CITIZEN

Service Manual

LINE THERMAL PRINTER
MODEL CT-S300

Rev. 2.00 Issued on Oct. 7, 2004

Japan CBM Corporation

REVISION

Rev. No.	Date	Comment
Rev. 1.00	2004/01/16	Newly issued
Rev. 2.00	2004/10/07	Changed “5.1 Part List for Mechanism” Added “5.3 Part List for PCB Control Assy”

CONTENTS

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of the line thermal printer CT-S300.

1. FEATURES

- Compact design
- Paper drop-in mechanism that facilitates setting paper and cleaning the print head
- High-speed printing at 100 mm/s max.
- Low-noise printing
- Built-in input buffer
- Bar code printing
- Page mode enabling free layout of printing
- Registration of user-defined characters and logos into user memory
- Built-in Drawer Kick-out interface
- Auto cutter mechanism provided as a standard unit (auto cut/partial cut)
- Use of 80 mm- or 58 mm wide paper is available.
- Replaceable interface board
- A variety of selection of functions is available with the memory switch.
- Horizontal-, vertical-, or wall-mounting (option) is possible.
- Built-in buzzer
- Either power supply box type or AC adapter type is selectable.
- Various kinds of customization are permitted.
- 2-color printing

2. SPECIFICATIONS

Item	Specifications	
Model	CT-S300-RF120 CT-S300-PF120 CT-S300-UF120	CT-S300-RF230 CT-S300-PF230 CT-S300-UF230
Print method	Line thermal dot print method	
Print width	72 mm/576 dots, (48 mm/384 dots) *1	
Dot density	8 × 8 dots/mm (203 dpi)	
Print speed	100 mm/s (Fastest, print density level 0), 800 dot lines/s)	
Number of print columns *2 ( ) shows the value with 58 mm wide paper.	Font A: 48/42 (32/30) columns; 12 × 24 dots Font B: 64/56 (42/40) columns; 9 × 17 dots Font C: 72/63 (48/45) columns; 8 × 16 dots	
Character size	Font A: 1.50 × 3.00 mm Font B: 1.13 × 2.13 mm Font C: 1.00 × 2.00 mm	
Character type	Alphanumeric, International, PC850/852/857/858/860/863/864/865/866/ WPC1252/Katakana/Thai code 18	
User memory	256 KB (Capable of registering user-defined characters and logos)	
Types of bar code	UPC-A/E, JAN (EAN) 13/8 columns, ITF, CODE 39, CODE 128, CODABAR, CODE 93	
Line spacing	4.23 mm (1/6 inch)	
Paper roll	Thermal paper roll: 80^{+0}_{-1} mm/58^{+0}_{-1} mm × ϕ83 mm Paper thickness: 65-75 µm	
Interfacing	Serial (RS-232C compliant), Parallel (IEEE 1284 compliant), USB	
Cash drawer interface	2 cash drawers are supported.	
Input buffer	4K bytes/45 bytes	
Supply voltage	DC 24 V ±7%	
Power consumption	Approx. 70 W (in normal printing)	
AC adapter	Rated input: AC 100 to 240 V, 50/60 Hz, 150 VA Rated output: DC 24 V, 2A	
	32AD-U	32AD-E
Weight	Approx. 1.2 kg	
Outside dimensions	145 (W) × 195 (D) × 121 (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: 100 km, 1×10^8 pulses (At normal temperature/humidity with recommended paper used) Auto cutter life: 1 million cuts (At normal temperature/humidity with recommended paper used)	
Safety standard *3	UL, C-UL, FCC Class A	TUV, GS, CE marking

Notes:
*1: Value in parentheses shows the case when a 58-mm wide paper roll is used.
*2: The number of printable columns is selectable with a DIP switch.
*3: Represents the safety standards acquired when CBM-made adapters (32AD series) are used.

3. DISASSEMBLY AND REASSEMBLY

Note the following items when maintaining the printer.

- Do not disassemble, reassemble, or adjust the printer unnecessarily when the printer is operation is satisfactory.
- Do not loosen the screws fixing each component carelessly.
- After finishing inspection, perform checking for normality before turning on the printer.
- Pay attention not to leave the part or screws used for maintenance inside the printer.
- When handling the print head and electronic components, pay attention to static electricity.
- When disassembling or reassembling the printer, check the wiring and cord for damage. Pay attention not to lay the wiring and cord by force.
- Lubricate the components as necessary when reassembling them.

3.1 Tools Used

- Phillips screwdriver #0, #1, and #2
- Tweezers
- Long-nose pliers
- Oil brush
- Nipper

3.2 Disassembly Procedure

Disassembly procedure is explained in three categories: “Overall Disassembly”, “Disassembly of Mechanism Chassis Assembly”, and “ Disassembly of Platen Assembly”.

3.3 Reasembly Procedure

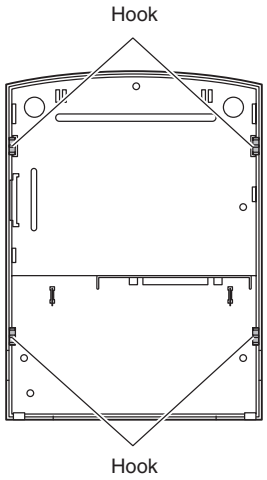
Reverse the procedure in “3.2 Disassembly Procedure”.

3.2 Disassembly Procedure

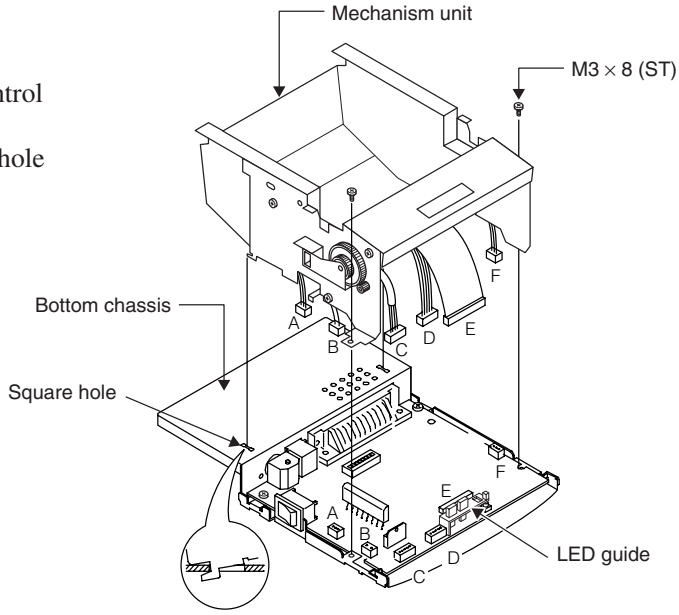
3.2.1 Overall Disassembly

(1) Removing top cover
- Place the printer in vertical state.
- Open the paper cover using the cover open lever.
- Remove the printer chassis from the four “hooks” at the bottom of the top cover.

