

CITIZEN

Service Manual

Model: iDP-460

Dot Matrix Printer

Rev. 1.00 Newly issued on June 03,1998

**Japan CBM Corporation
Information Systems Div.**

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of the dot impact printer CBM460. It is intended for field maintenance men.

FEATURES

This is a small-size dot impact printer developed for various data communication terminals, POS terminals, kitchen-use printers, bank card, terminals, and so on.

Its abundant built-in features allow you to widely use this printer for different applications. Prior to using it, read and understand this manual thoroughly.

- (1) Small size, light weight, and low price
- (2) High-speed print (Bi-directional)
- (3) Red and black print
- (4) Very easy paper loading by the auto loading function
- (5) Paper end detecting function
- (6) Power supply through an AC adapter

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* For the printer mechanism(DP-400/410), see the Service Manual.

1. HANDLING AND MAINTENANCE OF PRINTER

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

2. SPECIFICATIONS

2.1 Basic Specifications

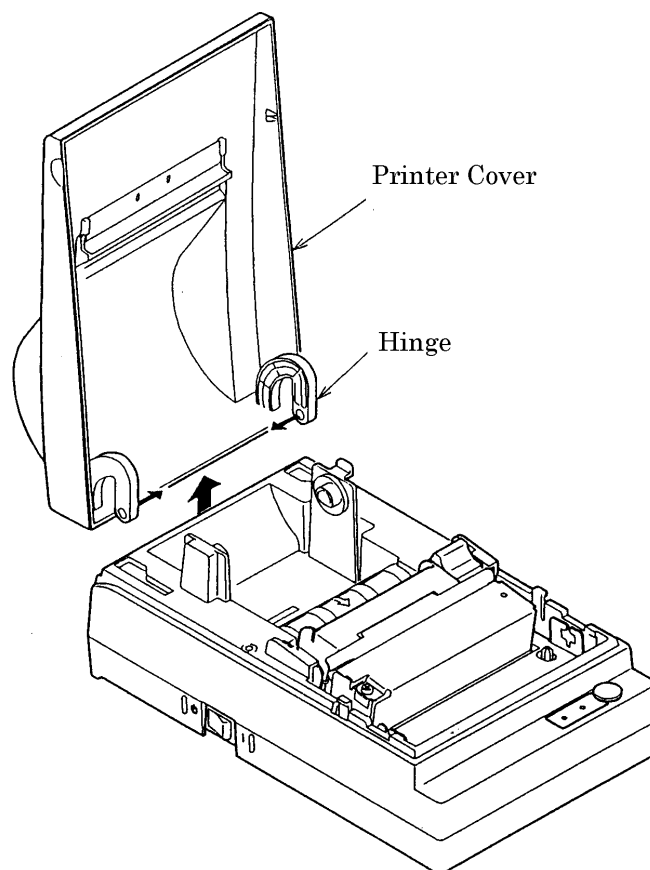
Item \ Model	iDP 460-RF120 iDP 460-VF120 iDP 460-PF120	iDP 460-RF230 iDP 460-VF230 iDP 460-PF230
Print method	Serial dot impact method (Bi-directional print)	
Print width	64mm	
Print head	7-pin	
Print speed	Approx. 3 lines/sec. (At single color continuous print)	
Print digits	40 or 42 Columns	
Character size	1.31mm (W) × 2.4mm (H)	
Character types	Alphanumeric, international characters	
Line spacing	4.23 mm(1/6 inch) or 2.82 mm(1/9 inch) Minimum paper feed pitch: 1.41 mm(1/18 inch)	
Paper	Normal paper and non-carbon paper; 76 +/- 0.5 mm(W) x φ83 mm (O.D.) • Single-sheet paper: 45 to 55 kg/1,000 sheets/1,091 x 788 mm • Copying paper : Non-carbon paper; 1 original + 1 copy, Total thickness: 0.2 mm or less	
Interface	Serial (RS-232C), Parallel (Conforms to CENTRONICS)	
Input buffer	250 bytes	
Paper end detection	Stops printing when the paper runs out	
Drawer kick connector	1 drawer (D-type only)	
Auto loading function	Automatically feeds the paper by several lines when paper is inserted. (Select with the DIP switch)	
Supply voltage	26 V DC +/- 5 %, 1.15 A	
Power consumption	When not printing: Approx. 8 W, When printing: Approx. 30 W	
AC adapter	• Rated input: 120 V AC(34AD-U), 230 V AC (34AD-E), 50/60 Hz, 35 W • Rated output: 26 V DC, 1.15 A	
Weight	Main body: 1.25 kg, AC adapter: 0.95 kg	
Outer dimensions	144(W) × 233(D) × 121(H)mm	
Operating temperature and humidity	0 to 40 °C, 35 to 85 % RH (No dew condensation)	
Storage temperature and humidity	-20 to 60°C, 10 to 90 % RH (No dew condensation)	
Reliability	• Print head: 80 million characters • Mechanism: MCBF 2.5 million characters, Recommended paper	
Applicable standards	VCCI Class-A, UL, C-UL, FCC Class-A, TUV, GS, CE marking (Acquired standards when our AC adapter 34AD series is used)	

3. DISASSEMBLY AND REASSEMBLY

3.1 Disassembly Procedure

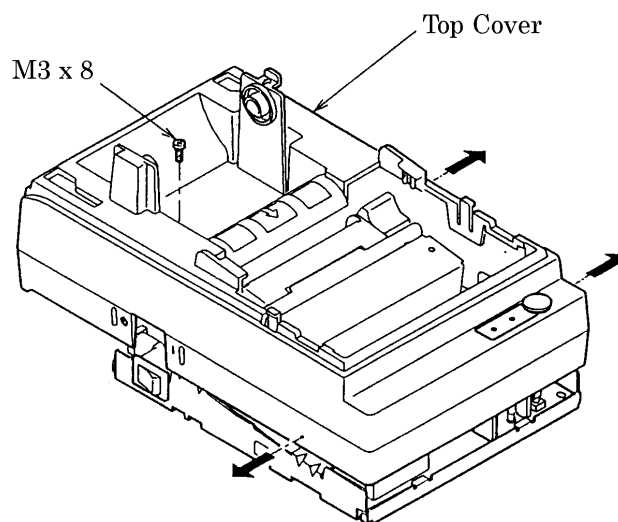
1. Removing the Printer Cover

- (1) Open the printer cover.
- (2) Remove the cover by bending the hinges inwardly.



