CITIZEN

Service Manual

LINE THERMAL PRINTER
MODEL CBM1000 TYPE II

Rev.1.00 Newly issued on Oct. 19, 2001

Japan CBM Corporation

REVISION

Rev.No.	Date	Comment
Rev.1.00	Oct. 19, 2001	Newly issued

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of the line thermal printer CBM1000 TYPE II. It is intended for field maintenance men.

FEATURES

The CBM1000 TYPE II is a compact-sized, line thermal printer developed for a variety of applications. It has abundant built-in features, and can be used as a data communication terminal, POS terminal, kitchen terminal and for other applications. Prior to using the printer, read this manual thoroughly to understand its contents.

1. Paper drop-in mechanism; when supplying or replacing paper rolls, all you have to do is just drop a paper roll into the printer and close its cover. This will facilitate paper handling and head cleaning greatly.
2. Ease of paper threading and head cleaning.
3. High speed (150 mm/s), and low-noise thermal printing.
4. Front-side paper ejection method, which allows the printer to be installed and used anywhere with few restrictions.
5. Hermetic covering structure, which helps prevent any foreign matter or liquid from getting into the printer.
6. Built-in input buffer.
7. Bar-code printing (Possible using special commands).
8. Page mode, which allows you to lay out pages freely.
9. Registration of user-defined characters and logos into flash memory.
10. Built-in Drawer Kick-Out interface.
11. Auto cutter mechanism provided as a standard unit.
12. Selection possible, as required, from two types: Easy-to-handle, built-in power supply type, and lightweight flat AC adapter type.
13. Use of 58 mm wide paper rolls possible by using the partition supplied.

CONTENTS

♦ For the auto cutter unit (ACS-130), see the separate Service Manual.

1. HANDLING AND MAINTENANCE OF PRINTER

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

2. SPECIFICATIONS

2.1 Basic Specifications

Item \ Model	CBM1000II RF120S/A CBM1000II PF120S/A	CBM1000II RF230S/A CBM1000II PF230S/A	CBM1000II RF024D CBM1000II PF024D
Print method	Line thermal dot print method		
Print width	72 mm/576 dots, (54 mm/432 dots)*1		
Dot density	8 × 8 dots/mm (203 dpi)		
Print speed	150 mm/sec (Fastest, print density standard level), (1,200 dot lines/sec)		
Number of print columns*2	Font A: 48/42 (36/30)*1 columns (12 × 24) Font B: 64/56 (48/40)*1 columns (9 × 24)		
Character size	Font A: 1.25 × 3.00 mm; Font B: 0.88 × 3.00 mm		
Character type code page	Alphanumeric characters, International characters, Code pages PC437, Katakana, PC850, PC860, PC863, PC865, PC852, PC866, PC857, and Windows code page		
Logo registration/print	Capable of registering user-defined characters and logos into flash memory.		
Types of bar code	UPC-A/E, JAN (EAN) 13/8 columns, ITF CODE 39, CODE 128, CODABAR, CODE 93		
Line spacing Paper roll	4.23 mm (1/6 inches), selectable using commands Thermal paper roll: 80 mm (58 mm) × ø 83 mm Thermal Label paper roll : 80 mm (58 mm) × ø 83 mm (See " Print Paper Specifications".)		
Label detection	Selects the L-Spec. (factory option)		
Interfacing	Serial (RS-232C), Parallel (IEEE1284 compliant, Bi-directional communication)		
Input buffer	4K bytes (72 bytes selectable with a DIP switch)		
Supply voltage	S type: AC 120/230 V ±10%; A type/D type: DC 24 V ±7%		
Power consumption	Approx. 100 W		
AC adapter specification	Rated input: AC 120 to 240 V, 50/60 Hz, 120 VA Rated output: DC 24 V, 1.9 A (Peak 3.5A)		—
Type	31 AD-U	31 AD-E	—
Weight	S type: Approx. 2.0 Kg; A type/D type: Approx. 1.4 Kg		
Outside dimensions	S type: 145 (W) × 190 (D) × 157 (H) mm A type/D type: 145 (W) × 190 (D) × 114 (H) mm		
Operating temperature and humidity	5 to 40°C, 35 to 85% RH (No condensation)		
Storage temperature and humidity	–20 to 60°C, 10 to 90% RH (No condensation)		
Reliability	Print head life: Pulse resistance 1×10^8 pulses (Print ratio 12.5%) Wear resistance 100 Km (At normal temperature/humidity with recommended paper used) Auto cutter life: 500,000 times of cutting (At normal temperature/humidity with recommended paper used)		
Safety Standard*3	UL, C-UL, FCC Class A	TUV, GS, CE marking	UL, C-UL, FCC Class A TUV, GS, CE marking

*1 Represents the value when a 58 mm wide paper roll is used (User selectable).

*2 The number of printable columns is selectable with a DIP switch.

*3 Represents the safety standards acquired when CBM-made adapters (31AD series) are used.

3. DISASSEMBLY AND REASSEMBLY

For maintenance operations, note the following:

- Do not disassemble/reassemble or adjust the machine, if it functions properly. Particularly, do not loosen screws on any component, unless necessary.
- After completing an inspection and before turning on the power, be sure to check that there is no abnormality.
- During maintenance, be careful not to leave parts or screws unattached or loose inside the printer.
- When handling the thermal head or electronic component, do not use gloves or other aids which can easily cause static electricity.
- When disassembling or reassembling, check wires and cables for any damage. Do not run them into a narrow space or set them in improper positions.
- After reassembling, apply lubricant as required.

3.1 Maintenance Tools

- Screwdrivers (+) #1 and #2
- Tweezers
- Round nose pliers
- Brush for lubrication
- Cutting nipper

3.2 Disassembly Procedure

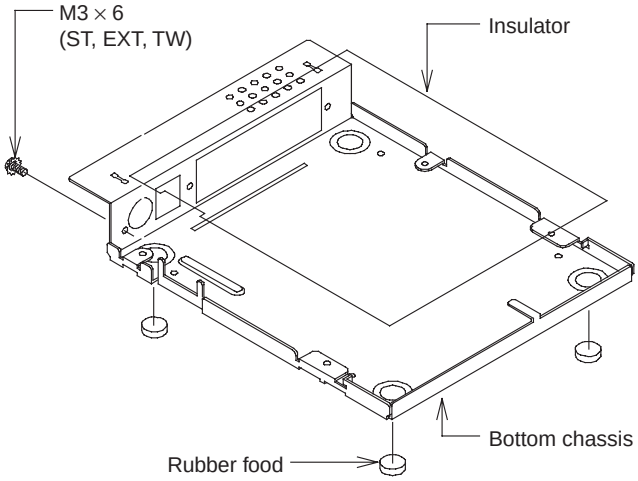
For disassembly, reverse the steps described in section 3.3, “Reassembly Procedure”.

3.3 Reassembly Procedure

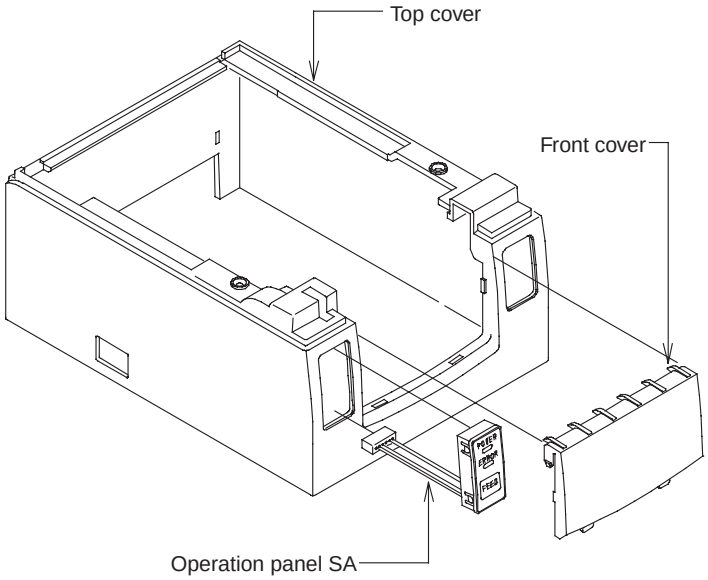
Reassembly steps are divided into two parts: Printer assembly and printer mechanism assembly.

3.3.1 Reassembly Procedure for Main Body

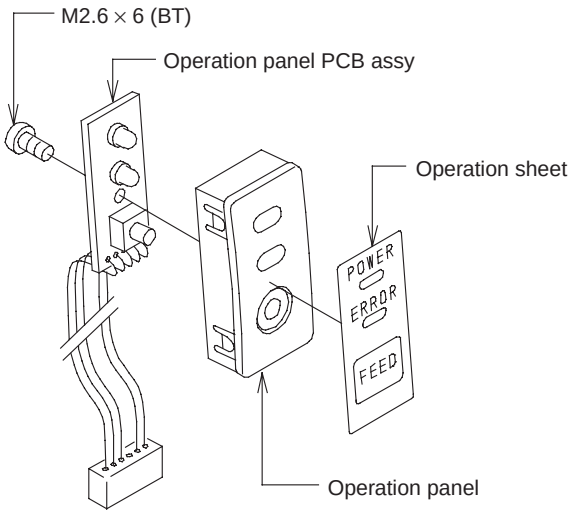
(1) Assembling Bottom Chasis SA
- Attach four rubber feet to the bottom chassis.
- Fasten the FG screws (M3 × 6). (Toothed lock washer screws)
- Spread insulator of bottom chassis.



(2) Assembling Top Cover SA
- Attach the front cover.
- Attach the operation panel SA.

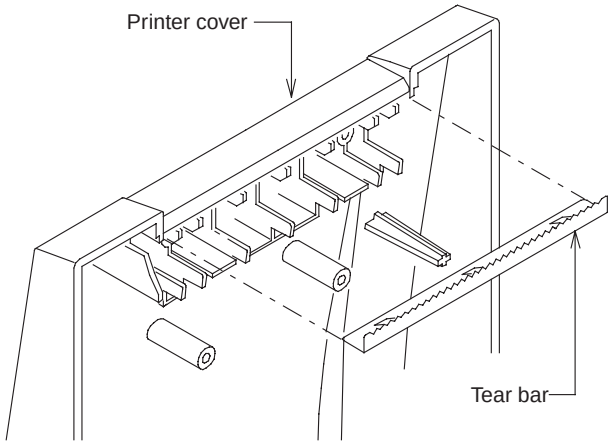


(3) Assembling Operation Panel SA
- Stick the operation sheet to the operation panel.
- Secure the operation panel PCB assy with a M2.6 × 6 screw (BT).
  (Verify that FEED switch clicks when pressed.)



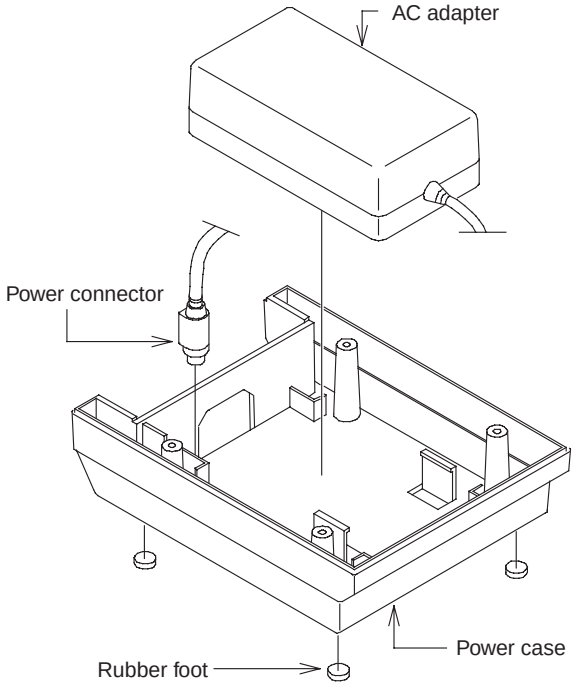
(4) Assembling Printer Cover SA

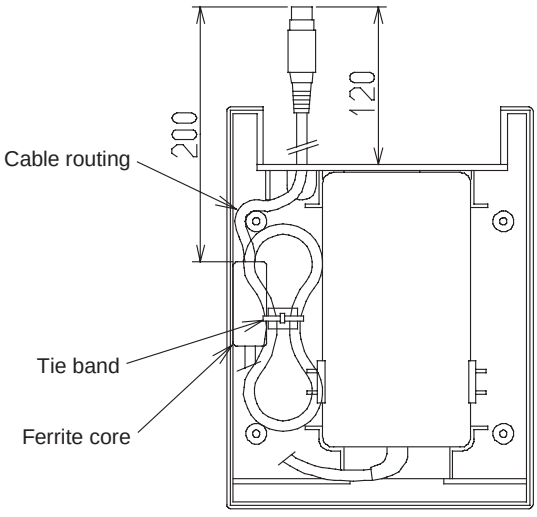
- Attach the tear bar by pressing it into printer cover as shown.



(5) Assembling Power Case SA

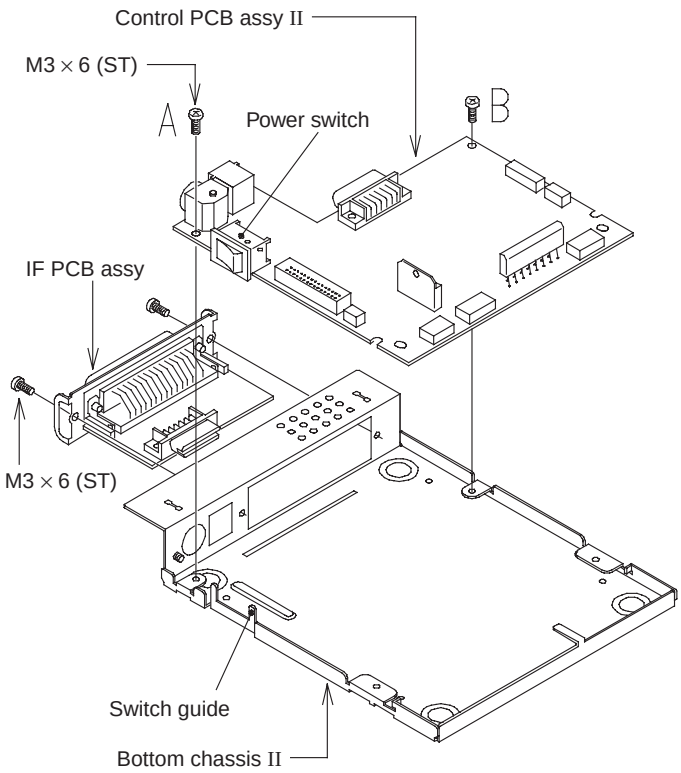
- Attach four rubber feet to the power case.
- Set ferrite core position at approx. 200 mm from the end of power connector.
- Pass power connector through the cable port in the bottom of power case and fasten as shown.
- Place the AC adapter in power case.
- Pass tie band through tie band holes in power case.
- Tuck AC adapter cable in power case and clamp it with tie band.