* Pay attention not to break the “hook”.

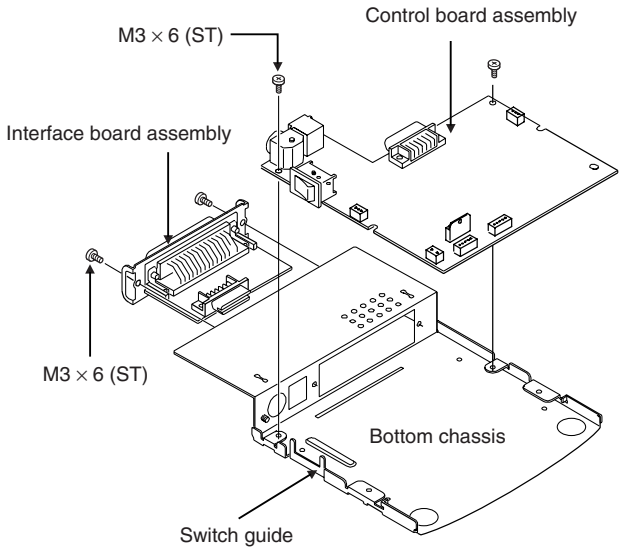


(2) Removing mechanism unit
- Remove the LED guide.
- Remove the two M3 × 8 (ST) screws.
- Remove the connectors and FFC from the control board assembly.
- Remove the mechanism unit from the square hole of the bottom chassis.



(3) Removing interface board assembly
- Remove the two M3 × 6 (ST) screws.
- Remove the interface board assembly.

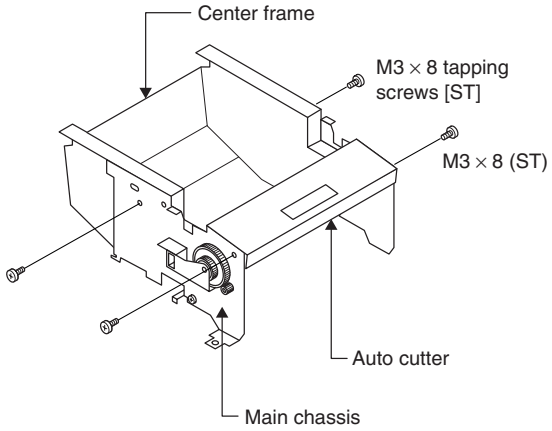
(4) Removing control board assembly
- Remove the two M3 × 6 (ST) screws.
- While removing the power switch from the switch guide, remove the control board assembly.



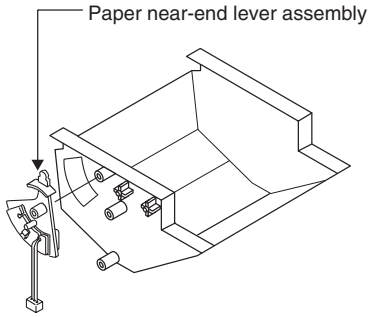
3.2.2 Disassembly of Mechanism Chassis Assembly

(1) Removing auto cutter
- Remove the two M3 × 6 (ST) screws from both sides.
- Widen the main chassis a little, remove the four guide bosses, and remove the auto cutter.

(2) Removing center frame
- Remove the two M3 × 8 tapping (ST) screws from both sides.
- Widen the main chassis a little and remove the center frame while removing the four guide bosses.

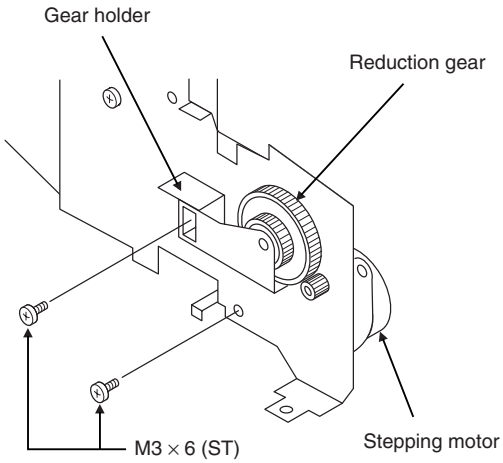


(3) Removing paper near-end lever assembly
- Remove the assembly from the center frame.



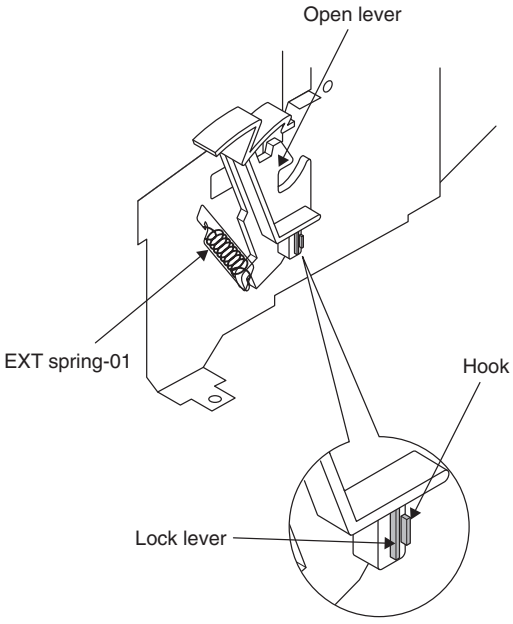
(4) Removing gear holder and reduction gear
- Remove them by removing the M3 × 6 (ST) screw.

(5) Removing stepping motor
- Remove the M3 × 6 (ST) screw.
- While unhooking the flange of the motor, remove the stepping motor.

