

CITIZEN

Service Manual

Model: CBM-292/293

**Line Thermal
Panel Printer**

Rev 1.00 Newly issued on 29.July.1998

**Japan CBM Corporation
Information Systems Div.**

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of the dot matrix printer CBM-292/293. It is intended for field maintenance men.

FEATURES

The CBM-292/293 is a thermal line dot type small printer equipped with a line thermal head. This printer, developed for various data communication terminals, POS terminals, kitchen printers, is widely available for a variety of applications.

- (1) Rack built-in type small line thermal printer
- (2) High speed and low noise
- (3) High reliability due to long-life printing head and simple mechanism
- (4) Serial and parallel interfaces selectable by a DIP switch
- (5) Built-in input buffer
- (6) Capable of printing bar codes (By a special command)
- (7) Equipped with an auto cutter (CBM-293 only)
- (8) External character registration function (94 characters)

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1. HANDLING AND MAINTENANCE OF PRINTER

See the User's Manual coming with the printer body.

2. SPECIFICATIONS

2.1 Basic Specifications

Item	Description
Printing method	Line thermal dot printing system
Printing speed	62.5 mm/sec. at maximum
Dot density	8 dots/mm (Horizontal and Vertical)
Printing columns	Font A: 48 columns, Font B: 64 columns
Character size	Font A: 1.25 mm x 3.00 mm (10 x 24 + 2 dots space), Font B: 0.88 mm x 2.13 mm (7 x 17 + 2 dots space),
Character types	Alphenumerals, international characters
Bar code types	UPC-A/E, JAN(EAN) 13 columns/8 columns, ITF, CODE 39, CODE 128, CODABAR
Line spacing	4.23 mm(1/6 inch), settable by a command
Paper	Thermal paper roll : 80 mm x ϕ 50 mm(Max)
Interface	Parallel(CENTRONICS) or serial(RS-232C) Selectable by a DIP Switch.
Input buffer	3 KB
Paper end detection	Stops printing when the paper runs out.
Auto loading	If new paper is set into the paper inlet, it will be fed automatically.
Auto cutter (CBM-293 only)	Cuts the paper automatically by a command. Either full cut or partial cut is selectable.
International character set	Capable of setting the following 10 countries for specific character codes by a command. (U.S., French, German, English, Danish 1 and 2, Swedish, Italian, Spanish, Japanese, Norwegian)
Supply voltage and power consumption	24V DC +/-7%. Standby: Approx. 0.2A, Printing: Approx. 1.8A (Ave) / Peak: Approx. 6A
AC adapter(30AD/31AD)	Rated input: 100 ~ 240V AC, 50/60 Hz, 120VA Rated output: 24V DC, 1.8A
Operating temperature	5 ~ 40 °C, 35 ~ 85 % RH (No dew condensation)
Storage temperature	-20 ~ 60 °C, 10 ~ 90 % RH (No dew condensation)
Outer dimensions	126 (W) x 109 (H) x 99 (D) mm
Weight	CBM-292: Approx. 500g (Main body only) CBM-293: Approx. 670g (Main body only) Fitting Metals: Approx. 53g AC adapter: Approx. 430g
Applicable standards *1	UL, CUL, TUV (GS)
EMI *1	VCCI: Class A applicable, FCC: Class A applicable
Reliability	Printing head life: Pulse resistance --- 50,000,000 pulses (Print ratio: 12.5 %), Wear resistance --- 30km (With specified paper at normal temperature and humidity) Auto cutter life: 300,000 cuts (CBM-293)

*1: Applicable when the accessory AC adapter is used.

2.2 Printing Paper Specifications (Specified Paper)

Type	: Thermal paper
Paper width	: 80 plus 0 / minus 1 mm
Paper thickness	: 65 plus 5 / minus 5 μ m
Roll diameter	: ϕ 50 mm(Max)
Printing surface	: Outside of the roll(Surface)
Recommended paper	: TF50KS-E2C by Nippon Seishi, or its equivalent
Core	: ϕ 12 mm(Inner diameter), ϕ 18 mm(Outer diameter)

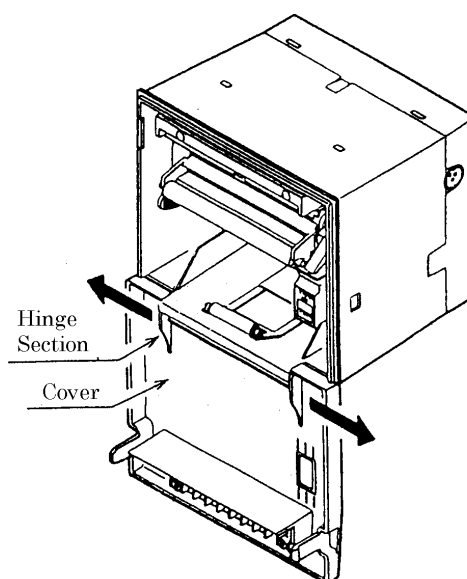


- CAUTION :**
1. User the paper which has not been pasted to the core.
 2. Note that if the paper comes into contact with a chemical or oil, it may discolor or lose the printed record.
 3. Note that if the paper is rubbed strongly with a nail or hard metal, it may discolor.
 4. Discoloring will start at about 70°C. Watch out fully for effects of the heat, moisture, light, etc.