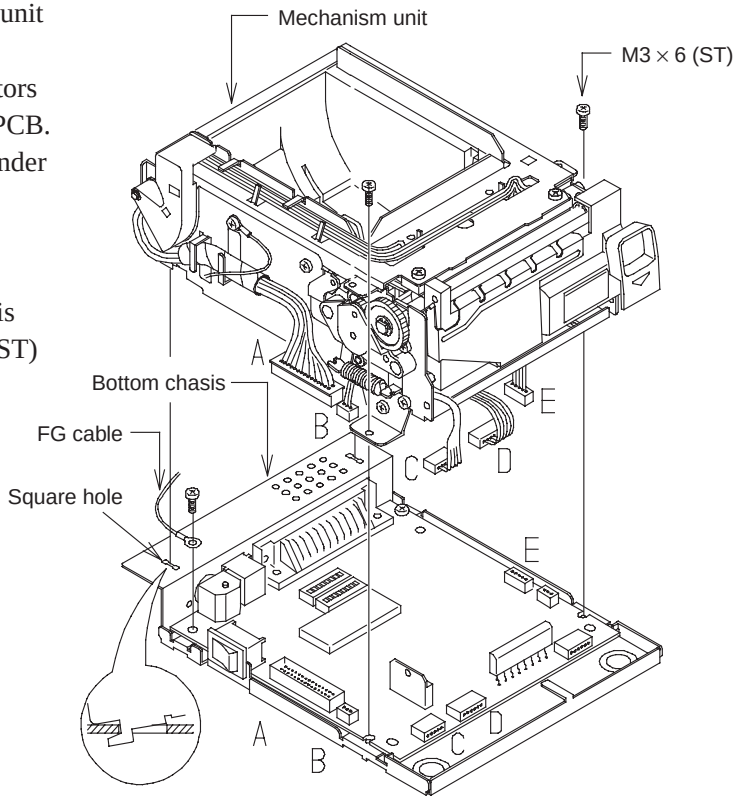
(6) Installing Control PCB Assy

- Fit control PCB's on-board connectors in their respective holes in the raised section of bottom chassis and then fit power switch in between switch guide posts.
- Insert IF PCB assy through raised section of bottom chassis and plug its connector into mating socket on control PCB assy.
- Secure IF PCB assy to bottom chassis with two screws (M3 × 6 (ST)).
- Secure corner B of control PCB assy with a screw (M3 × 6 (ST)).
  (Corner A will be secured together with FG cable when the mechanism assy is installed.)



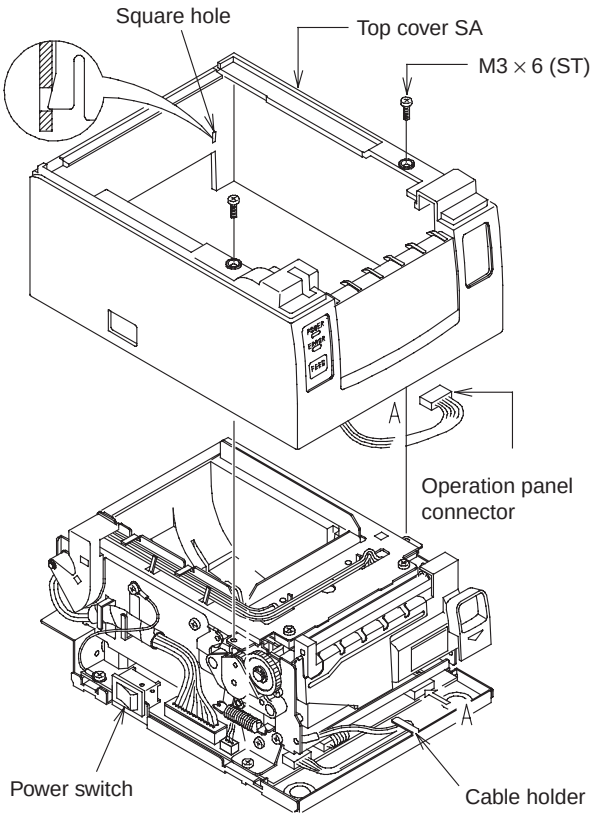
(7) Installing Mechanism Unit

- Insert hooks at the bottom of mechanism unit into the hook holes in the raised end of bottom chassis, and then plug the connectors (A – E) to the mating sockets on control PCB.
- Exercise care not to bite the connectors under mechanism unit.
- Secure mechanism unit to bottom chassis with two screws (M3 × 6 (ST)).
- Secure control PCB assy to bottom chassis together with FG cable, with an M3 × 6 (ST) screw.



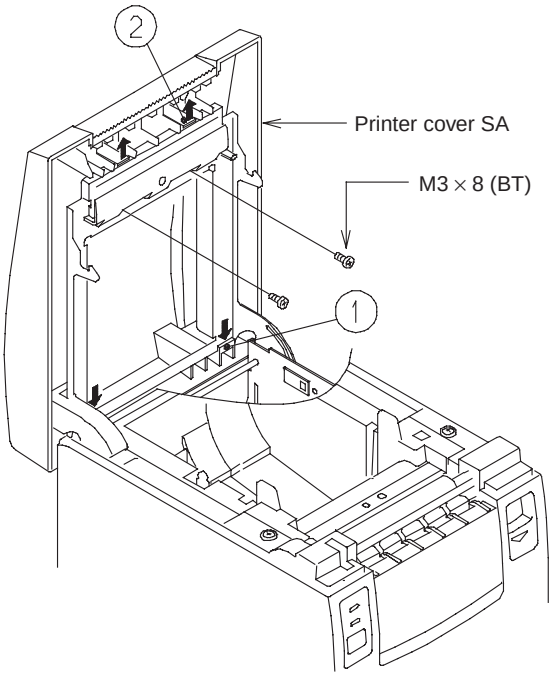
(8) Installing Top Cover SA

- Connect operation panel connector.
  Pass operation panel connector under cable holder.
- Cover with top cover SA directly over top of mechanism unit
  Fit power switch in the power switch cutout in top cover SA.
- Lower the top cover SA as shown in the diagram.
  Press it down from above until it clicks into place.
- Secure top cover SA to mechanism unit with two screws (M3 × 6 (ST)).



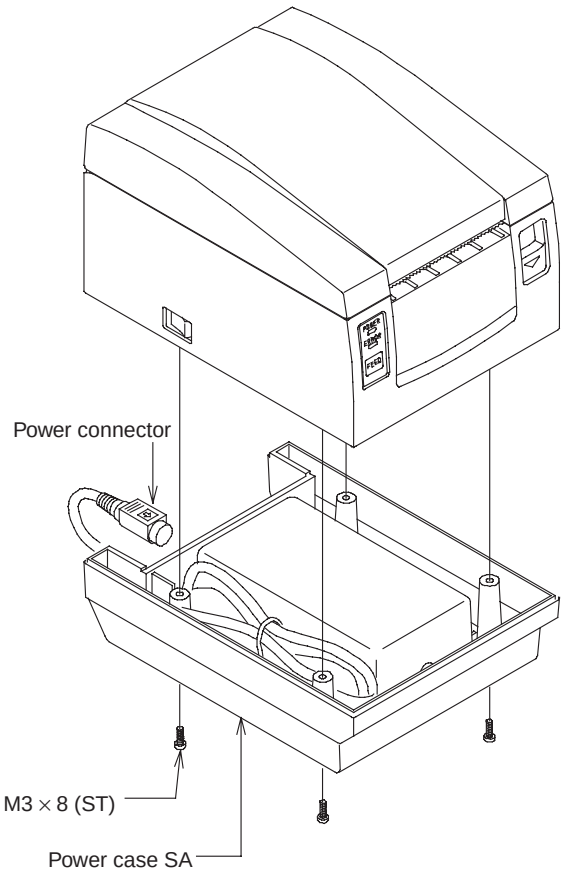
(9) Installing Printer Cover SA

- Hitch the two rear corners ①.
- Hitch the two sections ② and press in direction of arrow.
- Secure with two screws (M3 × 8 (BT)).



(10) Installing Power Case SA
(built-in power supply type)

- Secure printer to power case SA with four screws (M3 × 8 (ST)) from the bottom of power case SA.
- Plug power connector into printer's power connector port.



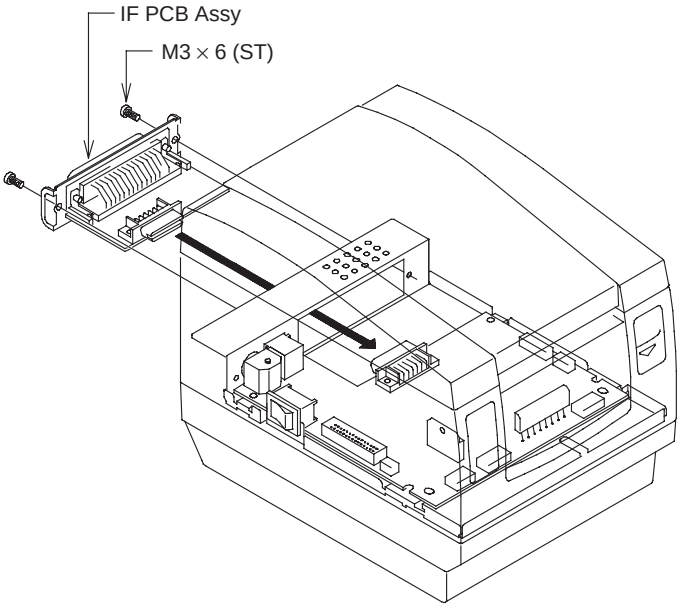
(11) Replacing IF PCB Assy

● Remove IF PCB assy

- Take off the two screws (M3 × 6 (ST)) that retain IF PCB assy.
- Pull out IF PCB assy from bottom chassis.

● Install replacement IF PCB assy

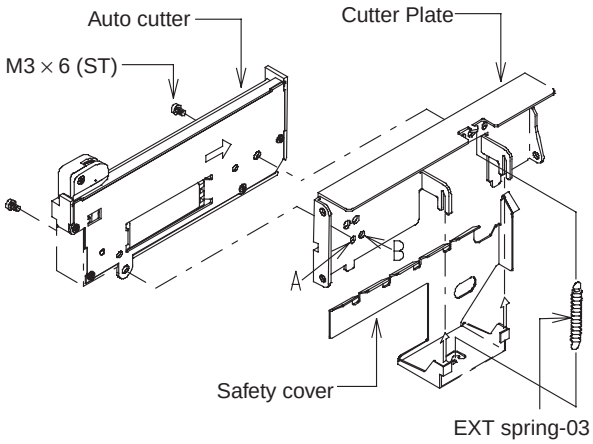
- Insert replacement IF PCB assy into printer until its card-edge connector properly plugs into the mating socket.
- Secure IF PCB assy to bottom chassis with two screws (M3 × 6 (ST)).



3.3.2 Reassembly Procedure for Mechanism Unit

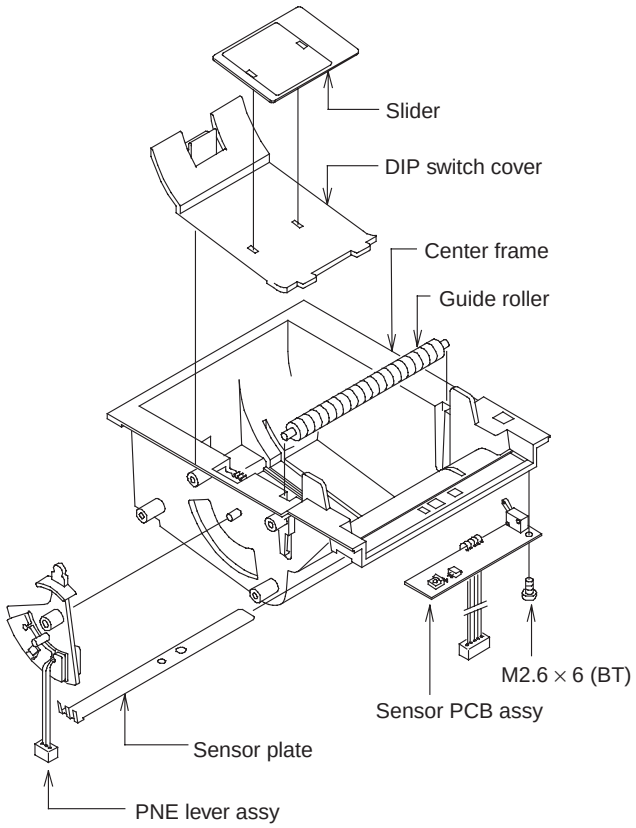
(1) Assembling Auto Cutter SA

- Insert safety cover over cutter plate through the slots (indicated by two upward arrows) into the mating slots.
- Attach EXT spring-03 as shown.
- Attach auto cutter in between cutter plate and safety cover in the direction of the arrow and secure it with two screws (M3 × 6 (ST)). (Use hole A for the partial-cut type, and hole B for the full-cut type.)



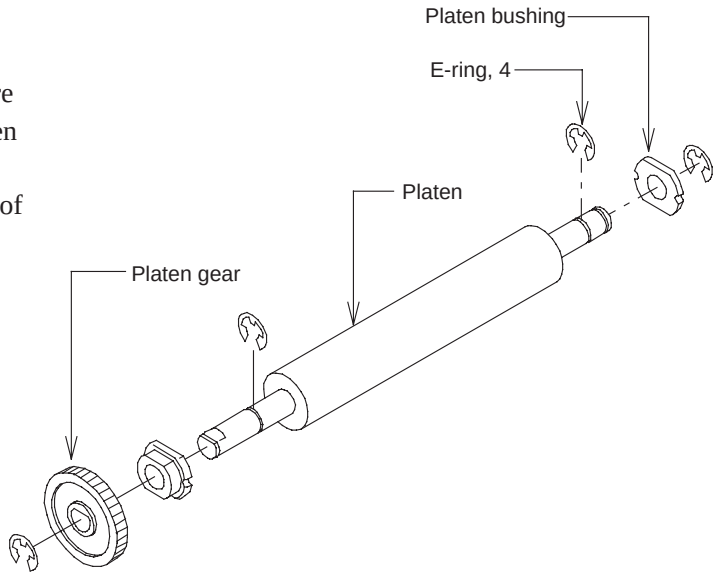
(2) Assembling Center Frame SA

- Set one end of sensor PCB assy in the holder and secure the other end to center frame with a screw (M2.6 × 8 (BT)) as shown.
- Attach slider to DIP switch cover.
- Install DIP switch cover, guide roller, sensor plate, and PNE lever assy.
  Grease both ends of guide roller shaft.