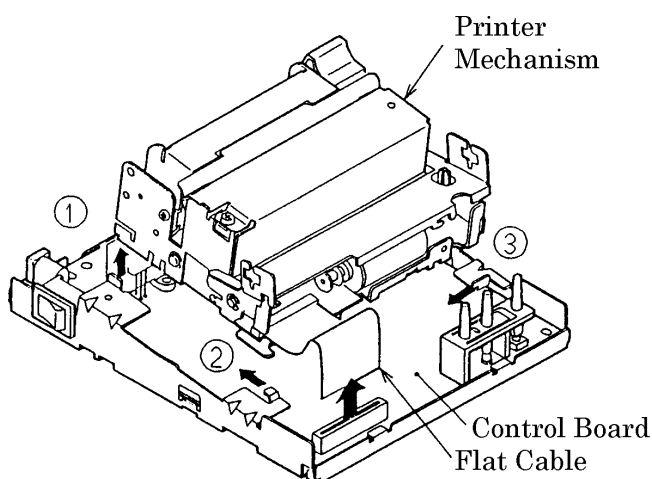
2. Removing the Top Cover

- (1) Remove a paper roll and cassette ribbon.
- (2) Remove a screw M3 x 8 (1 place).
- (3) Spread outwardly the three hooking parts of the top cover shown in the figure below to remove it.



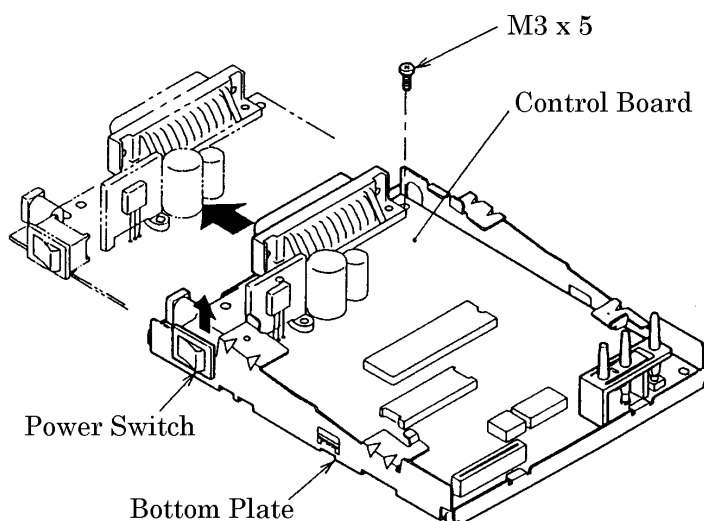
3. Removing the Printer Mechanism

- (1) Disconnect a flat cable from the connector of the control board.
- (2) Lift slightly the rear of the printer mechanism (paper insertion side). Turning it to the right, remove the front left side. Finally, unhook the right front side.



4. Removing the Control Board

- (1) Remove a screw M3 x 5 (1 place).
- (2) Lifting the rear of the control board, remove the power switch from the bottom plate.
- (3) Remove the control board, sliding it to the rear. (Do not pull out by force. Pull it out gently, unhooking it.)



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

• 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 goes immediately if replaced.	The mechanism or control board is defective.	The power is turned on by disconnecting a cable from the mechanism. (No operation)	Replace the mechanism.
		The phenomenon does not change after the above-mentioned check.	Replace the control board.
	The mechanism or circuit drive power is abnormal.	With a voltmeter, measure a mechanism drive voltage and circuit drive voltage.	Replace the control board.

- * If the fuse is gone while the specified AC adapter is being used, it is likely that the mechanism or control board 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 power supply	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Faulty mounting or connection of the printer mechanism	Check mounting and connection of the printer mechanism.	Mount the printer mechanism properly.
	Faulty printer mechanism	_____	Replace the printer mechanism.
Thin printing color	Faulty power supply	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Non-recommended paper is used.	_____	Replace it with the specified paper.
	Faulty ink ribbon.	Check wear and tear of the ink ribbon.	Replace the ink ribbon.
	Low supply voltage	Check the supply voltage with a tester, etc.	Use the supply voltage within the specified range.
Missing dots	Faulty connection of the printer mechanism	Check whether a printer mechanism cable is properly connected.	Connect the printer mechanism cable properly.
	Foreign substance is attached to the 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.
	Faulty printing head	_____	Replace the printing head or printer mechanism.
Badly blurred printout	Faulty power supply	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Foreign substance is attached to the 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.
Bad quality printing	Faulty printing paper	Check whether the paper meets the specifications.	Replace it with the specified paper.
	Low supply voltage	Check the supply voltage with a tester, etc.	Use the supply voltage within the specified range.
	Faulty ink ribbon	Check wear and tear of the ink ribbon	Replace the ink ribbon.

• Carriage Head Failure

Phenomenon	Cause	Check Method	Remedy
Abnormal sound	Faulty connection of the head connector	Check the connection of the connector	Connect the connector properly
ERROR lamp illuminated	The head does not move to the home position at power-on. It does not move.	Check for any foreign substance within an operating range or any wear of the gear, etc.	Replace the head or printer mechanism.
Shear in printing	The paper is jamming.	Turn off and on the power again.	If there is a shear in printing, replace the printer mechanism.
	Faulty power supply	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Foreign substance in the gear	Remove the printer mechanism and check for any foreign substance caught in the gear, head motor gear, or head moving part.	Eliminate the foreign substance.
	Broken gear	Remove the printer mechanism and check for any breakage of the gear, head motor gear, or head moving part.	If broken, replace the printer mechanism.
	Low supply voltage	Check the supply voltage with a tester, etc.	Use the specified supply voltage.

- Paper feed failure

Phenomenon	Cause	Check Method	Remedy
The printing paper is not fed or fed irregularly.	Faulty connection of a motor connector	Check connection of the connector.	Connect the connector correctly.
	Faulty power supply	Check whether the specified AC adapter is used.	Use the specified AC adapter.
	Defective motor body	Measure the supply voltage with a tester or oscilloscope.	If the supply voltage is normal, replace the motor (printer mechanism).
	Paper feed failure	Check whether or not the printing paper is jamming or torn and caught in a paper path.	Eliminate unnecessary recording paper and set properly.
	Foreign substance in the gear	Remove the printer mechanism and check for any foreign substance caught in the gear or motor gear.	Eliminate the foreign substance.
	Broken gear	Remove the printer mechanism and check for any breakage of the gear or motor gear.	If broken, replace the printer mechanism.
	Low supply voltage	Check the supply voltage with a tester, etc.	Use the specified supply voltage.