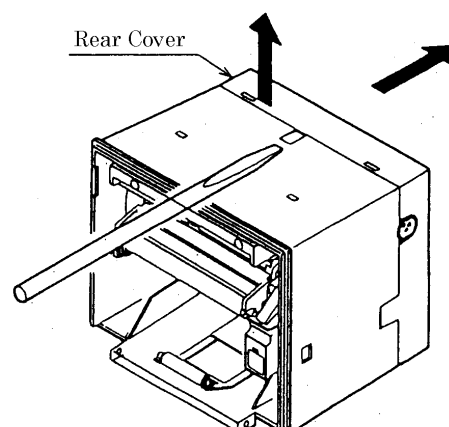
3. DISASSEMBLY AND REASSEMBLY

3.1 Disassembly Procedure

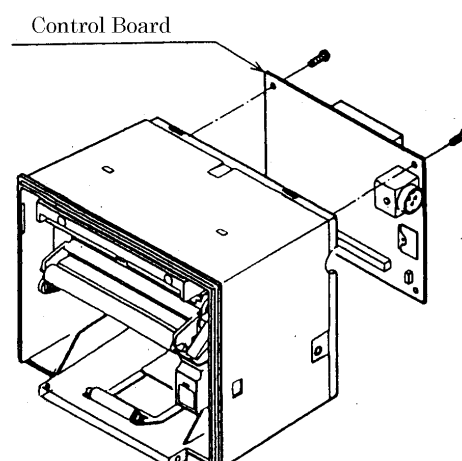
1. Remove a cover.
 - (1) Open the cover.
 - (2) Remove it, bending one hinge section outside.
 - (3) Remove the other hinge section.



2. Remove a rear cover.
 - (1) Insert a regular screwdriver into a slot located at the top (or bottom) of the rear cover.
 - (2) Raising the end of the regular screwdriver, remove the rear cover.

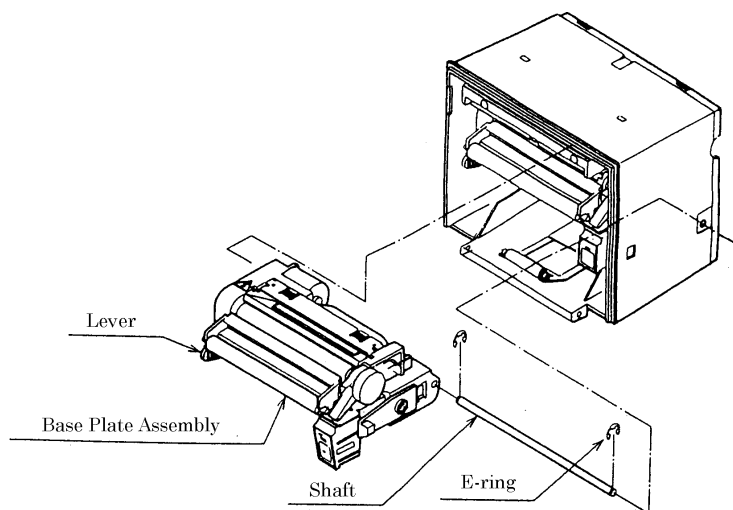


3. Remove a control board.
 - (1) Using a Phillips screwdriver, remove two screws (PHT M2.6 x 8).
 - (2) Disconnect a connector from the control board.



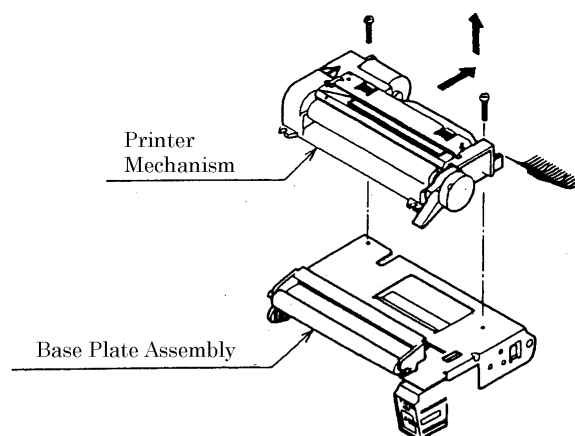
4. Remove a base plate assembly.

- (1) Remove an E-ring from a shaft.
- (2) Pull out the shaft.
- (3) Pushing a lever inside, pull out the base plate assembly to this side.



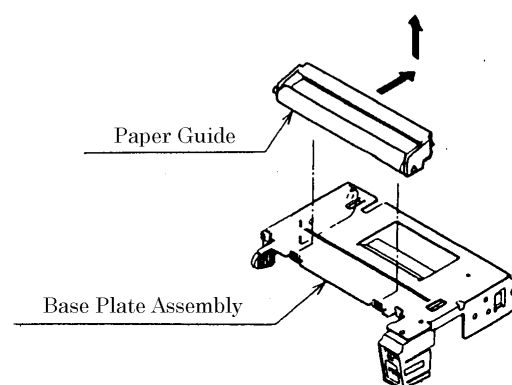
- Remove the printer mechanism (LT381H) from the base plate assembly.

- (1) Using a Phillips screwdriver, remove two screws (M2.6 x 5) from the printer mechanism.
- (2) Press the printer mechanism inside to disengage from the base plate.



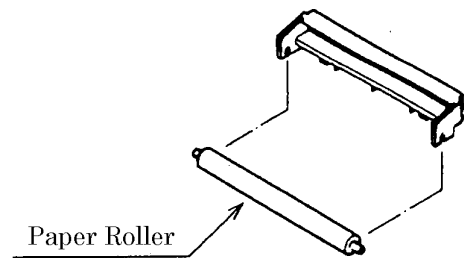
- Remove the paper guide from the base plate assembly

- (1) Press the paper guide inside to disengage it from the base plate.



- Remove the paper roller from the paper guide.

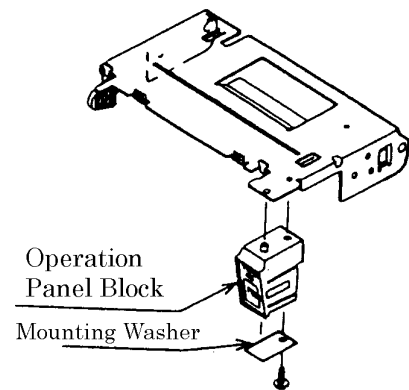
(1) Pull the paper roller downward to remove it from the paper guide.



- Remove the operation panel block from the base plate assembly.

(1) Using a Phillips screwdriver, remove a screw (M2.6 x 6) from the operation panel block.

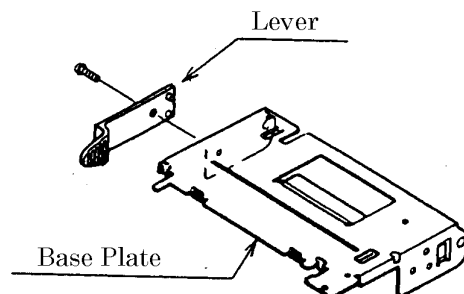
(2) Remove the operation panel block from the base plate assembly.