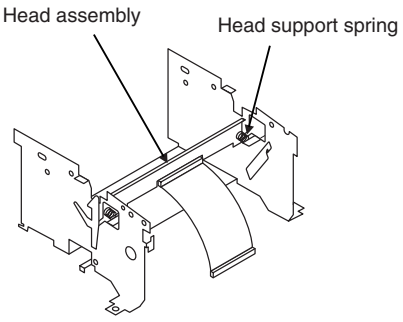


(6) Removing open lever and lock lever
- Remove the EXT spring-01.
- While unhooking the "hook" of the open lever, remove the open lever.
- Remove the lock lever.

* Note that removing the lock lever may result in detaching the "Head support spring" to be handled in (7).

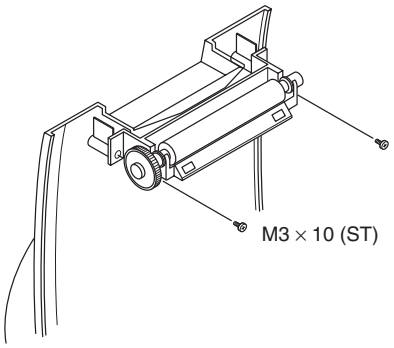


(7) Removing head assembly
- Remove the head support springs holding the head assembly at both sides.
- Remove the head assembly from the main chassis.

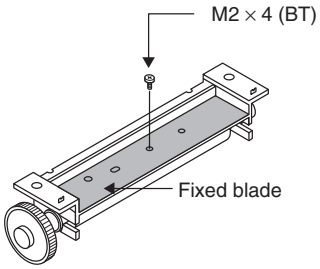


3.2.3 Disassembly of Platen Assembly

(1) Removing platen assembly
- Remove the platen assembly by removing the two M3 × 10 tapping (ST) screws.

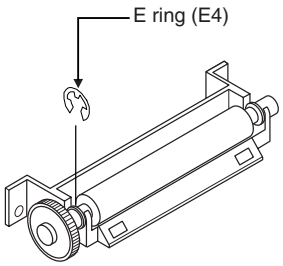


(2) Removing fixed blade.
- Remove the fixed blade by removing the M2 × 4 screw.



(3) Removing platen assembly
- Remove the E ring (E4) from the inside of the platen gear.
- Shift the platen bushing of the platen gear to the rubber roller side to remove it from the platen holder.
- Removing platen assembly

* Note that the bushing at the opposite side of the gear, when removed from the holder, may become free.



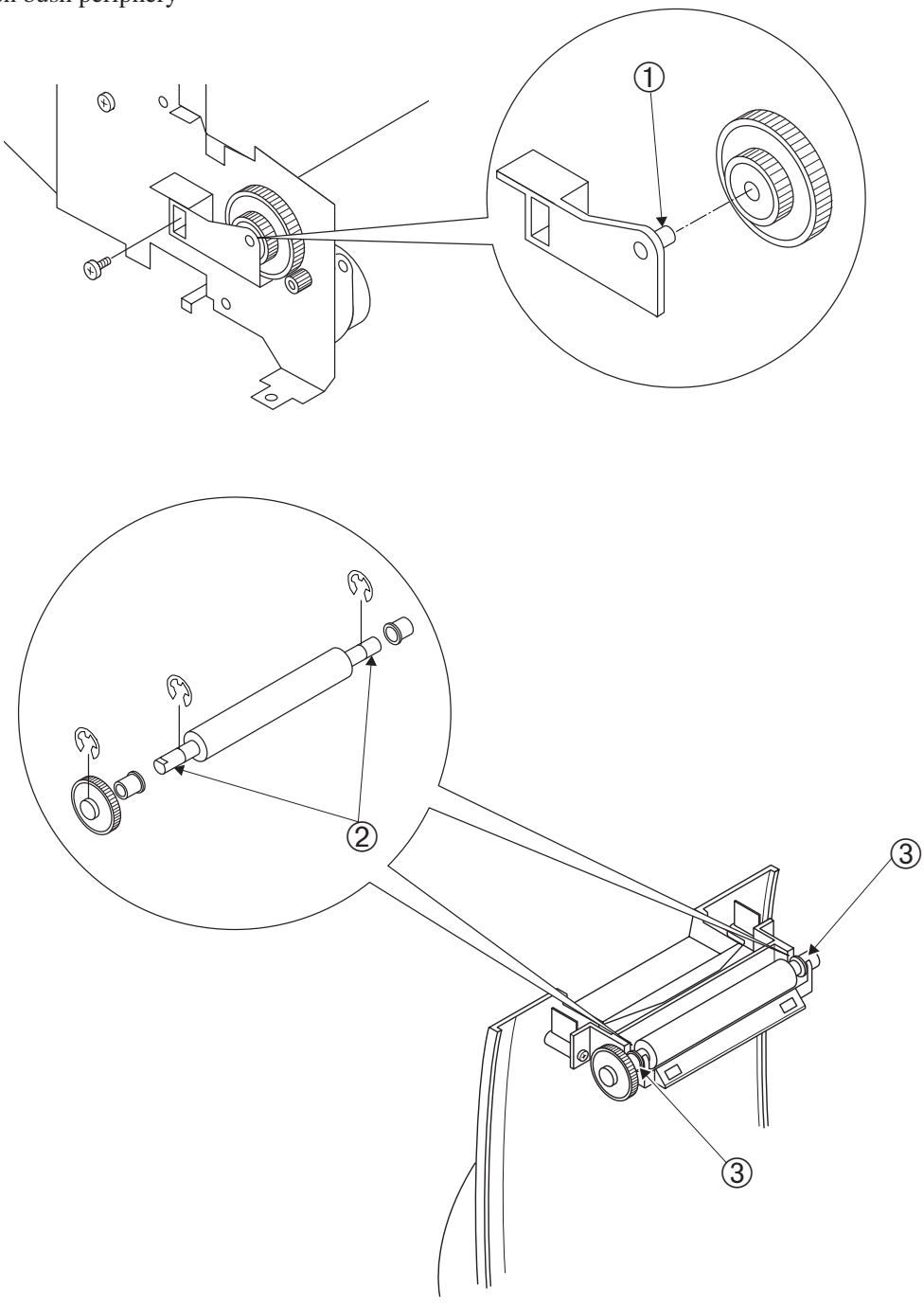
3.3 Reassembly Procedure

Reverse the procedure in “3.2. Disassembly Procedure”.