- Faulty sensor

Phenomenon	Cause	Check Method	Remedy
Does not detect the printing paper.	Faulty paper sensor	Replace the printer mechanism and check if it functions properly. If there is no recording paper, check whether the ERROR lamp flickers.	Replace the printer mechanism.
	Foreign substance, etc. caught by the sensor	Check for any foreign substance.	Eliminate the foreign substance.

* 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

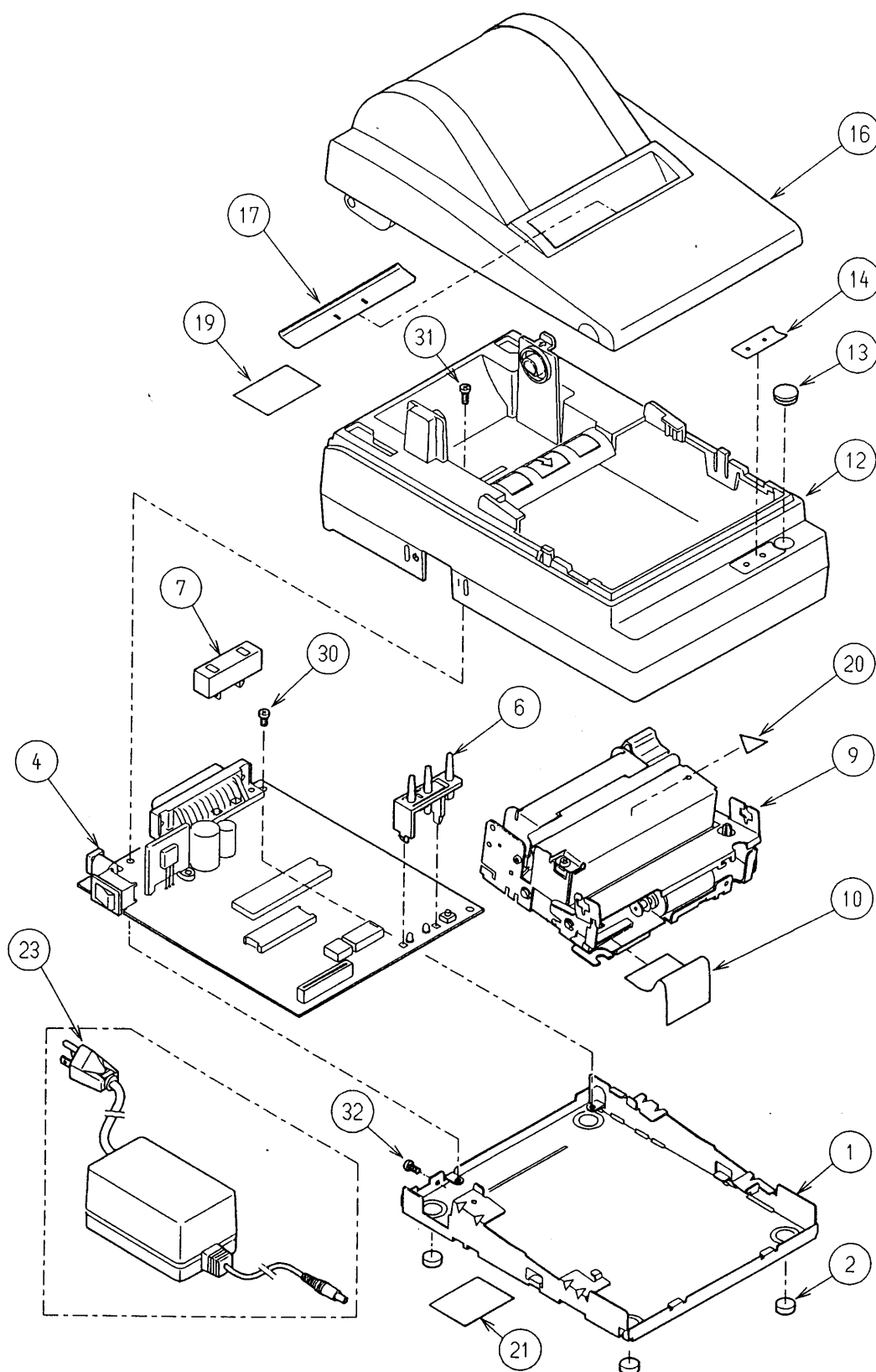
5.1 Parts List for Mechanism

EXPLODED VIEW

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Ref. No.	Parts No.	Description	Q'ty	Remarks
1	E 62020340	Bottom Plate	1	
2	E 6302-420	RB Foot	4	
4	E 77001-160 E 77001-170 E 77001-180	PCB Assy 460-01A PCB Assy 460-02A PCB Assy 460-03A		-RF -PF -VF
6	E 4018-240	LED Guide	1	
7	E 4018-260	Spacer	1	
9	400DF	Printer DP-400DF		
10	E 4900-520	FFC	1	
12	E 66201-040	Top Case	1	
13	E 5071-210	PF Button	1	
14	E 5200-340	OP Sheet	1	
16	E 62040450	Printer Cover	1	
17	E 6220-620	Paper Cutter	1	
19		Lable Paper set		
20		Label Hot		
21		Rating Label		
23	34ADU 34ADE	Adaptor 34AD-U Adaptor 34AD-E		120V only 230V only
30	76G29538	Screw M3x5	1	
31	76G22821	Screw M3x8	1	
32	76G42966	Screw M3x6	1	