- Remove a lever from the base plate assembly.

(1) Using the Phillips screwdriver, remove 1 screw (PHT, M2.6 x 5) used to secure the lever.

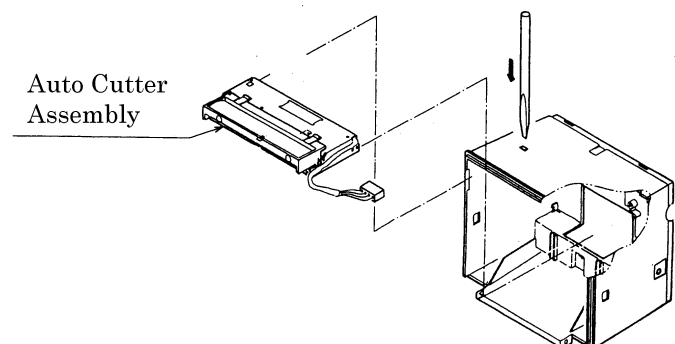
(2) Remove the lever from the base plate assembly.



5. Remove an auto cutter assembly.

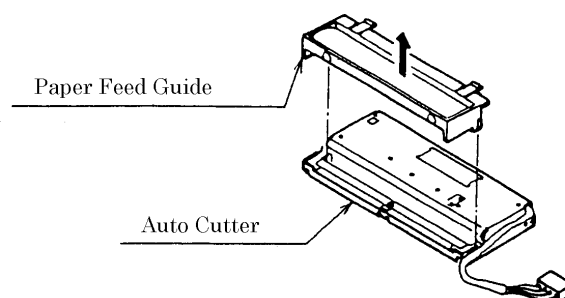
(1) Put the regular screwdriver into two holes located at the top of the case and disengage paper feed guide jaws.

(2) Pull out the auto cutter assembly to this side.



- Remove the paper feed guide from the auto cutter assembly.

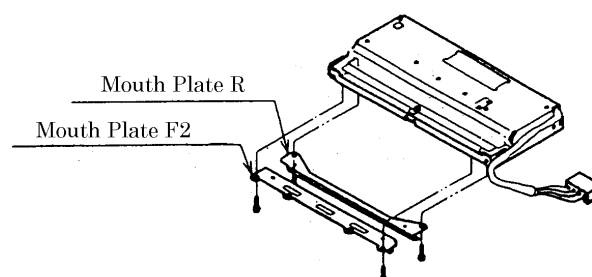
(1) Pull out the paper feed guide in an arrow-indicated direction.



- Remove the mouth plate from the auto cutter assembly.

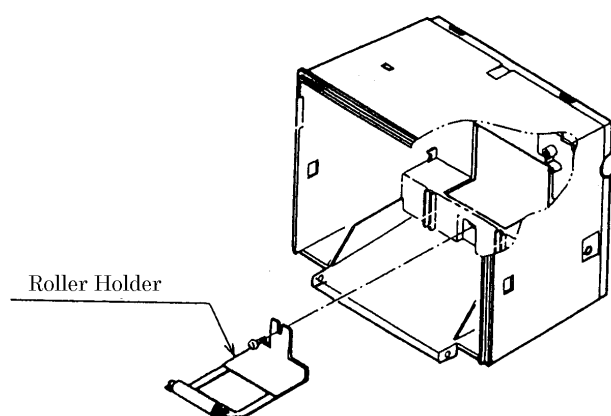
(1) Using a Phillips screwdriver, remove 4 screws (M2 x 3) from the mouth plates R and F2.

(Note) There are bosses on the cutter side. Pay attention to them when tightening the screws at assembly.



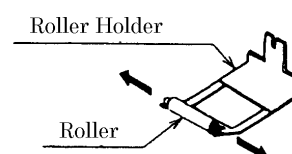
6. Remove a roller holder.

- Using the Phillips screwdriver, remove screws (binder, M2.6 x 6).
- Remove the roller holder from the case.



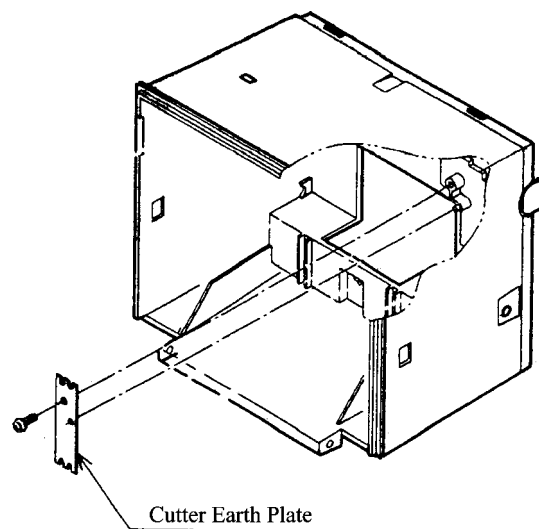
- Remove a roller from the roller holder.

(1) Expose the roller receiving section of the roller holder to the outside to remove a roller.



7. Remove a cutter earth plate

- (1) Using the Phillips screwdriver, remove a screw(PHT,M2.6x6).
- (2) Remove the cutter earth plate from the case.



3.2 Reassembly Procedure

Reassemble each part in the reverse order of the disassembly procedure described in Section 3.1.

4. TROUBLESHOOTING

4.1 Troubleshooting Procedure

When a trouble occurs, confirm its phenomenon, locate a defective part in accordance with 4.2 Troubleshooting Guide, and troubleshoot as described below.

- **Phenomenon:** Find a trouble phenomenon in this column. If there are multiple phenomena, take all the corresponding items into consideration. This allows you to specify a hidden defective part.
- **Cause:** Lists as many possible causes as possible. Guess a trouble cause out of them and take its check method to specify the trouble cause.
- **Check Method:** Describes a check method to specify a trouble cause.
- **Remedy:** Troubleshoot by taking a remedy described in this column.