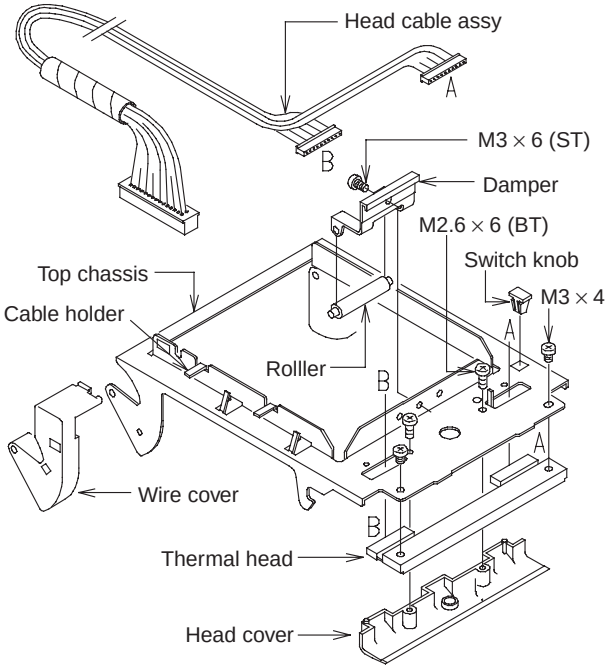
(3) Assembling Platen SA

- Attach two E-rings, 4 to inner slots of platen shaft.
- Insert two platen bushings on platen shaft while making sure that their orientations are correct. Grease the sliding surfaces of platen bushings.
- Insert platen gear on the D-shaped cut end of platen shaft.
- Attach two E-rings, 4 in the outer slots on platen shaft.



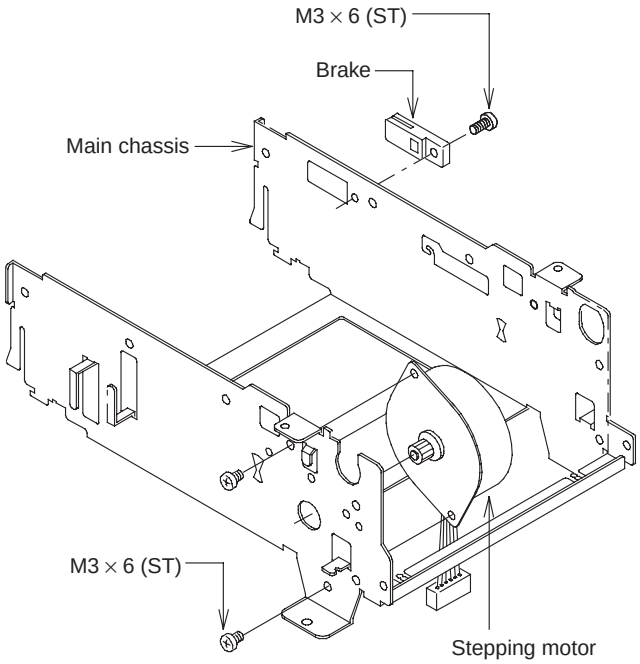
(4) Assembling Top Chassis SA

- Install roller on damper.
- Secure damper to top chassis with a screw (M3 × 6 (ST)).
- Pass two head cable assy connectors through the square holes (A and B) in top chassis.
- Plug the connectors into the mating sockets on thermal head, and then secure thermal head to top chassis with two screws (M3 × 4).
- Secure head cover to thermal head with two screws (M2.6 × 6 (BT)).
- Pass wire cover over head cable assy and install wire cover on top chassis.
- Pass head cable assy under cable holder.
- Insert switch knob into switch knob aperture while making sure that it is oriented properly.



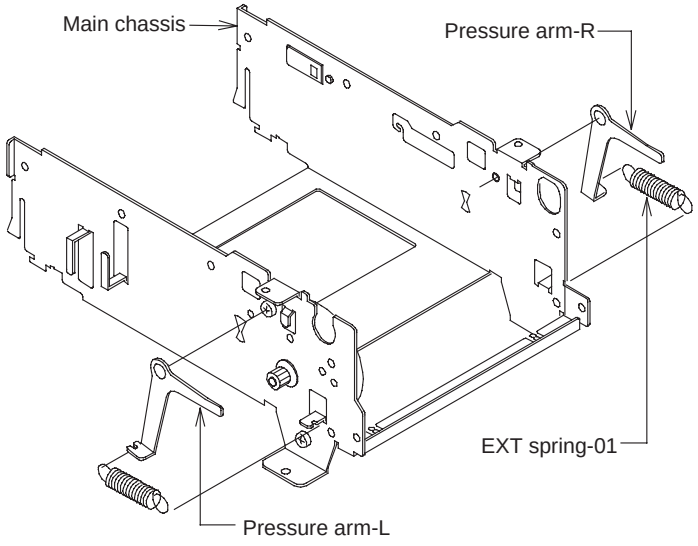
(5) Installing Brake and Stepping Motor

- Attach brake on main chassis with a screw (M3 × 6 (ST)) while making sure that it is oriented properly.
- Attach stepping motor on main chassis with two screws (M3 × 6 (ST)), with its cables dangled down.



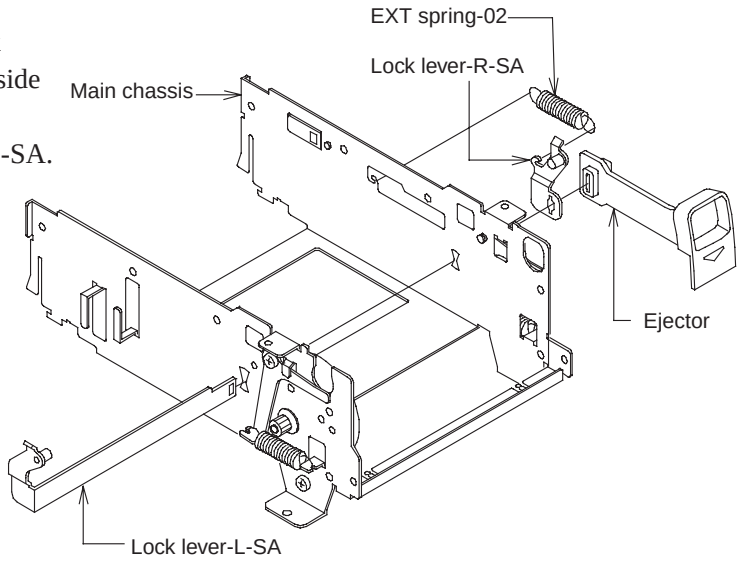
(6) Installing Pressure Arms

- Attach pressure arm-R on bar ring (at pivoting center) on the right side of main chassis, and then install EXT spring-01 as shown.
- Attach pressure arm-L on one of the stepping motor retention screw head on the left side of main chassis, and then attach EXT spring-01 as shown.



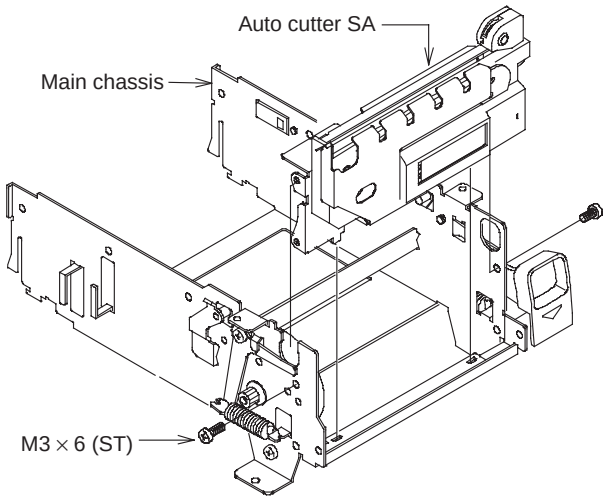
(7) Installing Lock Lever

- Pass lock lever-L-SA all the way through the double fan-shaped hole in the left side of main chassis and insert its end into another double fan-shaped hole in the right side of main chassis.
- Insert lock lever-R-SA on the end of lock lever-L-SA that protrudes from the right side of main chassis.
- Press ejector onto the end of lock lever-L-SA.
- Attach EXT spring-02.



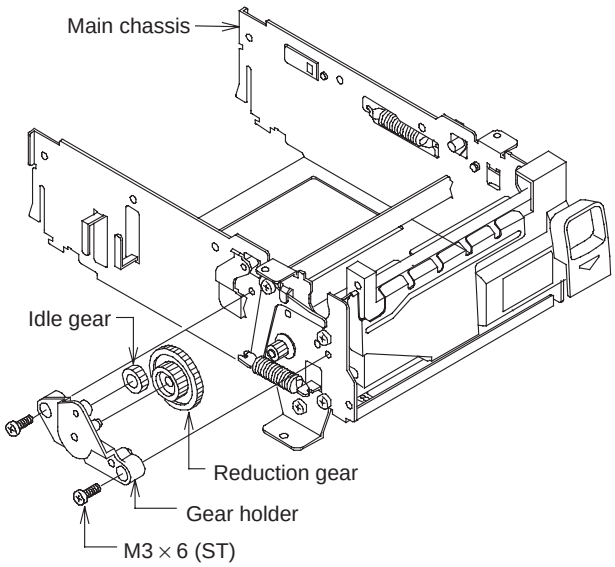
(8) Installing Auto Cutter SA

- Attach auto cutter SA in main chassis by fitting its two bottom projections into the respective holes.
- Fasten auto cutter SA to main chassis with two screws (M3 × 6 (ST)).



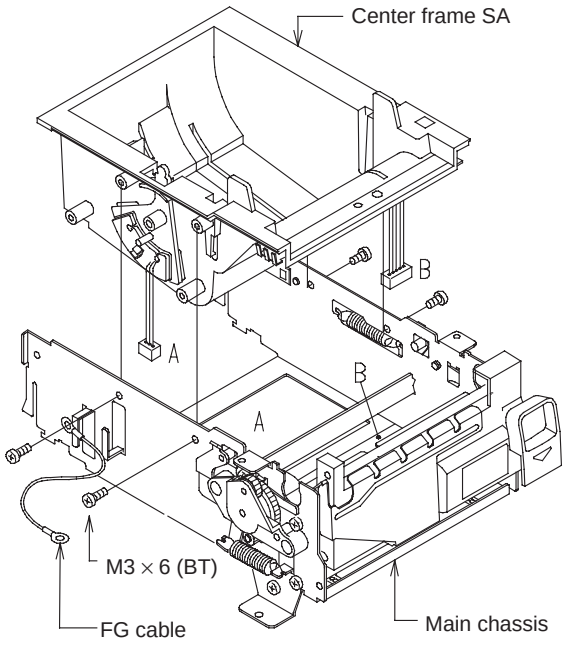
(9) Installing Stepping Motor Gear

- Grease gear holder bearing.
- Insert idle gear and then reduction gear over the respective studs on gear holder.
- Fasten gear holder to main chassis with two screws (M3 × 6 (ST)).



(10) Installing Center Frame SA

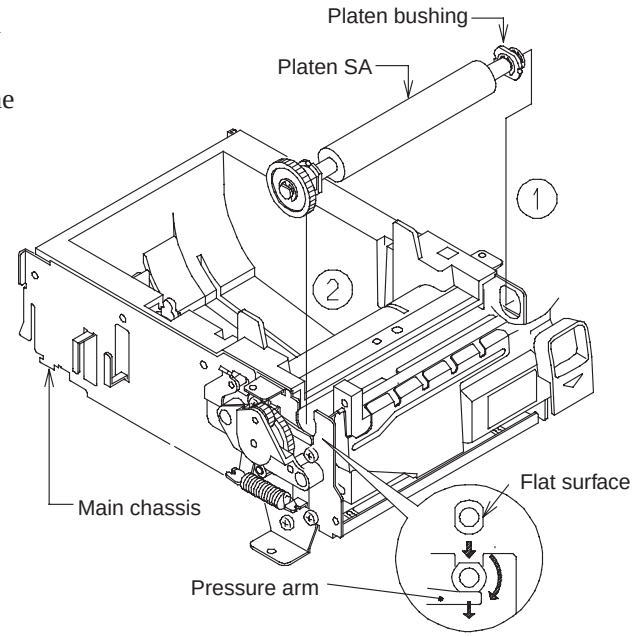
- Place center frame SA in main chassis. Pass connector A through hole A, and connector B through hole B.
- Secure center frame SA to main chassis with four screws (M3 × 6 (BT)) together with the FG cable installed as shown.



(11) Installing Platen SA

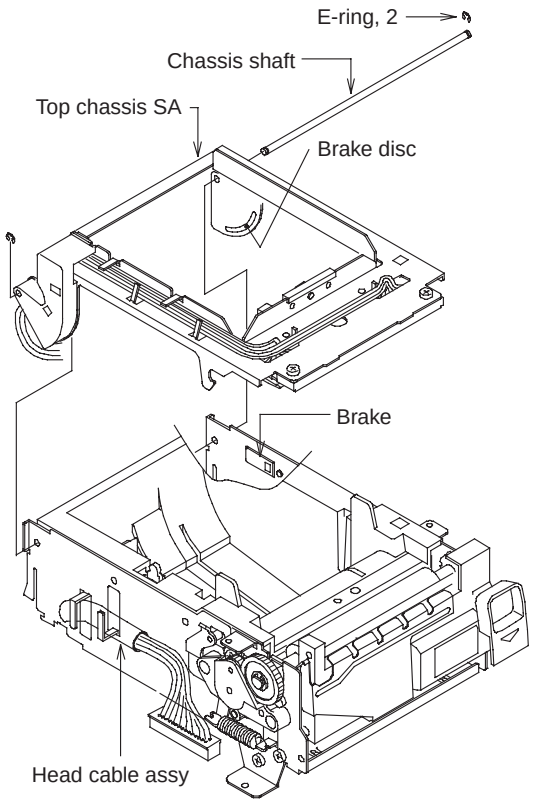
① Insert the right end of platen SA into platen SA holder, with the flat sides of platen bushing kept in a horizontal position and the pressure arm pressed down.

② Insert the left end of platen SA into the U-shaped slot, with the flat sides of platen bushing kept in a vertical position. While pressing down pressure arm, rotate platen bushing 90 degrees.



(12) Installing Top Chassis SA

- Attach the E-ring, 2 on one end of chassis shaft.
- Insert top chassis SA's brake disc into the brake slot to a position where chassis shaft can be passed through the pivoting center hole of brake disc.
- Pass chassis shaft all the way across main chassis.
- Attach another E-ring, 2 on the other end of chassis shaft.
- Pass head harness through harness clamps as shown.



