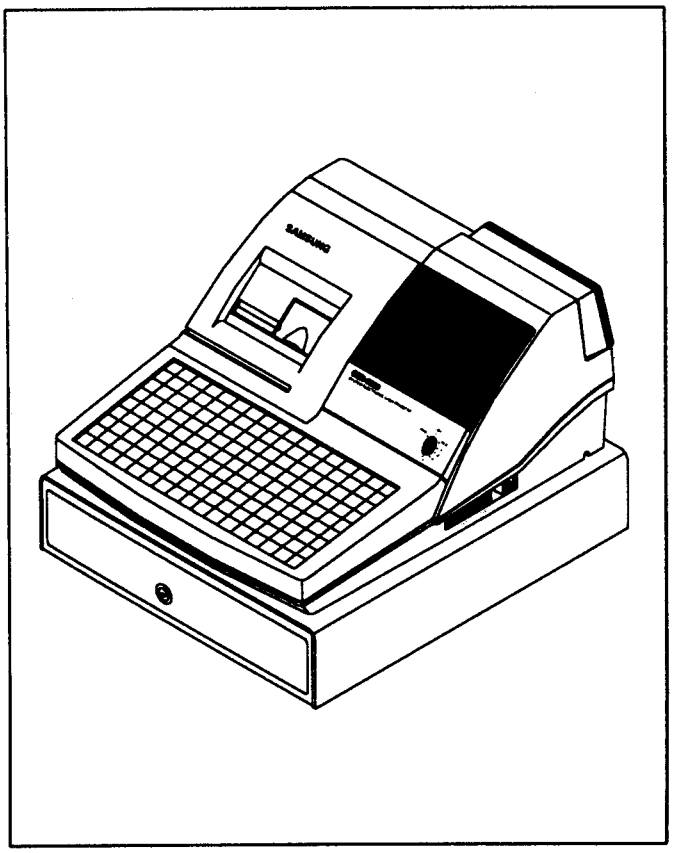
SAMSUNG

ELECTRONIC CASH REGISTER

SER-6500II/SER-6500II F
SER-6540II/SER-6540II F

SERVICE Manual

ELECTRONIC CASH REGISTER



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SER-6500 II Service Manual First edition.

January 2000.

V1.0

Printed in Korea

About this Manual

This service manual describes how to perform hardware service maintenance for the Samsung SER-6500 II System Electronic Cash Register.

Notes

Note: Notes may appear anywhere in the manual. They draw your attention to additional information about the item.

Precaution symbols

⚠. Indicates a Safety Precaution that applies to this part component.

⚠. indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

Overview of this System ECR

This System ECR is a Microprocessor-based system, using a 32 bit-microprocessor and an 8 bit-microprocessor.

This service manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center. Schematics and specifications provide the needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Samsung Electronics Co., Ltd. .

Note: Before using this System Electronic Cash Register (SECR) for the first time, leave it powered on in the REG mode for at least twenty-four hours. This allows the Ni-MH battery, which maintains the memory of the SECR while the power is off, to charge completely.

1 Precaution Statements

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including non-metallic control knobs and compartment covers.
3. Make sure there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages.
   Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.
4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the SECR. Unauthorized alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or over- heating, and correct any potential hazards.
6. Observe the original lead dress, especially near the following areas : sharp edges, and especially the AC and high voltage supplies.
   Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection.
   These safety features and the protection they give might be lost if the replacement component differs from the original - even if the replacement is rated for higher voltage, wattage, etc.
   Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠).
   Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1-2 Servicing Precautions

Warning 1: First read the - Safety Precautions - section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

Warning 2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the units AC power cord from the AC power source before attempting to:
   (a) Remove or reinstall any component or assembly
   (b) Disconnect an electrical plug or connector (c) Connect a test component in parallel with an electrolytic capacitor
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples : metal panels and input terminals).
6. Insulation Checking Procedure:
   Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead ; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power - this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2. Reference Information

2-1 Semiconductor Base Diagram

2-1-1. CPU

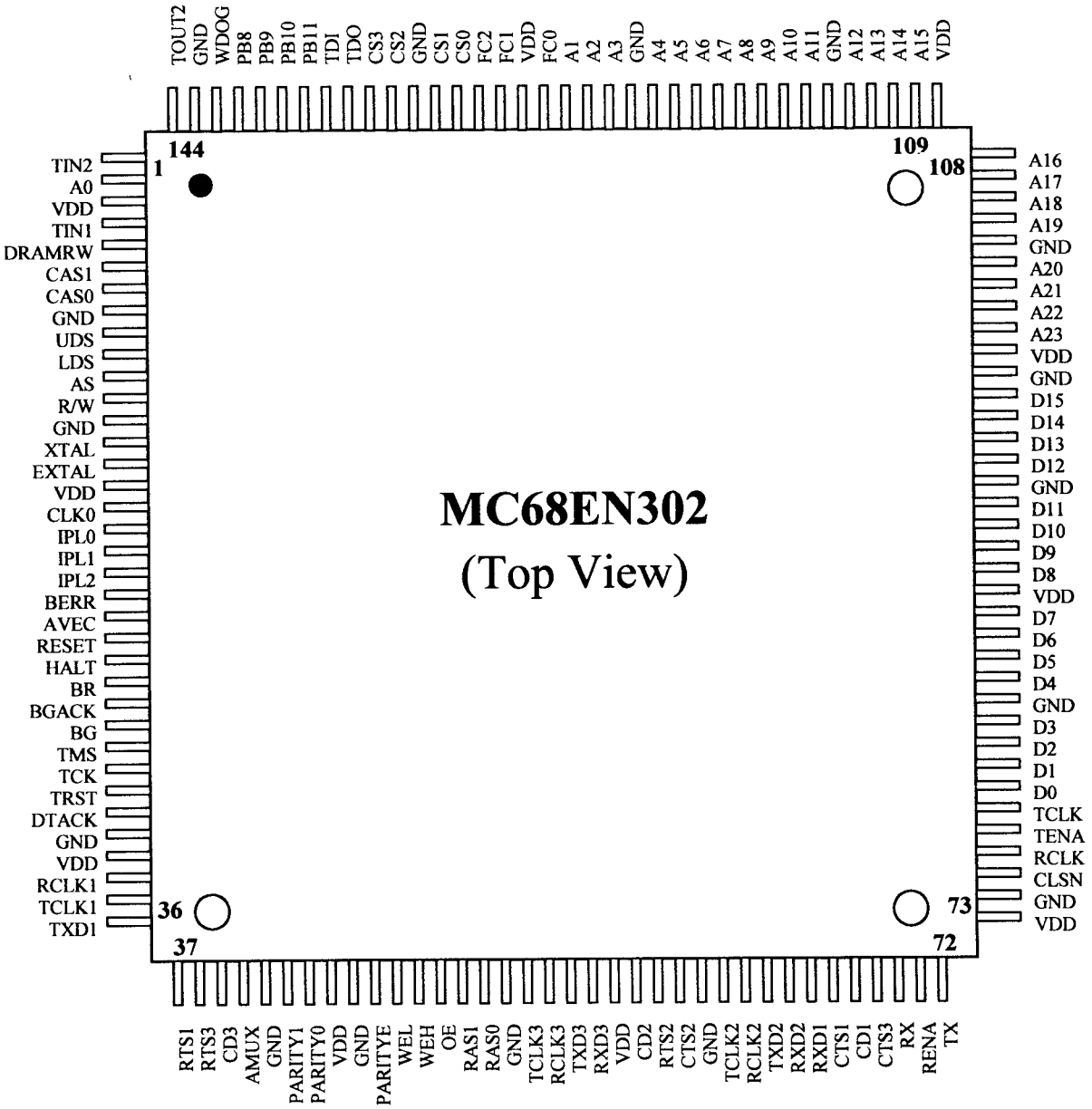


Table 2-1. MC68EN302 Signal Description

Pin	Function	I/O	Pin	Function	I/O	Pin	Function	I/O
1	Ethernet LOOP	O	49	Output Enable	O	97	Data 7	I/O
2	Address 0	I/O	50	Flash Memory Busy	O	98	GND	
3	Vcc		51			99	Vcc	
4	Fiscal EPROM enable	O	52	GND		100	N.C	
5	MICOM Reset	O	53	Ethernet TPAPCE	O	101	N.C	
6	P-fail Input	I	54	Ethernet TPFULDL	O	102	Address 21	I/O
7	+12V Enable (Fiscal)	O	55	Memory Blocking	O	103	Address 20	I/O
8	GND		56	N.C		104	GND	
9	N.C		57	Vcc		105	Address 19	I/O
10	N.C		58	/DTR1 (Serial)	O	106	Address 18	I/O
11			59	/DTR2 (Serial)	O	107	Address 17	I/O
12	Write Enable	O	60	/DSR2 (Serial)	I	108	Address 16	I/O
13	GND		61	GND		109	Vcc	
14	N.C		62		O	110	Address 15	I/O
15	Main CPU Clock	I	63	/DSR1(Serial)	I	111	Address 14	I/O
16	Vcc		64	TxD2 (Serial)	O	112	Address 13	I/O
17			65	RxD2 (Serial)	I	113	Address 12	I/O
18	Key Interrupt	I	66	RxD1 (Serial)	I	114	GND	
19	P-fail Interrupt	I	67	/CTS1 (Serial)	I	115	Address 11	I/O
20			68	/CD1 (Serial)		116	Address 10	I/O
21			69	N.C		117	Address 9	I/O
22			70	Ethernet RX	I	118	Address 8	I/O
23	/RESET		71	Ethernet RENA	I	119	Address 7	I/O
24	/HALT		72	Ethernet TX	O	120	Address 6	I/O
25			73	Vcc		121	Address 5	I/O
26			74	GND		122	Address 4	I/O
27	N.C		75	Ethernet CLSN	I	123	GND	
28	N.C		76	Ethernet RCLK	I	124	Address 3	I/O
29			77	Ethernet TENA	O	125	Address 2	I/O
30			78	Ethernet TCLK	I	126	Address 1	I/O
31			79	N.C		127		
32	GND		80	N.C		128	Vcc	
33	Vcc		81	N.C		129		
34	N.C		82	N.C		130		
35	N.C		83	GND		131	CS0 (Flash or EPROM)	O
36	TxD1 (Serial)	O	84	N.C		132	CS1 (MICOM Interface)	O
37	/RTS1 (Serial)	O	85	N.C		133	GND	
38	N.C		86	N.C		134	CS2 (138 Decoder)	O
39	N.C		87	N.C		135	CS3 (Flash or EPROM)	O
40	N.C		88	Vcc		136	N.C	
41	GND		89	Data 0	I/O	137	N.C	
42			90	Data 1	I/O	138	Option232 Interrupt 1	I
43			91	Data 2	I/O	139	Option232 Interrupt 0	I
44	Vcc		92	Data 3	I/O	140	N.C	
45	GND		93	GND		141	N.C	
46			94	Data 4	I/O	142	/WDOG	O
47	Fiscal Address 16	I	95	Data 5	I/O	143	GND	
48	Fiscal Address 17	I	96	Data 6	I/O	144	Ethernet TPSQEL	O

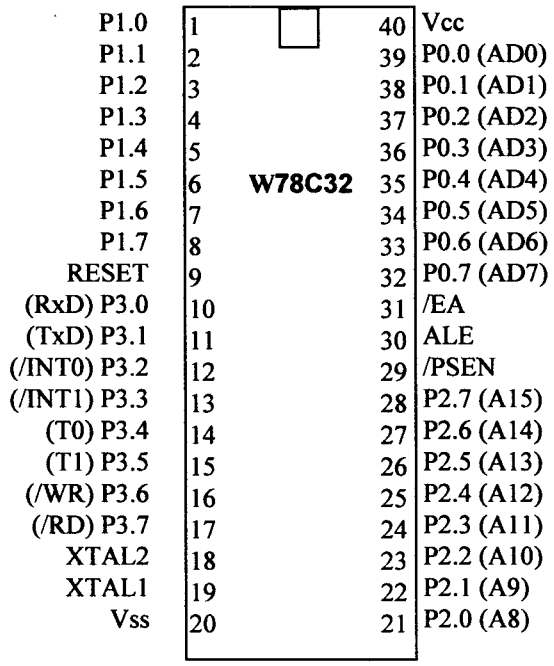
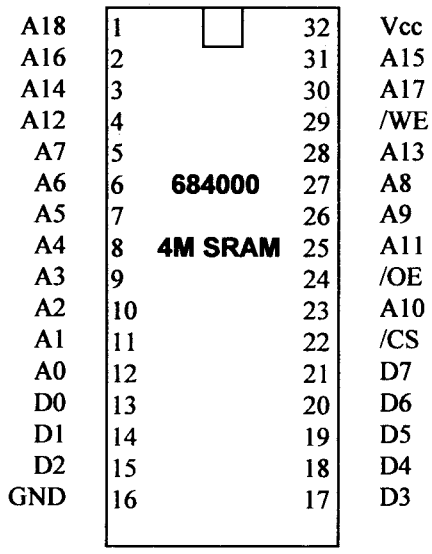
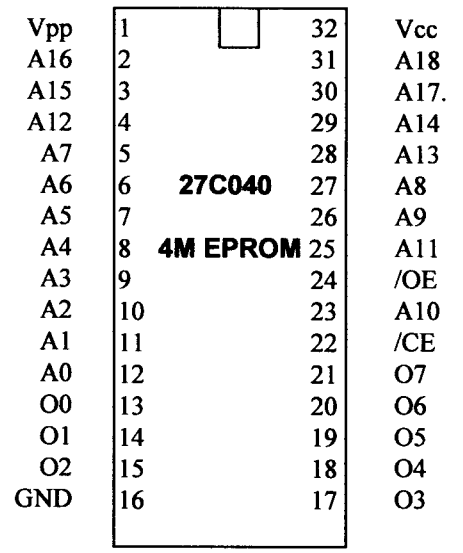


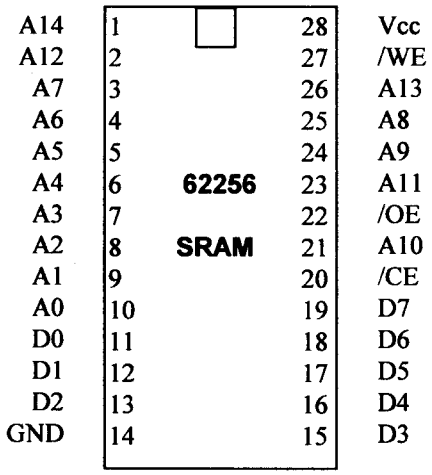
Table 2-2. W78C32 Signal Description

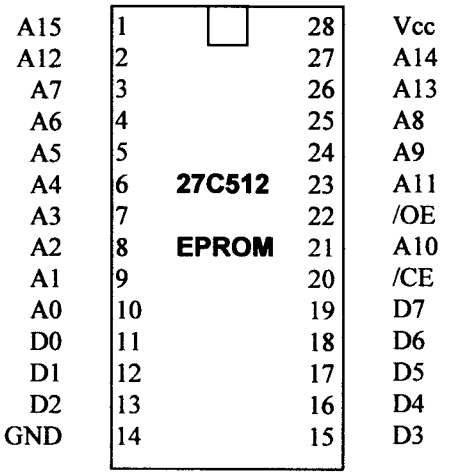
Pin	Port	Function	I/O	Pin	Port	Function	I/O
1	P1.0	VFD Disconnect Detect	I	21	P2.0	Address 8	I/O
2	P1.1	P-Fail Detect	I	22	P2.1	Address 9	I/O
3	P1.2	Printer J-Reset	I	23	P2.2	Address 10	I/O
4	P1.3	Printer R-Reset	I	24	P2.3	Address 11	I/O
5	P1.4	Validation Paper Sensor	I	25	P2.4	Address 12	I/O
6	P1.5	Printer Paper-end Sensor	I	26	P2.5	Address 13	I/O
7	P1.6	All Clear	I	27	P2.6	Address 14	I/O
8	P1.7	Auto-Cutter Sensor	I	28	P2.7	Address 15	I/O
9		RESET		29		/PSEN(Program Strobe Enable)	O
10	P3.0	VFD Data	O	30		ALE(Address Latch Enable)	O
11	P3.1	VFD Clock	O	31		/EA(Enable)	O
12	P3.2	Printer Timing interrupt	I	32	P0.7	Address/Data 7	I/O
13	P3.3	Printer Reset interrupt	I	33	P0.6	Address/Data 6	I/O
14	P3.4	Buzzer	O	34	P0.5	Address/Data 5	I/O
15	P3.5	Port Reset		35	P0.4	Address/Data 4	I/O
16	P3.6	/WR	O	36	P0.3	Address/Data 3	I/O
17	P3.7	/RD	O	37	P0.2	Address/Data 2	I/O
18		N.C		38	P0.1	Address/Data 1	I/O
19		CPU Clock	I	39	P0.0	Address/Data 0	I/O
20		GND		40		Vcc	