3.4 Lubrication

(1) Oil (Grease)
Furoyl G--943 (Kanto Kasei Co., Ltd.)

(2) Lubrication points
① Gear holder shaft
② Platen bearing
③ Platen bush periphery



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.

5. SERVICE PARTS LIST

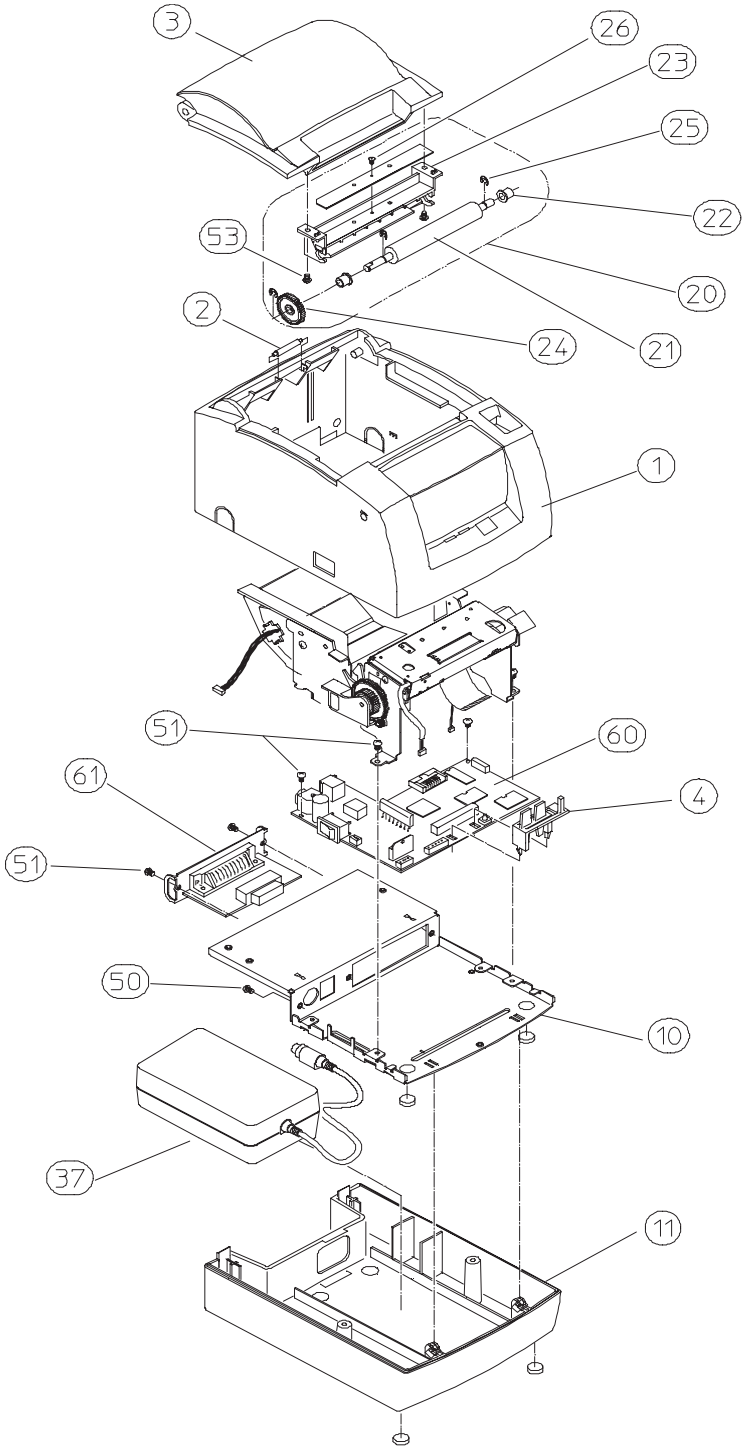
5.1 Parts List for Mechanism

Ref. No.	Parts No.	Description	Q'ty			Remarks
			R	P	U	
1	100118-00	Top Cover Assy				
1	100118-00-B	Top Cover Assy (Black)				
2	600387-00	Roller	1	1	1	
3	600370-00	Printer Cover	1	1	1	
3	600370-00-B	Printer Cover (Black)				
4	600371-00	LED Guide	1	1	1	
5	100113-00	Paper Holder Assy				
6	600377-00	Reduction Gear	1	1	1	
7	600378-00	Gear Holder	1	1	1	
8	600379-00	Open Lever	1	1	1	
9	500316-00	Plate Spring	1	1	1	
	600383-00	(Sensor Cover)	1	1	1	Black mark option
	600388-00	(Wire Stopper)	1	1	1	Black mark option
10	100114-00	Bottom Chassis Assy				
11	600381-00	Power Case	1	1	1	Built-in adapter model
12	100115-00	Power Case Assy				
12	100115-00-B	Power Case Assy (Black)				
13	500313-00	Mecha Chassis	1	1	1	
14	500314-00	Lock Lever	1	1	1	
15	700021-00	Head SP SEC-3698	2	2	2	
16	700025-00	Lock Lever SP	1	1	1	
20	100116-00	Platen Holder Assy	(1)	(1)	(1)	
21	800452-00	Platen	1	1	1	
22	650001-00	Platen Bushing	2	2	2	
23	600372-00	Platen Holder	1	1	1	
24	600376-00	Platen Gear	1	1	1	
25	F60440-00	E-RING, 4	3	3	3	
26	F14520-04	Screw, PHT (BT), M2 × 4	1	1	1	
27	ACS-531	ACS-531 (Including fixed blade)	1	1	1	
28	000010-00	Stepping Motor SP-42RD-020S	1	1	1	
29	100117-00	Thermal Head Assy	(1)	(1)	(1)	
30	25-0347	Head Cable (FFC) SEC-2310	1	1	1	