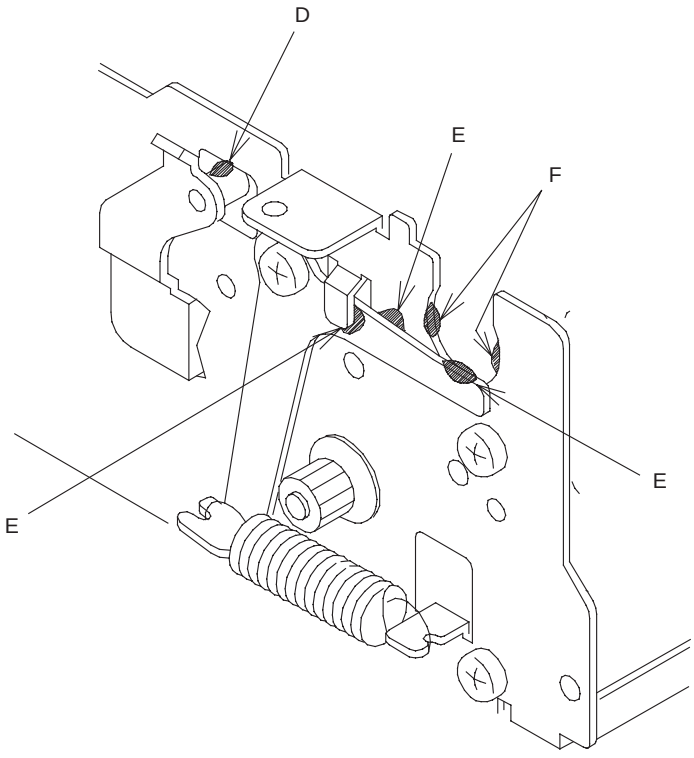
3.4 Lubrication

3.4.1 Lubricant

Fluoil G-943 (Kanto Chemical Industries Co., Ltd.)

3.4.2 Where to Lubricate

A. Platen bushings and the platen shafts (2 places each)
B. Gear shafts of the gear holder (2 places)
C. Sliding surface of the brake disc
D. Lock shaft parts of the lock lever-R/L (2 places on both sides)
(See the following figure.)
E. Sliding parts of the pressure arm-R/L (3 places on both sides)
(See the following figure.)
F. U-shaped grooves of the main chassis, where the platen bushings are engaged (2 places on both sides)
(See the following figure.)
G. Both ends of guide roller shaft



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

- **Power Supply Failure**

Phenomenon	Cause	Check Method	Remedy
No power (POWER lamp not illuminated)	The AC adapter is not connected.	———	Connect the specified AC adapter.
	The fuse is gone.	Check whether any unspecified power has been used so far.	Use the specified AC adapter.
		Check whether the specified fuse is used.	Use the specified fuse.
The fuse immediately goes again after replacing with new one.	The control PCB assy is defective.	———	Replace the control PCB assy.
	The circuit drive power is abnormal.	With a DC voltmeter, measure the circuit drive voltage.	Replace the control PCB assy.

✦ If the fuse is gone with the specified AC voltage supplied to the AC adapter, it is likely that the thermal head unit or control PCB assy is defective. Replace either defective one. Incidentally, check the wiring of the drawer and interface cable.

- **Printing failure**

Phenomenon	Cause	Check Method	Remedy
No printing	Faulty DC output voltage from the AC adapter	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Faulty control PCB assy	———	Replace the control PCB assy.
	Faulty connection of the thermal head connector	Check connection of the thermal head connector.	Connect the thermal head connector properly. Or replace the head cable assy.
	Faulty thermal head	———	Replace the thermal head.
Partly not printed	Faulty connection of the thermal head connector	Check connection of the thermal head connector.	Connect the thermal head connector properly. Or replace the head cable assy.
	Faulty thermal head	———	Replace the thermal head.
Faint printout or uneven printout	Faulty DC output voltage from the AC adapter	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Low DC output voltage from the AC adapter	Check the DC voltage with a DC voltmeter.	Supply the specified AC voltage to the AC adapter.
	Faulty thermal head	———	Replace the thermal head.
	Foreign substance is adhered to the thermal head.	Check whether any foreign substances are adhered to the thermal head.	Dip a cotton swab or soft cloth in ethyl alcohol and wipe the foreign substances with them.
	Non-recommended paper is used.	Check whether the paper being used meets the specification.	Replace it with the specified paper.
	Faulty mounting of the platen roller	Check mounting condition of the platen roller.	Mount the platen roller properly.

- **Paper feed failure**

Phenomenon	Cause	Check Method	Remedy
Paper is not fed or fed irregularly	Faulty connection of the motor connector	Check connection of the motor connector.	Connect the connector correctly.
	Defective motor	Measure the supply voltage with a DC voltmeter or oscilloscope.	If the supply voltage is normal, replace the motor.
	Faulty DC output voltage from the AC adapter	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Low DC output voltage from the AC adapter	Check the DC voltage with a DC voltmeter.	Supply the specified AC voltage to the AC adapter.
	Faulty control PCB assy	_____	Replace the control PCB assy.
	Faulty mounting of the platen roller	Check mounting condition of the platen roller.	Mount the platen roller properly.
	Paper feed failure	Check whether or not the paper is jamming or torn and caught in the paper path.	Eliminate unnecessary paper in the paper path and set paper properly.
	Foreign substance in the gear	Remove the gear holder and check for any foreign substance caught in the gears.	Eliminate the foreign substance.
	Broken gear	Remove the gear holder and check for any breakage of the gears.	If the gear is broken, replace it with new one.

- **Faulty sensor**

Phenomenon	Cause	Check Method	Remedy
Does not detect presence of paper.	Faulty paper sensor	Check whether the ERROR lamp flickers when paper is out.	Replace the sensor PCB assy.
	Foreign substance is attached to the paper sensor.	Check whether any foreign substances are adhered to the paper sensor.	Remove the foreign substance.
	Faulty connection of the paper sensor connector	Check connection of the paper sensor connector.	Connect the connector correctly.
Does not detect paper near-end status.	Faulty paper near-end sensor	Check whether the ERROR lamp flickers when paper is out.	Replace the paper near-end sensor.
	Foreign substance is attached to the paper near-end sensor.	Check whether any foreign substances are adhered to the paper near-end sensor.	Remove the foreign substance.
	Faulty connection of the paper near-end sensor connector	Check connection of the paper near-end sensor connector.	Connect the connector correctly.

- **Faulty auto cutter**

Phenomenon	Cause	Check Method	Remedy
The cutter does not function.	Faulty connection of the auto cutter connector	Check connection of the auto cutter connector.	Connect the connector correctly.
	Faulty DC output voltage from the AC adapter	Check whether the specified	AC adapter is used. Use the specified AC adapter.
	Defective auto cutter	Measure the supply voltage with a DC voltmeter or oscilloscope.	If the supply voltage is normal, replace the auto cutter.
	Paper feed failure (Paper jam)	Check whether or not the paper is jamming or torn and caught in the paper path.	Eliminate unnecessary paper in the paper path and set paper properly.

- If the no-paper condition is not detected while the printer is running out of the recording paper, it will print without the paper, leading to a trouble of the head, and so on.

5 SERVICE PARTS LIST

5.1 Parts List for Mechanism

EXPLODED VIEW 1/3

Ref. No.	Parts No.	Description	Q' ty	Remarks
1-2	232SEC-0166	Bottom Chassis II	1	
2	E 6302-370	Rubber Foot (ø10 × 3)	4	
4		Control PCB Assy II (F)	1	
6-1	231001-01A-1	IF PCB Assy (P)	1	Parallel Only
	232SEC-3237	Parallel IF Plate	1	Parallel Only
6-2		IF PCB Assy (R) Screw (mm)	1	RS-232C Only
		IF PCB Assy (R) Screw (inch)	1	RS-232C Only
	23SEC-3236	Serial IF Plate	1	RS-232C Only
7	E 4002-600	Main Chassis	1	
8	E 8017-110	Stepping Motor	1	
9	E 8032-120	Pressure Arm-R	1	
10	E 8021-130	Pressure Arm-L	1	
11	23G74985	EXT Spring-01	2	
12	E 8012-030	Lock Lever-R-SA	1	
13	E 8013-040	Lock Lever-L-SA	1	
14	E 6602-140	Ejector (Ivory)	1	
	E 6602-141	Ejector (Black)		
	E 6602-142	Ejector (Gray)		
	E 6602-143	Ejector (Cool White)		
15	E 6602-150	Brake	1	
17	E 8019-200	Reduction Gear	1	
18	E 8516-030	Idle Gear	1	
19	E 8500-100	Gear Holder	1	
20	23G88351	Ext Spring-02	1	
22	23SEC-3232	Cutter Plate	1	
23	ACC-230	Auto Cutter	1	
24	E 8023-130	Safety Cover	1	
26	23G74992	EXT Spring-03	1	
28	E 8031-150	Platen	1	
29	E 8025-120	Platen Bushing	2	
30	E 8019-210	Platen Gear	1	
32	232SEC-0157	Center Frame (Ivory)	1	
32	232SEC-0157-W	Center Frame (White)	1	
32	232SEC-0157-B	Center Frame (Black)	1	
32	232SEC-0157-G	Center Frame (Gray)	1	
33	E 4019-230	DIP SW Cover (Ivory)	1	
	E 4019-231	DIP SW Cover (Black)		
	E 4019-232	DIP SW Cover (Gray)		
	E 4019-233	DIP SW Cover (Cool White)		
34	600332-00	Slider		
35	700018-00	Guide Roller	1	

EXPLODED VIEW 2/3

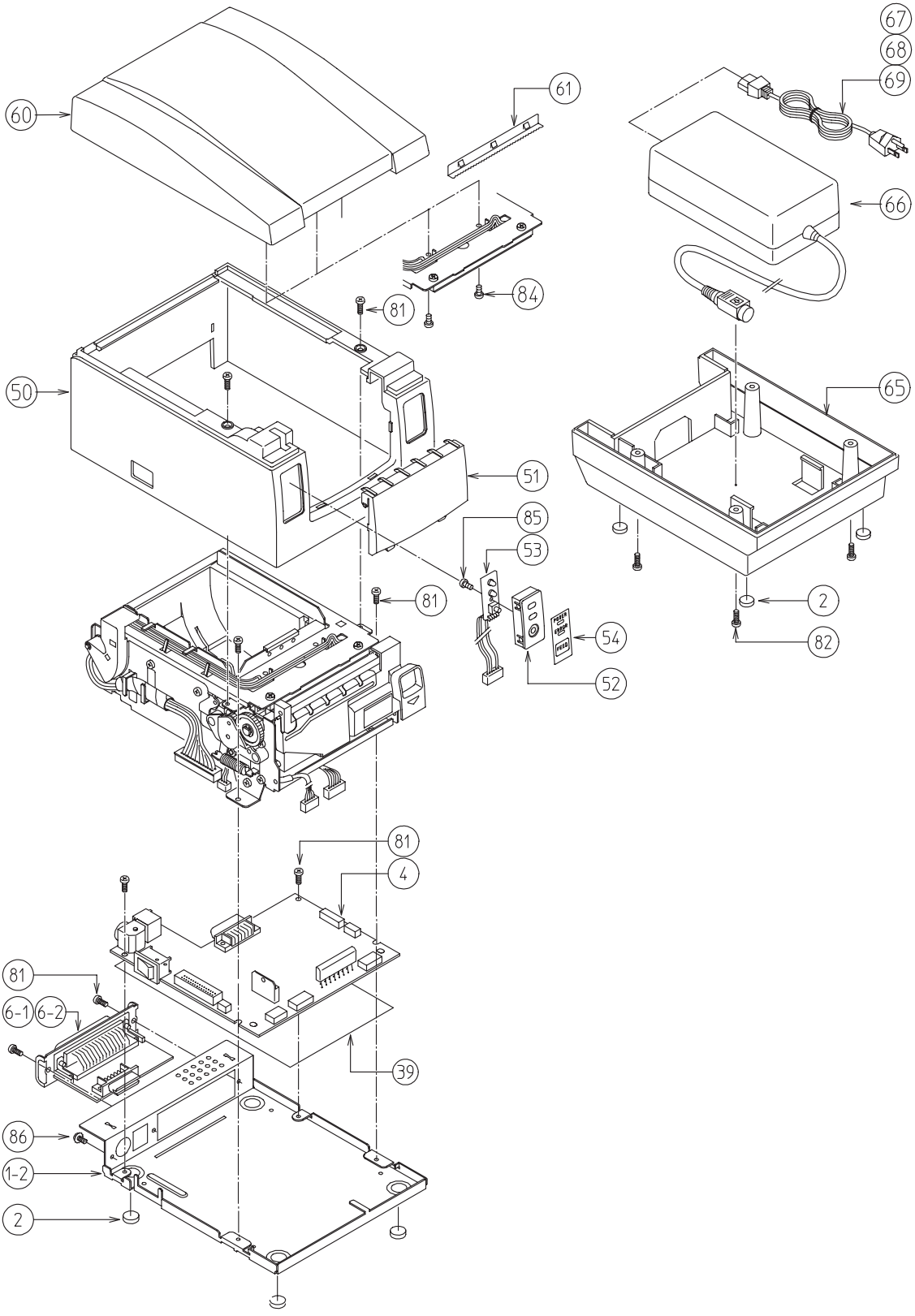
Ref. No.	Parts No.	Description	Q' ty	Remarks
36	E 40000350	Sensor PCB Assy	1	
37	E 6601-390	Sensor Plate	1	
38	E 5071-115	PNE Lever Assy	1	
39	23SEC-3269	Insulator	1	
41	E 4002-610	Top Chassis	1	
42-2	23F64802	Thermal Head	1	
43	E 4900-650	Head Cable Assy	1	
44	E 8023-120	Head Cover	1	
45	E 6602-160	Damper	1	
46	E 6612-05	Roller	1	
47	E 8023-140	Wire Cover (Ivory)	1	
	E 8023-141	Wire Cover (Black)		
	E 8023-142	Wire Cover (Gray)		
	E 8023-143	Wire Cover (Cool White)		
48	E 6233-180	Chassis Shaft	1	
49	23SEC-3032	Switch knob	1	
50	E 66201-090	Top Cover (Ivory)	1	
	E 66201-091	Top Cover (Black)		
	E 66201-092	Top Cover (Gray)		
	E 66201-093	Top Cover (Cool White)		
51	E 6200-700	Front Cover (Ivory)	1	
	E 6200-701	Front Cover (Black)		
	E 6200-702	Front Cover (Gray)		
	E 6200-703	Front Cover (Cool White)		
52	E 40000340	Operation Panel	1	
53	E 40000330	Operation PCB Assy	1	
54	E 5200-370	Operation Sheet	1	
55	23F66447	FG Cable	1	
60	E 62040590	Printer Cover (Ivory)	1	
	E 62040591	Printer Cover (Black)		
	E 62040592	Printer Cover (Gray)		
	E 62040593	Printer Cover (Cool White)		
61	E 6220-670	Tear Bar	1	
63	E 6601-400	Partition (Ivory)	1	
	E 6601-401	Partition (Black)		
	E 6601-402	Partition (Gray)		
	E 6601-403	Partition (Cool White)		
65	E 62020420	Power Case (Ivory)	1	
	E 62020421	Power Case (Black)		
	E 62020422	Power Case (Gray)		
	E 62020423	Power Case (Cool White)		