5.2 Disassembly Drawing



5.3 Parts List for Control Board

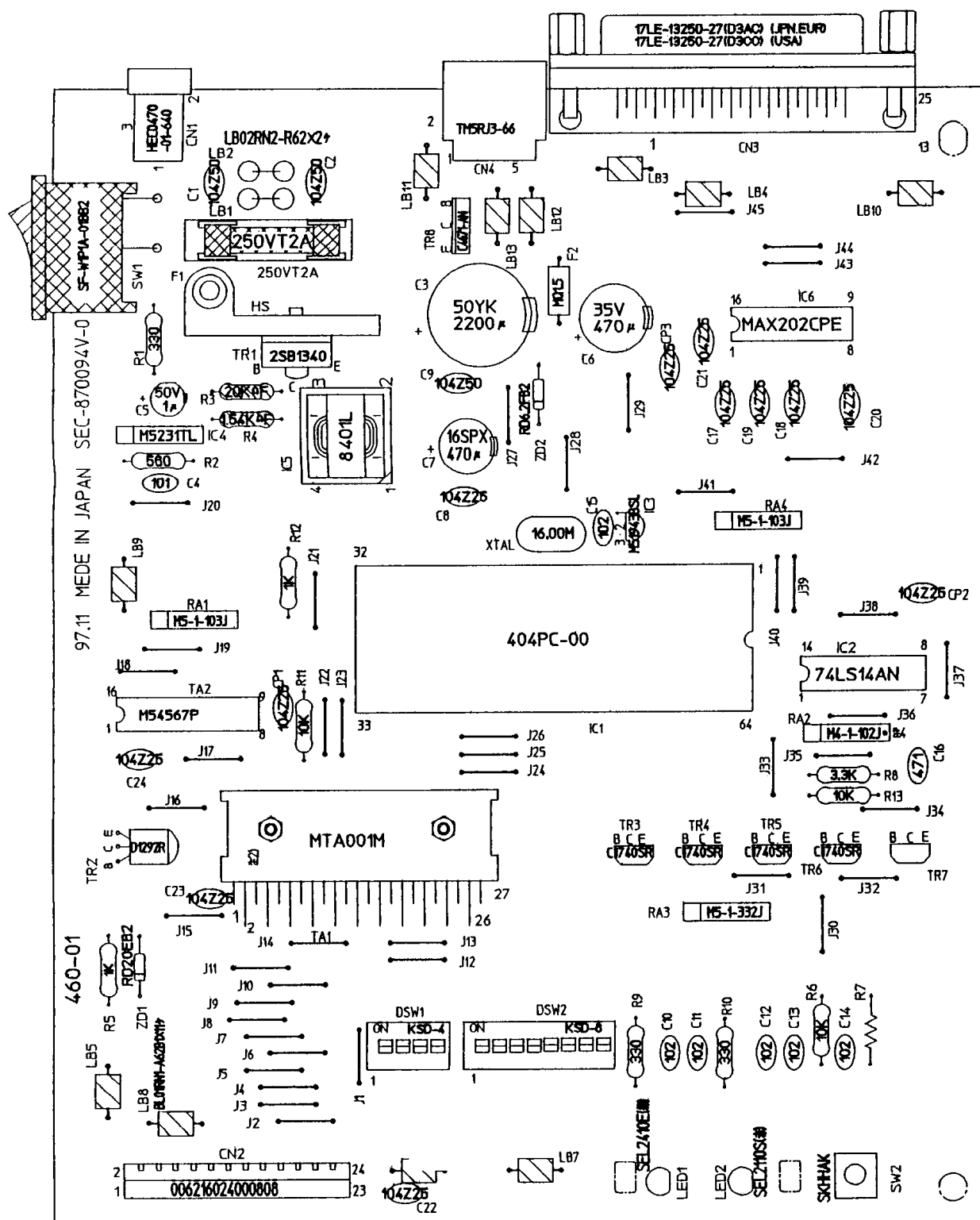
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Ref. No	Parts No.	Description	iDp460-RF	iIDP460-PF	iDP460-VF
IC 1	404PC-00	CPU 404PC-00	1	1	1
IC 2	E 2010081	TTL SN74LS14AN	1	1	1
IC 3	E 2029670	Reset IC M51943BSL	1	1	1
IC 4	E 390-150	Regulator M52131T	1	1	1
IC 5	E 4101-720	DC-DC conv. SI-8401L	1	1	1
IC 6	E 202-950	I/F IC MAX202CPE	1		1
	E 201-581	TTL SN74LS373AP		1	
IC 7	E 202-451	TTL SN74LS74AP		1	
IC 8	E 202-431	TTL SN74LS00AP		1	
TA 1	E 390-300	Tr. Array MTA001M(F4002)	1	1	1
TA 2	E 390-370	Tr. Array M54567P	1	1	1
TR 1	E 324-011	Transistor 2SB1340	1	1	1
TR 2	E 379-120	Transistor 2SD1292R	1	1	1
TR 3-6	E 359-090	Transistor 2SC1740SR	4	4	4
TR 8	E 359-170	Transistor 2SC4671-NA	1	1	1
ZD 1	E 420-030	Z. Diode RD20EB2	1	1	1
ZD 2	E 406-050	Z. Diode RD6.2FB2	1	1	1
X tal	E 501-410	X'tal CST16.00MXW0C4	1	1	1
DSW 1	E 5103-490	Dip SW. KSD-4	1	1	1
DSW 2	E 5103-510	Dip SW. KSD-8	1	1	1
SW 1	E 4003-630	Power SW. SF-W1P1A-01BB2	1	1	1
SW 2	E 5102-530	Tact SW. SKHHAK	1	1	1
F 1	E 4005-590	Fuse 5ST-2A	1	1	1
F 2	E 4005-770	Fuse MQ1.5	1	1	1
HF	E 4006-270	Fuse Holder F218P	2	2	2
LED 1	E 480-390	LED SEL2410E	1	1	1
LED 2	E 480-330	LED SEL2110S	1	1	1
LB 1,2	E 4009-280	Fe. Beads BL02RN2-R62	2	2	2
LB 3-13	E 4009-500	Fe. Beads BL01RN1-A62B1	11	11	11
	76G22796	Screw M3x8	1	1	1
	76G42141	Screw M3x8	1	1	1
	71G37190	Screw M3x10	2	2	2
	76G22646	Nut M6	2	2	2