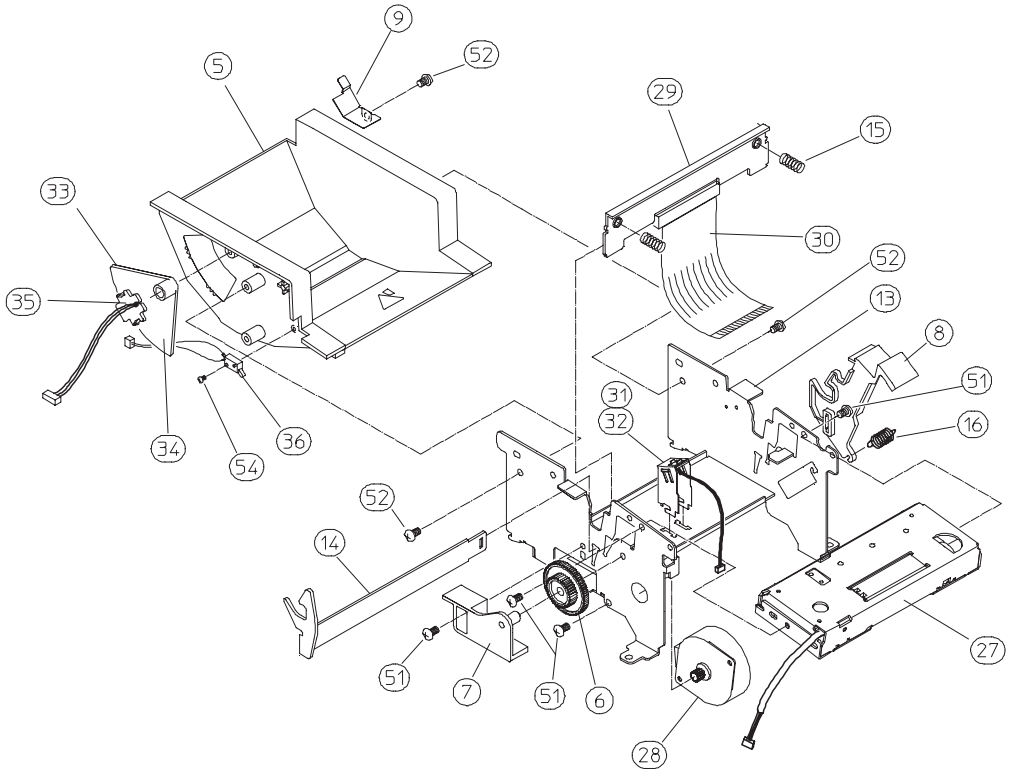
Ref. No.	Parts No.	Description	Q'ty			Remarks
			R	P	U	
31	200041-00	PE PCB Assy SEC-3784	(1)	(1)	(1)	
32	500322-00	PE PCB Holder	1	1	1	
33	90-0197	PNE PCB Assy SEC-2856	(1)	(1)	(1)	1 PNE sensor
	200055-00					2 PNE sensors
	(25-0379)	(PNE Cable Assy) SEC-2854	1	1	1	
34	600374-00	PNE Lever	1	1	1	1 PNE sensor
	600408-00					2 PNE sensors
35	600375-00	PNE Cap	1	1	1	1 PNE sensor
	600409-00					2 PNE sensors
36	200036-00	Switch Assy	(1)	(1)	(1)	
		(Leaf Switch MLS-29Au)	1	1	1	
	(200035-00)	(SW Cable Assy) SEC-	1	1	1	
	(200040-00)	(BM PCB Assy)	(1)	(1)	(1)	Black mark option
	(200039-00)	(BM Cable Assy)	1	1	1	Black mark option
37	32AD	AC Adapter 32AD	1	1	1	
38	25-0370	AC Cord 100V SEC-2706	1	1	1	
39		Plug converter MPR-25B (Black)	1	1	1	
38	25-0102	AC Cord 120V SEC-1003				
38	25-0103	AC Cord 230V SEC-1004				
50	F13630-06	Screw, PHT (ST), M3 × 6 with washer	1	1	1	
51	F10230-06	Screw, PHT (ST), M3 × 6	10	10	10	
52	F11130-08	Screw, PHT (BT), M3 × 8	3	3	3	
53	F11230-10	Screw, PHT (BT), M3 × 10	2	2	2	
54	F13417-06	Screw, No0PHT (BT#1), M1.7 × 7	1	1	1	
55	F10430-08	Screw, PHT (ST), M3 × 8	2	2	2	
56	600380-00	Partition	1	1	1	Standard accessory
60-1	950031-00	Control PCB Assy JPN	(1)	(1)	(1)	For 100V model 1 PNE sensor
	950031-10					2 PNE sensors
60-1	950032-00	Control PCB Assy USA/EUR	(1)	(1)	(1)	For 120/230V model 1 PNE sensor
	950032-10					2 PNE sensors
61-1	950033-00	IF PCB Assy (Serial) mm	(1)			Metric screw
61-2	950034-00	IF PCB Assy (Serial) inch	(1)			Inch screw
61-3	950035-00	IF PCB Assy (Parallel)		(1)		
61-4	950036-00	IF PCB Assy (USB)			(1)	