EXPLODED VIEW 3/3

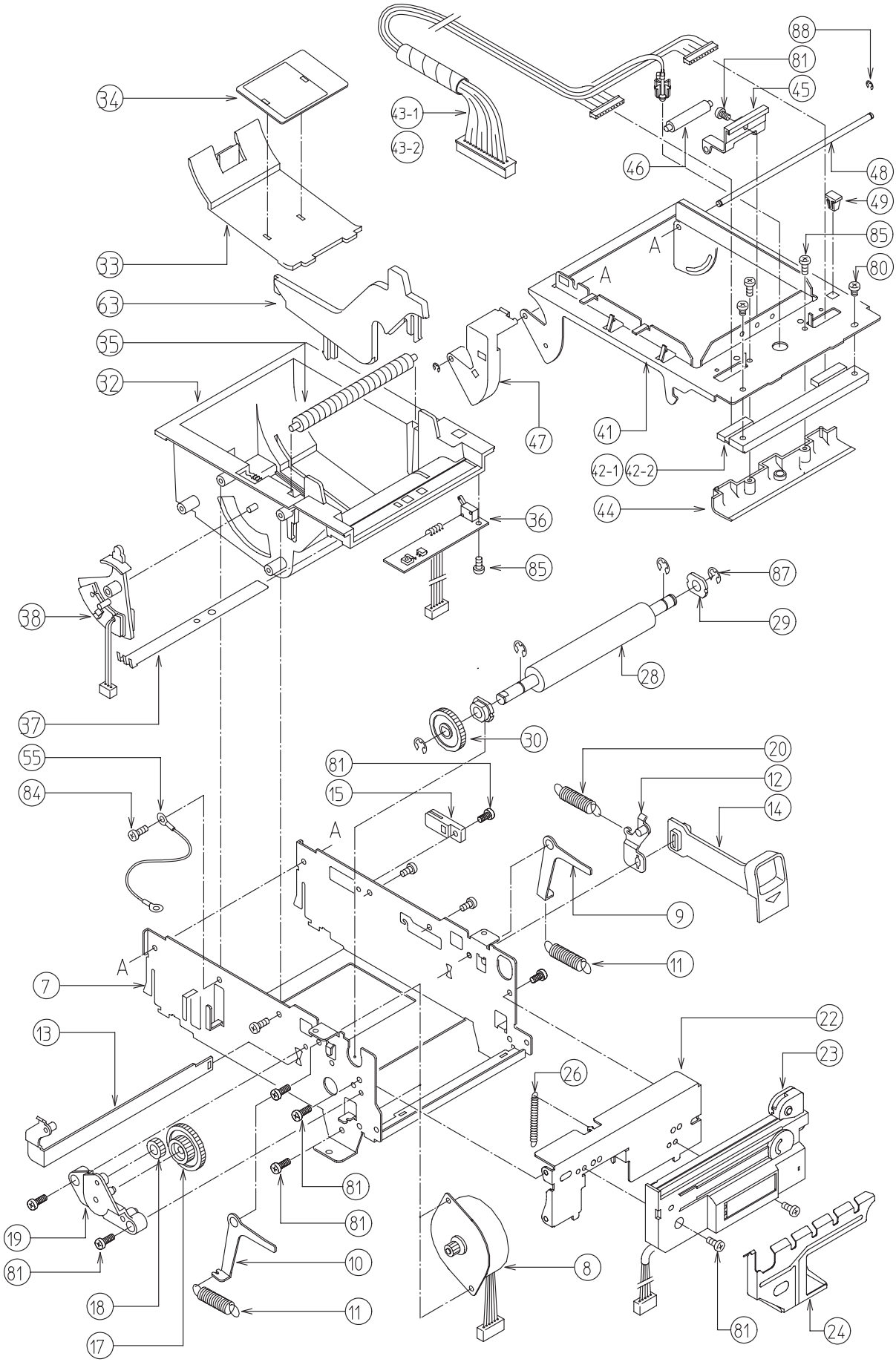
Ref. No.	Parts No.	Description	Q' ty	Remarks
66	31AD	AC Adapter	1	
67	E 6100-765	AC Cord-100V	1	
68	E 6100-755	AC Cord-120V		
69	E 6100-730	AC Cord-230V		
70		Caution Label, Paper	1	
71		Caution Label, Hot	1	
72		Caution Label, Drawer	1	
80	23G75069	Screw, PH, M3×4	2	
81	23G22579	Screw, PHT (ST), M3×6	18	
82	23G22821	Screw, PHT (ST), M3×8	4	
83	23G23251	Screw, PHT (BT), M3×6		
84	23G22796	Screw, PHT (BT), M3×8	6	
85	23G23179	Screw, PHT (BT), M2.6×6	4	
86	23G42966	Screw, PHT (ST, EXT, TW), M3×6	1	
87	23G22829	E-Ring, 4	4	
88	23G65865	E-Ring, 2	2	

5.2 Disassembly Drawing

- **Disassembly Drawing-1**



- **Disassembly Drawing-2**



5.3 Parts List for Control PCB Assy

5.3.1 Control PCB Assy

1/3

Ref. No.	Parts No.	Description		Q'ty	Remarks
IC1	23F58596	CPU	HD6412350F20	1	
IC2	E 104-530	Gate Array	CBM202LA-00	1	
IC3,(IC101)	23F64631	Flash Memory	M29F800B-70N1	(2)	
IC4	23F60056	RAM	TC554001FL-70L	1	
IC5	E 4101-720	DC/DC Converter	SI-8401L	1	
IC6	23F46940	RESET IC	M51953BPE	1	
IC7		HC-MOS	SN74HCU04AF	(1)	
TA1	E 390-380	Transistor Array	SMA7022MU	1	
TA2	E 390-230	Transistor Array	TA8428K	1	
TR1,8,9,(6,7)	E 358-080	Transistor	RN1302	3	
TR2	23F46989	Transistor	2SJ549S	1	
TR3,4,10,11,16,(101)	E 358-120	Transistor	RN1310	5	
TR5,12,13,(17,),18	E 359-210	Transistor	2SC2712	4	
TR14,15	23F60160	Transistor	2SC3786	2	
TR19	E 358-130	Transistor	RN2302	1	
(TR21,22,23)		Transistor	2SK1133	(3)	
TR20	23F67571	Transistor	RN1423	1	
ZD1	23F50910	Z.Diode	RD6.2FM	1	
D1,(4,5,6)	23F47913	Diode	1SS193	1	
D2,3	23F55041	Diode	S5688B	2	
(R19),R56	23F47219	Resistor	CR10-000J	1	
R3,(18),26,42,45,51,(38)	23F49184	Resistor	CR10-101J	5	
R13	23F67499	Resistor	CR10-121F	1	
R23,39,(R15,35)	23F49145	Resistor	CR10-181J	2	
(R21)		Resistor	CR-511F	(1)	
R12	23F67500	Resistor	CR10-471F	1	
R17,22,28,30,33,34,48,(58)	23F49491	Resistor	CR10-102J	7	
R44	23F58137	Resistor	CR10-102F	1	
(R20)		Resistor	CR10-221J	(1)	
R9,10,(49,50)	23F58661	Resistor	CR10-222J	2	
R1,2,14,16,27,29,32,(57)	23F49191	Resistor	CR10-332J	7	
R43	23F60234	Resistor	CR10-622F	1	
R5,46,47,(101)	23F49177	Resistor	CR10-103J	4	
R31	23F58685	Resistor	DR10-223J	1	
R4	23F50884	Resistor	CR10-303F	1	
R25,41.(37)	23F49152	Resistor	CR10-333J	2	
R6.7	23F50891	Resistor	CR10-473J	2	
R24.(36)	23F49160	Resistor	CR10-683J	1	
R40	23F46730	Resistor	CR10-823J	1	
(R55)		Resistor	CR10-105J	(1)	
(R52.53.54)		Resistor	CR10-475J	(3)	
R8.11	23F58692	Resistor	CR01-1.8J(1W)	2	
RA1.2.3.4.5	23F67257	Resistor Array	BCN16-4AI103J	5	
RA6.7	23F62872	Resistor Array	BCN16-4AI102J	2	
VR1		PV12H202A01BB00		(1)	

2/3

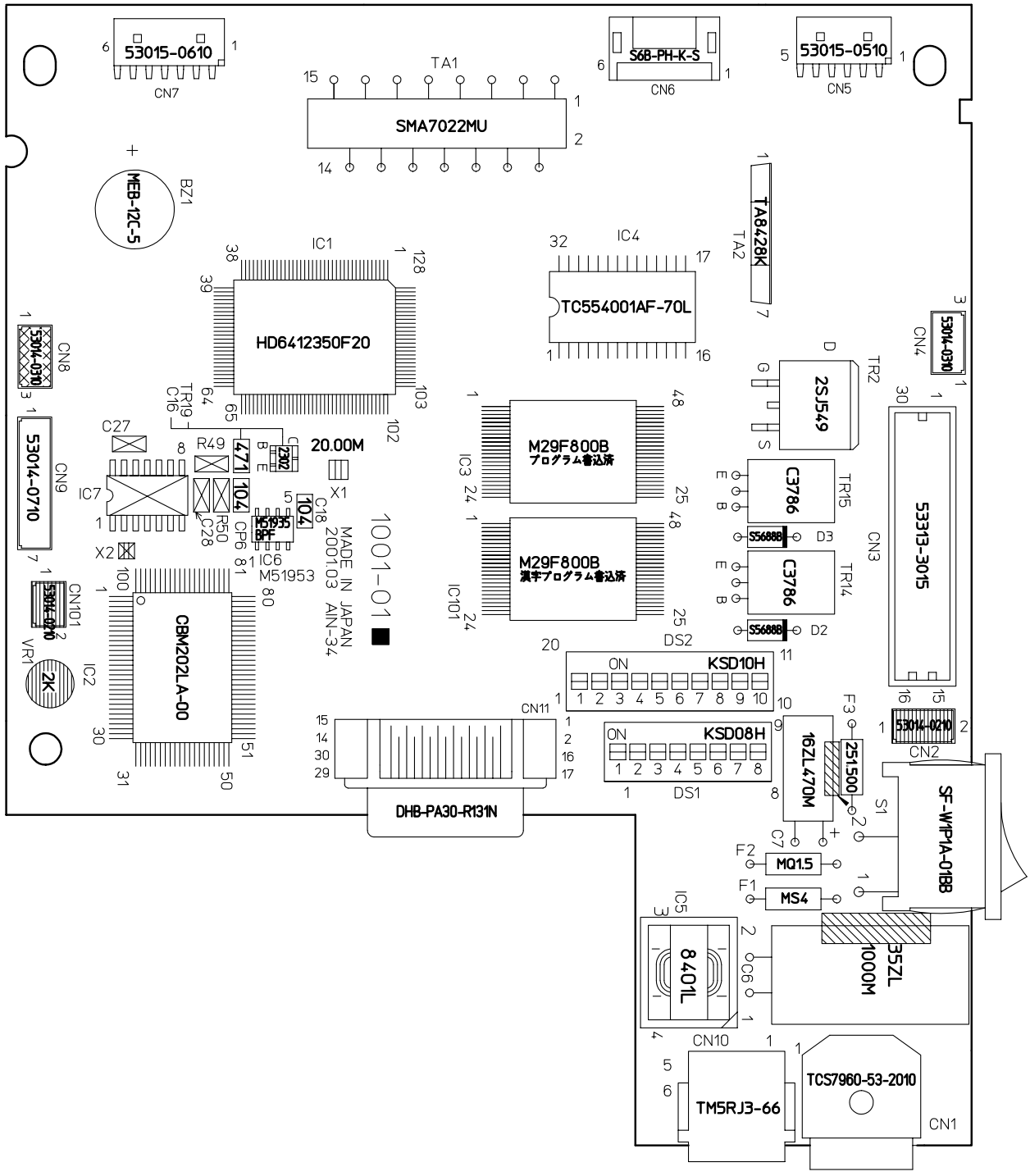
Ref. No.	Parts No.	Description		Q'ty	Remarks
C6	23F56621	Cera. Capacitor	35ZL1000M	1	
C7	23F56638	Cera. Capacitor	16ZL470M	1	
C1.2	23F60024	Cera. Capacitor	GRM1545B474K250PT	2	
C3	23F56645	Cera. Capacitor	GRM42-6F474Z50PT	1	
C4.5.8.9.10.11.18.26	23F63102	Cera. Capacitor	C1608JF1H104Z	8	
CP1A.1B.1C1D.2B.2C.2D3.4.6.7.101	23F63102	Cera. Capacitor	C1608JF1H104Z	11	
C12,13,16,29,102	23F63885	Cera. Capacitor	C1608JB1H471K	5	
C14,15,(30,31,32)	23F64738	Cera. Capacitor	C1608JB1H222K	2	
C17,19,(20),21,22,23,26,(24),25.(33)	23F63878	Cera. Capacitor	C1608JB1H102K	7	
(C27,28),C101,103~109	23F63084	Cera. Capacitor	C1608CH1H101J	8	
DS1	23F19675	DIP Switch	KSD08H	1	
DS2	23F17197	DIP Switch	KSD10H	1	
S1	E 4003-630	Switch	SF-W1P1A-01BB2	1	
F1	E 4005-840	Fuse	MS4	1	
F2	E 4005-770	Fuse	MQ1.5	1	
F3	E 4005-815	Fuse	251.500	1	
X1	E 501-430	Cera. Capacitor	CSTCV20.00MXJ040	1	
(X2)		Cera. Capacitor	CSTCW3200MX01	(1)	
CN1	E 48000690	Connector	TCS7960-53-2010	1	
(CN2,CN101)	E 48000940	Connector	53014-0210	(2)	
CN3	E 48000945	Connector	53313-3015	1	
CN4	E 48000755	Connector	53014-0310	1	
CN5	E 48000765	Connector	53015-0510	1	
CN6	E 48000955	Connector	S6B-PH-K-S	1	
CN7	E 48000930	Connector	53015-0610	1	
(CN8)	E 48000755	Connector	53014-0310	(1)	
CN9	E 48000950	Connector	53014-0710	1	
CN10	E 48000705	Connector	TM5RJ3-66	1	
CN11	23F67218	Connector	DHB-PA30-R131N	1	
BZ1	23F20791	Buzer	MEB-12C-5	1	
L1~14,21,22,24~27	23F47750	Ferrite Beads	ACC4516L-600	20	
(L15~18),19.20.23	23F47767	Ferrite Beads	ACB2012M-120	3	
(L101.102)	23F47767	Ferrite Beads	ACB2012M-120	(2)	
LA1~6,(7),8	23F67225	Ferrite Beads Array	ACA3216H4-120-X	7	
	23F64671	Cont.PCB	PCB	1	
	23C23181	ROM Label	PDL-91	(2)	