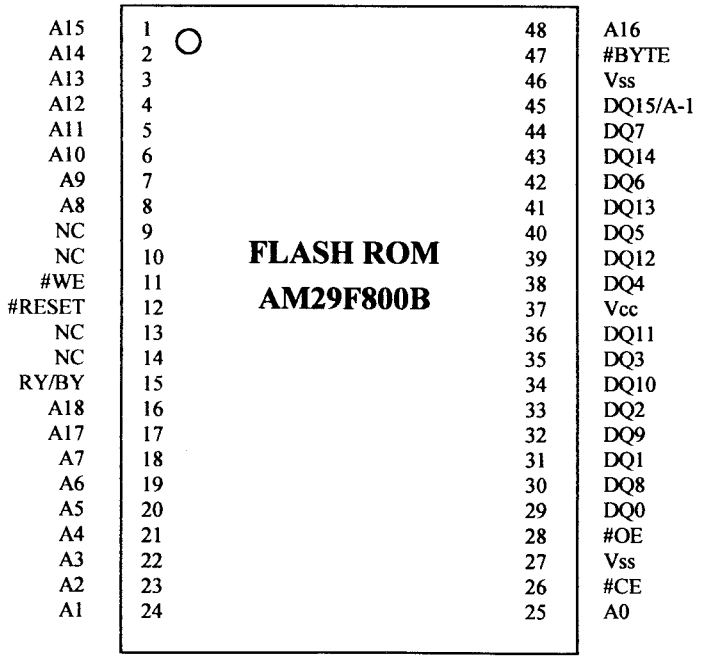
2-1-2. Memorys


A18 1 32 Vcc
A16 2 31 A15
A14 3 30 A17
A12 4 29 /WE
A7 5 28 A13
A6 6 684000 27 A8
A5 7 26 A9
A4 8 4M SRAM 25 A11
A3 9 24 /OE
A2 10 23 A10
A1 11 22 /CS
A0 12 21 D7
D0 13 20 D6
D1 14 19 D5
D2 15 18 D4
GND 16 17 D3


Vpp 1 32 Vcc
A16 2 31 A18
A15 3 30 A17.
A12 4 29 A14
A7 5 28 A13
A6 6 27C040 27 A8
A5 7 26 A9
A4 8 4M EPROM 25 A11
A3 9 24 /OE
A2 10 23 A10
A1 11 22 /CE
A0 12 21 O7
O0 13 20 O6
O1 14 19 O5
O2 15 18 O4
GND 16 17 O3


A14 1 28 Vcc
A12 2 27 /WE
A7 3 26 A13
A6 4 25 A8
A5 5 24 A9
A4 6 62256 23 A11
A3 7 22 /OE
A2 8 SRAM 21 A10
A1 9 20 /CE
A0 10 19 D7
D0 11 18 D6
D1 12 17 D5
D2 13 16 D4
GND 14 15 D3


A15 1 28 Vcc
A12 2 27 A14
A7 3 26 A13
A6 4 25 A8
A5 5 24 A9
A4 6 27C512 23 A11
A3 7 22 /OE
A2 8 EPROM 21 A10
A1 9 20 /CE
A0 10 19 D7
D0 11 18 D6
D1 12 17 D5
D2 13 16 D4
GND 14 15 D3


A15 1 48 A16
A14 2 47 #BYTE
A13 3 46 Vss
A12 4 45 DQ15/A-1
A11 5 44 DQ7
A10 6 43 DQ14
A9 7 42 DQ6
A8 8 41 DQ13
NC 9 40 DQ5
NC 10 FLASH ROM 39 DQ12
#WE 11 AM29F800B 38 DQ4
#RESET 12 37 Vcc
NC 13 36 DQ11
NC 14 35 DQ3
RY/BY 15 34 DQ10
A18 16 33 DQ2
A17 17 32 DQ9
A7 18 31 DQ1
A6 19 30 DQ8
A5 20 29 DQ0
A4 21 28 #OE
A3 22 27 Vss
A2 23 26 #CE
A1 24 25 A0

2-1-3. Logic ICs

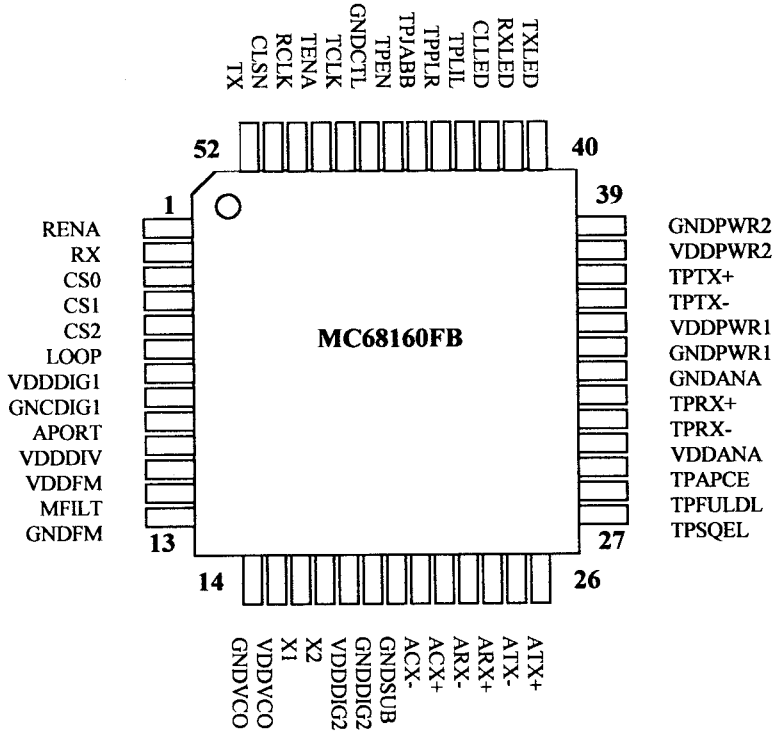
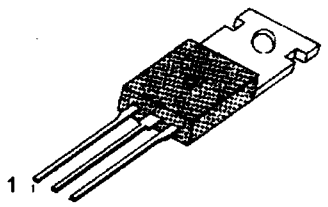


Table 2-3. MC68160FB Ethernet Driver signal Descriptions

Pin	Function	I/O	Pin	Function	I/O	Pin	Function	I/O
1	Receive Enable	O	19	Digital GND		37	Differential Receive Data	O
2	Receive Data	O	20	Substrate GND		38	Power Supply	
3	Mode Select 0	I	21	N.C		39	Power GND	
4	Mode Select 1	I	22	N.C		40	N.C	
5	Mode Select 2	I	23	N.C		41	N.C	
6	Diagnostic Loop back	I	24	N.C		42	N.C	
7	Digital Supply		25	N.C		43	N.C	
8	Digital GND		26	N.C		44	N.C	
9	Port Selection Enable	I	27	Error Test Enable	I	45	N.C	
10	Frequency Divider supply		28	Full Duplex Mode Select	I	46	Port Enable	I/O
11	Frequency Multiplier supply		29	Polarity Correction Enable	I	47	Controller Interface GND	
12	Frequency Multiplier Filter		30	Analog Supply		48	Transmit Clock	O
13	Frequency Multiplier GND		31	Differential Receive Data	I	49	Transmit Enable	I
14	Oscillator GND		32	Differential Receive Data	I	50	Receive Clock	O
15	Oscillator Supply		33	Analog GND		51	Collision Output	O
16	Oscillator Input		34	Power GND		52	Transmit Data	I
17	Oscillator Output		35	Power Supply				
18	Digital Supply		36	Differential Transmit Data	O			

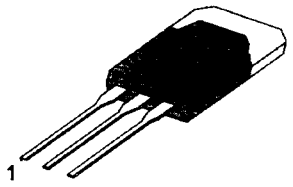
2-1-4. Tr & Diodes

TR A1010, A473, D560, D288



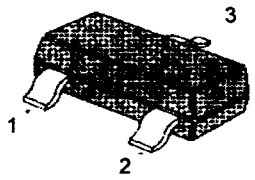
1: Base 2: Collector 3: Emitter

TR TIP142



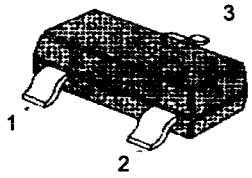
1:Base 2: Collector 3: Emitter

TR MMBT2222



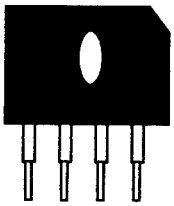
1:Base 2: Emitter 3: Collector

DIODE MMBD6050

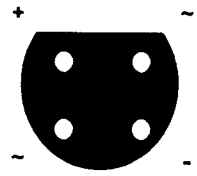


1:Anode 2: N.C 3: Cathode

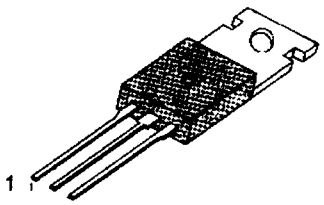
DIODE KBU6B



DIODE W02G

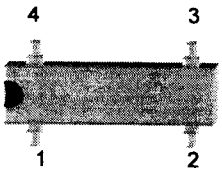


REGULATOR M7812



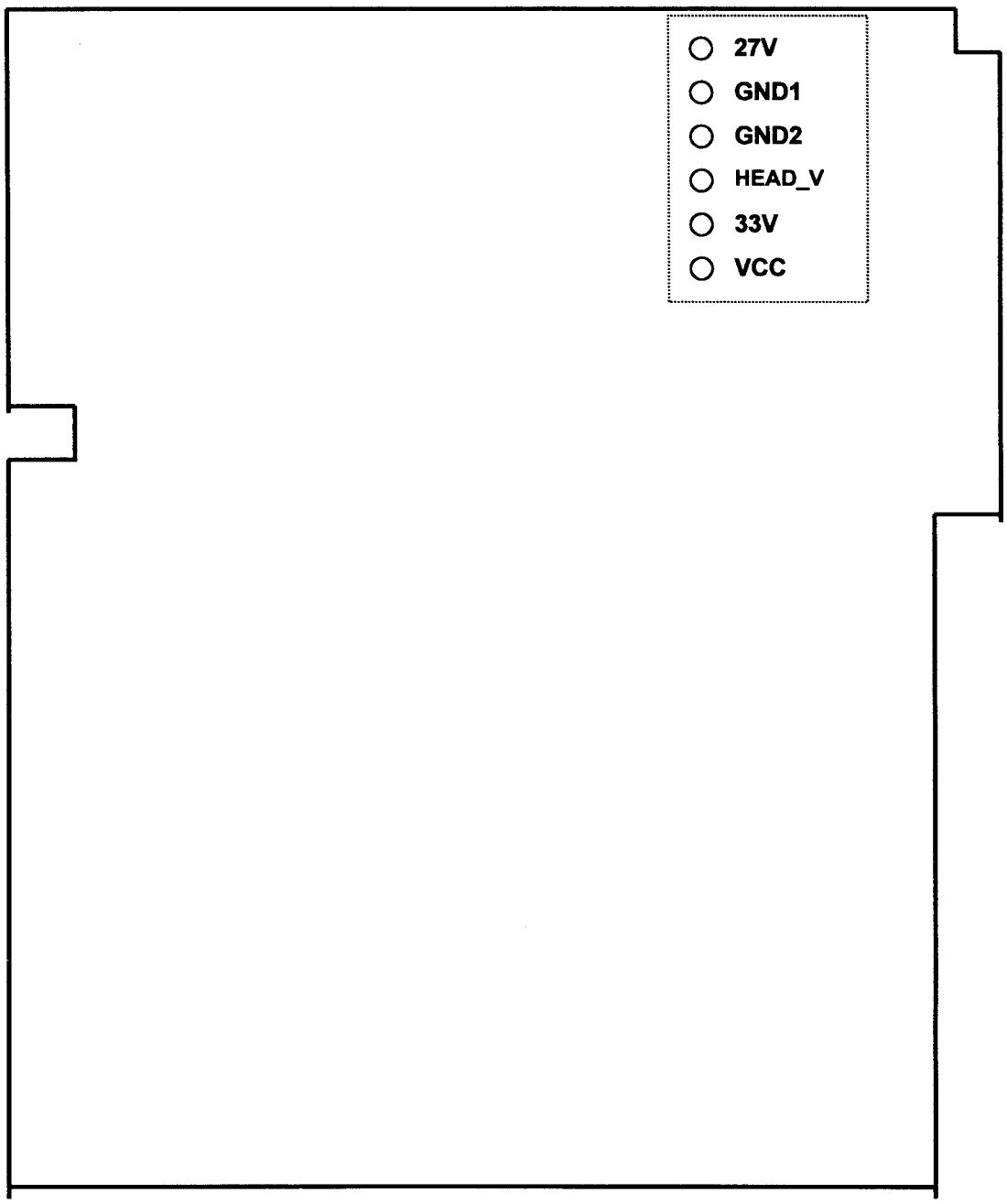
1: IN 2: GND 3: OUT

OSCILLATOR



1:X1 2: N.C 3: N.C 4. X2

2-2 Main Board Voltage Check Points



3 Product Specifications and Comparison Charts

Specifications are correct at the time of printing. Product specifications are subject to change without notice. See below for product specifications.

3-1 Specifications

Item	Description	Remark
AC Power Source	AC 120V, 60Hz AC 230V, 50 Hz	USA Europe
Power Consumption	40WMax	USA and Europe
R/J Printer	1 pair, 9-pin Dot matrix Printing speed: 3.0 lines per second Receipt paper auto-cutter (optional) Receipt/Journal paper sensor (optional)	
Processor	MOTOROLA MC68EN302 (32bit) INTEL 80C32/WINBOND 78C32 (8bit)	
Memory	• MC68EN302 Default : SRAM (KM684000*1) : 512kbytes EPROM (27C040) : 512kbytes Option : SRAM (KM684000*3) : 1536kbytes • W78C32 SRAM (KM62256*1) : 32kbytes EPROM (27C512*1) : 64kbytes	
Data Storage	60 Days	When battery fully charged
Battery	Ni-MH, 3.6V, 70mAh Charging time: 24 hours	
Display	Front : 5*7 dot(12Char.) and 7segment(10 digit) combination VFD Rear : 7segment(10 digit) VFD	
Keyboard	160-key 90-key	SER-6500 II SER-6540 II
Interface	Default : RS-232C : 2 ports : IRC : 1 port Option : RS-232C : 2 ports	
IRC	Communication mode: Ethernet Communication speed: 10Mbps Communication distance: 100m	
Drawer	D5508, 5C5B 8C4B Weight: 9.3Kg Dimensions: 400 (W) x 450 (L) x 111 (H)	USA Europe When packed millimeters
Packing Carton	Weight: 17.6Kg Dimensions: 400 (W) x 462(L) x 305 (H)	 millimeters