By troubleshooting in accordance with the above-mentioned procedure, you can troubleshoot efficiently with fewer misjudgments.

4.2 Troubleshooting Guide

Phenomenon	Cause	Check Method	Remedy
Printing failure	Faulty power supply	Check whether 24 V DC is available.	Replace the adapter.
No printing	Faulty mounting and connection of an interface cable	Check mounting and connection of the interface cable.	Connect the interface cable correctly.
	Faulty printer mechanism		Replace the printer mechanism unit.
Thin printing color	Faulty power supply	Check whether a 24 V DC power capacity is sufficient.	Replace the adapter.
Missing dots	Foreign substance adhered to a printing head	Check the head for any adhered foreign substance.	Dip a cotton swab or soft cloth in ethyl alcohol and wipe away the foreign substance.
Badly blurred printout	Faulty power supply	Check whether a 24 V DC power capacity is sufficient.	Replace the adapter.
	Contaminated thermal head	Check the thermal head for any contamination.	Dip a cotton swab or soft cloth in ethyl alcohol and wipe away the foreign substance.
Bad printing quality	Faulty printing paper	Check whether the paper meets the specifications.	Replace it with the specified paper.
Paper feed failure	Faulty connection of a motor connector	Check connection of the connector.	Connect the connector correctly.
A printing paper feed motor does not function or malfunctions.	Faulty power supply	Check whether a 24 V DC power capacity is sufficient.	Replace the adapter.
	Faulty printer mechanism		Replace the printer mechanism.

Phenomenon	Cause	Check Method	Remedy
The printing paper is not fed or fed irregularly.	Paper feed failure	Check whether or not the printing paper is jamming or torn and caught in a paper path.	Eliminate unnecessary printing paper and re-set it correctly.
	Foreign substance in the gear	Check the platen gear or motor gear of the printer mechanism for any foreign substance.	Eliminate the foreign substance.
	Broken gear	Check the platen gear or motor gear of the printer mechanism for breakage.	If broken, replace the printer mechanism.
Faulty sensor Does not detect the printing paper.	Faulty paper sensor	Check the window of the paper sensor for any foreign substance.	Eliminate the foreign substance or replace the printer mechanism.
Faulty auto cutter The cutter does not function	Motor connector connection failure	Check the connector for connection.	Connect the connector properly
	Paper jam	Check for the printing paper for jamming.	Eliminate the jammed paper.
	Faulty auto cutter		Replace the auto cutter.
When the trouble still persists		Replace the control board and check whether the printer functions properly.	Replace the control board.

* For the printer mechanism LT-381H and auto cutter ACS-230, see the Service Manual separately provided.

5. SERVICE PARTS LIST

5.1 Parts List for Mechanism

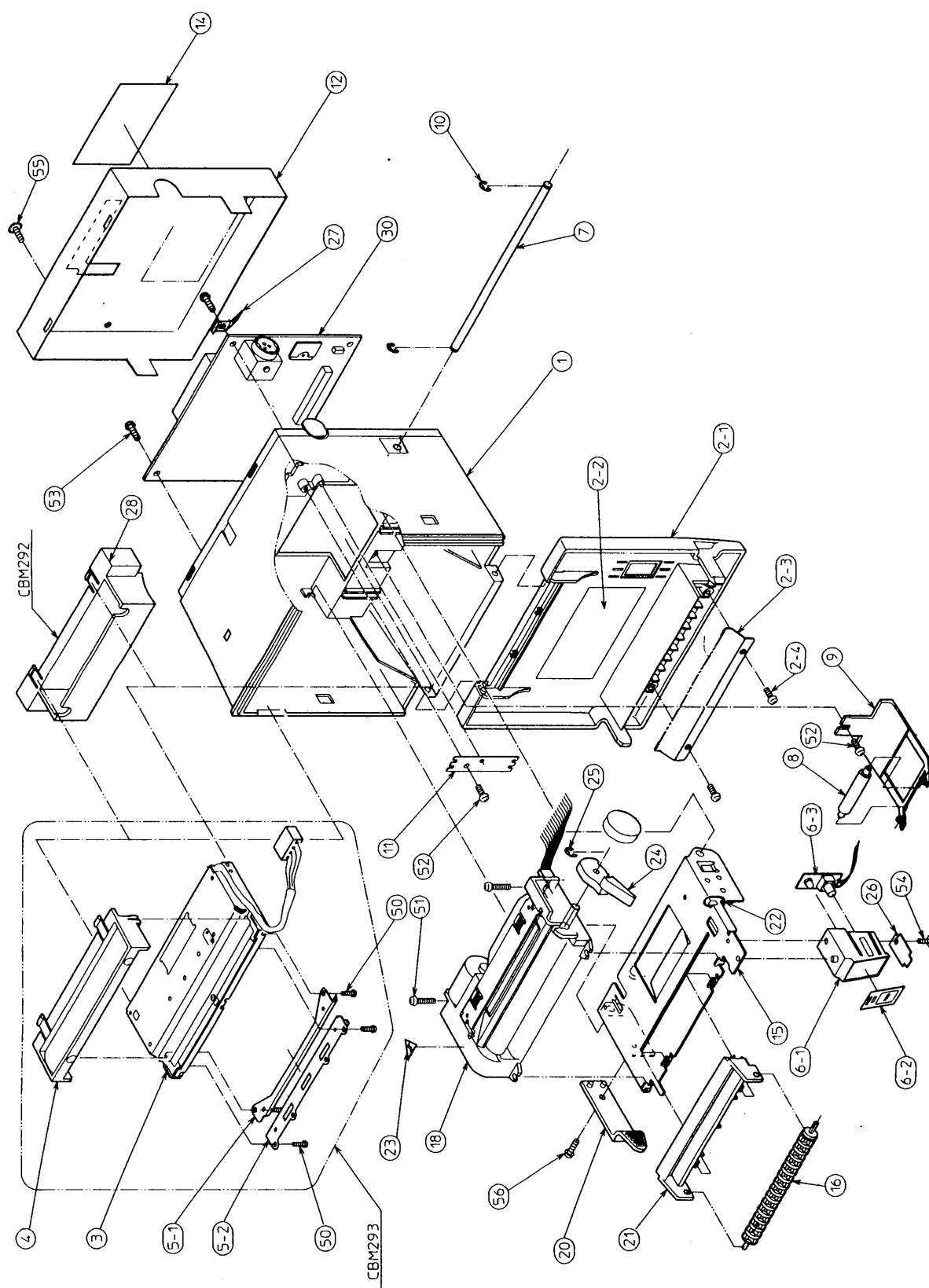
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Ref. No.	Parts No.	Description	CBM-292	CBM-293
1	E 6210-020	Case	1	1
2	E 6200-680	Front panel		1
	E 6200-690	Front panel	1	
2 - 2		Label Paper set		
2 - 3	E 6220-630	Paper cutter	1	
2 - 4	23G66725	Screw M2.6x5	2	
3	ACS231	Auto cutter ACS-231		1
4	E 8022-110	PF guide		1
5 - 1	E 8010-270	Mouth plate		1
5 - 2	E 8010-270	Mouth plate F2		1
6 - 1	E 4019-220	OP block	1	1
6 - 2	E 5200-310	OP sheet	1	1
6 - 3	E 40000210	OP PCB assy	1	1
	E 4900-410	Harness CA212-9	1	1
	E 5102-490	Switch SKHHBV	1	1
	E 480-330	LED SEL2110S	1	1
7	E 6233-120	Shaft	1	1
8	E 6233-080	Roller	1	1
9	E 6233-090	Roller holder	1	1
10	E 3	E ring E 3	2	2
11	E 4035-810	Cutter earth plate		1
12	E 6310-040	Rear cover	1	1
14		Rating label		
15	E 6601-360	Base plate	1	1
16	E 6612-080	PF roll	1	1
18	LT381H	Printer LT-381H	1	1
20	E 8029-030	Lever	1	1
21	E 8028-030	Paper guide	1	1
22	E 8035-010	Wire band	1	1
23		Label Hot		
24	E 8032-100	Head up lever	1	1
25	E 2.5	E ring E 2.5	1	1
26	E 8003-020	OP plate	1	1
27	E 4035-790	FG plate	1	1
28	E 8022-100	PF guide 292	1	