3/3

Ref. No.	Parts No.	Description		Q'ty	Remarks
IC1,2	23F46597	I/F-IC	SP232ECN	2	
C1	23F64706	Cera. Capacitor	16MRE100	1	
C2~12	23F63102	Cera. Capacitor	C1608JB1H104KT	11	
C13	23F60024	Cera. Capacitor	GRM1545B474K250PT	1	
CN1	23F67232	Connector	DHB-RA30-R131N	1	
(CN2)	23F67271	Connector	70013-025-03	(1)	
(CN2)	23F67225	Connector	70013-025-04	(1)	
LA1,2	23F67225	Ferrite Beads Array	ACA3216H4-120-X	2	
R1	23F47219	Resistor	CR10-000J	(1)	
DS3	23F19675	DIP Switch	KSD08H	1	
	23F64688	PCB	1001-02	1	
	23SEC-3236	Serial If Plate	500288-00	1	
IC1,2	23F54338	H-CMOS	74HC05	2	
IC3	23F58614	H-CMOS	74HC244	1	
RA1,2	23F52351	Resistor Array	BCN31-8SI332J	2	
RA3	23F68455	Resistor Array	BCN31-8SI473J	1	
C1	23F64706	Cera. Capacitor	16MRE100	1	
C2,7,8	23F63102	Cera. Capacitor	C1608JB1H104KT	3	
C3,4	23F63878	Cera. Capacitor	C1608JB1H102KT	2	
C5	23F56645	Cera. Capacitor	GRM42-6F474Z50PT	1	
C6	23F60024	Cera. Capacitor	GHM1545B474K250PT	1	
CN1	23F67232	Connector	DHB-RA30-R131N	1	
CN2	23F67240	Connector	57RE-40360-730B(D29)	1	
L1,2	23F47767	Ferrite Beads	ACB2012M-120	2	
LA1~5	23F67225	Ferrite Beads Array	ACA3216H4-120-X	5	
	23F64695	PCB	1001-03	1	
R1	23F47219	Resistor	CR10-000J	(1)	
	23SEC-3237	Parallel If Plate	500287-00	1	

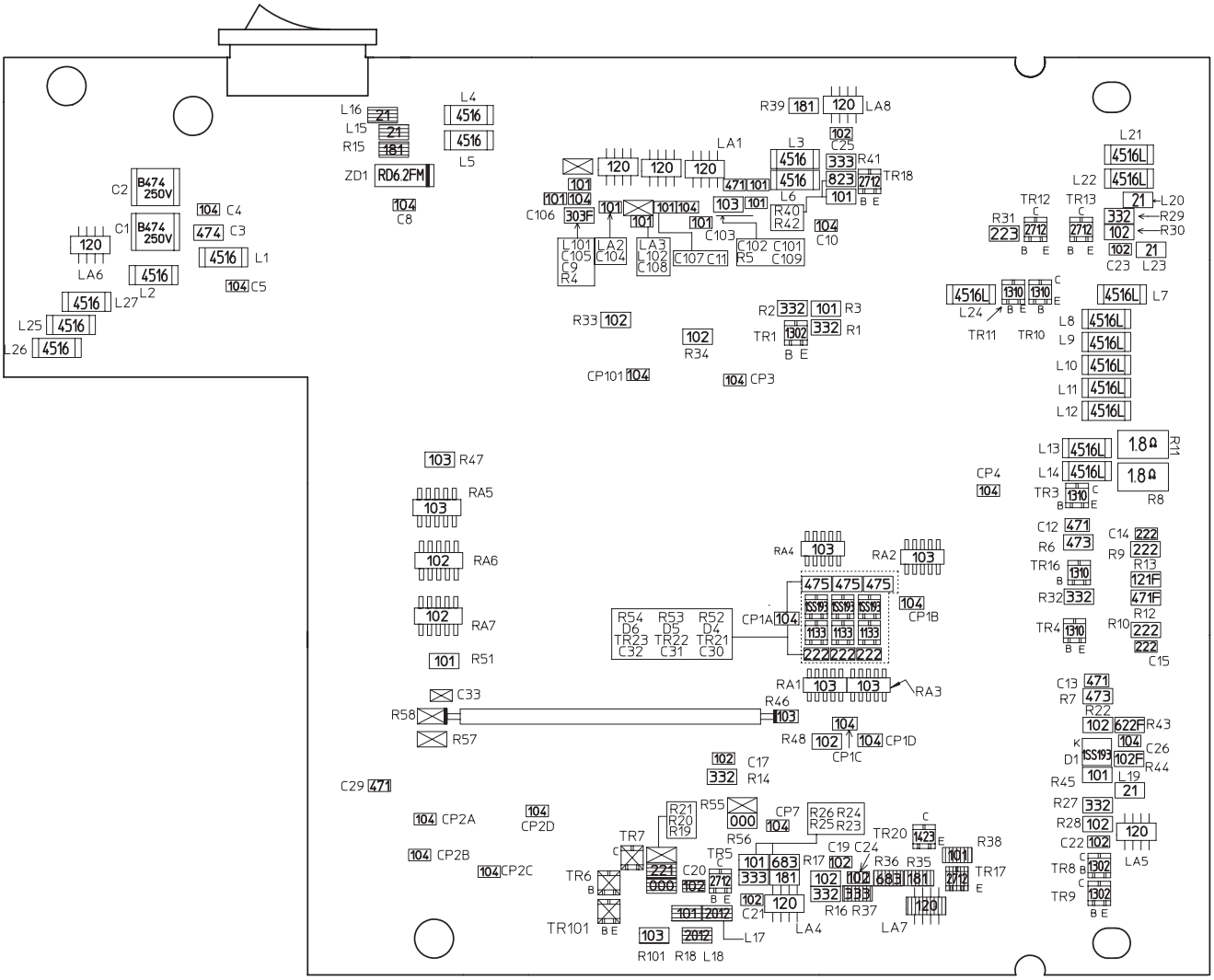
5.4 Parts Layout Drawing

5.4.1 Control PCB Assy (Main Board Part Surface)



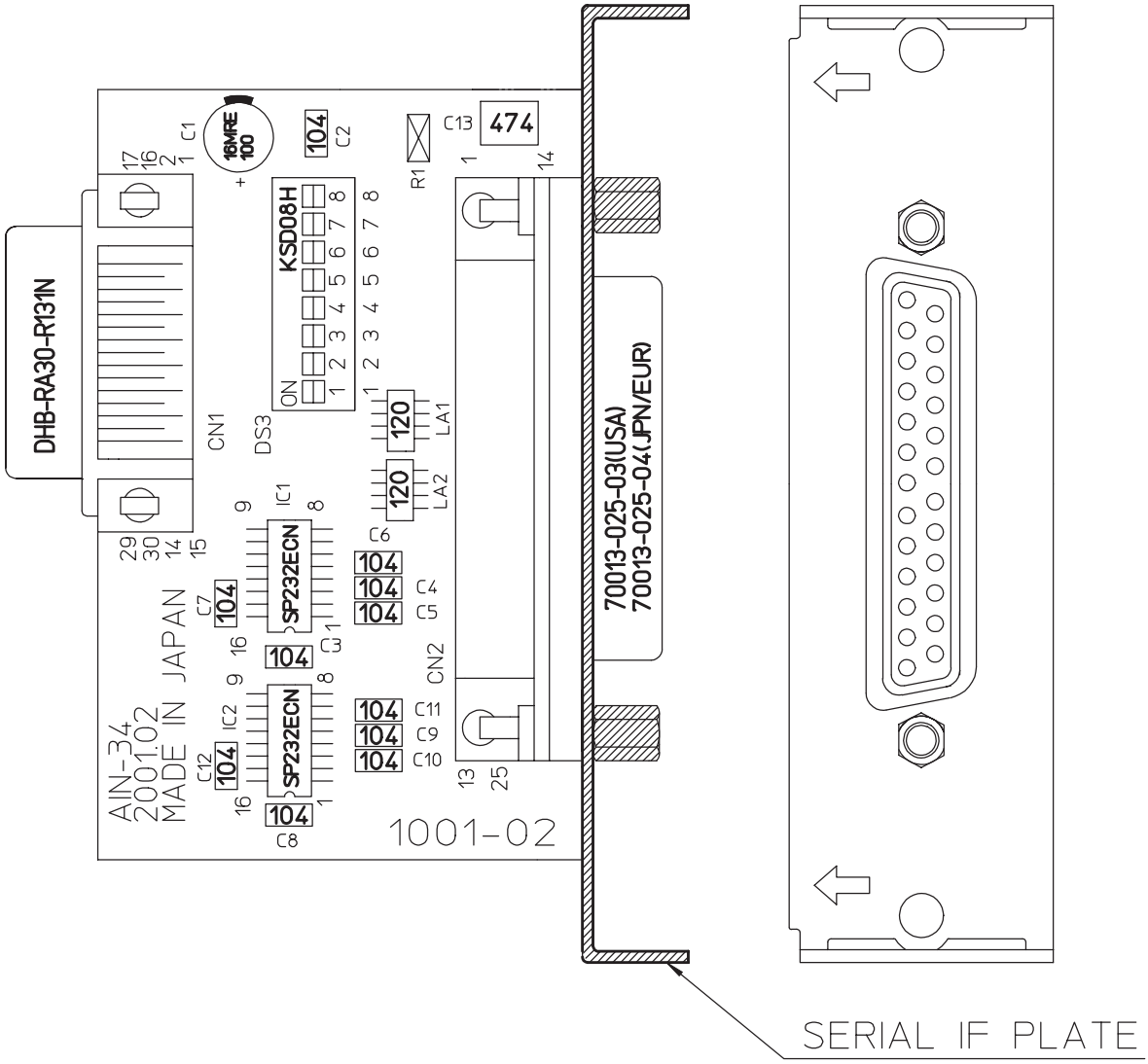
3SEC-1137

5.4.2 Control PCB Assy (Main Board Soldering Surface)



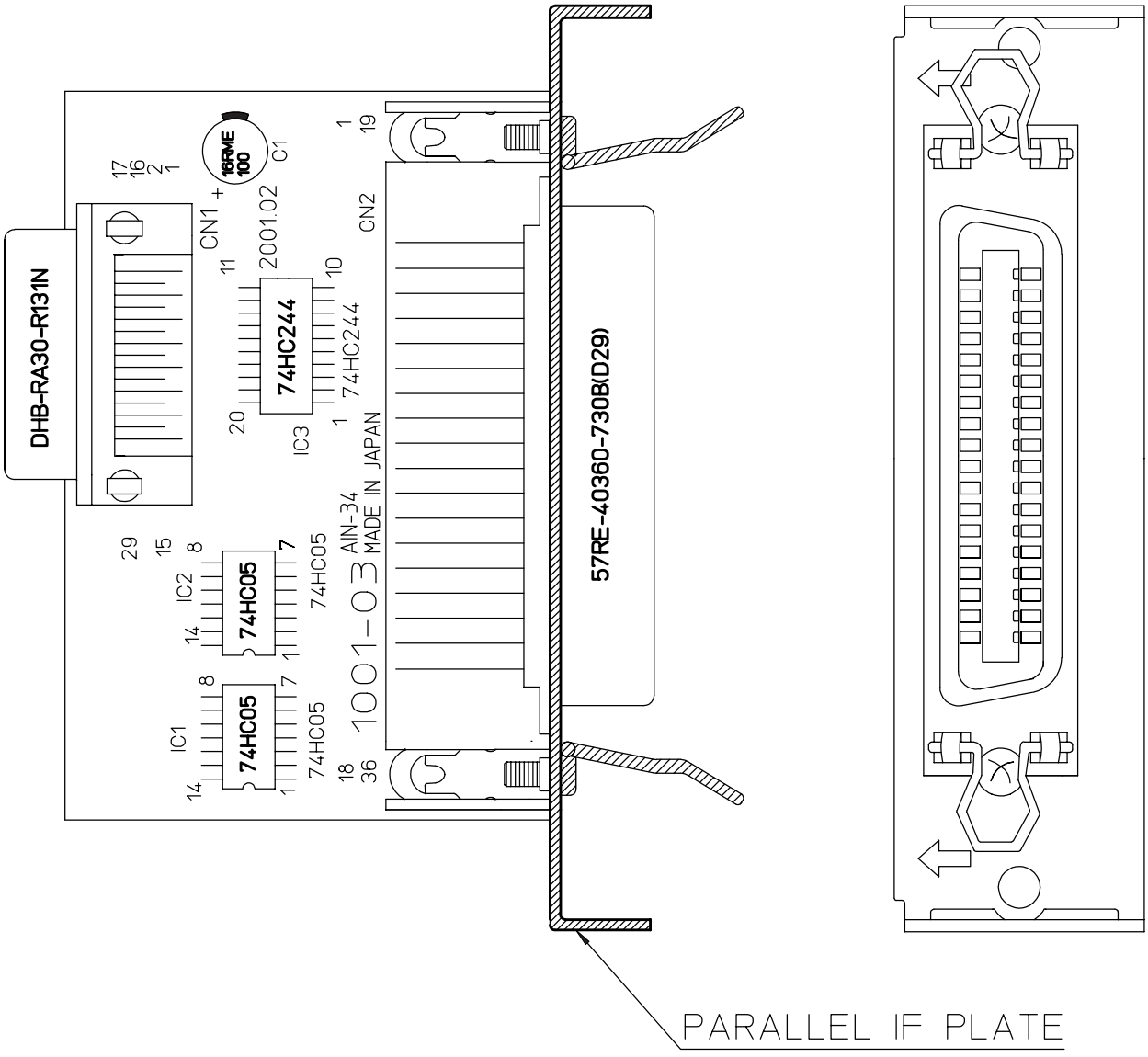
3SEC-1140

5.4.3 Control PCB Assy (Serial Interface)



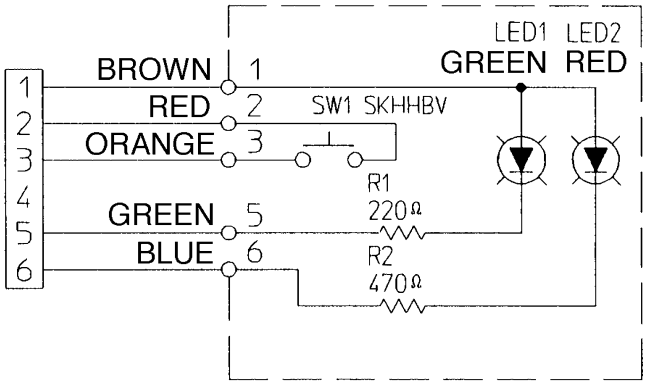
SEC-3285

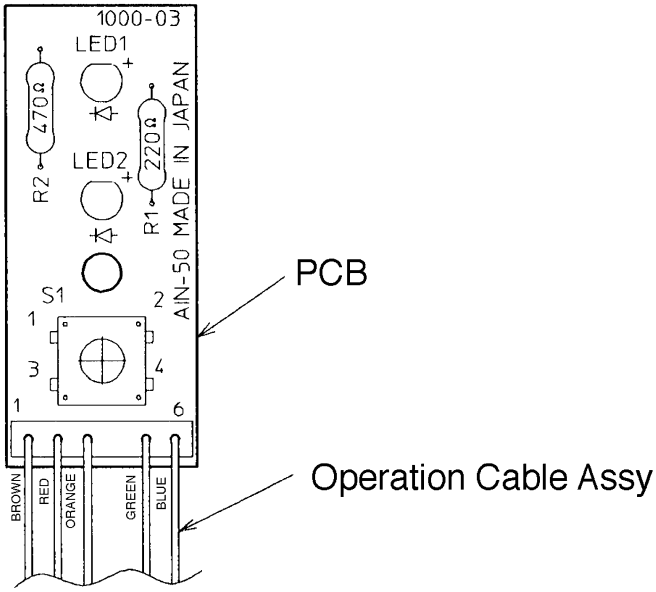
5.4.4 Control PCB Assy (Parallel Interface)