5.2 Exploded View of Mechanism

- **Exploded View-1**



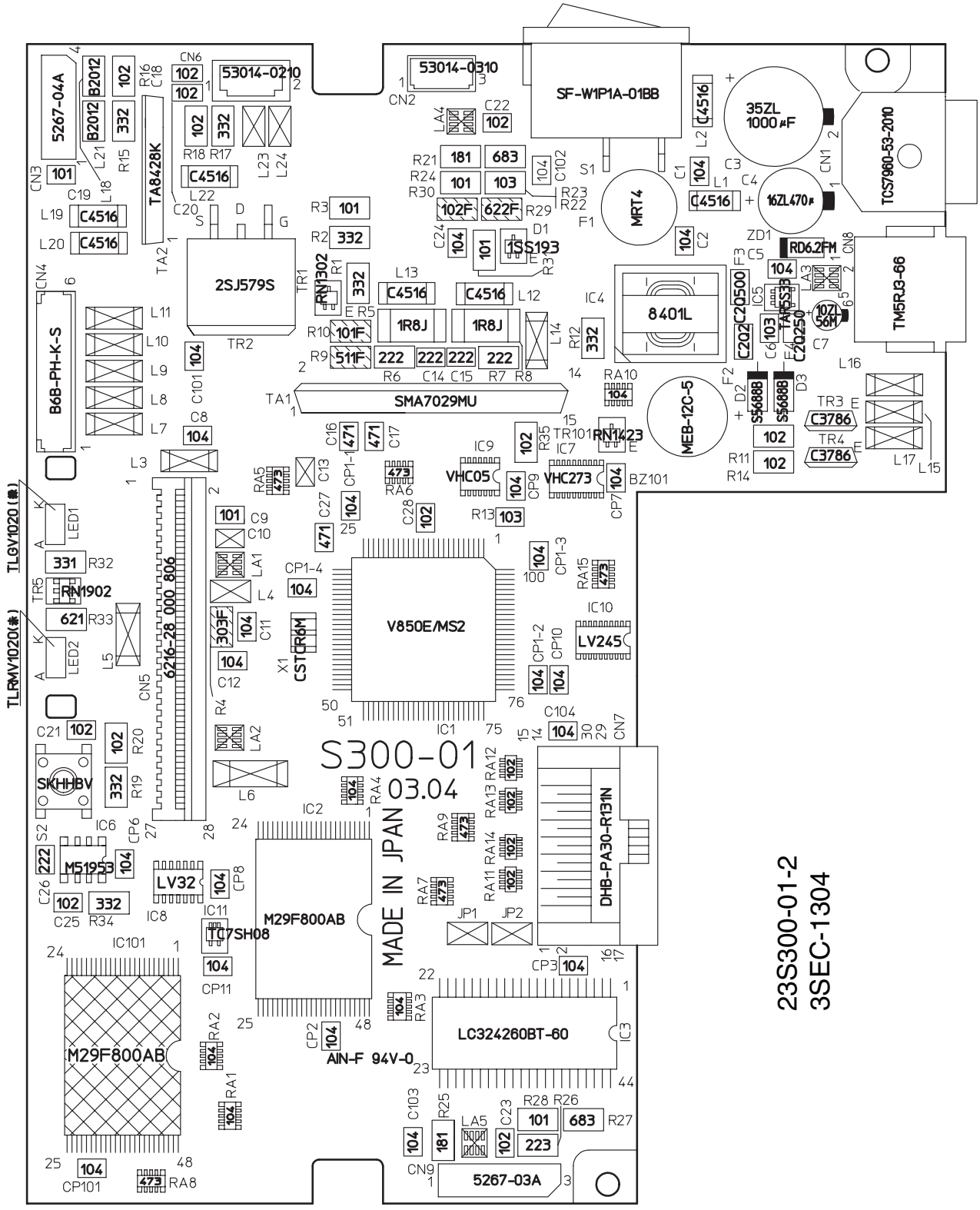
- **Exploded View-2**



5.3 Parts List for PCB Control Assy

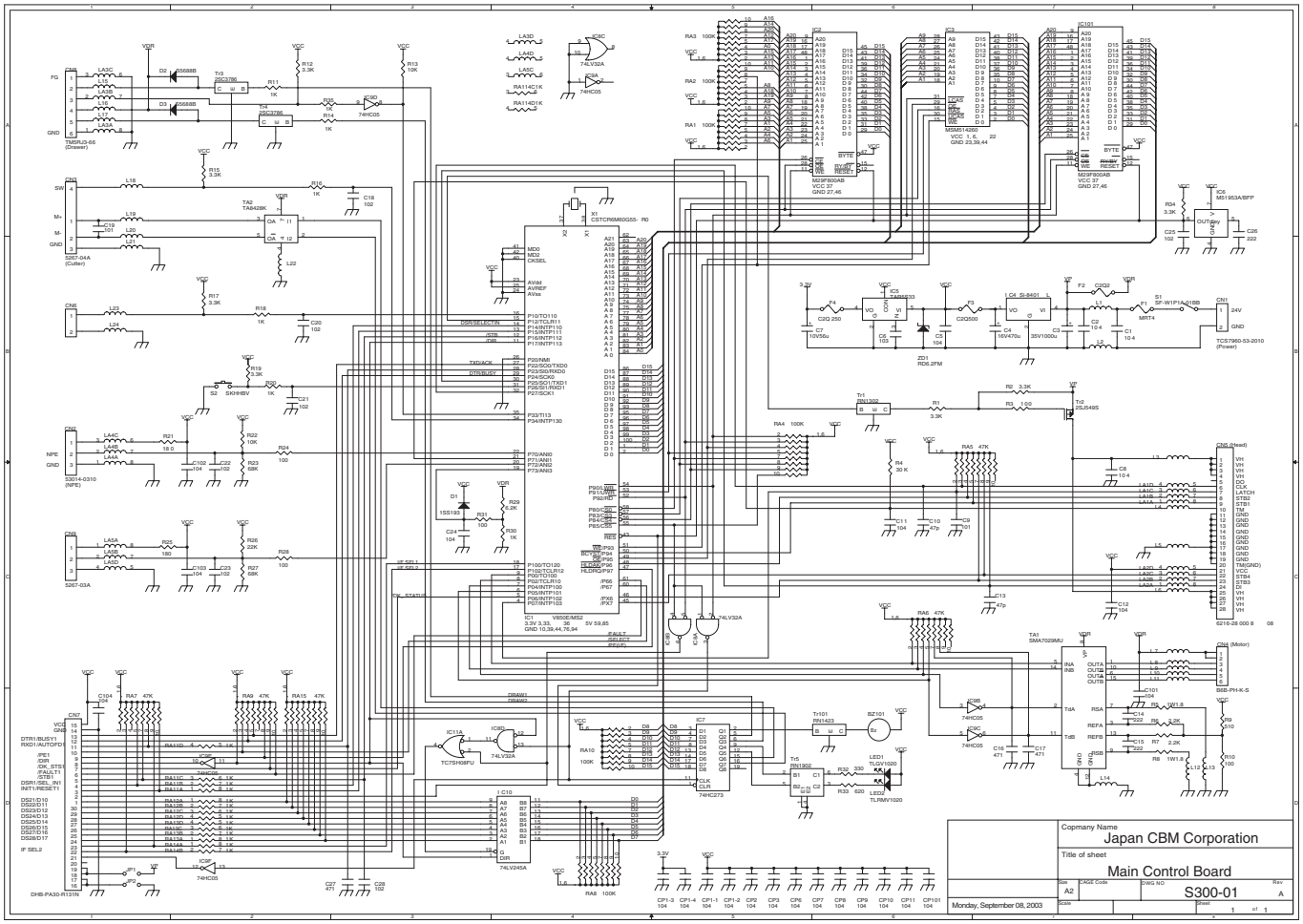
Ref. No.	Parts No.	Description		Q'ty			Remarks
				JP	EU	US	
IC1	H130005-10	CPU	uPD703130 FP 100 Pin	1	1	1	
IC2	H120005-00	Flash Memory	F-Memory 8 Mbit 55 ns 48 PIN TSOP	1	1	1	
IC101	H120005-00	Kanji ROM	F-Memory 8 Mbit 55 ns 48 PIN TSOP	1			
IC3	H120011-00	RAM	DRAM 4M 60 ns 44 Pin SOP	1	1	1	
IC4	H170002-10	DC/DC	SI-8401L	1	1	1	
IC5	H170004-10	REGULATOR	TAR5S33	1	1	1	
IC6	H150001-10	RESET IC	M51953BFP 8 Pin	1	1	1	
IC7	H110015-00	HC-MOS	HCMOS, 74VHC273, 20 PIN, TSSOP	1	1	1	
IC8	H110017-00	HC-MOS	HCMOS, 74LV32A, 14P IN, TSSOP	1	1	1	
IC9	H110016-00	HC-MOS	HCMOS, 74VHC05, 14 PIN, TSSOP	1	1	1	