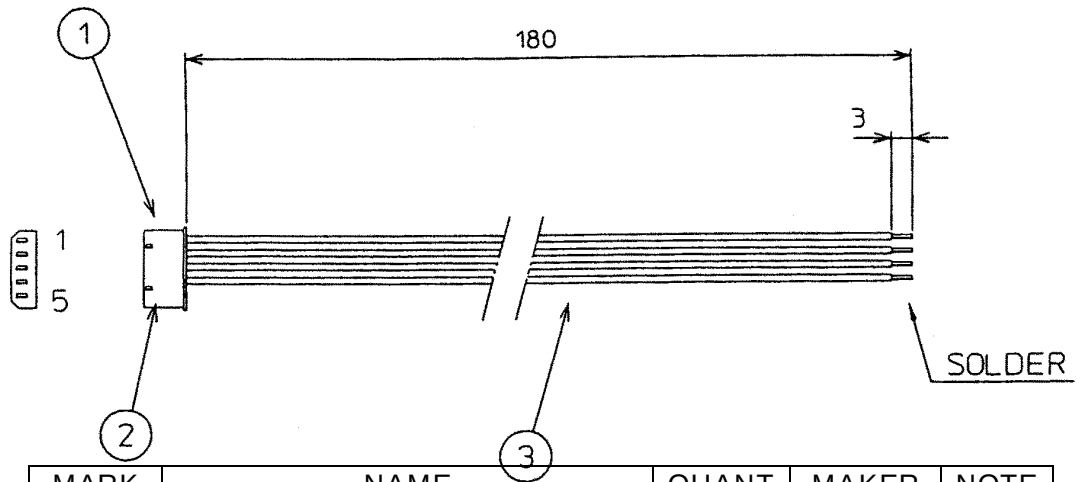
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Ref. No.	Parts No.	Description	CBM-292	CBM-293
63	E 4900-460	Cord assy CA212-5	1	1
	E 6233-130	Mounting BRT	1	1
	23G22294	Screw M3x12	2	2
	30AD	Adaptor	1	1
	E 6100-750	AC cord for 230V	1	1
	E 6100-750	AC cord for 120V	1	1