3SEC-1138

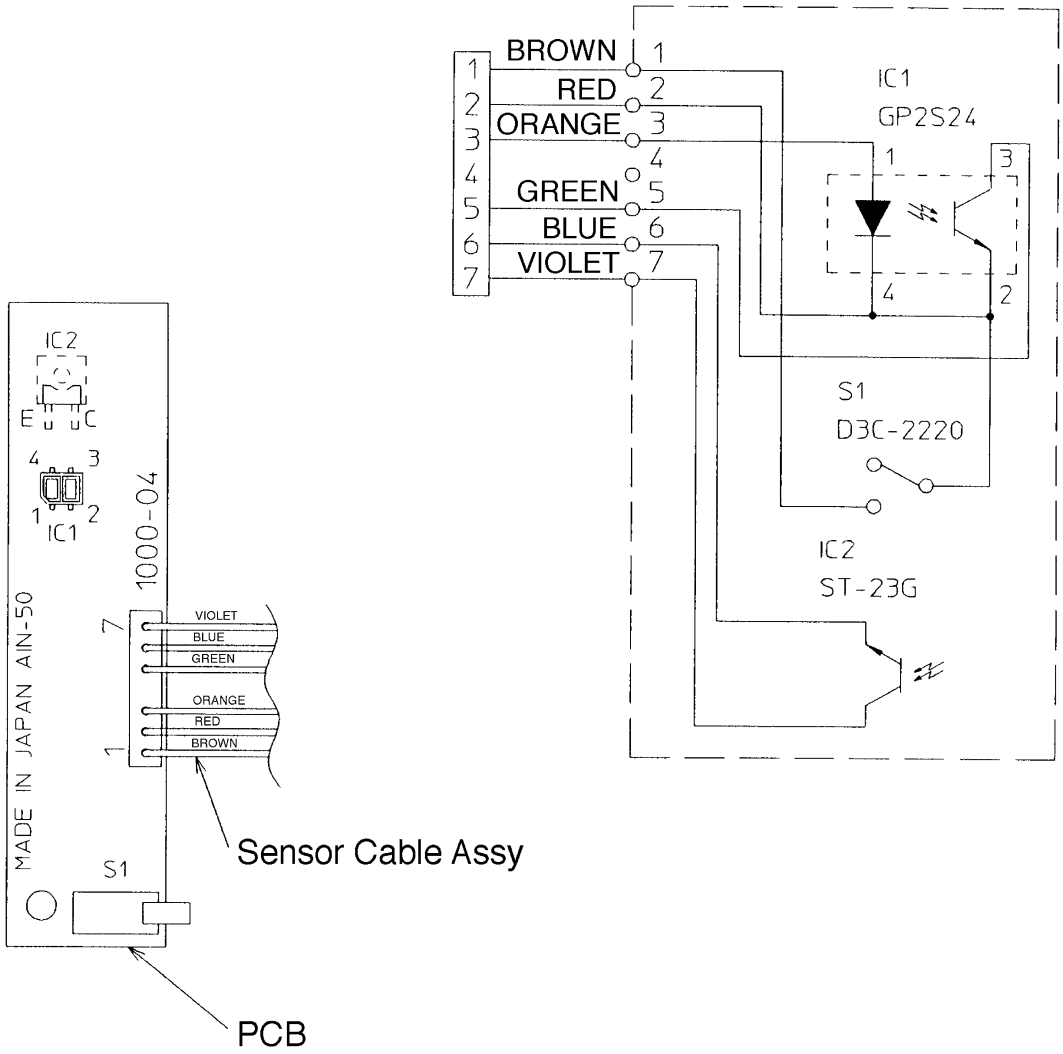
5.4.5 Operation PCB Assy





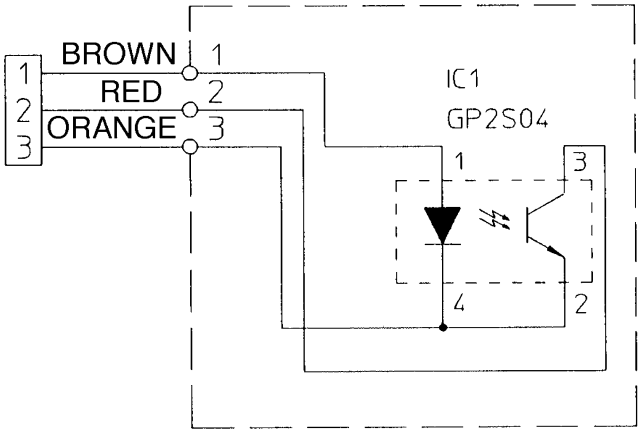
Ref. No.	Description	
LED1	LED	SEL-2410E (GREEN)
LED2	LED	SEL-2110S (RED)
R1	Resistor	RD25M10-220Ω
R2	Resistor	RD25M10-470Ω
S1	Tact Switch	SKHHBV
	Operation Cable Assy	SEC-2855
	PCB	1000-03

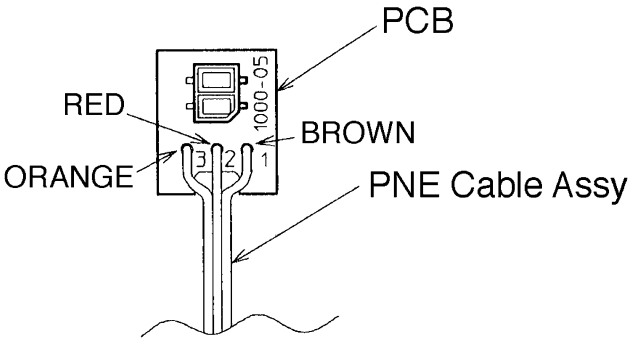
5.4.6 Sensor PCB Assy



Ref. No.	Description	
IC1	Interrupter	GP2S24
IC2	Photo Transistor	ST-23G-C
S1	Micro Switch	D3C-2220
	Sensor Cable Assy	SEC-2853
	PCB	1000-04

5.4.7 PNE PCB Assy in PNE Lever Assy





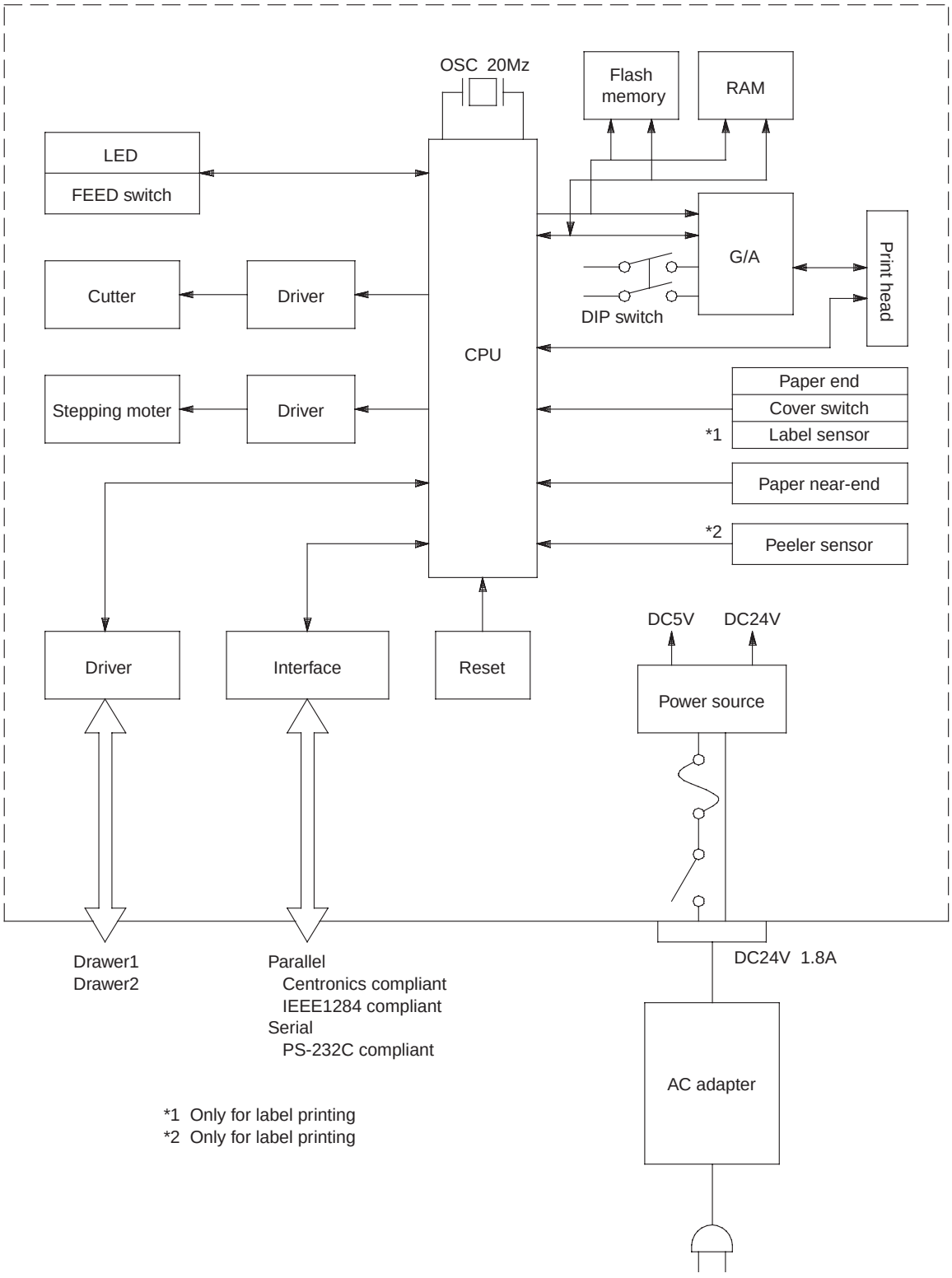
Ref. No.	Description	
IC1	Interrupter	GP2S24
	PNE Cable	SEC-2854
	PCB	1000-05

6. DRAWING

The following lists the reference drawings for maintenance, and so on.

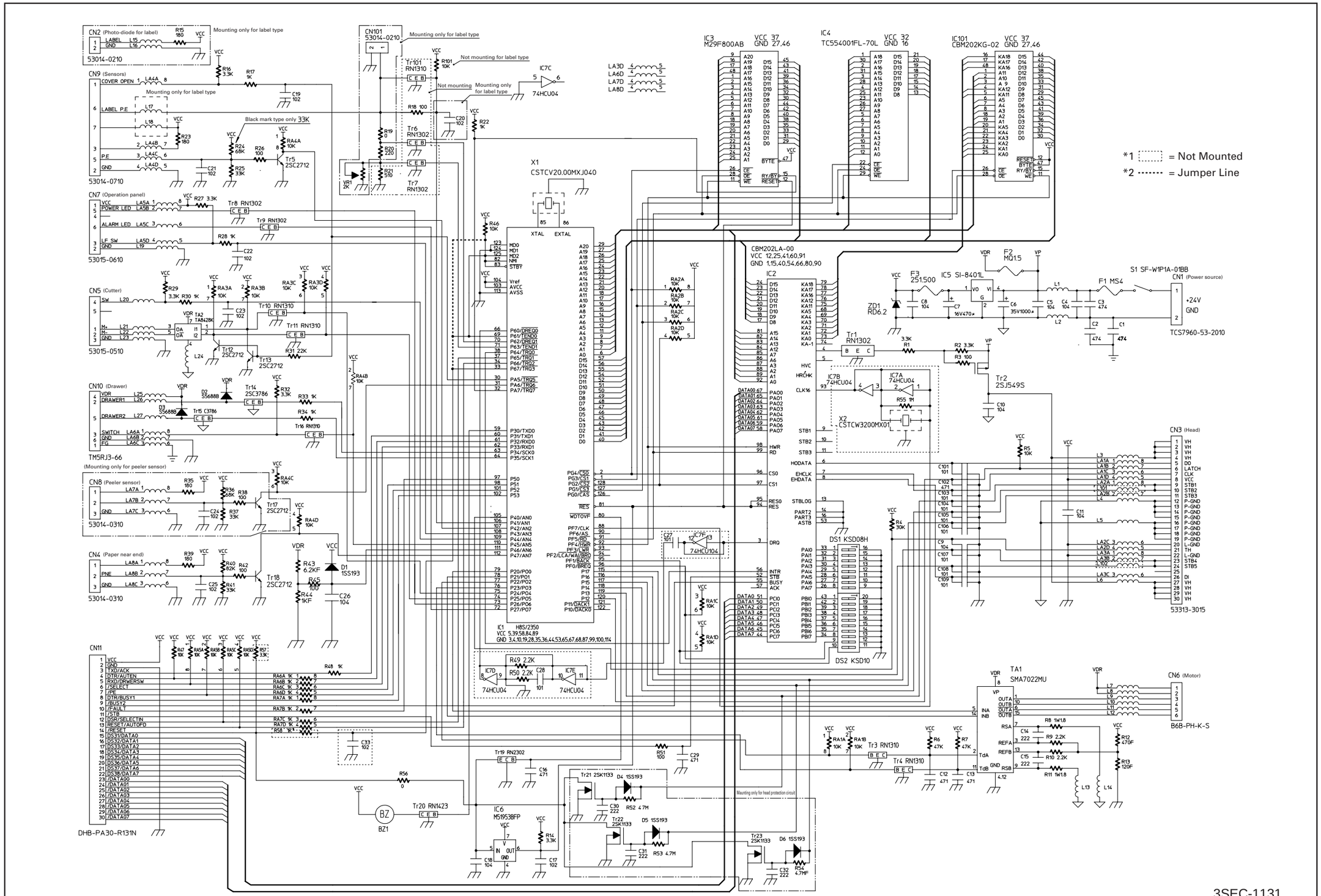
- Block diagram
- Circuit diagrams for the following circuits
- Control PCB Assy (Main Board)
- Control PCB Assy (Serial Interface)
- Control PCB Assy (Parallel Interface)