3-2 Set Dimension and Feature

3-2-1. Set Dimension

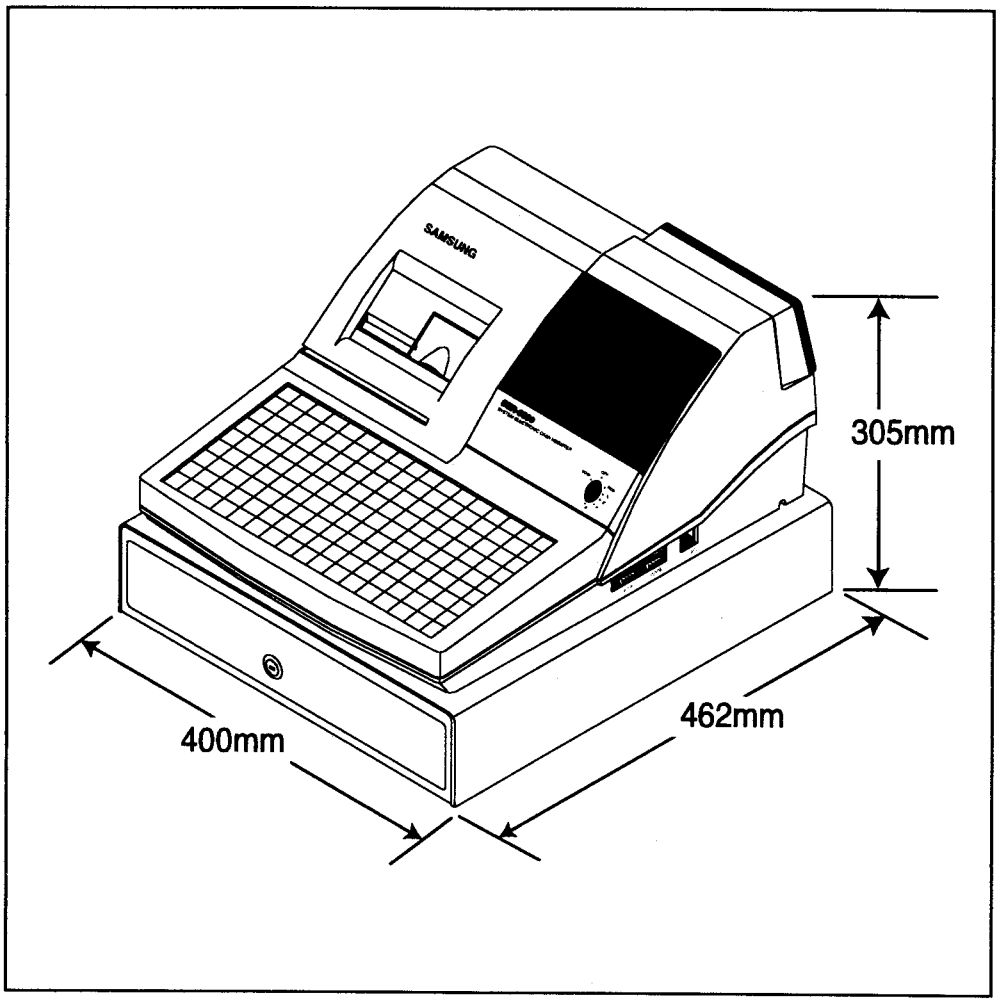


Figure 3-1 SET Dimension

3-2-2. Set Feature

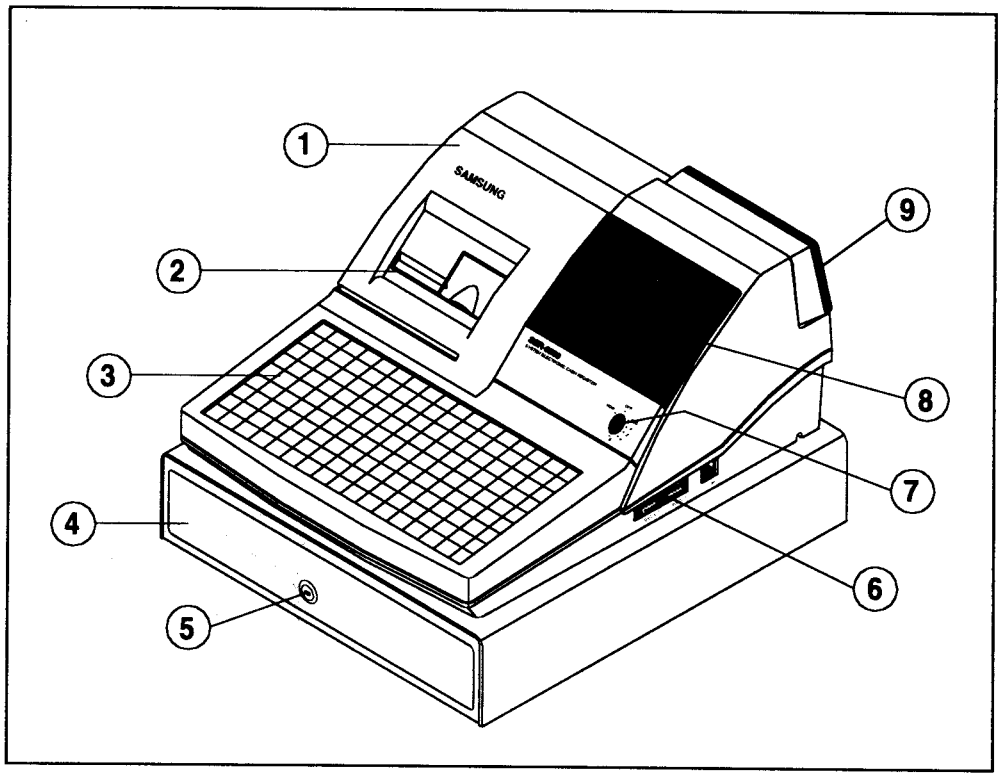


Figure 3-2 SET Feature

① Cover Printer
② Impact dot printer
③ Key-board
④ Drawer
⑤ Drawer lock key
⑥ IRC (Inter Register Communication)
Serial 1 (RS232C)
⑦ Mode switch
Serial 2 (RS232C)
⑧ Window display
⑨ Rear display

3-3 Serial & IRC Interface Specifications

3-3-1. Serial & IRC Port Location

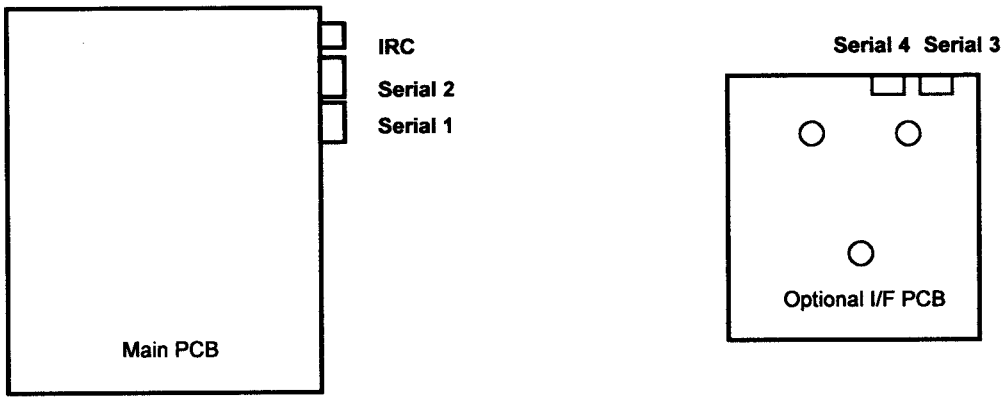


Figure 3-3. Serial & IRC Port Location

3-3-2 Serial & IRC Connectors / Cables

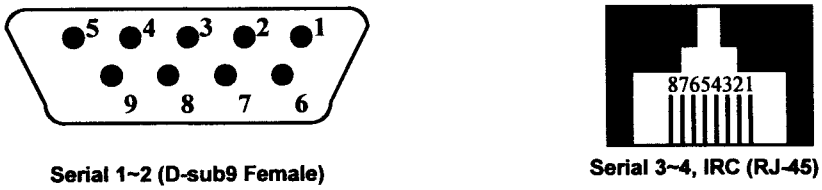
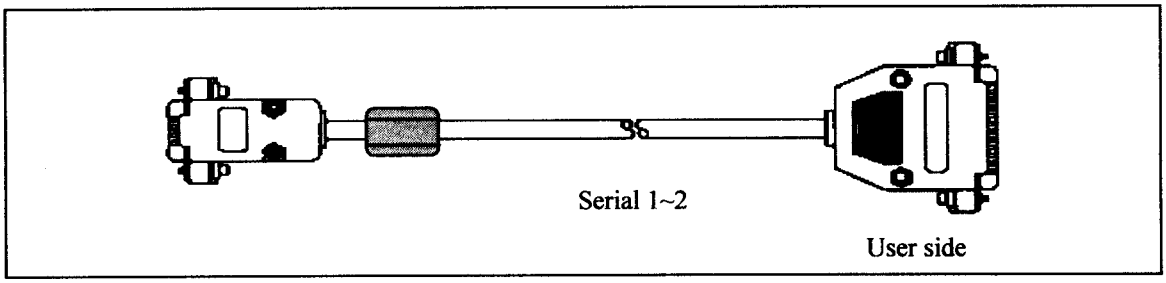


Figure 3-4. Serial & IRC Connector

Caution: When connecting the interface cables to Serial and IRC Ports, Unplug the Register.



WARNING: Don't load more than 200mA externally to # 9pin(+5V) of Serial 1 and Serial 2

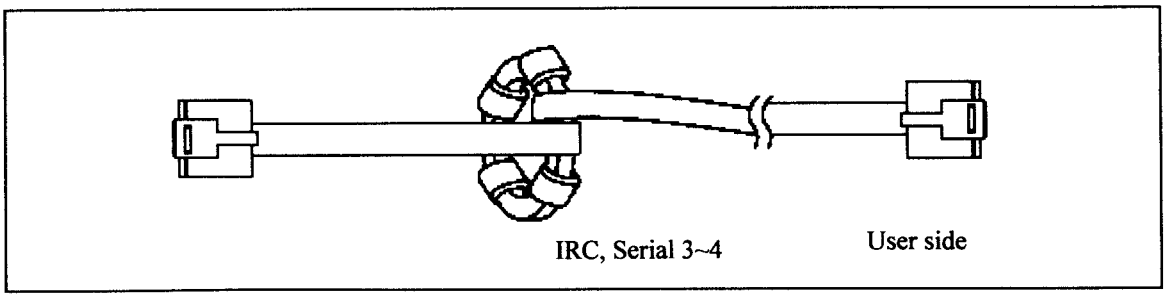


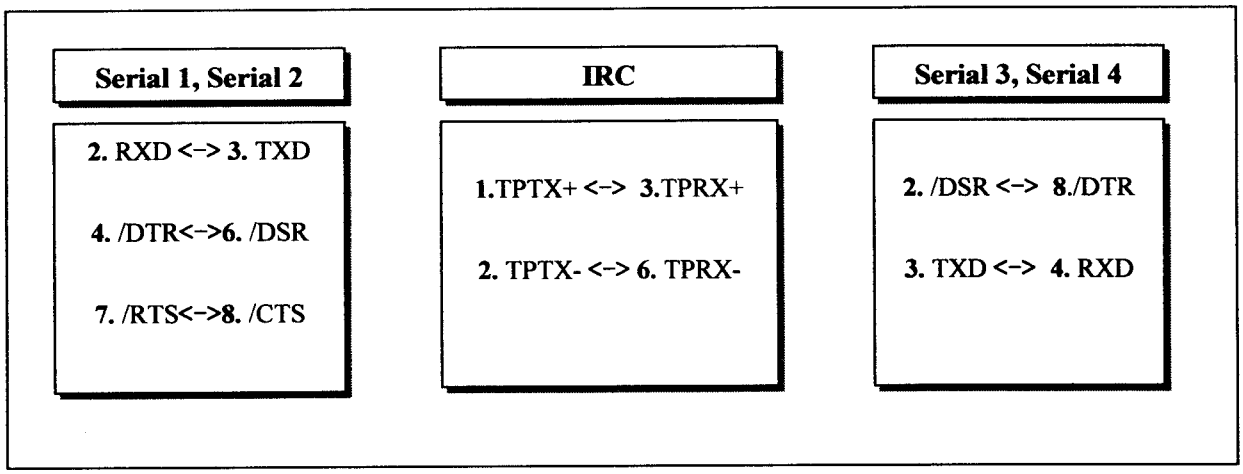
Figure 3-5. Serial & IRC Cable

3-3-3. Serial & IRC Signal Descriptions

Table 3-1. Signal Descriptions

Serial 1		Serial 2		Serial 3~4		IRC	
Pin NO.	Signal	Pin NO.	Signal	Pin NO.	Signal	Pin NO.	Signal
1	/CD	1	N.C	1	N.C	1	TPTX+
2	RxD	2	RxD	2	/DSR	2	TPTX-
3	TxD	3	TxD	3	TxD	3	TPRX+
4	/DTR	4	/DTR	4	RxD	4	N.C
5	GND	5	GND	5	N.C	5	N.C
6	/DSR	6	/DSR	6	N.C	6	TPRX-
7	/RTS	7	/RTS	7	GND	7	N.C
8	/CTS	8	/CTS	8	/DTR	8	N.C
9	Vcc	9	Vcc	/DTR<->/RTS /DSR<->/CTS			
		/DTR<->/RTS /DSR<->/CTS					

3-3-4. Serial & IRC Loop Back Connections



3-4 Comparison Chart

3-4-1 Power Transformer / Fuse

1) POWER TRANSFORMER

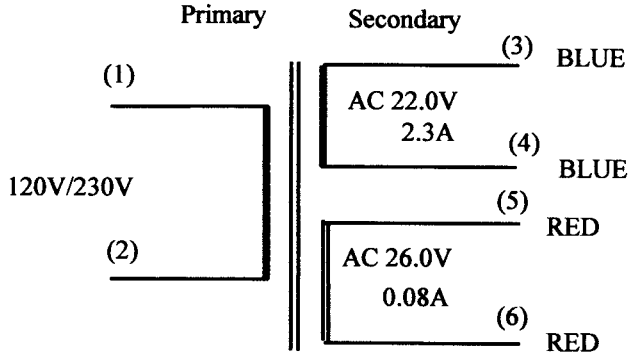


Figure 3-5 Transformer Diagram

2) Fuse

Table 3-2 Fuse Specification

Loc. No.	Spec.	Remark
FU1	250V 3.15A	POWER

3-4-2 Model Comparison Chart

Table 3-3 Model Comparison List

	Model	Key Board	Printer	Power Transformer	Remark
USA	SER-6540 II	90KEY	ERP-300V / ERP-300A ERP-400	120V 60Hz	ERP - 300A (Auto Cutter)
	SER-6500 II	160KEY			
EUROPE	SER-6540 II	90KEY	ERP-300V / ERP-300A ERP-400	230V 50Hz	ERP - 300A (Auto Cutter)
	SER-6500 II	160KEY			

4 Installation and Operation

This chapter details the method for installing the ECR system.

4-1 System Configuration

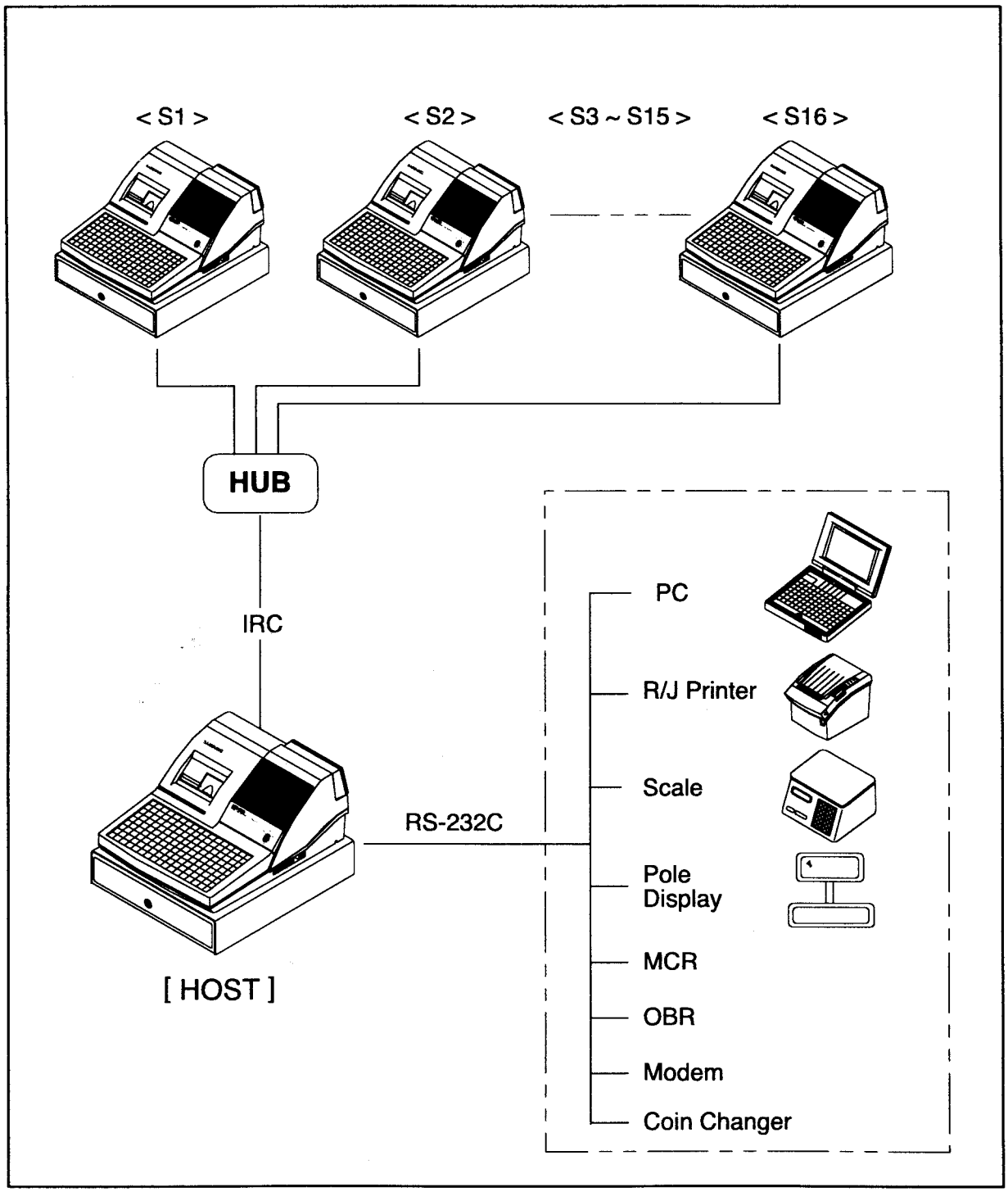


Figure 4-1. System Configuration

4-2 Installation

WARNING: When connecting the keyboard to the Main PCB, make sure the membrane sheet is shaped as in Figure 4-2 (a), below. If the membrane is shaped as in Figure 4-2 (b), the keyboard may malfunction.