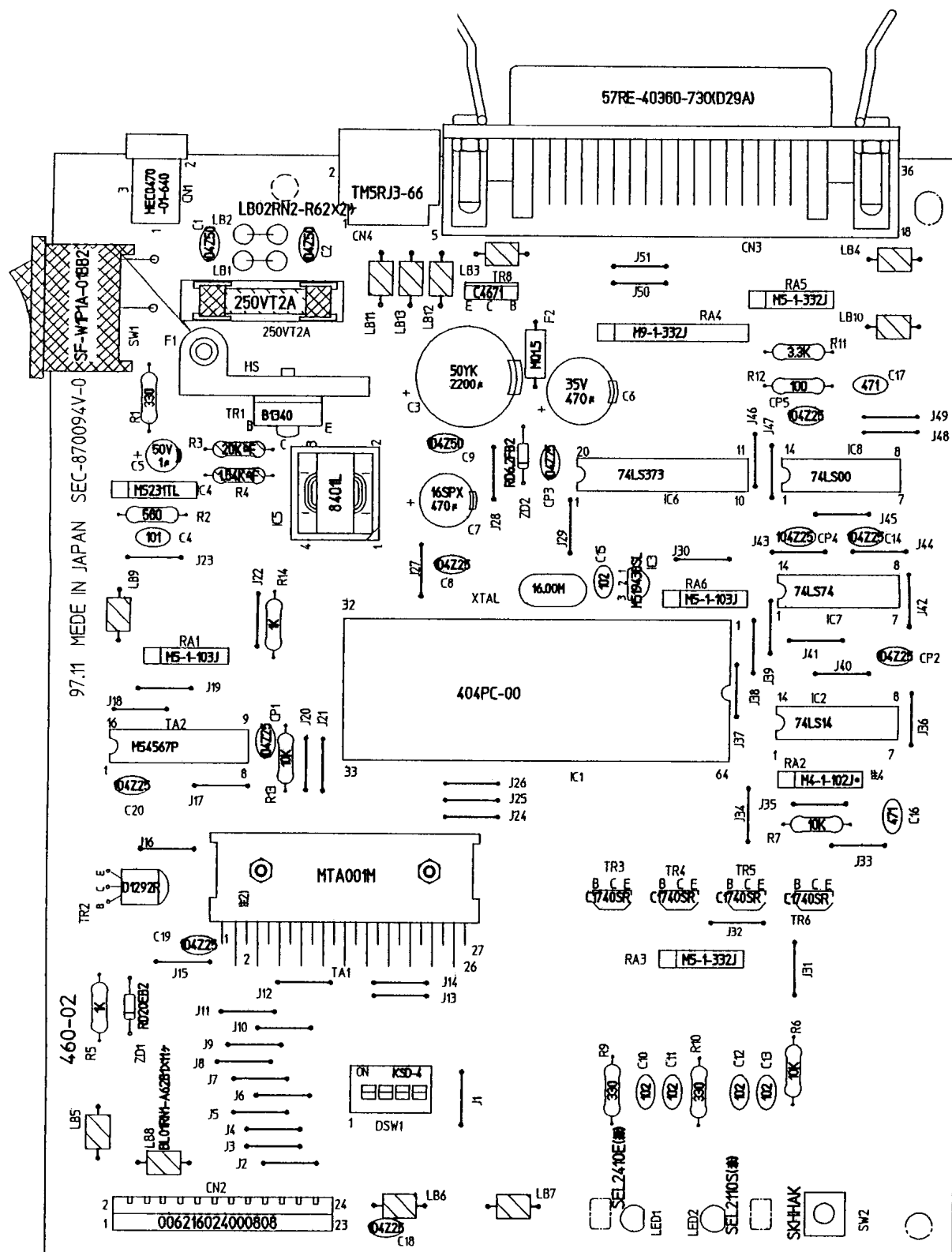
Ref. No.	Parts No.	Discription		iDP460-RF	iDP460-PF	iDP460-VF
CN 1	E 48000790	Conn.	HEC0470-01-640	1	1	1
CN 2	E 48000825	Conn.	006213024000808	1	1	1
CN 3	E 48000640	Conn.	17LE-13250-27(D3AC)	1(EUR only) 1(USA only)		
	E 48000640	Conn.	17LE-13250-27(D3CC)			
	E 48000830	Conn.	57RE-40360-73B(D29A)		1	
CN 4	E 48000530	Conn.	TM5RJ3-66	1	1	1
CN 3	E 48000835	Conn.	TCS7587-01-401			1
HS	E 4010-480	Heat Sink	50-0191	1	1	1
C 3	E 2010-910	El. Cap.	50YK2200M	1	1	1
C 5	E 2010-915	El. Cap.	50YK1M-TA	1	1	1
C 6	E 2010-920	El. Cap.	35YK470M	1	1	1
C 7	E 2010-925	El. Cap.	16SPX470	1	1	1
RA 1,4	E 3500-050	Re. Array	M5-1-103J	2	2	2
RA 2	E 3500-290	Re. Array	M4-1-102J	1	1	1
RA 3	E 3500-190	Re. Array	M5-1-332J	1		1
RA 3,5	E 3500-190	Re. Array	M5-1-332J		2	
RA 4	E 3500-080	Re. Array	M9-1-332J		1	
R 1,9,10		Resistor	RD25T(26)-330 J	3	3	3
R 2		Resistor	RD25T(26)-560 J	1	1	1
R 3		Resistor	RNE25T26-20K F	1	1	1
R 4		Resistor	RNE25T26-1.54K F	1	1	1
R 5,12		Resistor	RD25T(26)-1K J	2		2
R 5,14		Resistor	RD25T(26)-1k J		2	
R 8		Resistor	RD25T(26)-3.3K J	1		1
R 11		Resistor	RD25T(26)-3.3K J		1	
R 12		Resistor	RD25T(26)-100 J		1	
R 6,11,13		Resistor	RD25T(26)-10K J	3		3
R 6,7,13		Resistor	RD25T(26)-10K J		3	
C 1,2,9		C. Cap.	DD308-959F-104Z50	3	3	3
C 8,17-24		C. Cap.	DD308-959F-104Z25	12		12
CP 1-3						
C 8,14,18-20		C. Cap.	DD308-959F-104Z25		10	
CP 1-5						
C 4		C. Cap.	DD104-989B101K50	1	1	1
C 10-14		C. Cap.	DD104-989B102K50	5	5	5
C 16		C. Cap.	DD104-989B471K50	1		1
C 16,17		C. Cap.	DD104-989B471K50		2	