5.2 Disassembly Drawing



5.2.1 Drawing for Harness CA212-9

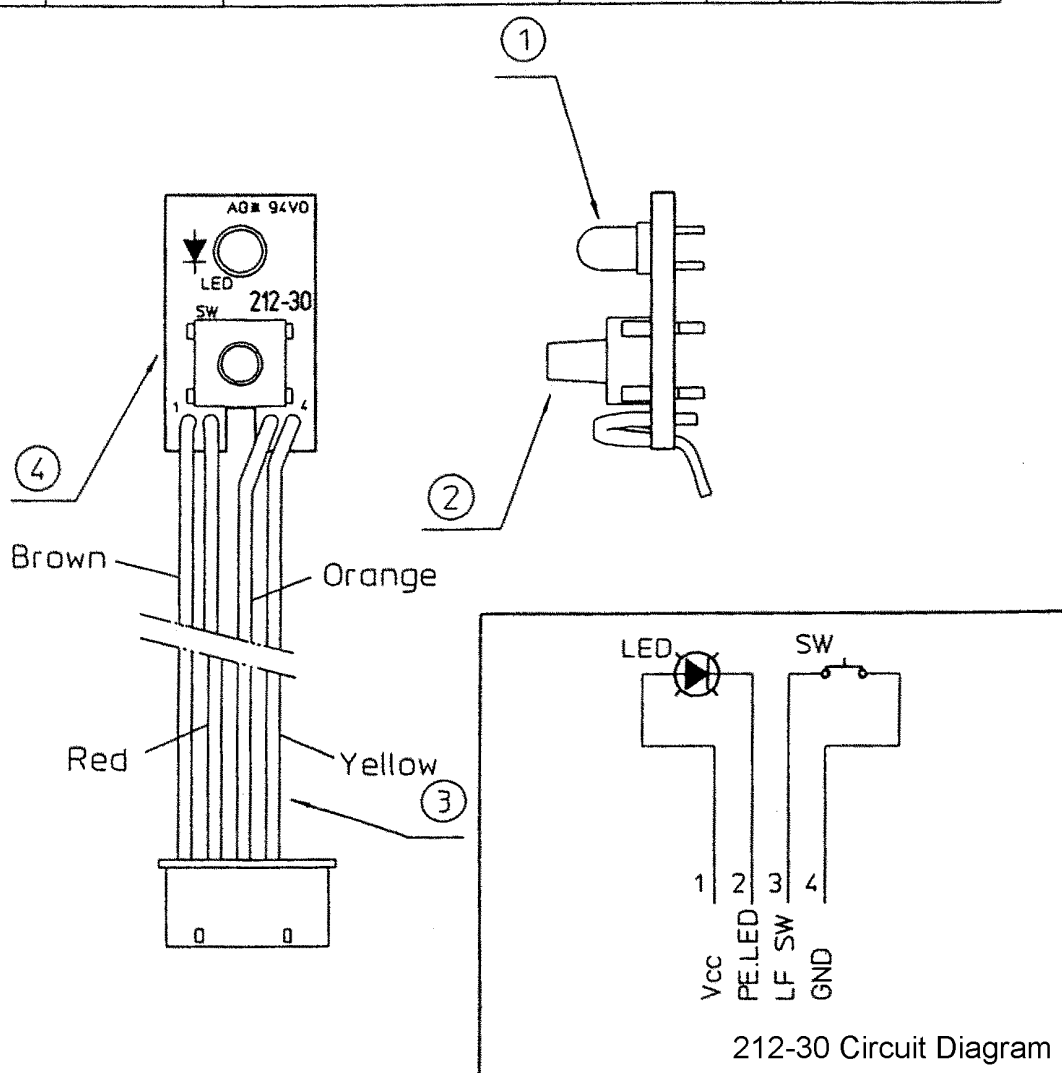


MARK	NAME	QUANT	MAKER	NOTE
1	HOUSING 51021-0500	1	MOLEX	
2	TERMINAL 50058-8100	4	MOLEX	
3	WIRE UL1061 CSA AWM AWG#28	4		

PIN No.	1	2	3	4	5
COLOR	BROWN	YELLOW	ORANGE	RED	
		RED		YELLOW	

5.2.2 Drawing for OP Panel Assy 212-30

MARK	PICT No.	PART No.	NAME	MAKER	QUANT	NOTE
①	SEC-2255		LED SEL2110S	Sanken	1	
②			Switch SKHHBV	ALPS	1	
③			Code Assy CA212-9	Timex	1	
④			Boad 212-30	Asahi Gazo	1	



5.3 Parts List for Control Board

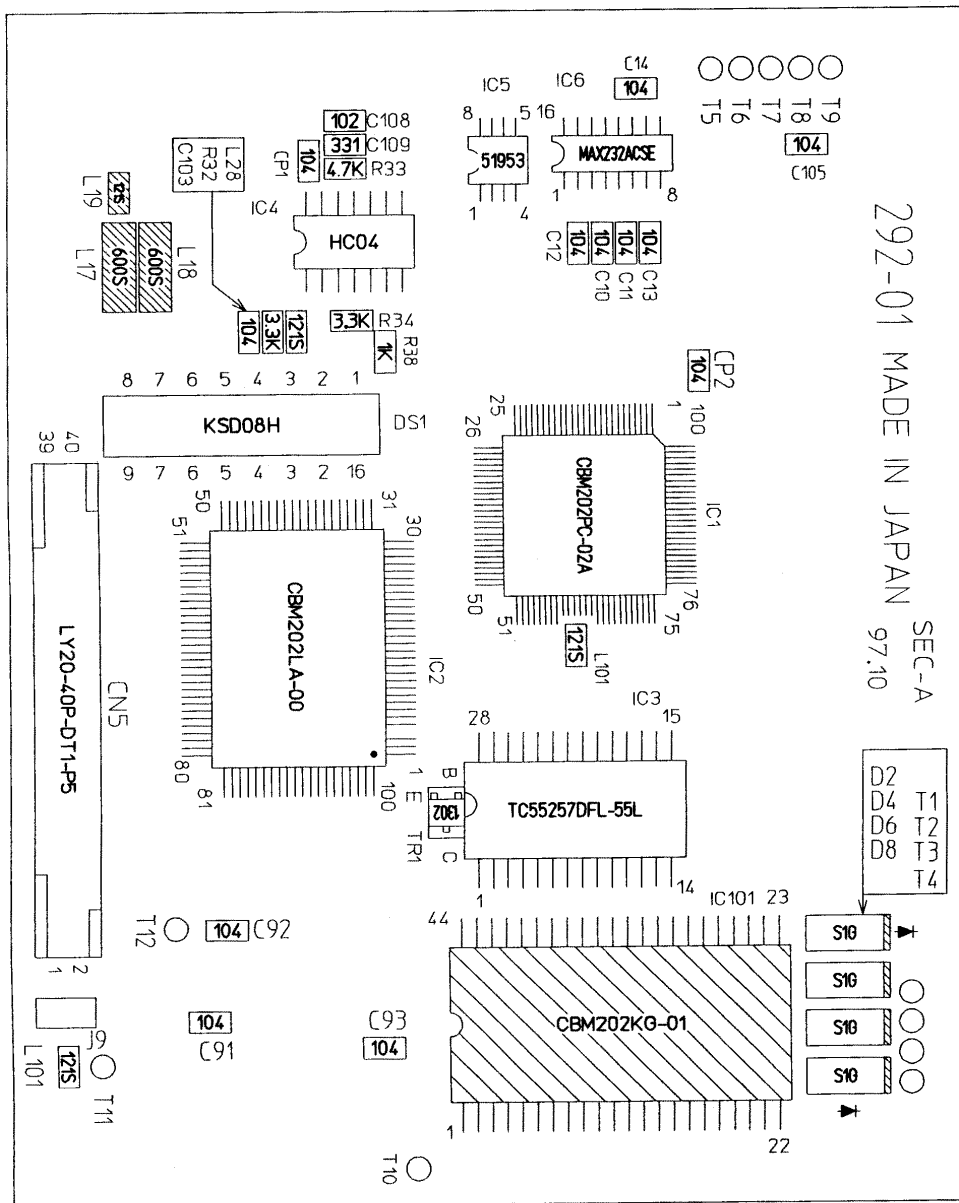
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Ref. No.	Parts No.	Description		CBM-292	CBM-293
	E 77001-190	PCB Assy		1	
	E 77001-200	PCB Assy			1
IC 1	202PC-02A	CPU	202PC-02A	1	1
IC 2	E 104-530	Gate array	202LA-00	1	1
IC 3	E 107-330	RAM	TC55257DFL-55L	1	1
IC 4	E 210-070	HC MOS	74HC04AF	1	1
IC 5	E 210-130	Reset IC	M51953BPF-600C	1	1
IC 6	E 210-120	I/F IC	SP232ACN	1	1
IC 7	E 4101-720	DC-DC conv.	SI-8401L	1	1
Tr 1	E 358-080	Transistor	RN1302	1	1
Tr 3	E 358-090	Transistor	2SJ267-FD13	1	1
Tr 4,5	E 359-190	Transistor	2SC2712-GR	2	2
TA 1	E 202-890	Tr. array	LB1650	1	1
TA 2	E 202-830	Tr. array	TA8428K	1	1
D 1-9	E 400-600	Diode	S1G-GI1	9	9
X 1	E 501-370	X'tal CSTCS16.00MX0C3-TC		1	1
C 1	E 2230-230	El. cap.	KMF16VB-470M	1	1
C 2	E 2230-240	El. cap.	KMF35VB-220M	1	1
F 1	E 4005-815	Fuse	251.500	1	1
F 2	E 4005-	Fuse	MS3	1	1
FB 1,2	E 4009-280	Fe. beads	BL02RN2-R62	2	2
L 1	E 4009-480	Fe. beads	BLM41P 600S	1	
L 17,18	E 4009-480	Fe. beads	BLM41P 600S		2
L 4-16,21-41 101	E 4009-490	Fe. beads	BLM21A121S	35	
L 4-16,21-41 19,20,101	E 4009-490	Fe. beads	BLM21A121S		37
DS 1	E 5103-510	Dip SW.	KSD-08	1	1