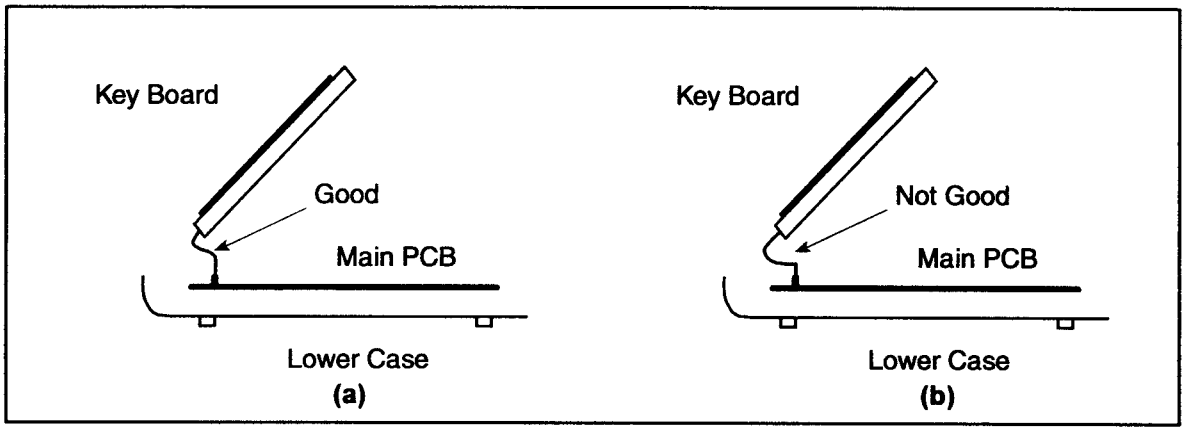
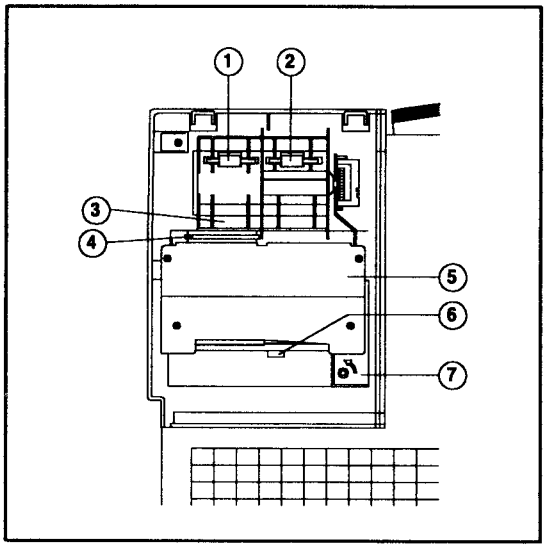


Figure 4-2. Membrane Shape

4-2-1. Printer



① Paper Roller
② Spool
③ Stamp(LOGO)
④ Paper Chute
⑤ Impact Dot Printer
⑥ Paper Release Lever
⑦ Ribbon Cassette

Figure 4-3. Printer

4-2-2. Ribbon Cassette Installation

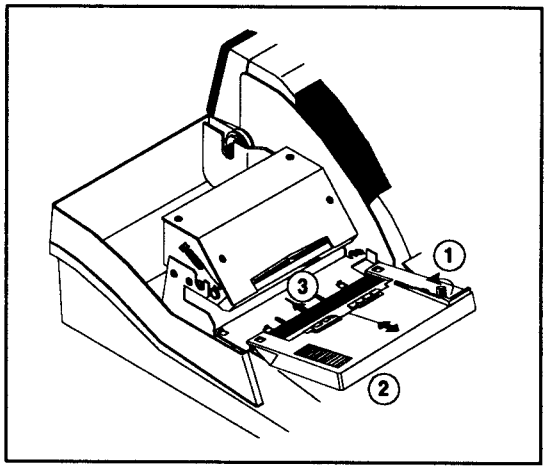


Figure 4-4. Ribbon Cassette

1. Before inserting ribbon cassette②, turn knob ① (see Figure 4-4) counterclockwise to prevent twisting the ribbon.
2. After inserting the ribbon cassette② at the center③ of the printer, turn the knob ① counterclockwise again to make sure the ribbon moves freely in the cassette.

4-2-3. Receipt / Journal Paper Insertion

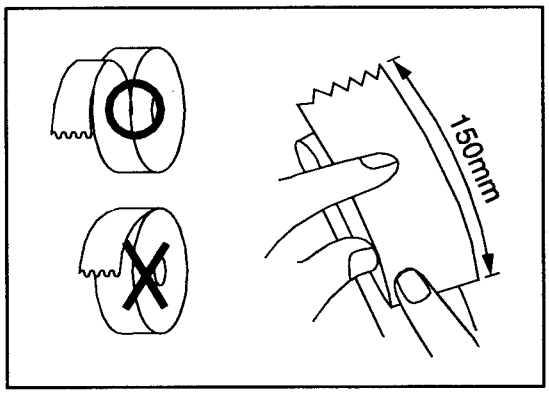


Figure 4-5. Folding Paper for Insertion

1. Using a new roll of paper, unroll the paper about 150 mm and fold the paper as shown in Figure 4-5.

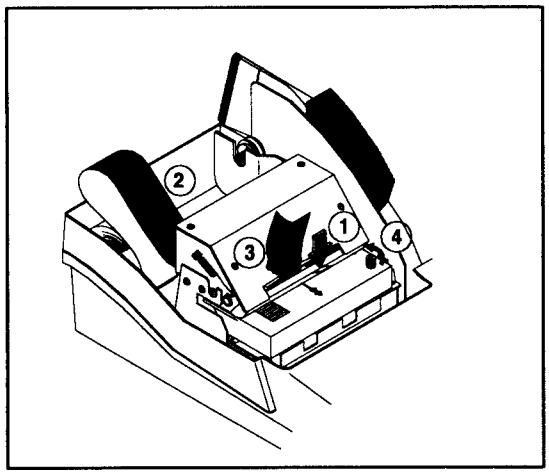


Figure 4-6. Inserting the Paper

2. Insert folded paper into the chute ② of the ERP-300V printer. While holding the lever ① down, pull the paper out until the fold point ③ is completely out of the printer. And turn the knob ④ like an arrow.
3. Cut the receipt paper

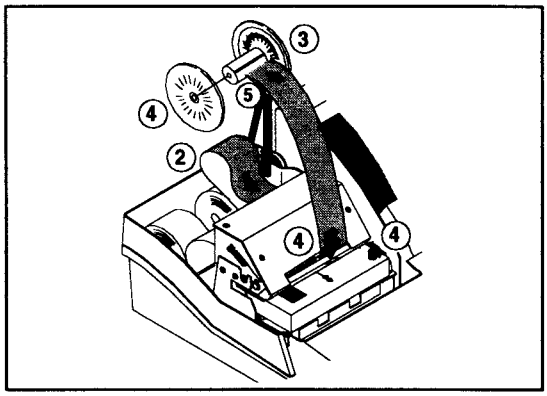


Figure 4-7. Inserting the Journal Paper

4. Insert the journal paper into the slit ③of the rewind spindle. Wind the spindle three or four times.
5. Push end disk ④ onto the spindle as shown in Figure 4-7.
6. Insert the spool to the printer part ⑤.
7. When the journal paper is loose, rewind the spindle to tighten the paper.

4-2-4. RS232C Option Board Installation

The SER-65** II series allows for an increase in the serial interfaces by using an optional I/F board. Refer to the following instruction when installing this optional I/F board.

1. Disconnect the ECR from the external power outlet.
2. Lift off the Printer Cover.
3. Remove three screws (C2, C3 and C4) on Upper Case and lift it up.
4. Remove Mode-Key connector (CN17) and Front Display connector (CN19) on the Main PCB.
5. Remove Upper Case and Keyboard.
6. If you will connect peripheral equipment (barcode reader or computer or etc) to the Optional I/F Board, insert cable connector through the channel in the back of ECR.
7. Insert three supporters into the hall on the Main PBA to fix Optional I/F Board.
8. Position Optional I/F Board over CN8 and three supporters on the Main PBA and then press Optional I/F Board down carefully to seat it firmly.
9. Attach the Ferrite core in the accessories to the serial cable as Figure 4 –9.
10. Insert serial cable connector into the serial port 3 or port 4.

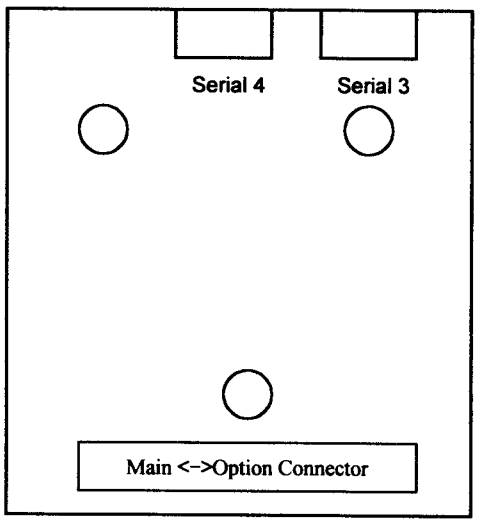


Figure 4-8. RS232C Option Board

11. Re-connect the Mode-Key connector and Front Display Connector to CN19 and CN17 on the Main PBA.
12. Reposition Upper Case and Keyboard on Lower Case and replace three screws at C2, C3 and C4.
13. Replace the Printer Cover.
14. Re-connect the ECR to the power outlet.

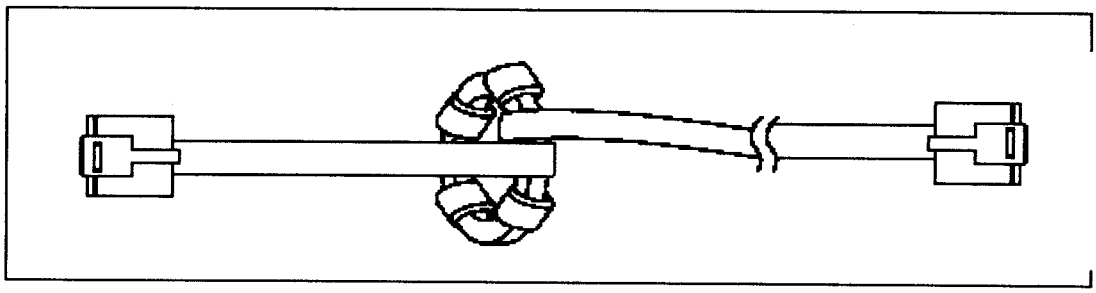


Figure 4-9. Serial 3~4 Cable

4-3 Operation

Note: Before using this System Electronic Cash Register (SECR) for the first time, leave it powered ON in the REG mode for at least twenty-four hours. This allows the Ni-MH battery, which maintains the SECR's memory while the power is OFF, to fully charge.

4-3-1. Mode Switch

The position of the Mode Switch determines the action of the SECR. The modes are as shown in Table 4-1, below.

Table 4-1. SECR Modes

Mode	Function
VOID	Cancel operation
OFF	Operation stop
REG	Sales Operation
X	X-level report generation
Z	Z-level report generation
P	Program mode
S	Service mode

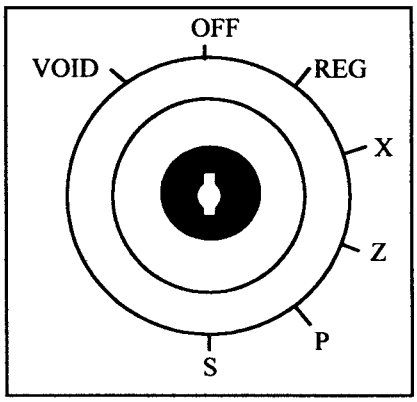


Figure 4-10. Mode Switch

4-3-2. Keyboard Matrix

The SER-6600 and SER-6640 SECR offer two different types of keyboards; 90-key or 160-key as shown in Table 4-2 .

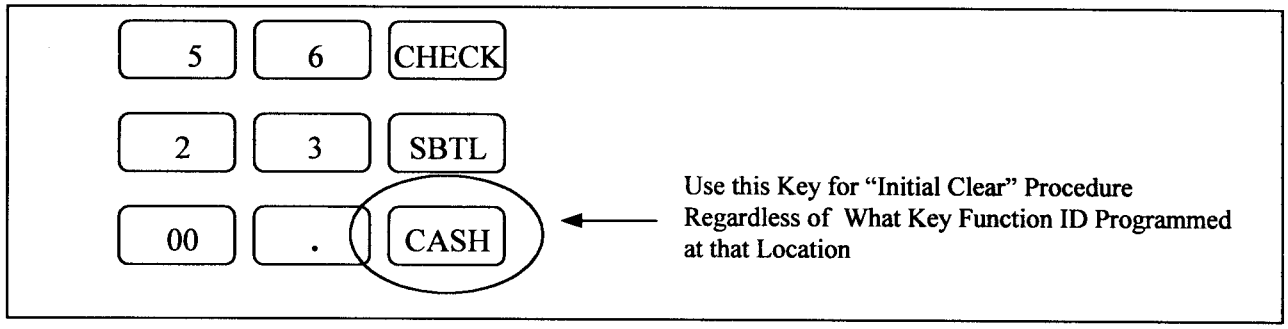
Table 4-2. Keyboard Types

Model	Keys	Type
SER-6540 II	90	Raised
SER-6500 II	160	Flat

4-4 Initial some Procedures

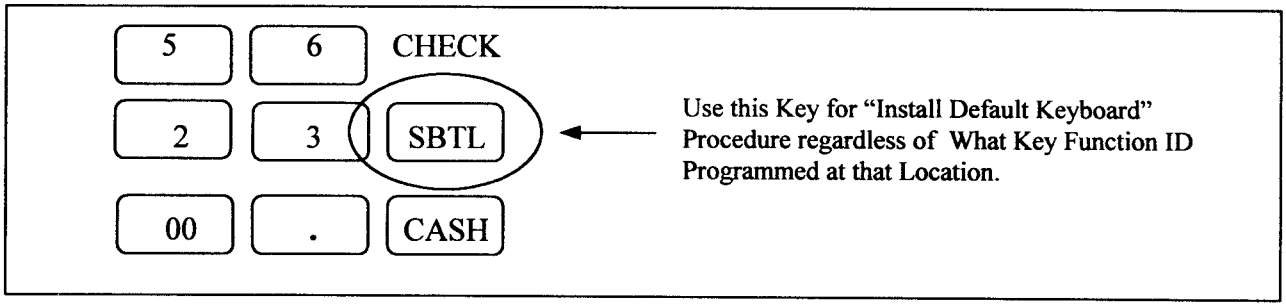
4-4-1. Initial Clear Procedure

1. Turn the Mode key to P-Mode.
2. Unplug the Register.
3. Hold down the lower right key on keyboard and plug in the Register at the same time.
4. The Register issues an Initial Clear receipt.



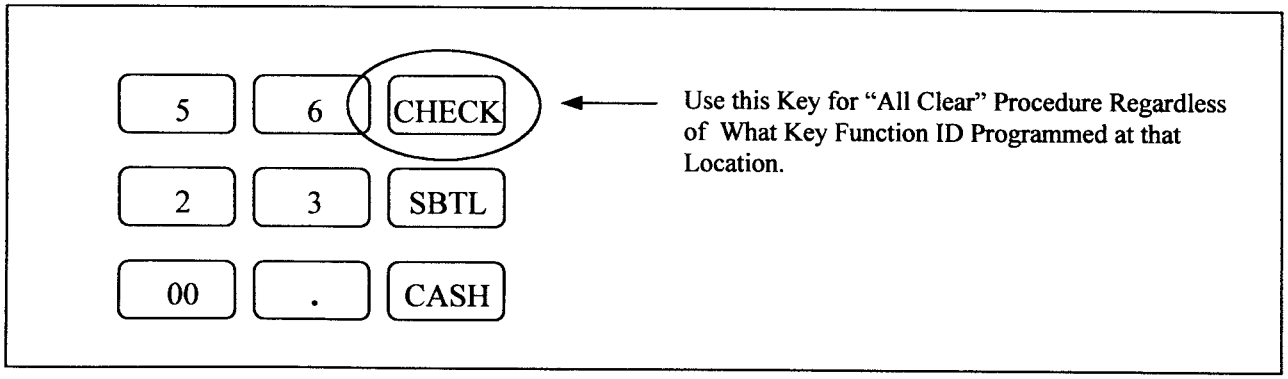
4-4-2. Install Default Keyboard

1. Turn the Mode key to S-Mode.
2. Unplug the Register.
3. Hold down the second key up from lower right key on keyboard and plug in the Register at the same time.
4. The Register issues an Install Default Keyboard receipt.