5.4 Parts Layout Drawing

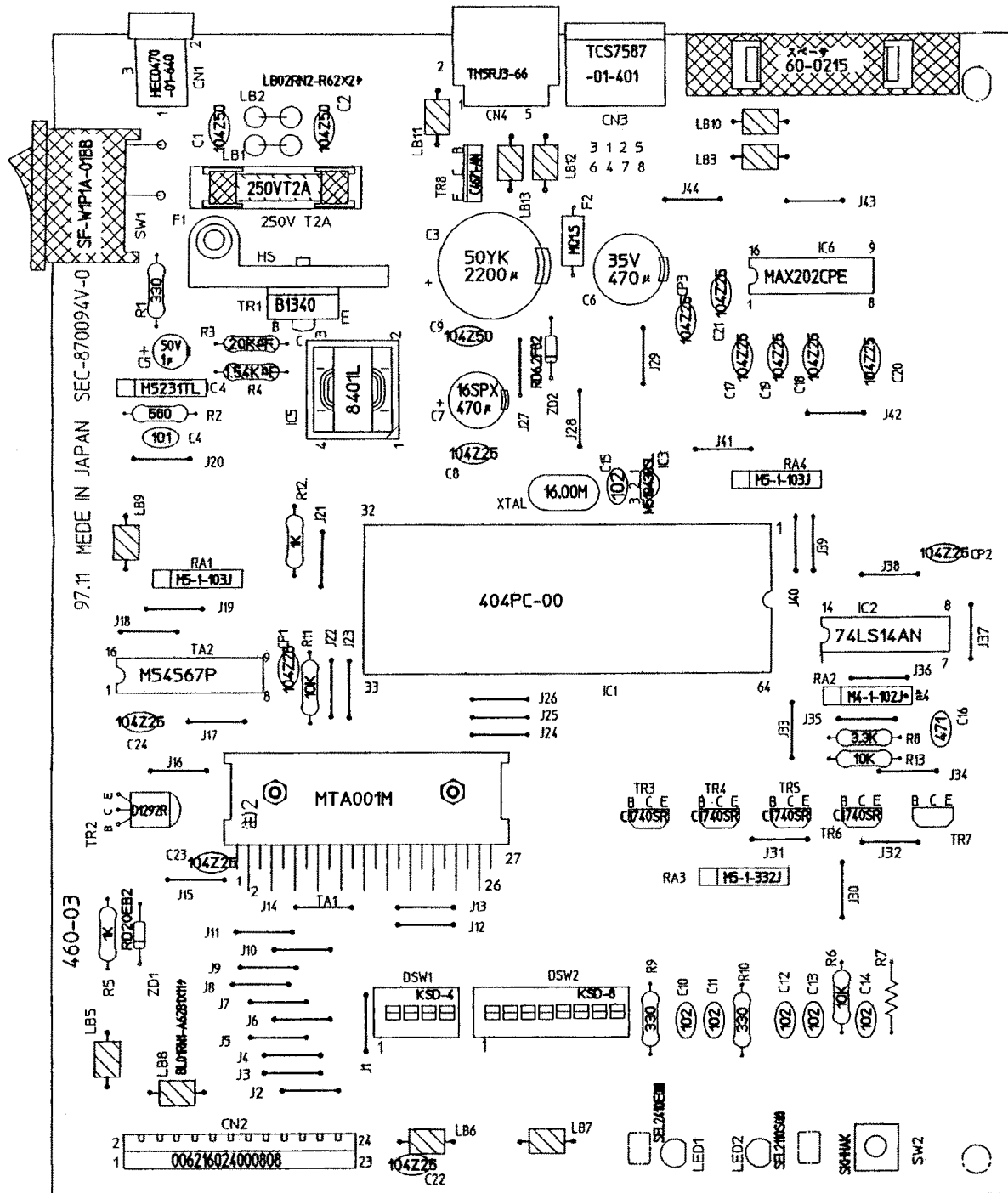
5.4.1 Main PCB Assy for iDP-460-RF(Serial Interface D-sub 25)