6.1 Block Diagram

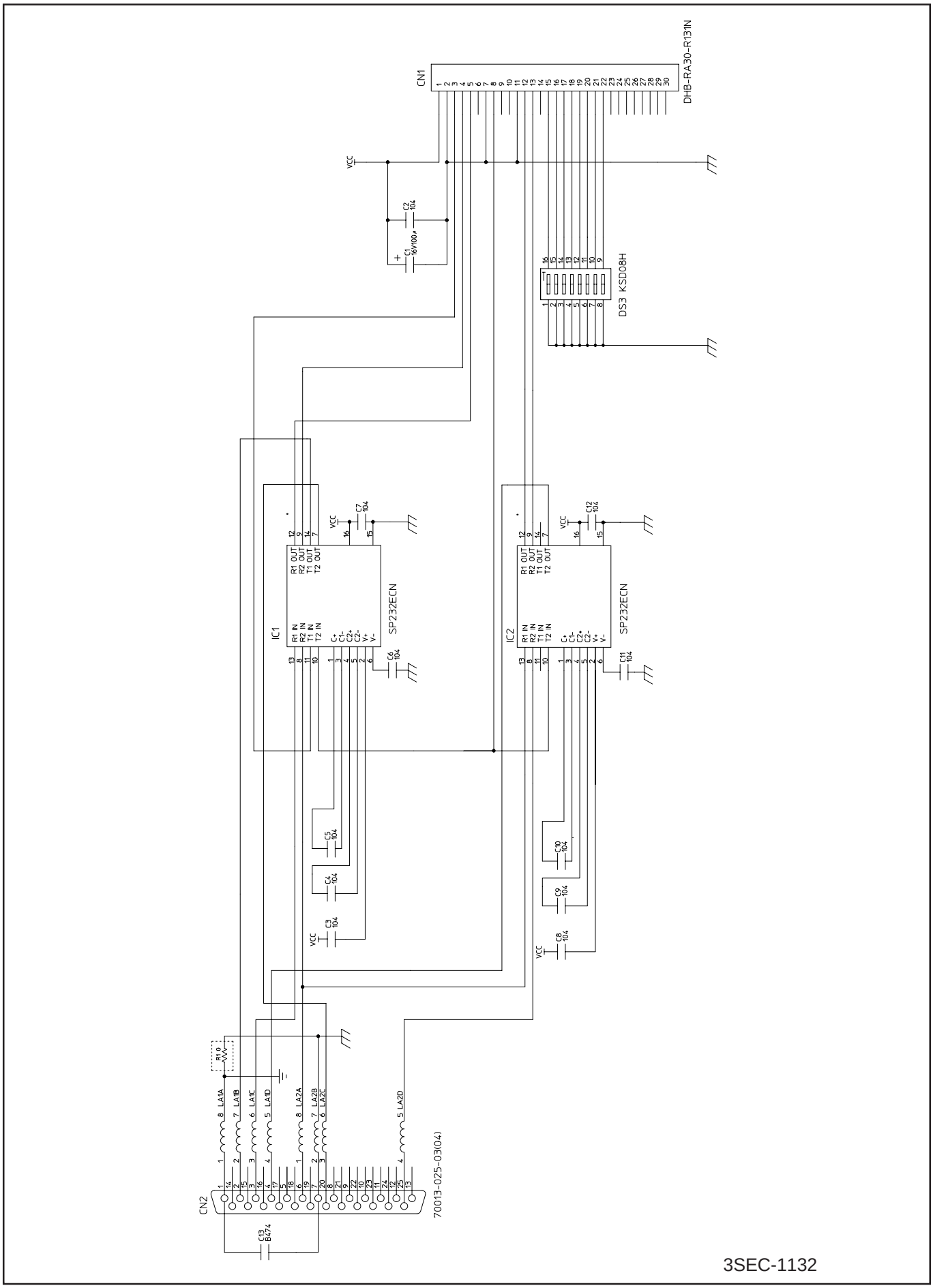


6.2 Circuit Diagram

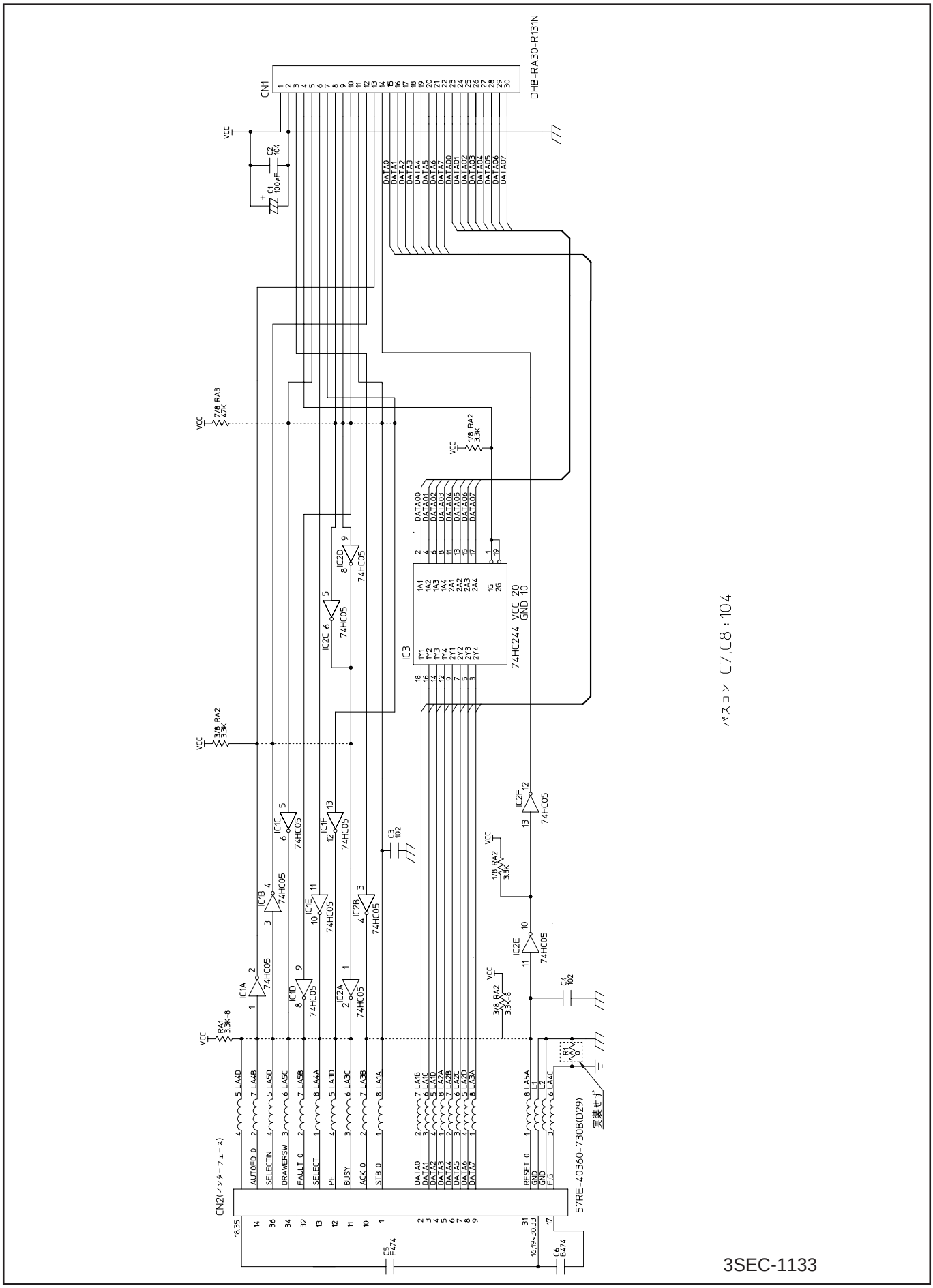
6.2.1 Control PCB Assy (Main Board)



6.2.2 Control PCB Assy (Serial Interface)



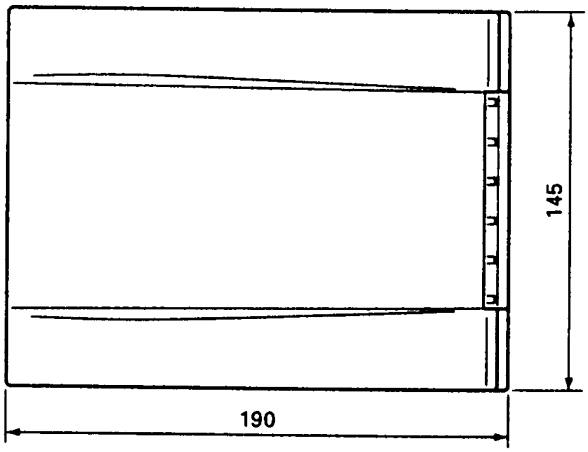
6.2.3 Control PCB Assy (Parallel Interface)

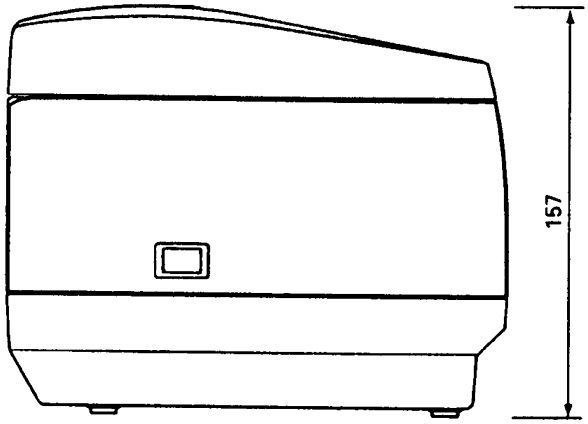


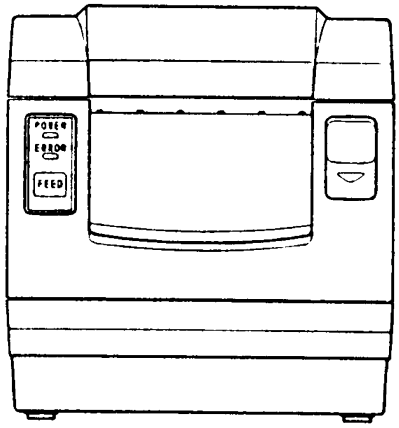
7. OUTER DIMENSION

- CBM1000IIS

Unit: mm

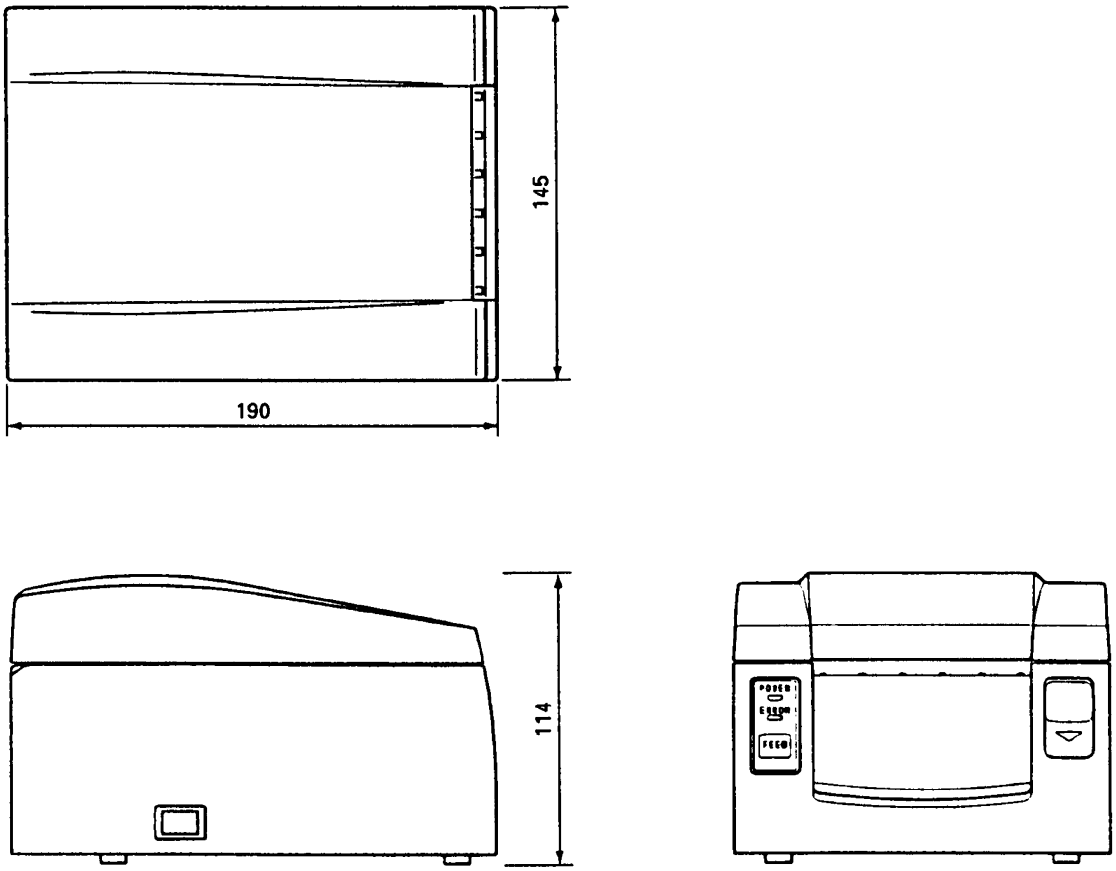






• CBM1000IIA/CBM1000IID

Unit: mm



• AC Adapter (31 AD)

Unit: mm