4-4-3. All Clear

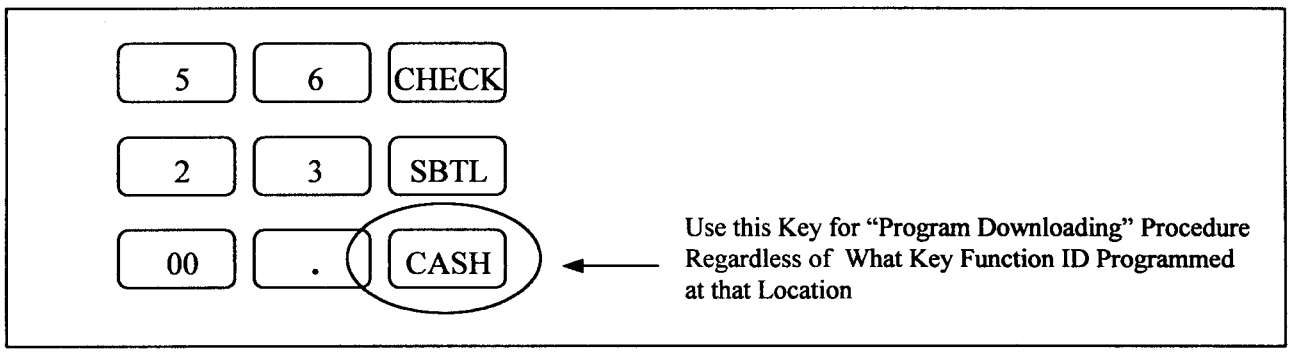
1. Turn the Mode key to S-Mode.
2. Unplug the Register.
3. Hold down the third right key up from the lower right key on the Keyboard and plug in the Register at the same time.
4. The Register issues an All Clear receipt.



4-5 Program Downloading

4-5-1. (Booting area + Application area) Program Downloading

1. Unplug the Register.
2. Place Download EPROM in the blank 32 Pin Socket(U44).
3. Shift the Jumper of CN12, CN25 from 'ON' to 'OFF' position.
4. Connect the Serial 1 cable of the Set to PC.
5. Turn the Mode key to S-Mode.
6. Hold down the lower right key on the Keyboard and plug in the Register at the same time.
7. The Register will display "PC Downloading".
8. Download the latest version of SER-6500 II .
9. Unplug the Register.
10. Remove the Download EPROM in the 32 Pin Socket.
11. Shift the Jumper of CN12, CN25 from 'OFF' to 'ON' position.
12. Perform All Clear.

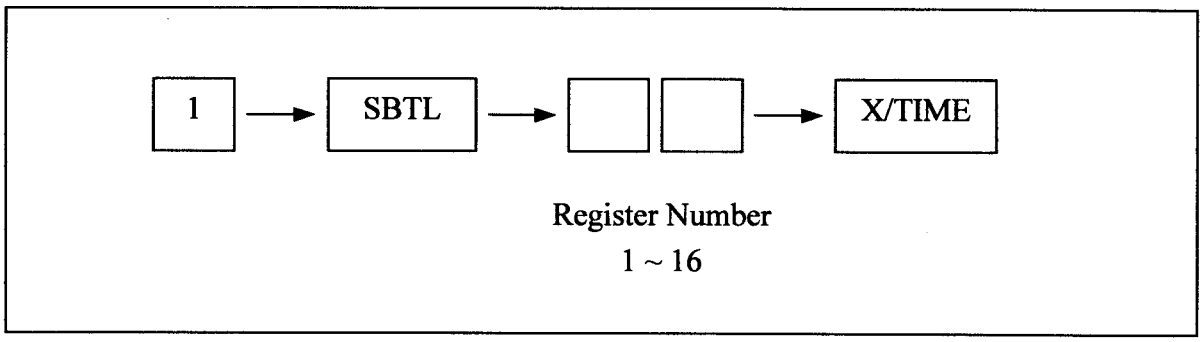


4-5-2. Application area Program Downloading

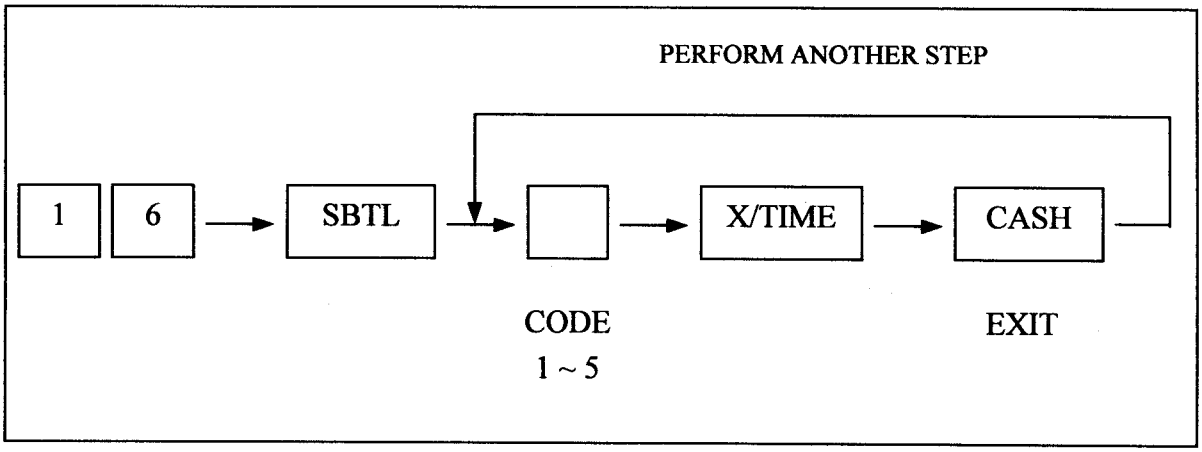
1. Unplug the Register.
2. Connect the Serial 1 cable of Set to PC.
3. Turn the Mode key to S-Mode.
4. Hold down the lower right key on the Keyboard and plug in the Register at the same time.
5. The Register will display "PC Downloading".
6. Download the latest version of SER-6500 II .
7. Unplug the Register.
8. Perform All Clear.

4-6 S- Mode Programming

4-6-1. S-Mode Register Number Setting

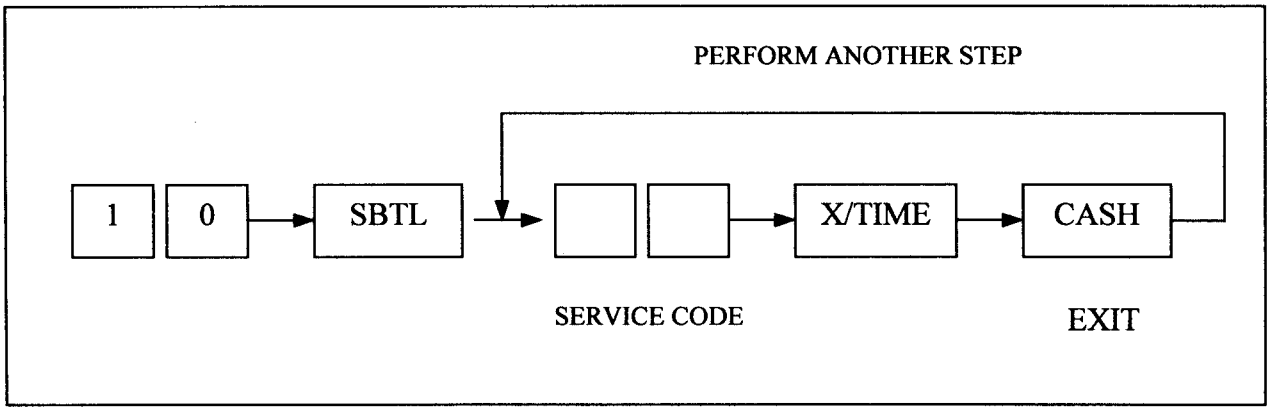


4-6-2. S-Mode IRC Test



Code	Function
1	Register Number Setting
2	Internal IRC Loop Back Test (Chip)
3	Internal IRC Loop Back Test (Driver)
4	External IRC Loop Back Test - Use Loop Back Connector (Refer to 3-3-4)
5	System IRC Loop Back Test - Input Start and Destination Number to send packet

4-6-3. S-Mode Service Programming



CODE	FUNCTION
1	ALL REPORT RAM CLEAR
2	CLEAR TOTALS AND COUNTERS
3	CLEAR GRAND TOTALS ONLY
4	PRINTER TEST
5	PRINTER DOT ALIGNMENT TEST
6	DISPLAY TEST
7	RAM TEST
8	EPROM CHECKSUM PRINT OUT
9	S-MODE PROGRAMMING PRINT OUT
10	CLEAR PLU FILE
11	CHECK UNLOCK
12	POLE DISPLAY TEST

5 Disassembling and Reassembling

This chapter describes the disassembly and reassembly procedures for SER-6500 series, electronic cash registers.

WARNING:This ECR contains electrostatically sensitive devices. Use caution when handling any components.

5-1 Disassembling

Caution: Disconnect the ECR from the external power source before disassembly.

Note: The following directions are given for the SER-6500. Differences between the models are identified in the text.

5-1-1 Upper Case Disassembling

1. Lift off the Printer Cover.
2. Remove three screws (C2, C3 and C4) on the Upper Case and lift it up.
3. Remove the red and the white connectors on the Main PCB.
4. Remove the Upper Case.

5-1-2 ERP-300V/400 Printer Disassembling

1. Remove the four screws ⓐ on the Upper Frame Assembly, C, and remove the Cover, A. See Figure 5-1, below.
2. Remove the two screws, ⓑ ,and remove the Ribbon Frame, B, from the Lower Frame ssembly , I, as shown in the drawing.

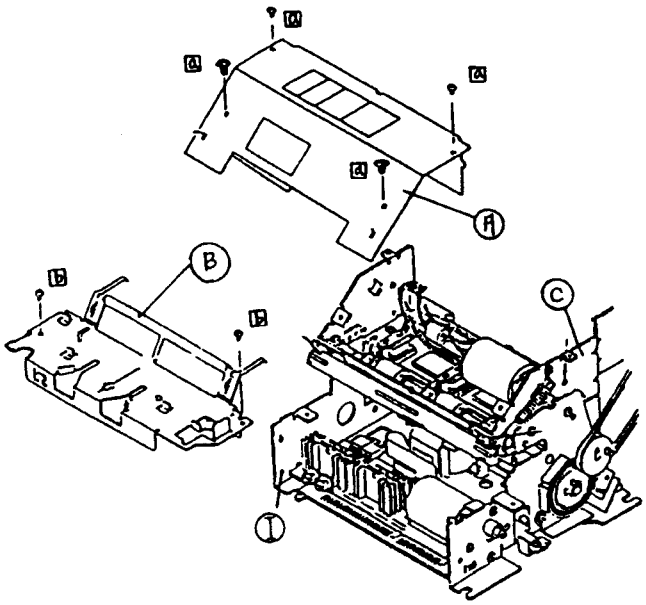
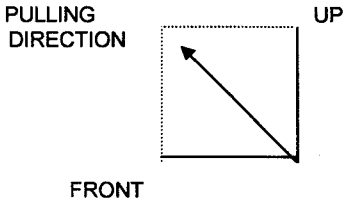


Figure 5-1. Printer Disassembling

3. Remove the four screws, ⓒ , and separate the Upper Frame Assembly, C, from the Lower Frame assembly ,I . Pull the Upper Frame assembly in the direction shown in Figure 5-2.



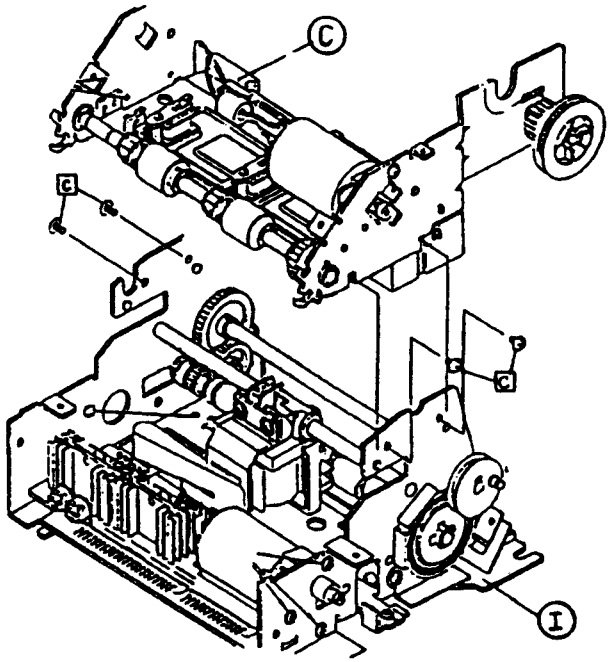


Figure 5-2. Separating the Upper Frame from the Lower Frame

4. Turn the Upper Frame Assembly, down and remove the three screws, ⓓ. Remove the Stamp Paper Guide Assembly D, from the Upper Frame Assembly C.

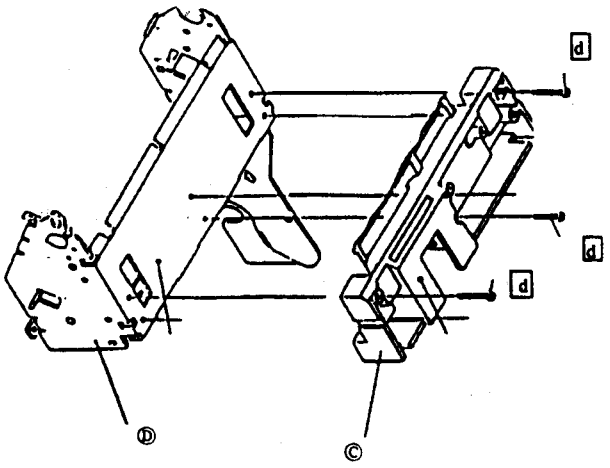


Figure 5-3. Stamp Paper Guide Removal

5. Remove the left-side screw, ⓔ, on the Platen Paper Guide, E. This screw connects the Platen Paper Guide Assembly E, -to Stamp Paper Guide Assembly, D. See Figure 5-4, below.

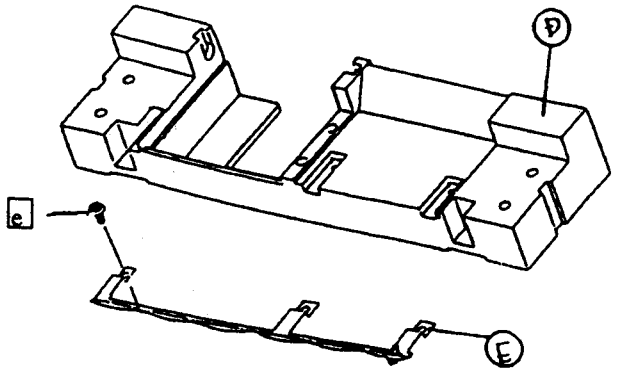


Figure 5-4. Platen Paper Guide Removal

5-2 Reassembling

Caution: Adjust the Head Gap (see Alignment and Adjustments chapter) before returning the ECR to the owner.

5-2-1 ERP-300V /400 Printer Reassembling

1. Position the Platen Paper Guide Assembly , E, on the Stamp Paper Guide Assembly , D, and replace the screw - ⓔ (see Figure 5-4, above).
2. With the Upper Frame Assembly C, upside-down, position the Stamp Paper Guide Assembly, D, and replace the three screws - ⓓ (see Figure 5-3, above).
3. Position the Upper Frame Assembly, C, on the Lower Frame Assembly, I, and replace the four screws © (see Figure 5-5, to the right).

Caution: Locate Stamp Pusher ⓕ on the hatched area as shown in the figure.

4. Position the Ribbon Frame, B, on the Lower Frame Assembly, I, and replace the two screws ⓑ (see Figure 5-1, above).
5. Position the Cover, A, on the Upper Frame Assembly, C, and replace the four screws_ - ⓐ.

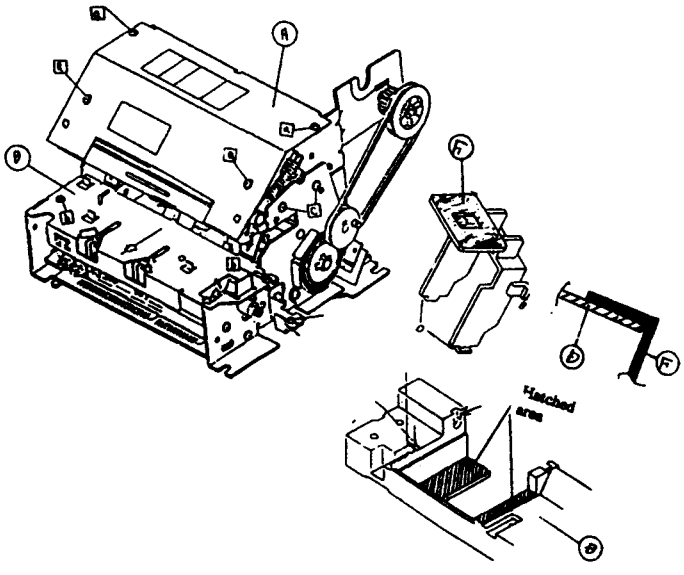


Figure 5-5. Stamp Pusher Position

5-2-2 Upper Case Reassembling

1. Position the Upper Case so that the connectors are within reach of the Main PCB. Replace the red and the white connectors.
2. Position the Upper Case on the Lower Case and replace the three screws
3. Position the Printer Cover.

6 Alignment and Adjustments

This chapter describes the methods for aligning and adjusting components in this ECR.

6-1 Printer Adjustments

6-1-1. Head Gap Adjustment

1. Assemble the Upper Frame Assembly, A, to the Lower Frame Assembly, I and loosely fix screws ⓒ .
2. Wind the Head Gear counterclockwise to; move the Head to the right end of the Platen Guide.
3. Insert the Gap Gauge (width 0.5 mm) between the Head and Platen. Tighten the screws ⓒ .
4. Wind the Head Gear counterclockwise again and move the Head to the left end of the Platen Guide.
5. Insert the Gap Gauge (0.5 mm) and tighten the screws.
6. After tightening all screws ⓒ, apply Nej-Lock (a brand of grease) on each of the four screws ⓒ .