5.4.2 Main PCB Assy for iDP-460-PF(Parallel Interface)



5.4.3 Main PCB Assy for iDP-460-VF(Serial Interface Mini DIN)



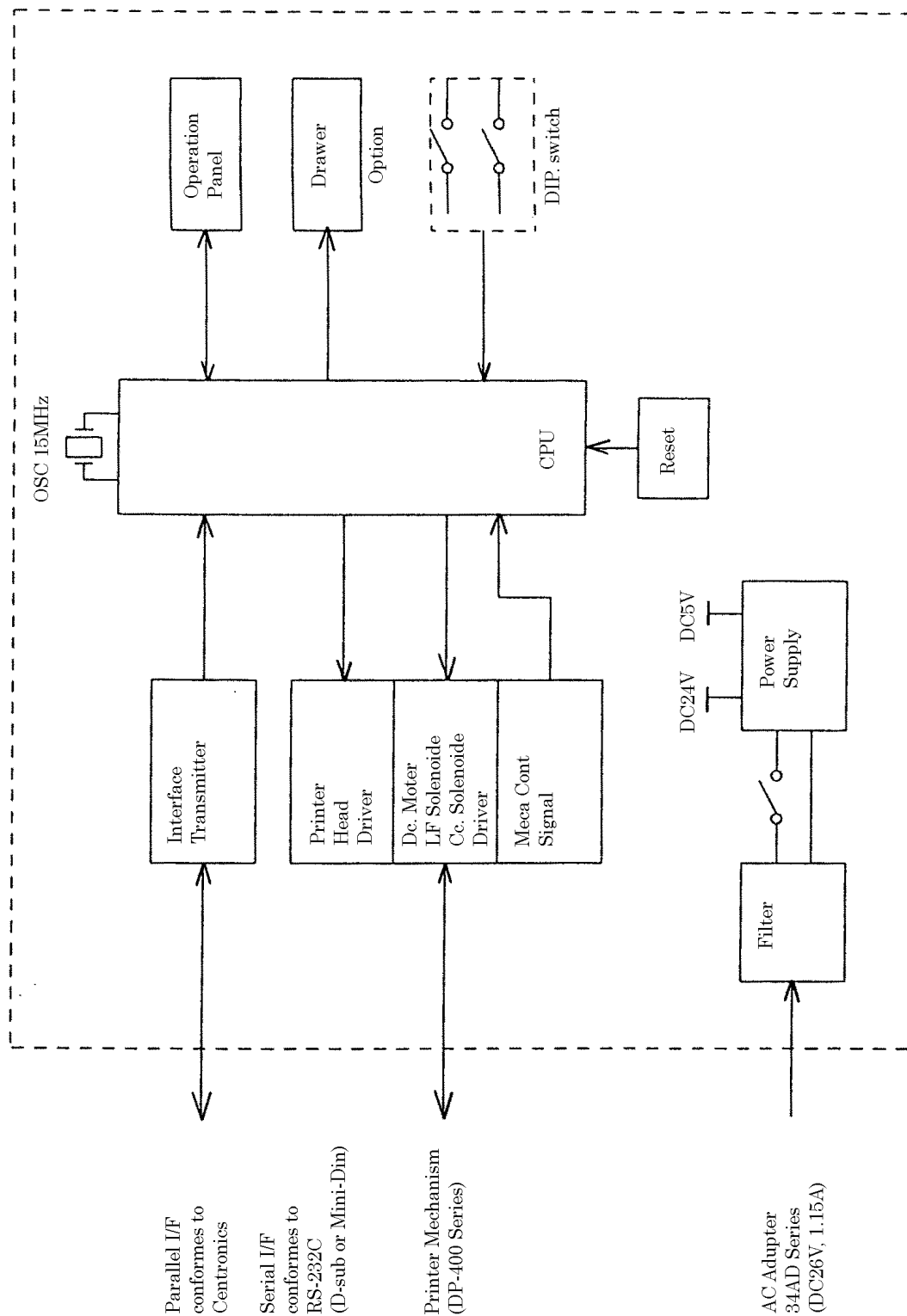
6. DRAWING

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

- Block Diagram
- Circuit Diagram ----- For the serial interface, For the parallel interface