2/2

Ref. No.	Parts No.	Description		CBM-292	CBM-293
CN 1	E 48000610	Connector	5597-30CPB	1	1
CN 3	E 48000615	Connector	53047-0410	1	1
CN 4	E 48000635	Connector	53047-0610	1	1
CN 5	E 48000785	Connector	LY20-40P-DT1-P5	1	1
CN 6	E 4800-945	Connector	5267-04AX	1	1
CN 7	E 48000690	Connector	TCS7960-53-2010	1	1
OP 1	E 48000775	Connector	53047-0510	1	1
R1,2,23,32,34		Chip Re.	RK73K 3.3KJ	5	5
R 3		Chip Re.	RK73K 100 J	1	1
R 6-9,11-14 17,19-21,27 28,35-37		Chip Re.	RK73K 10K J	17	17
R 10		Chip Re.	RK73K 6.8KJ	1	1
R 15		Chip Re.	RK73K 180 J	1	1
R 16		Chip Re.	RK73K 220 J	1	1
R 18		Chip Re.	RK73K 33K J	1	1
R 22,24,38		Chip Re.	RK73K 1K J	3	3
R 25,26		Chip Re.	RK73K 330 J	2	2
R 33		Chip Re.	RK73K 4.7K J	1	1
C 4,6,108		C. Cap.	GRM40B102K50	3	
C 4,6,8,108		C. Cap.	GRM40B102K50		4
C 5,7,9-14,86 91-93		C. Cap.	GRM40F104Z50	25	25
CP-6,101-107					
C 17,79		C. Cap.	GRM40B471K50	2	2
C 51-77		C. Cap.	GRM40CH470J50	27	27
C 78,80-85		C. Cap.	GRM40CH101J50	7	7
C 87-90		C. Cap.	GRM40B331K50	4	4