IC10	H110018-00	HC-MOS	HCMOS, 74LV245A, 20 PIN, TSSOP	1	1	1	
IC11	H110019-00	HC-MOS	HCMOS, TC7SH08FU, 5 PIN, TSSOP	1	1	1	
TA1	H240009-10	Transistor Array	SMA7029MU	1	1	1	
TA2	H240005-10	Transistor Array	TA8428K	1	1	1	
S1	H650008-10	Switch	SF-W1P1A-01BB2	1	1	1	
S2	H650012-10	Switch	SKHHBV	1	1	1	
F1	H620006-10	Fuse	MRT4	1	1	1	
F2	H620010-10	Fuse	C2Q2	1	1	1	
F3	H620008-10	Fuse	C2Q500	1	1	1	
F4	H620009-10	Fuse	C2Q250	1	1	1	
X1	H630007-10	X'tal	CSTCR6M40G53-R0	1	1	1	
CN1	H500013-10	Connector	TCS7960-53-2010	1	1	1	
CN2	H500015-10	Connector	53014-0310	1	1	1	
CN3	H500006-10	Connector	5267-04A	1	1	1	
CN4	H500042-10	Connector	B6B-PH-K-S	1	1	1	
CN5	H500043-10	Connector	6216-28 000 806	1	1	1	
CN6	H500014-10	Connector	53014-0210	1	1	1	
CN7	H500022-10	Connector	DHB-PA30-R131N	1	1	1	
BZ1	H680001-10	BUZZER	MEB-12C-5	1	1	1	