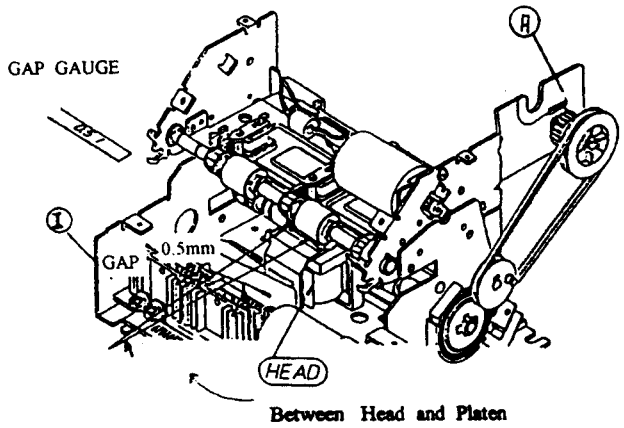
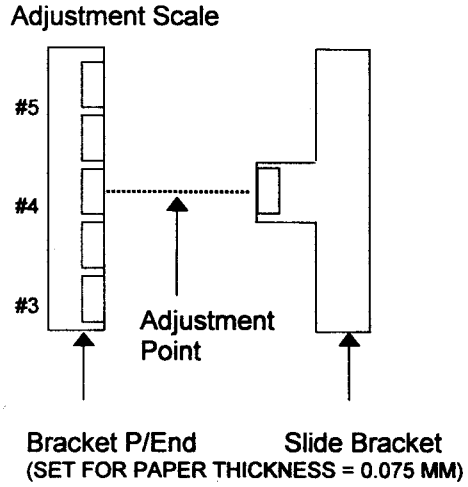


Figure 6-1. Head Gap Adjustment

6-1-2. Roll Paper Near-End Detector (Type 1 Paper Sensor)

6-1-2 (A) Adjustment Point

Figure 6-2. Adjustment Point



As Figure 6-2 shows, the slide bracket is set at Adjustment Scale #3. This is the appropriate scale for the recommended paper thickness (0.075 mm).
The accuracy of the Near-End Detector depends on the Adjustment Scale setting and the Roll Paper Winding Core diameter. The only paper approved for use in this ECR has the following characteristics:

Table 6-1. Roll Paper Characteristics

Characteristic	Measurement
Paper Thickness	0.075 mm
Paper Width	44.5 mm ± 0.5 mm
Winding Core Inner Diameter	110mm

The relationship between the Adjustment Scale and the paper remnant remaining on the core is as shown in Figure 6-3.

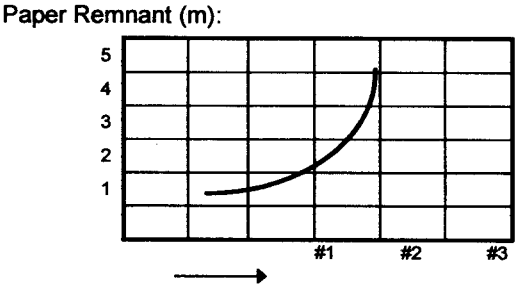
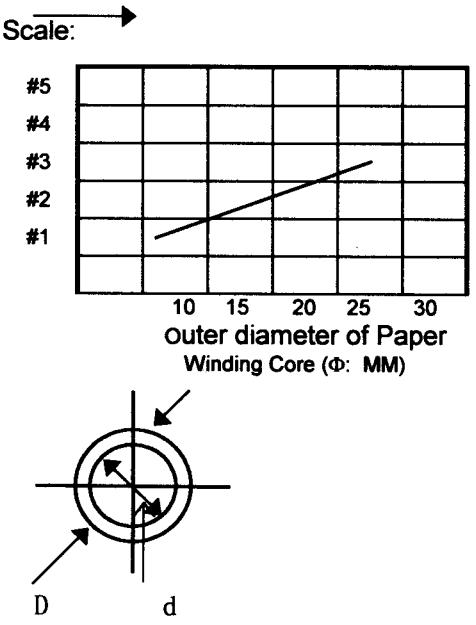


Figure 6-3 Relationship: Adjustment Scale to Remnant Length

Note: Figure 6-3 applies only when using Samsung recommended papers.

Figure 6-4 shows the relationship between the Adjustment Scale and the outer diameter of the Winding Core.



D: Outer Diameter
d: Inner Diameter

Figure 6-4. Relationship: Adjustment Scale to Winding Core Diameter

Note:

1. When using roll paper other than Samsung recommended paper, the roll paper remnant lengths will differ.
2. When using roll paper with a red end mark, the Winding Core may pull out of its holder due to the paper sticking to Winding Core. If the Winding Core pulls out of its holder, the Paper Sensor may indicate an inaccurate remnant length.

6-1-3. Clearing a Paper Jam

6-1-3 (A) Paper Jamming Causes

1. When more than two papers have entered the paper path.
2. When paper cutting remnants remain in the paper exit space.

6-1-3 (B) Clearing Procedure

Caution: Always disconnect the power cord from the power outlet *before* working on the Paper Cutter.

1. Open the Printer Cover and remove the Auto-Cutter Cover 2.
2. Remove all jammed paper at the Auto-Cutter.
3. Replace Auto-Cutter Cover 2 and close the Printer Cover.
4. The Auto-Cutter will operate as soon as power is restored to the ECR. After cutting once, the Auto-Cutter goes to its normal state.

7 Special Circuit Descriptions

7-1 Power Circuit

This system is operated under 120Vac or 230Vac, all data is saved by the Battery when the Main power is turned off. The power circuit supplies the six different DC voltage sources.

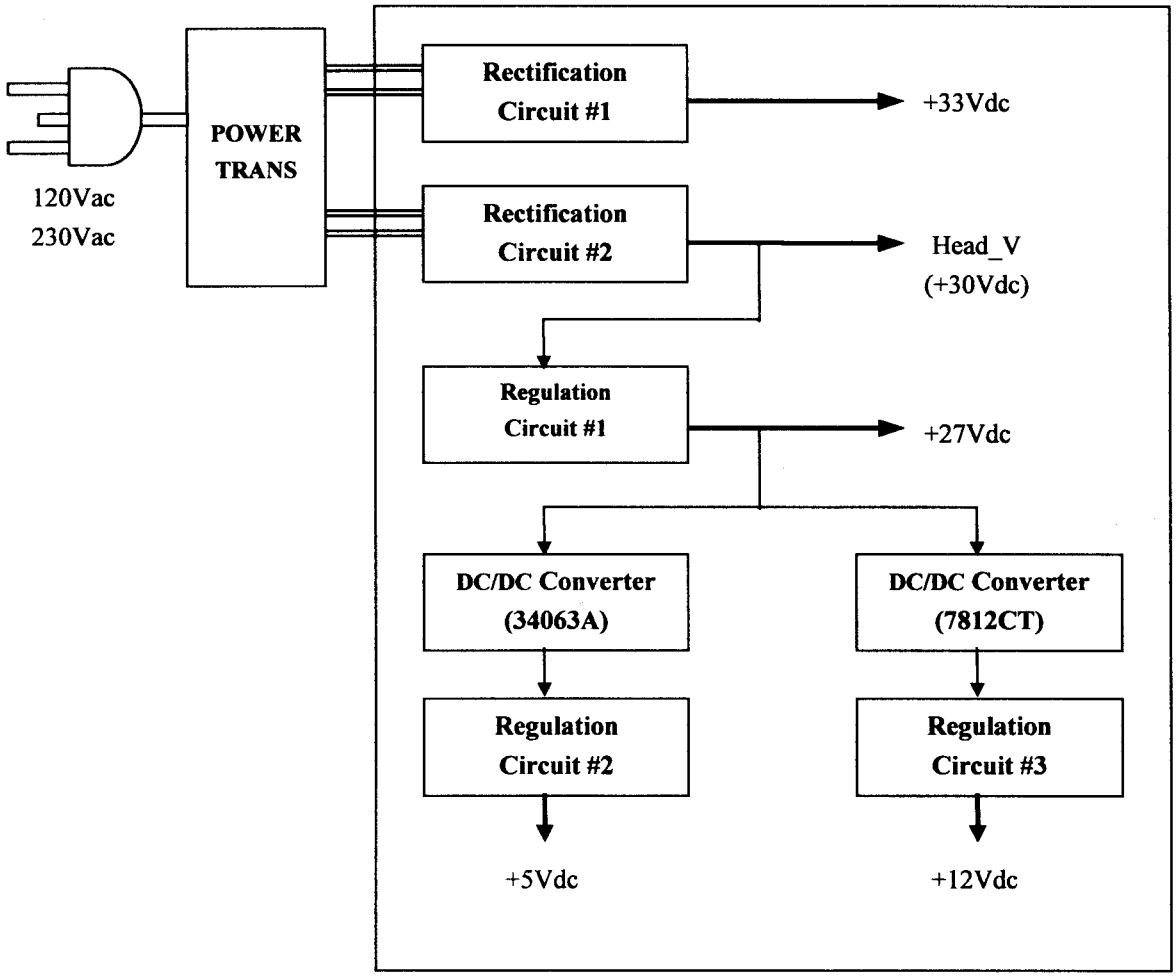


Figure 7-1 Power Circuit Block Diagram

NO.	Voltage	Descriptions
1	+33Vdc	Front / Rear Display Driving Voltage
2	+30Vdc	Printer Head On-time Control Voltage
3	+27Vdc	Printer / Cash Drawer Solenoid Driving Voltage
4	+5Vdc	Logic IC Driving Voltage
5	+12Vdc	Fiscal EPROM Writing Voltage
6	+3.6Vdc	Battery Voltage

Table 7-1. Power Source Voltage Descriptions

7-1-1. Operator / Customer Display Driving voltage : +33Vdc

This system uses +33Vdc made by the Bridge diode(D1) and the smoothing capacitor(C5). And it is used as Grid and Anode supply voltage.

7-1-2. Printer Head On-time Controlling Voltage : +30Vdc

+30Vdc is produced from the secondary AC Output Voltage of the Power Transformer by the Bridge Diode (BD1) and the smoothing capacitor(C12). This voltage is used to control Head on-time.

7-1-3. Printer / Cash Drawer Solenoid Driving Voltage : +27Vdc

+30Vdc is produced from the secondary AC Output Voltage of the Power Transformer by the Bridge Diode (BD1) and the smoothing capacitor(C12). The Zener Diode (ZD1, 27V) sets a reference Voltage, and +27Vdc voltage is obtained by the Power Transistor(Q2, TIP142) and the capacitor(C2). This voltage drives the Printer and the Cash Drawer Solenoid.

7-1-4. Logic IC Driving Voltage: +5Vdc

+5Vdc Logic Driving Voltage is produced by the step-down method used DC/DC Converter (U5, 34063). That is, U5 produces 45KHz rectangular wave at the Collector of Q3(A1010) by switching Q3 using input voltage (+27Vdc). This makes D6(1N5822) & L10 store Energy. This Voltage is smoothed by C49 and then +5Vdc Logic Voltage is produced .

7-1-5. Fiscal EPROM Writing voltage (+12Vdc)

+12Vdc is produced from voltage regulator (U37, 7812) which input voltage is 27Vdc. And CPU(U12, P7) controls On/Off of this voltage. This Voltage is used to write data to fiscal EPROM.

7-1-6. Battery Voltage : +3.6Vdc

Vcc is supplied to SRAM(U18, U22, U26, U31) and the Clock IC (U24, 5C15) through the D16 under the Power-on state. When the Power is off , Battery Voltage(3.6VDC) is supplied to SRAM and Clock IC.

7-2 Reset and Power Fail circuit

7-2-1. Reset Circuit

Reset is a signal in order to start-up CPU under Power-on, and Reset circuit uses an Reset IC(U8, 7705). When +5V is fallen under 4.4V by Power-off, Reset signal prohibits the system from misoperating by lowering down to 0V.

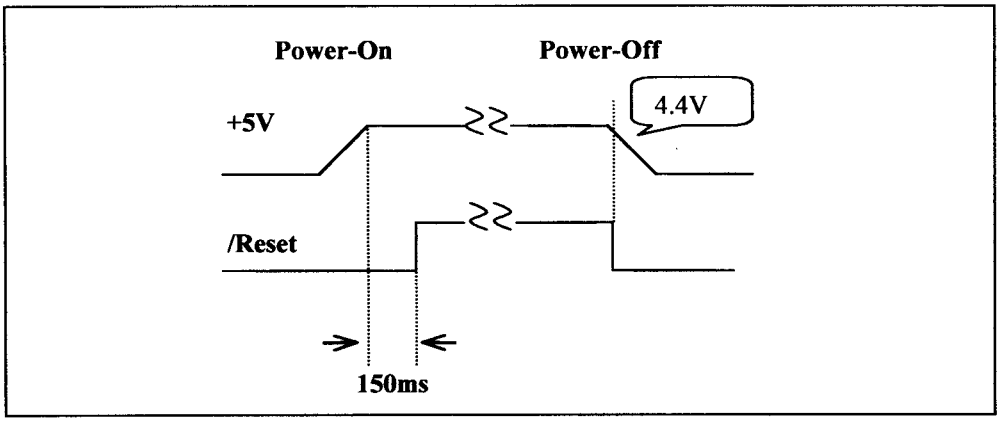


Figure 7-2. Reset Waveform

7-2-2. Power Fail Sensing Circuit

Power Fail Sensing Circuit senses suddenly power-off to backup the needed data and current CPU status into SRAM before 80ms just before +5V drops. When power is turned on, the CPU does the operations which were working before power-off. This system is designed to sense the time when the printer driving voltage +27V goes down to +12V.

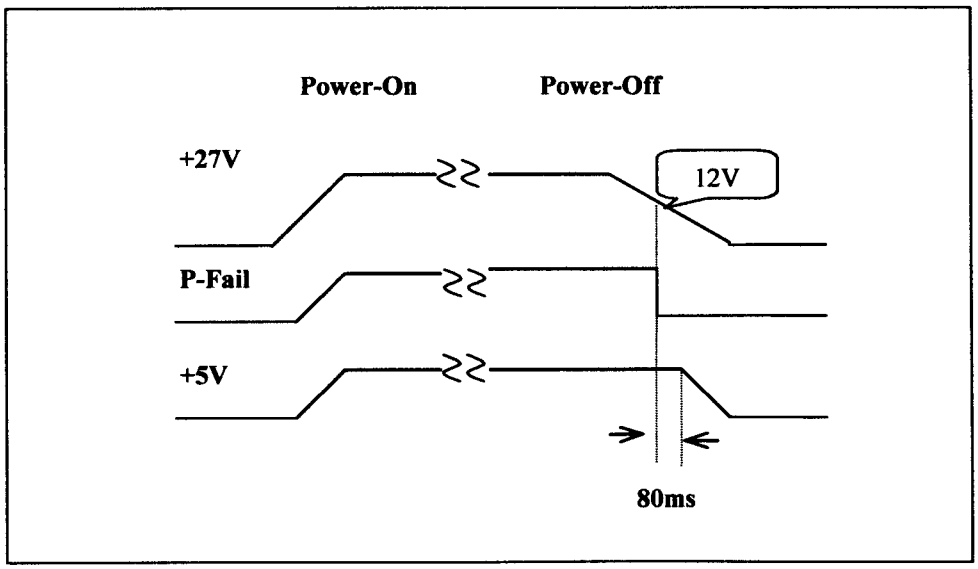


Figure 7-3. Power Fail Waveform

7-3 Battery, RTC(Clock), Buzzer, Cash Drawer Driving Circuit

7-3-1. Battery Circuit

Battery Circuit supplies SRAM and RTC (U24, 5C15) with voltage source and is used to drive Clock and to save Data when the main Power is turned off. When the Power is turned on, Vcc(+5V) source is supplied to SRAM, RTC through the D16 and the Battery is charged. When the Power is turned off, D16 is shut and the source charged in the Battery is supplied to SRAM and RTC.

