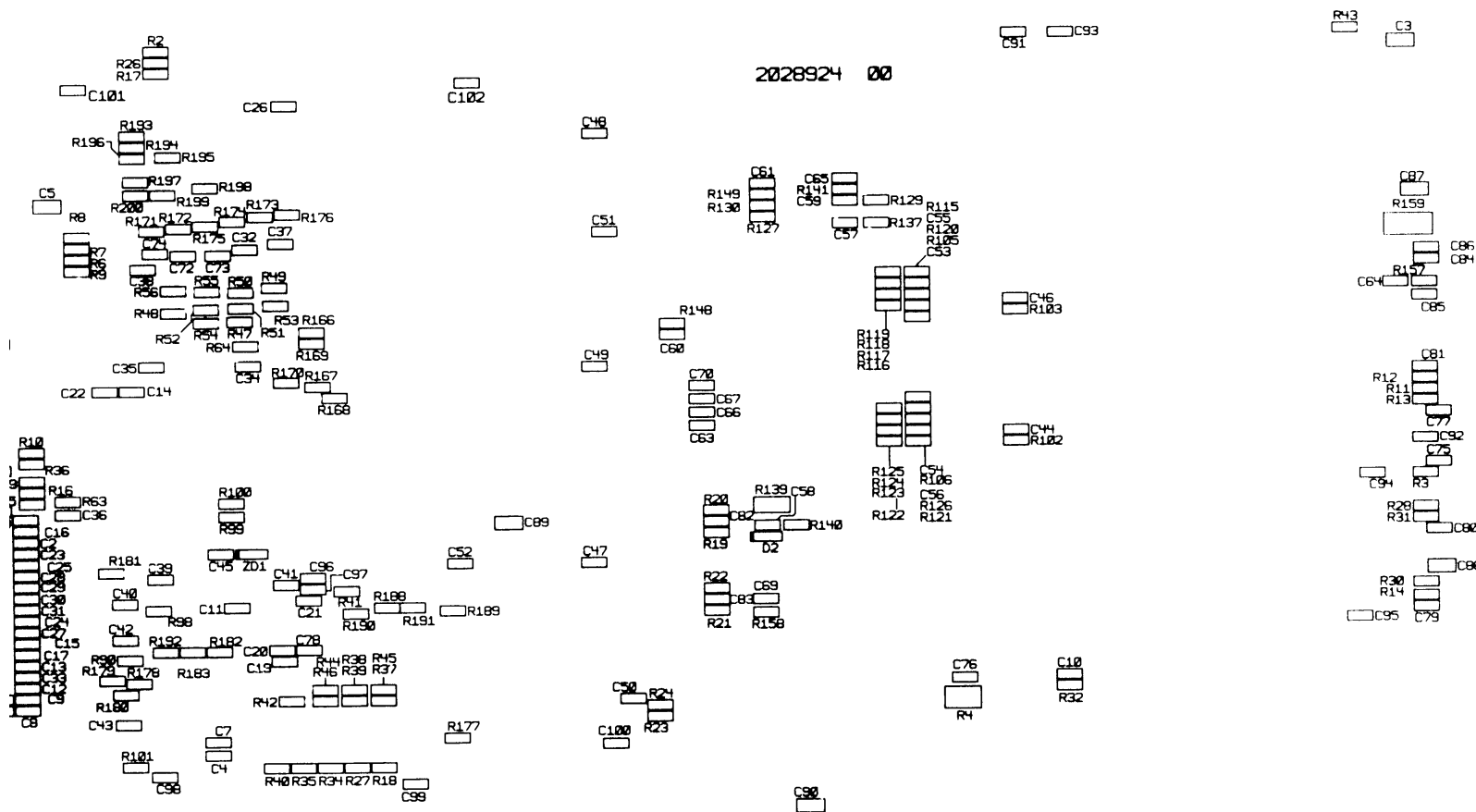
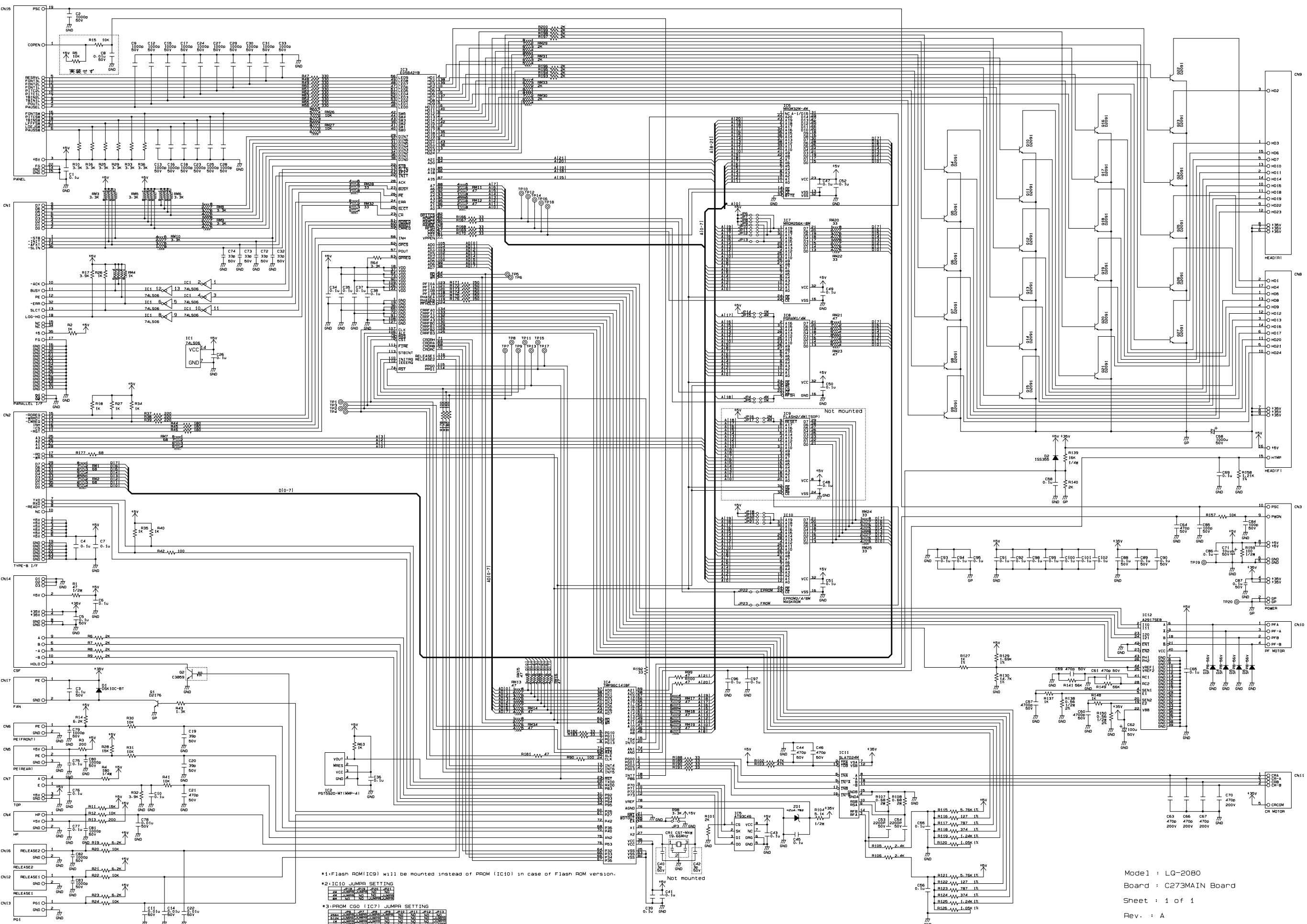


Figure 7-2. C273 Main Board Component Layout - Soldering Side

7.4 Circuit Diagram

See the following page for the circuit diagram for the C273 Main Board.



*1:Flash ROM(IC9) will be mounted instead of PROM (IC10) in case of Flash ROM version.
 *2:IC10 JUMPR SETTING
 *3:PROM CGO (IC7) JUMPR SETTING

Pin	IC10	IC9	IC7	IC6	IC5	IC4	IC3	IC2	IC1	IC0
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

Model : LQ-2080
 Board : C273MAIN Board
 Sheet : 1 of 1
 Rev. : A