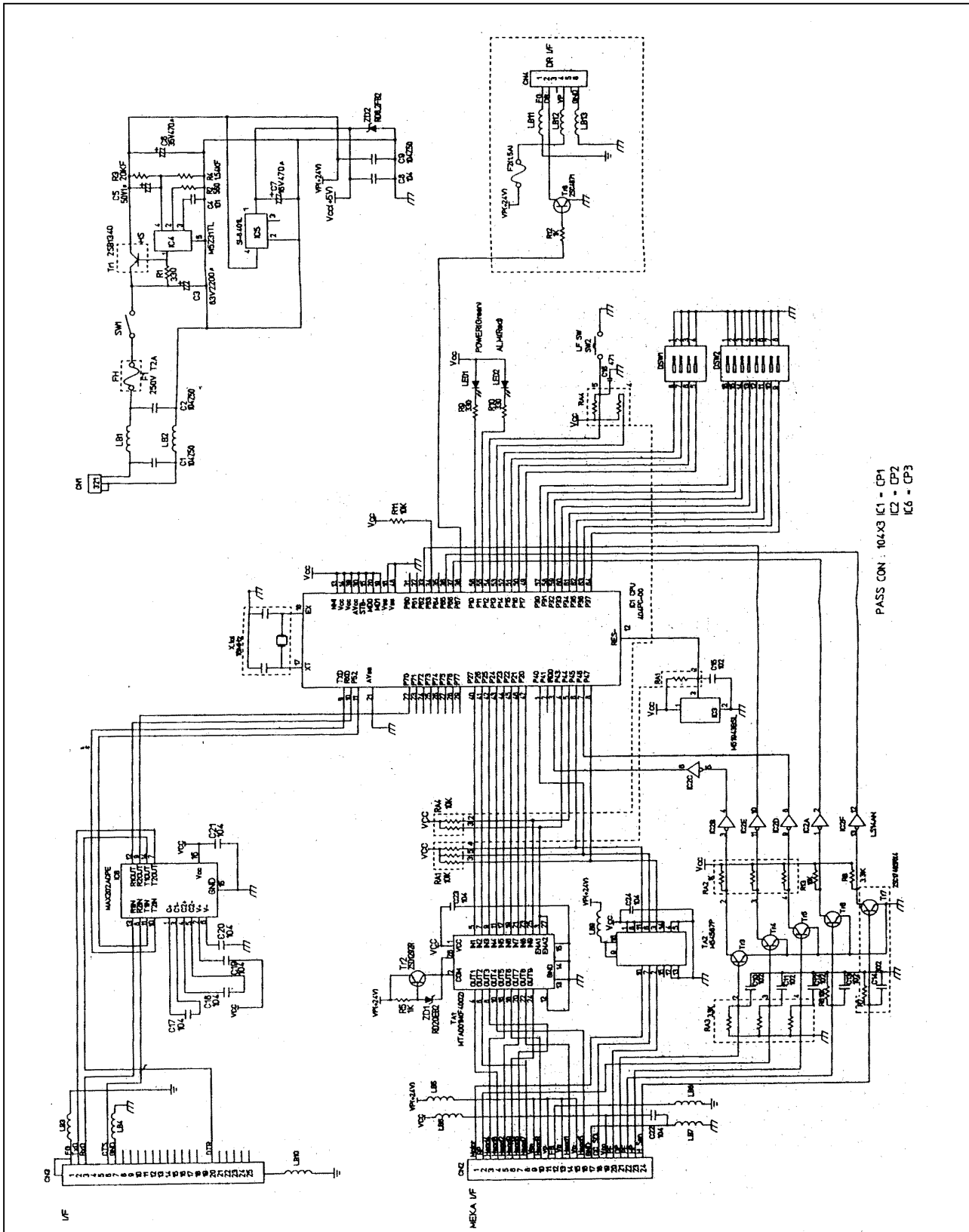
6.1 Circuit

6.1.1 Block Diagram

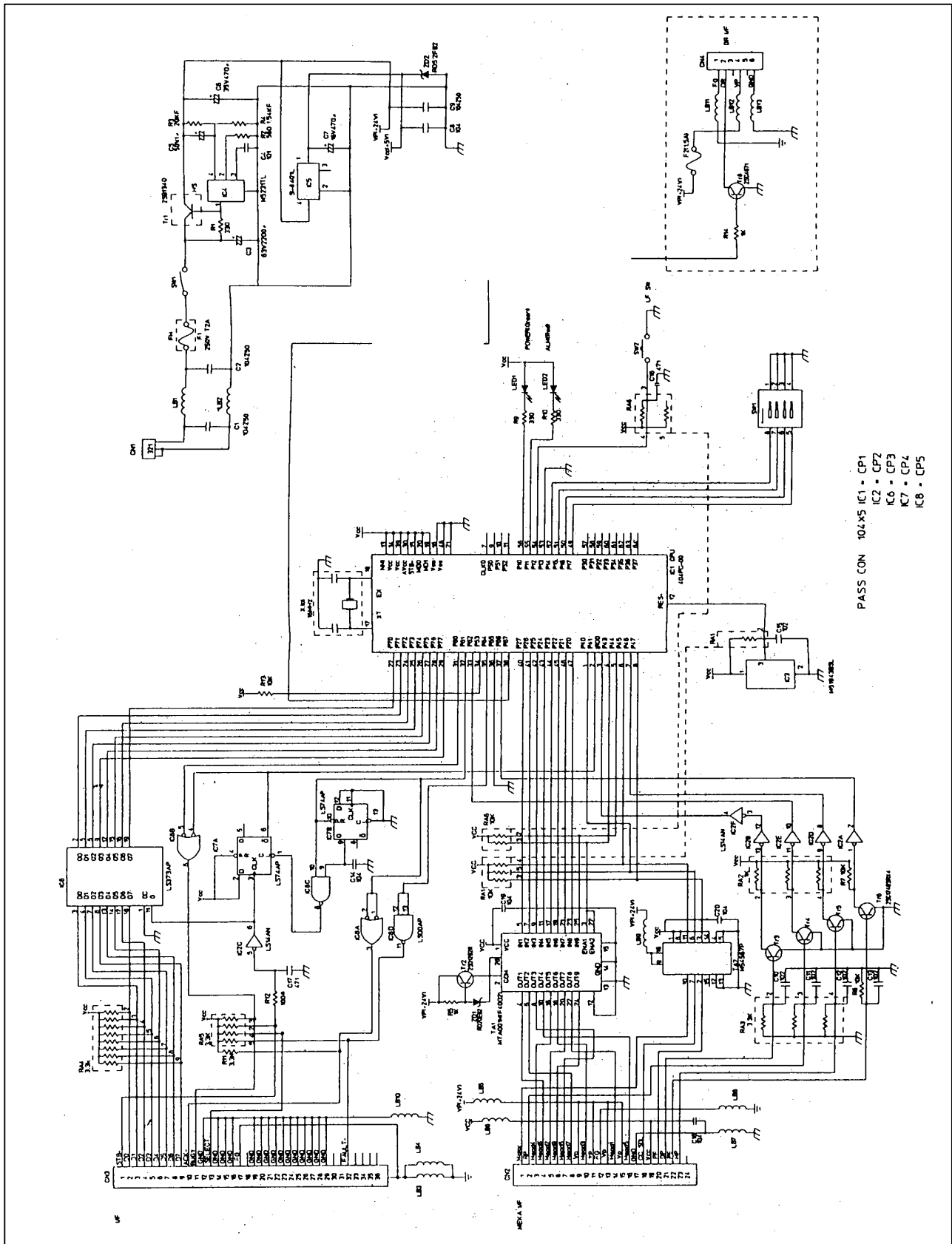


6.2 Circuit Diagram

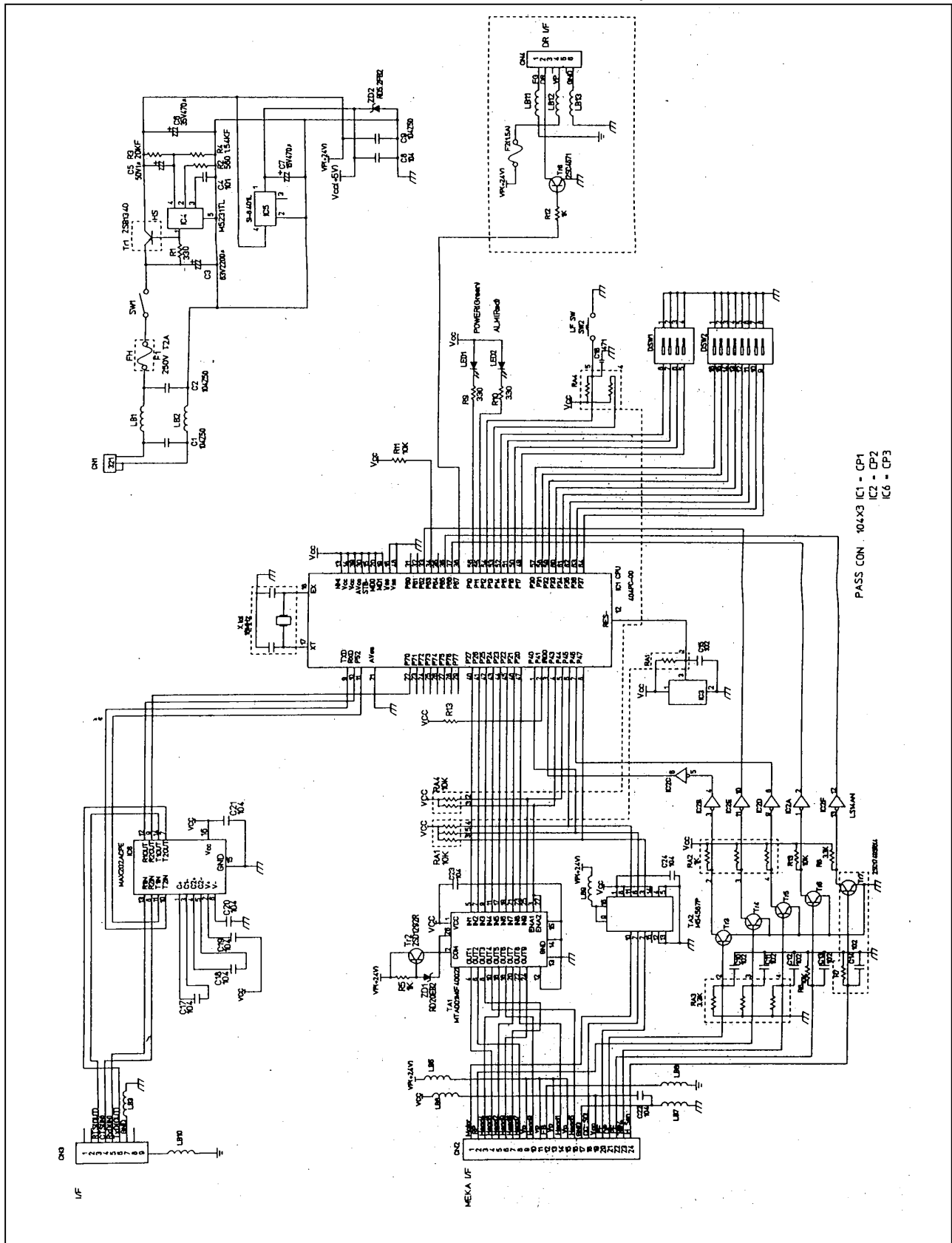
6.2.1 Control Board for iDP-460-RF(Serial Interface D-sub 25)



6.2.2 Control Board for iDP-460-PF(Parallel Interface)



6.2.3 Control Board for iDP-460-VF(Serial Interface Mini DIN)



7. OUTER DIMENTION