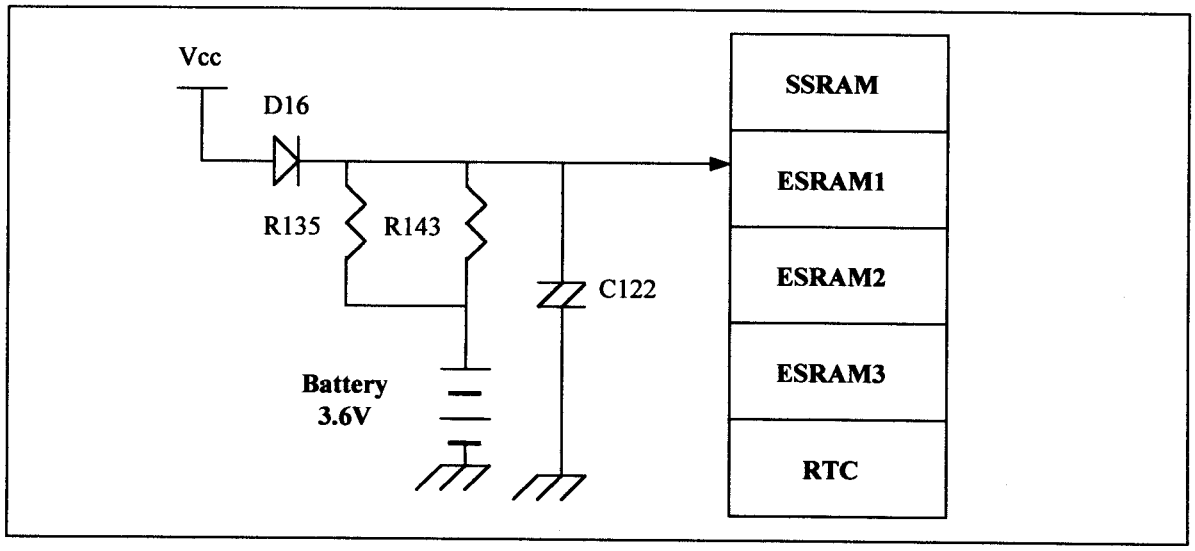


Figure 7-4 Battery Block Diagram

7-3-2. RTC(Real Time Clock) Circuit

This uses an Clock IC 5C15(U24) which is driven by Vcc when the main power is turned on, or by the Battery when the main Power is turned off, and the frequency 32.768KHz inputs to this circuit.

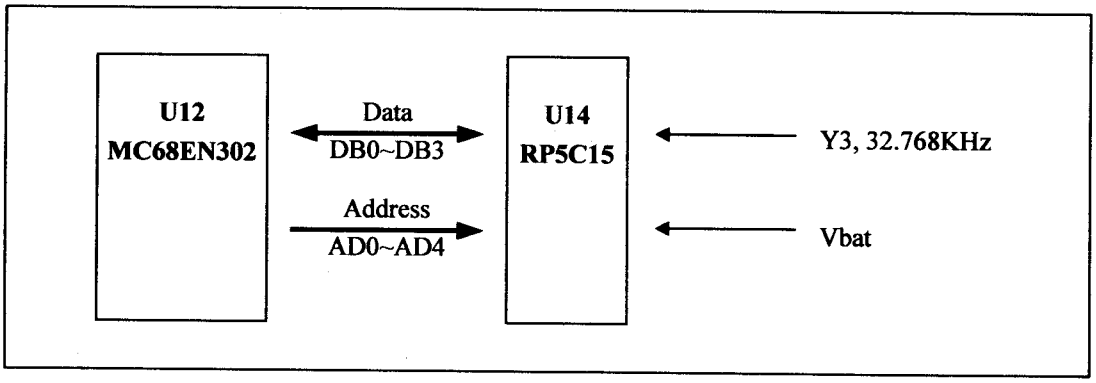


Figure 7-5 RTC Block Diagram

7-3-3. Buzzer Driving Circuit

The Buzzer is used to inform several kinds of states which occur under system operating and gives some information to users by oscillating the P3.4 of MICOM (U36, W78C32).

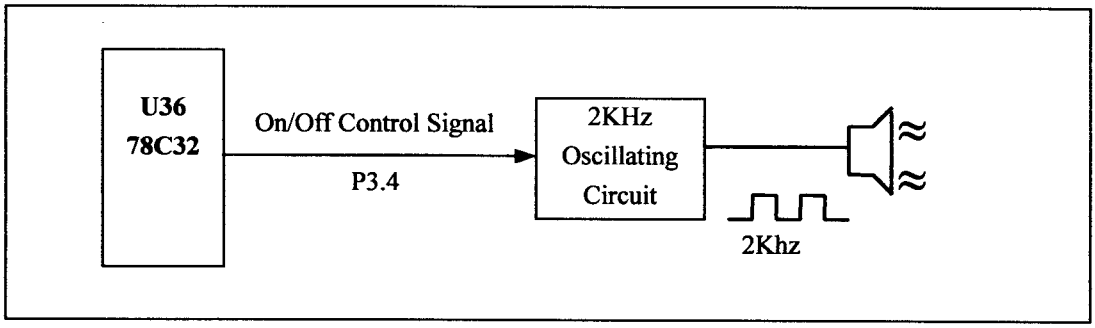


Figure 7-6 Buzzer Block Diagram

7-3-4. Cash Drawer Driving Circuit

The circuit is used for opening the cash drawer and driven by the signals of pin 17~19 of 574 (U15). When its state is high level, U1(STA371A) drives the solenoid to open the cash drawer. As an optional item, we provide sensor switch (we call it a compulsory switch) which checks the drawer is opened or not. This sensor switch turns on for the drawer open condition, and turns off for the others.

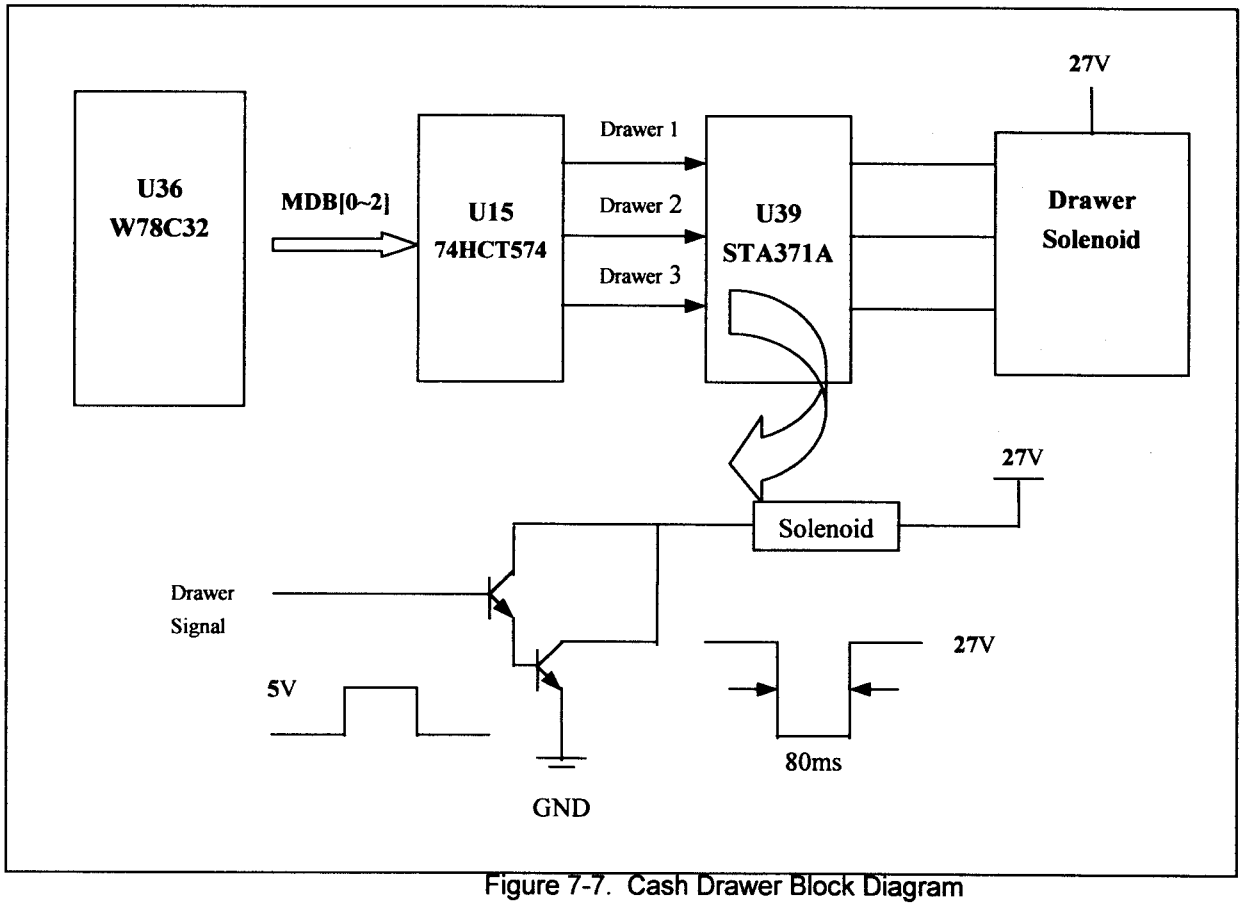
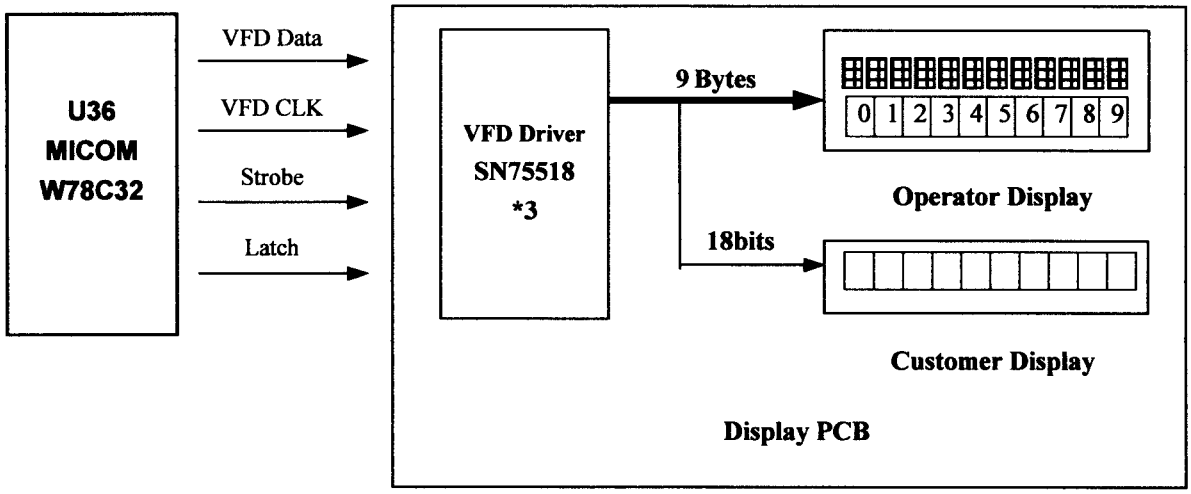


Figure 7-7. Cash Drawer Block Diagram

7-4 Operator / Customer Display Block Diagram

This uses 12chars & 10digit combination Display (Operator VFD) and 10digit Display (Customer VFD) and uses three Driver IC; SN75518 (are located on the Display PCB). MICOM(U36, W78C32) sends display data (9Bytes) to the Driver IC repeatedly having given time interval in series and then three Driver IC send display data (9Bytes) to the Operator and Customer Display in parallel at a time. And then Vacuum Fluorescent Display is operated.



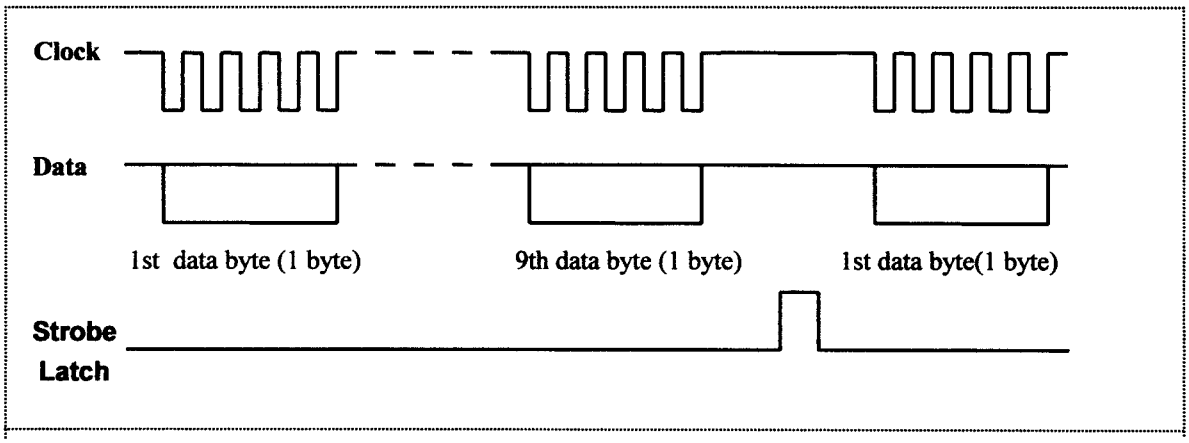


Figure 7-7 Display Block Diagram

7-5 RS-232C Serial Communication Block Diagram

The CPU(U12, MC68EN302) is used for serial communication and three RS232c Driver, Max232 are used to communicate serial 1, serial 2. And a TL16C452 Controller and two RS232c Driver , Max232 are used for optional serial 3, serial 4. Show following Block diagram.

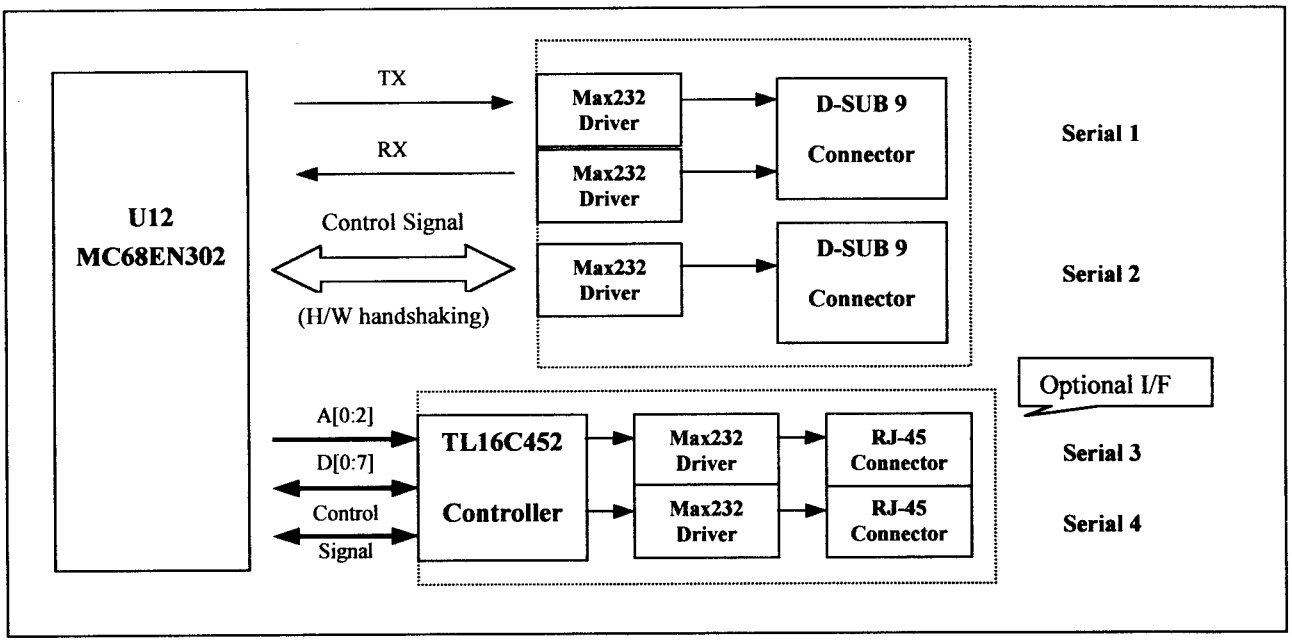


Figure 7-8 RS-232C Block diagram

7-6 IRC Communication Block Diagram

This uses an Ethernet controller which is built-in CPU(MC68EN302) and a Transceiver MC68160FB(U3) and a Pulse Trans SF1012(T1). This IRC Communication uses the 10Base-T Ethernet System with CSMA/CD Protocol.