5.4.2 PCB Assy (Solder Side)

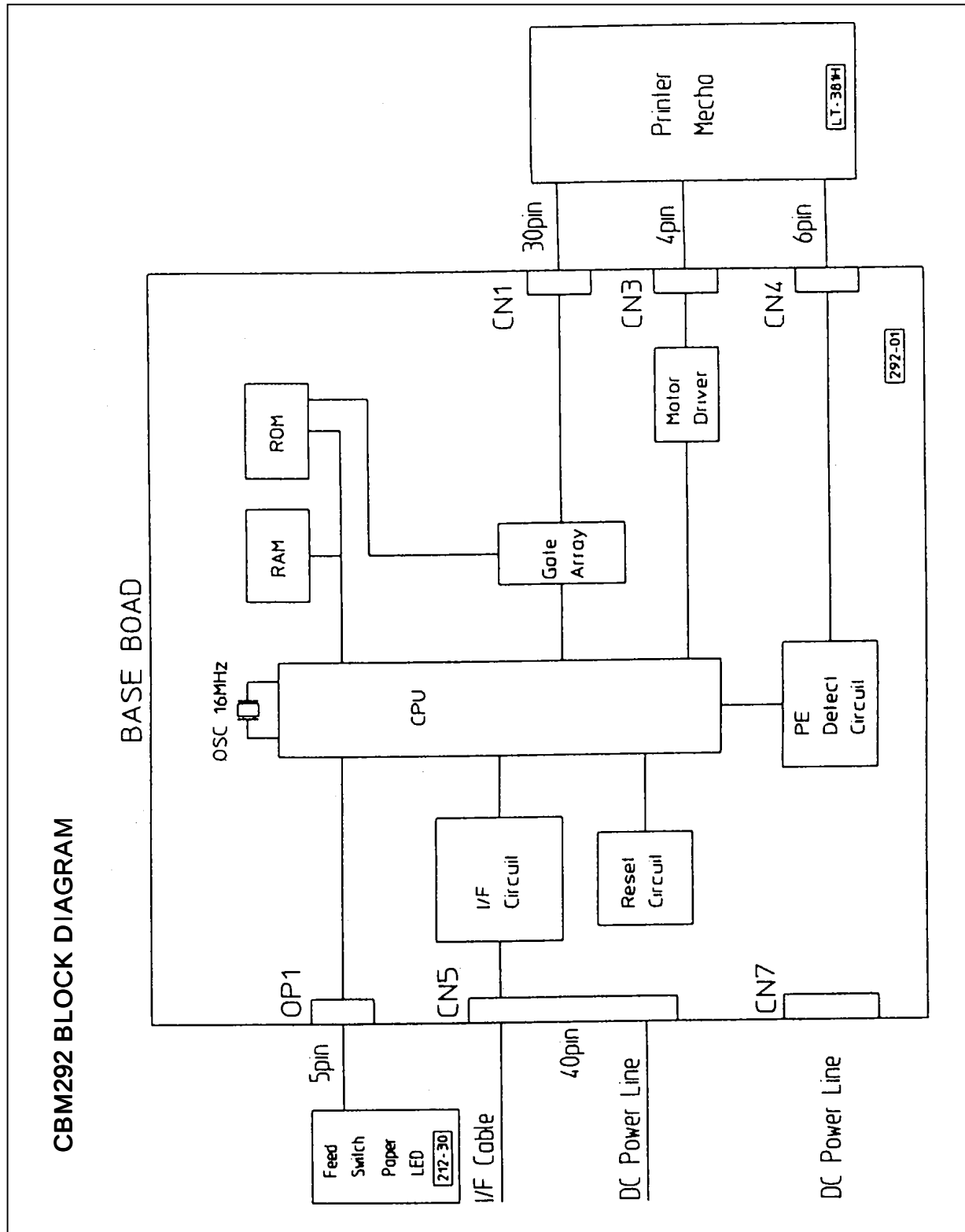


PARTS LAYOUT
CBM-292/293
SOLDER SIDE

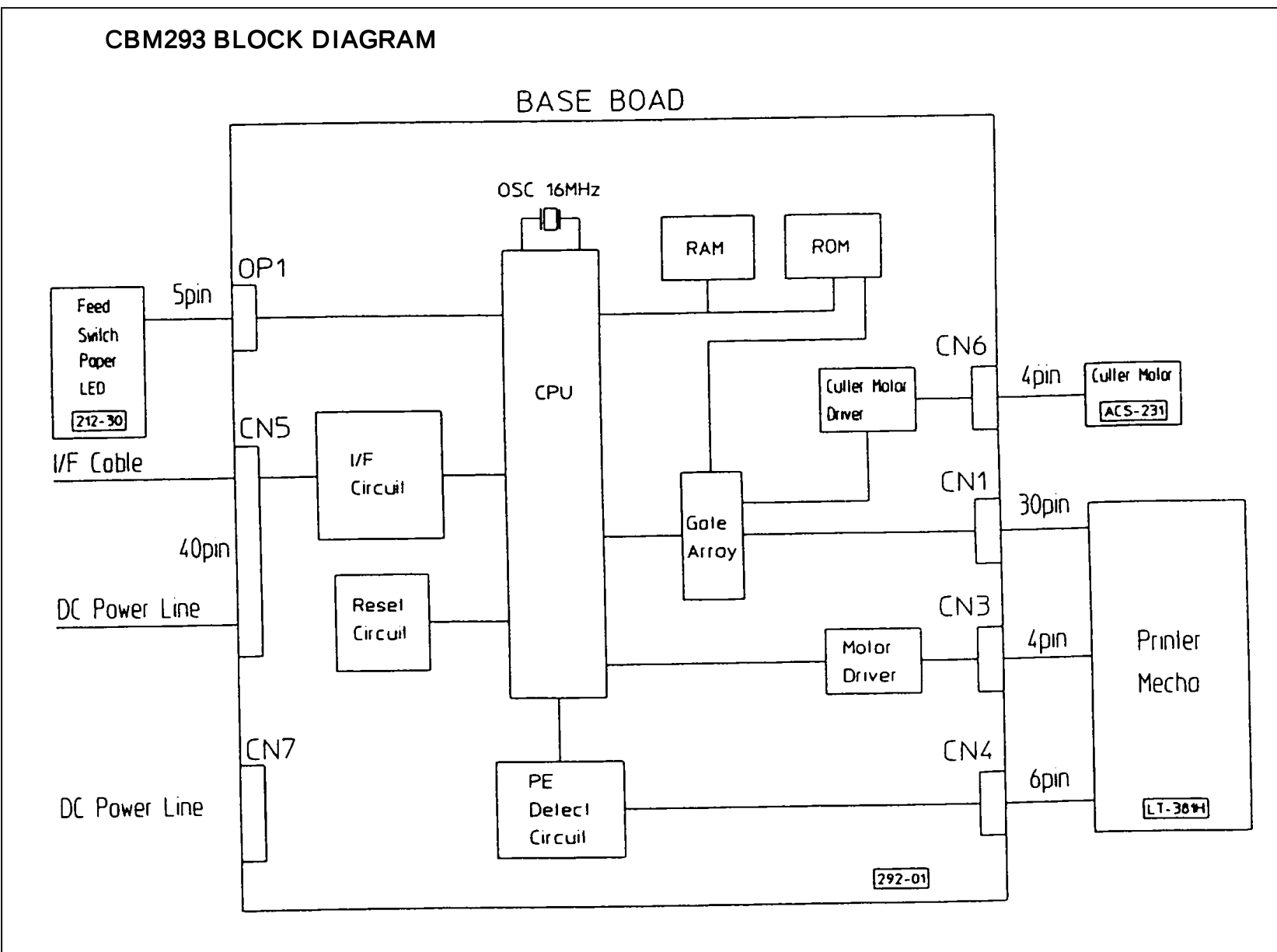
6. DRAWING

6.1 Block Diagram

6.1.1 CBM-292 (Without Auto Cutter)



6.1.2 CBM-293 (With Auto Cutter)



7. OUTLINE DRAWING