5.4 Main Board

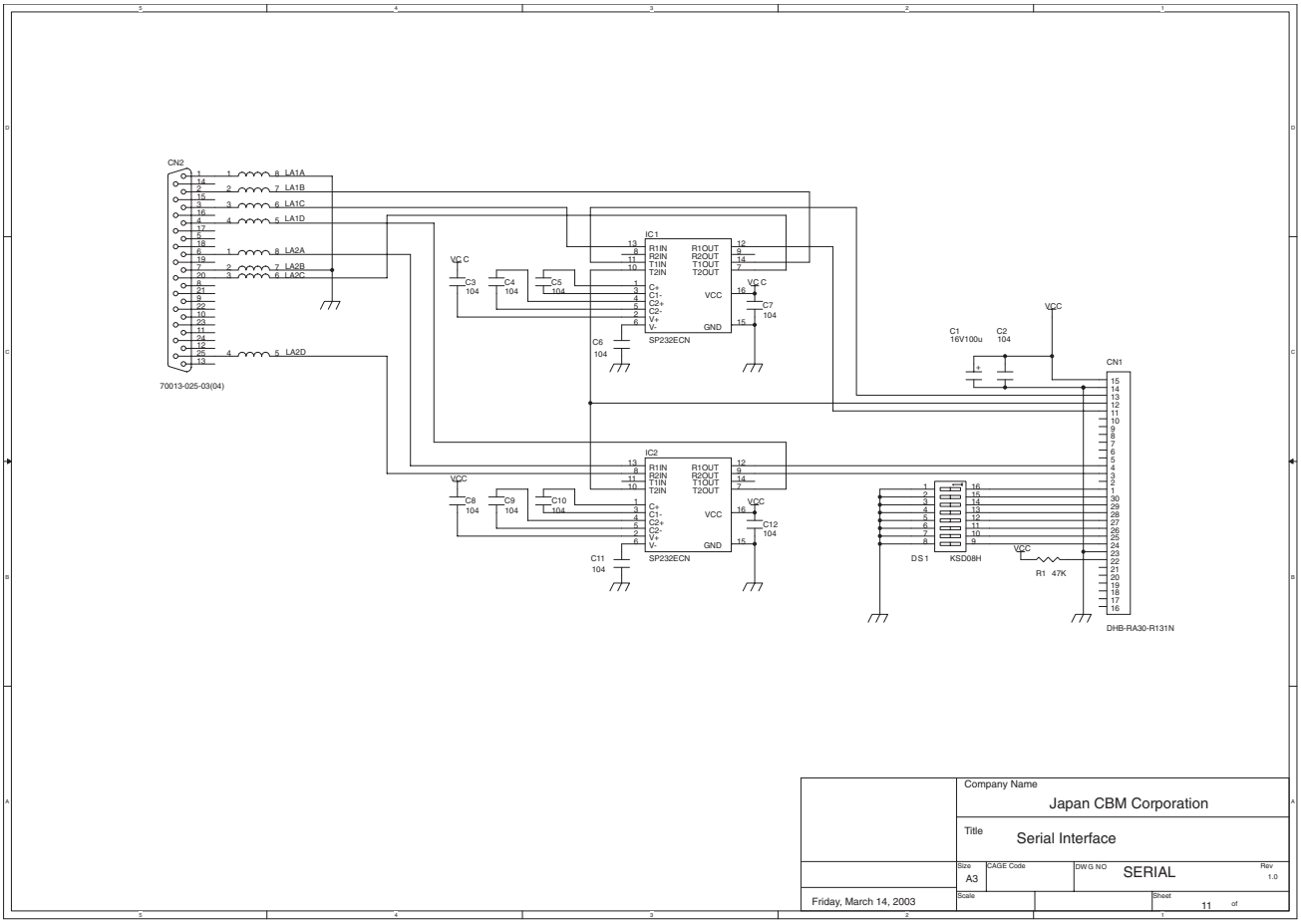


6. CIRCUIT DIAGRAM

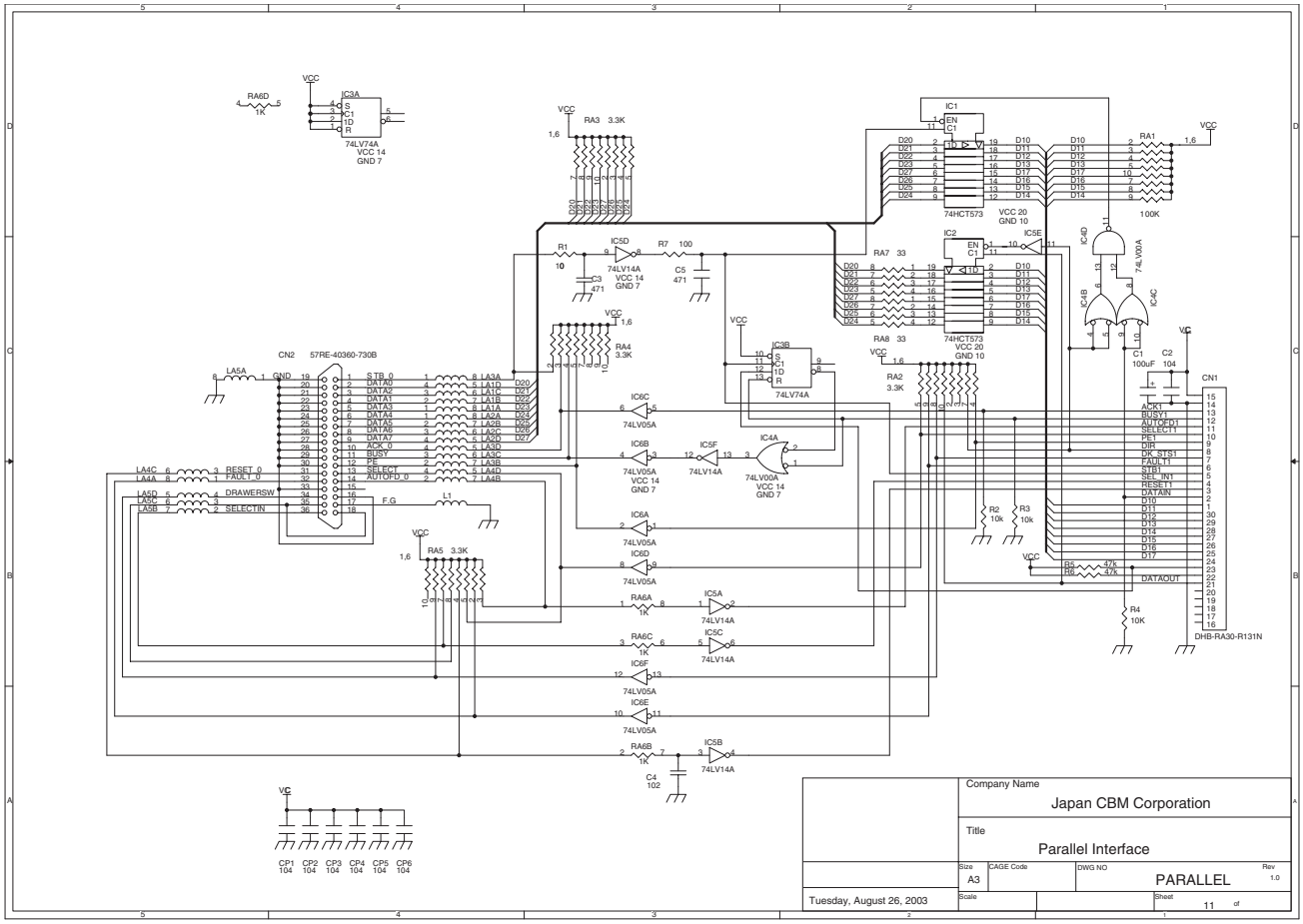
6.1 Main Board



6.2 Serial Interface



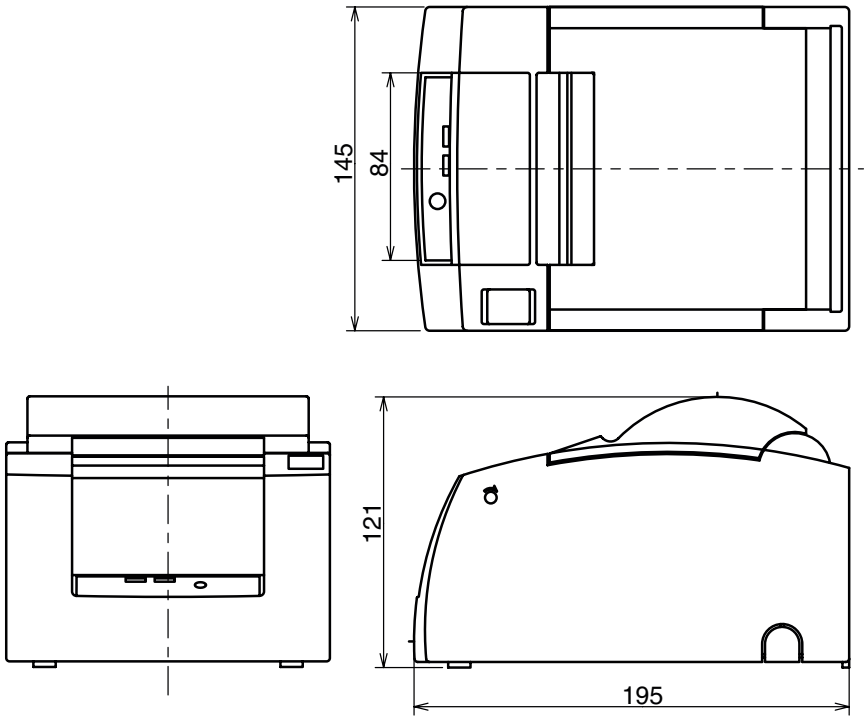
6.3 Parallel Interface



7. EXTERNAL VIEW

(Unit: millimeter)

AC Adapter Type



Built-in Power Supply Type