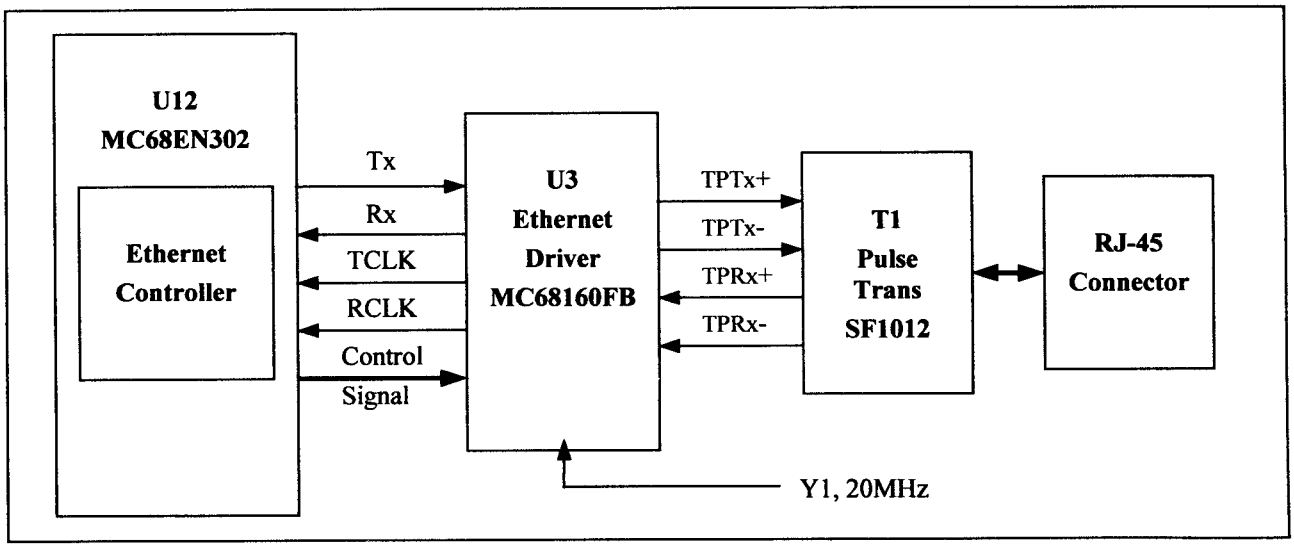


Figure 7-9 IRC Communication Block Diagram

7-7 Printer Driving Block Diagram

This printer prints several kinds of information having a maximum of 24 characters on the Receipt/Journal paper using the ERP-300V/400(Samsung) Dot-matrix printer. Taking the data to print from CPU(U12, MC68EN32), the MICOM analyzes the data and forms the fonts to print and drives the Printer motor's of PART B and then prints the data. The print information is taken from several signal states given at PART A driven by the Motor's driving signal. The Head solenoid's driving voltage and time have the relationship to each other, these are controlled at PART C to have the given printing resolution and not to affect the driving voltage.

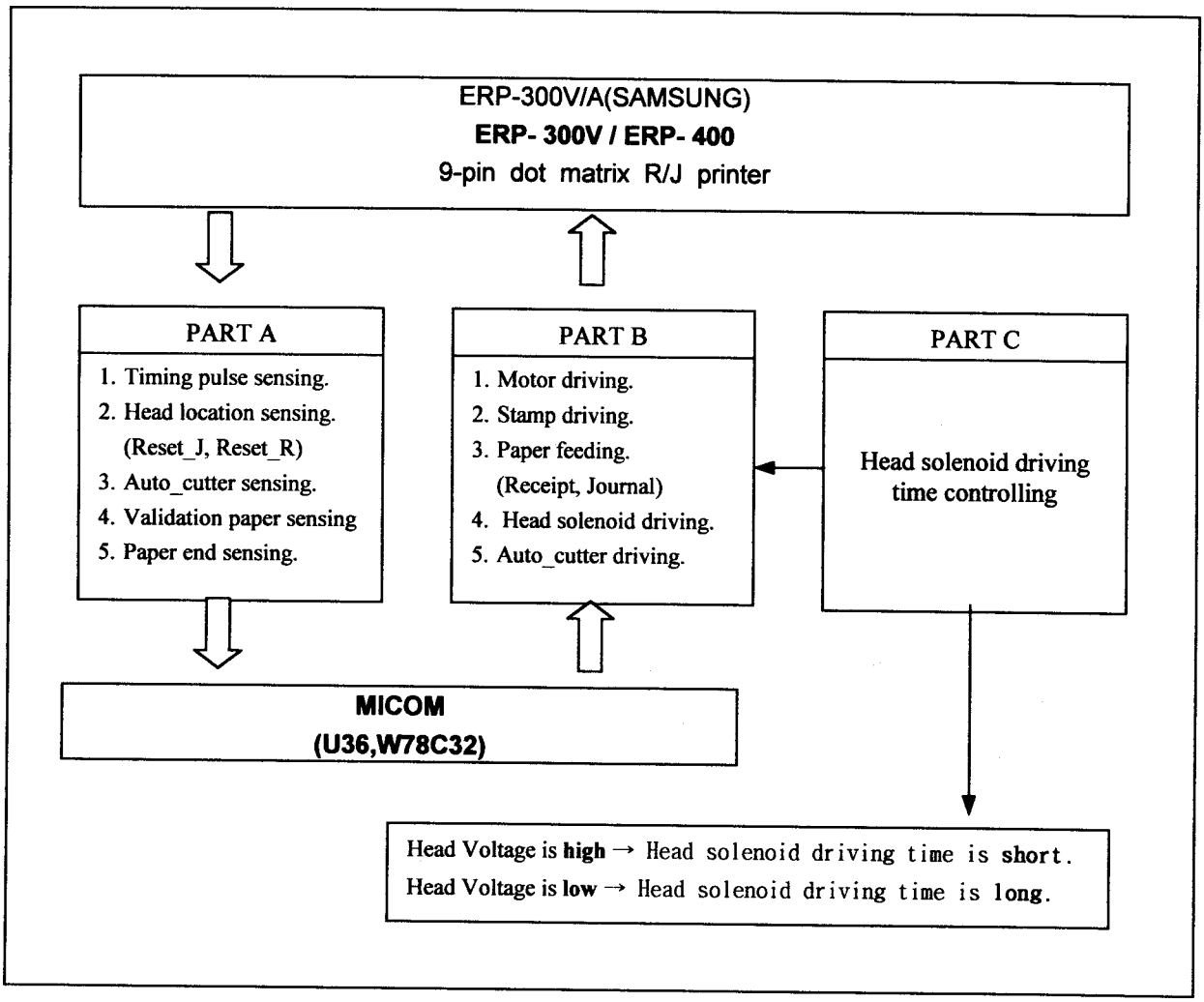


Figure 7-10 Printer Block Diagram

7-8 Keyboard Circuit

The key Circuit consist of the scan signal of 20 lines and the return signal of 8-lines, the scan signals S0-S7 are limited to the 90 Key Board (SER-6640) and the S0-S19 are to 160 Key Board (SER-6600). The MICOM(U36, W78C32) sends repeatedly and continuously the scan data S0-S19 through the 138(U38~U40). The key Information input in the return signal if the specific key is pressed during the given time. The MICOM reads the data through 541(U43) and analyzes what key is pressed and transmits this information to the CPU(U12), then performs the selected function.

The MICOM sends the mode scan signal to the Mode-lock switch and takes the return data through the 541(U43) and transmits this to the U12(MC68EN302) and performs the selected function.

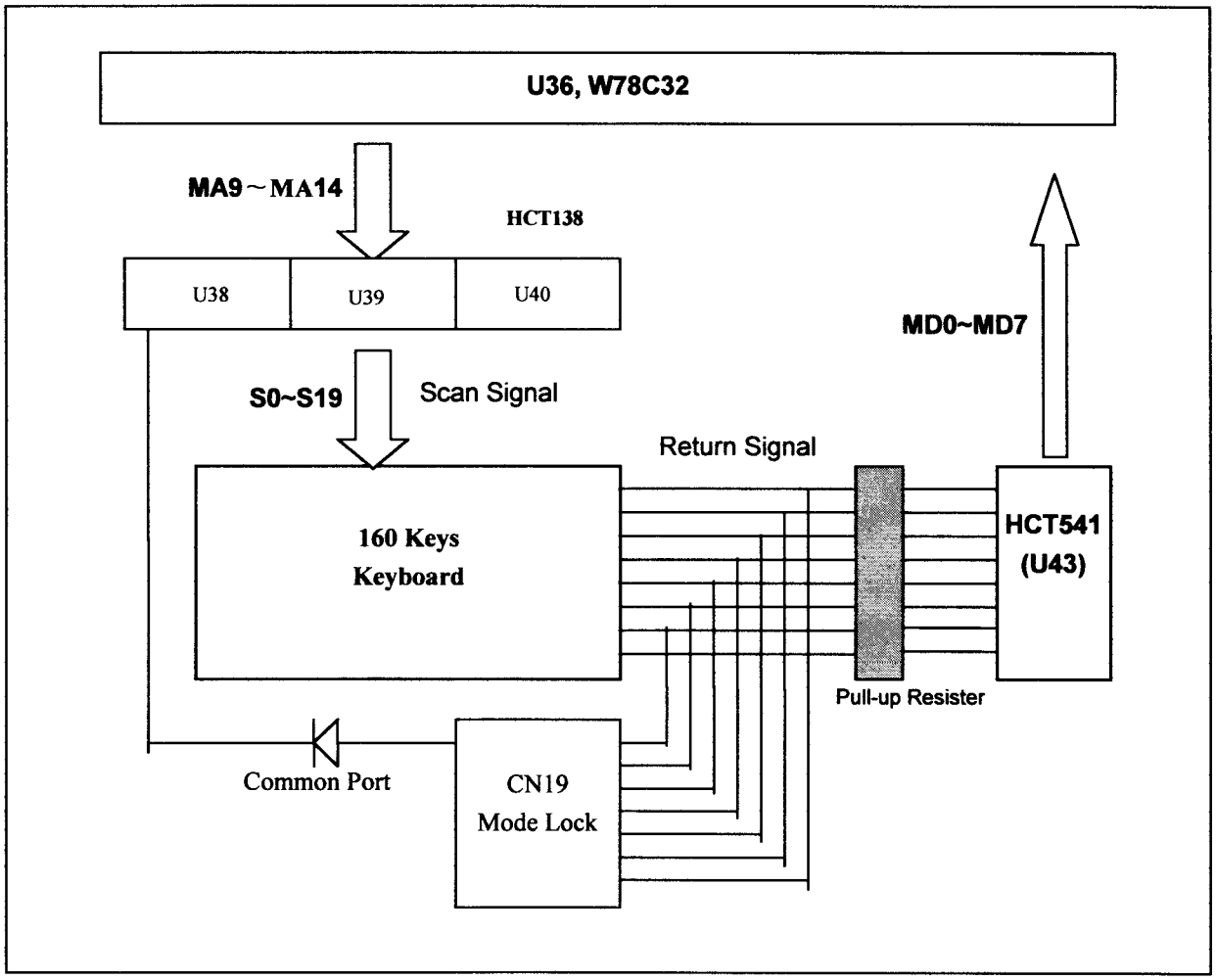
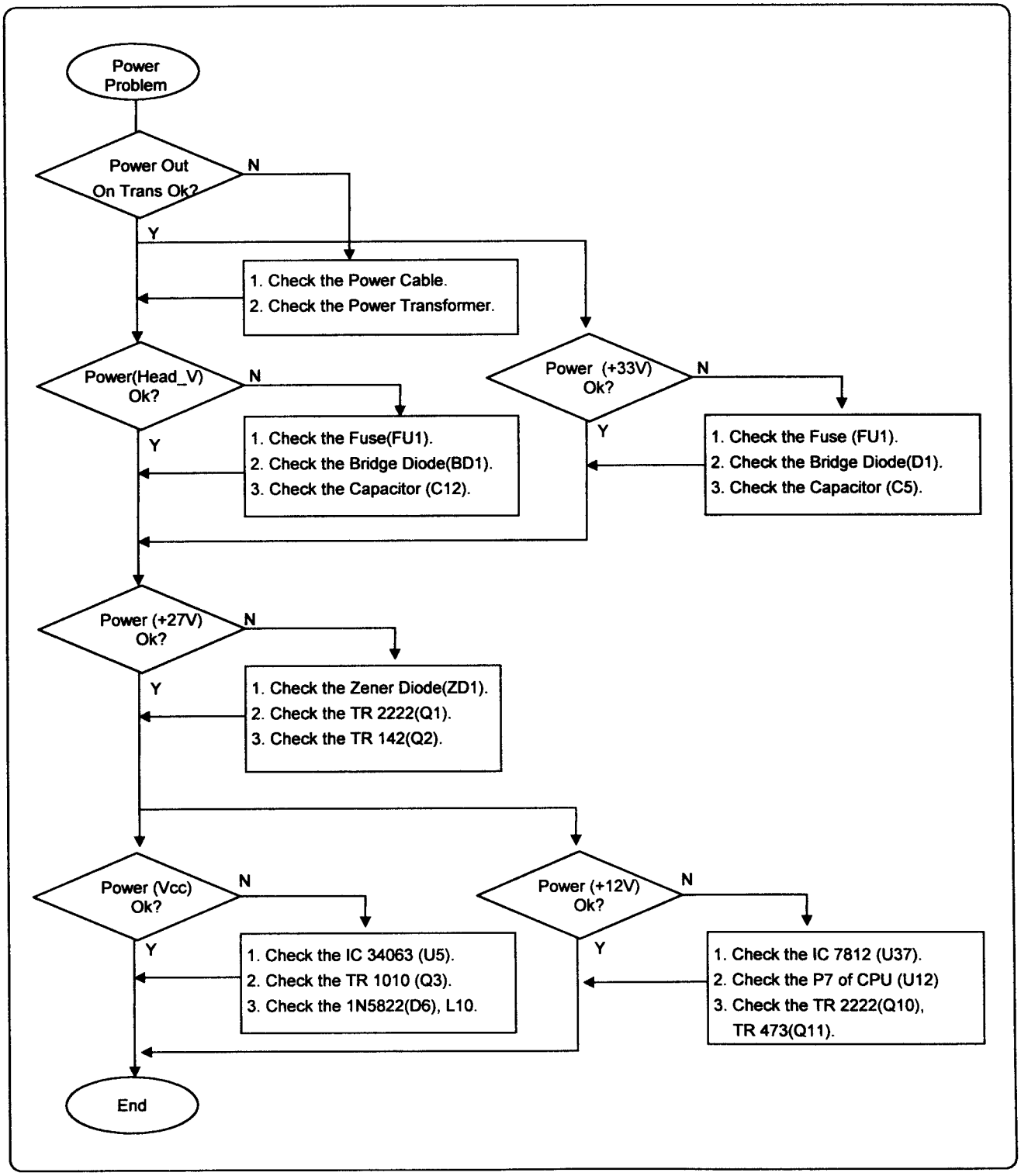


Figure 7-11 Keyboard Block Diagram

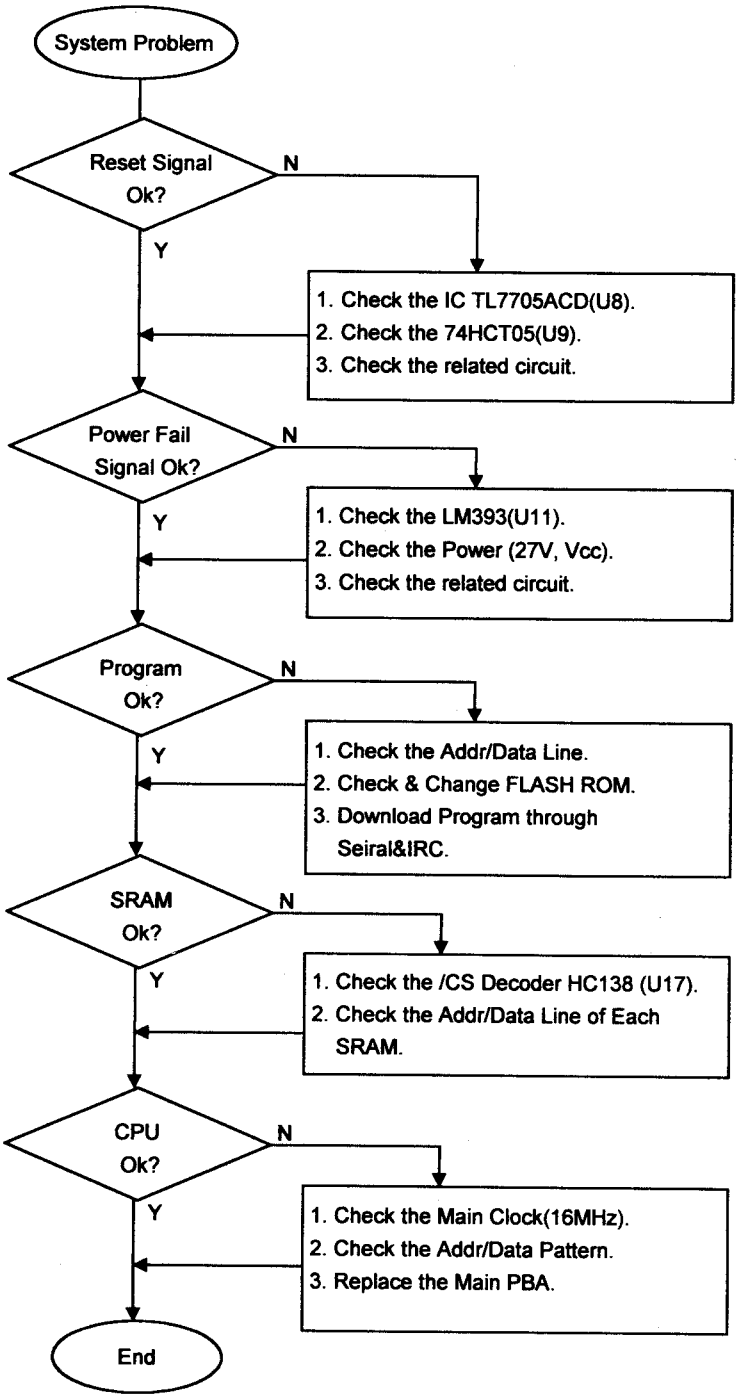
8 Troubleshooting

This chapter describes the methods for determining the source of malfunction in this SECR.

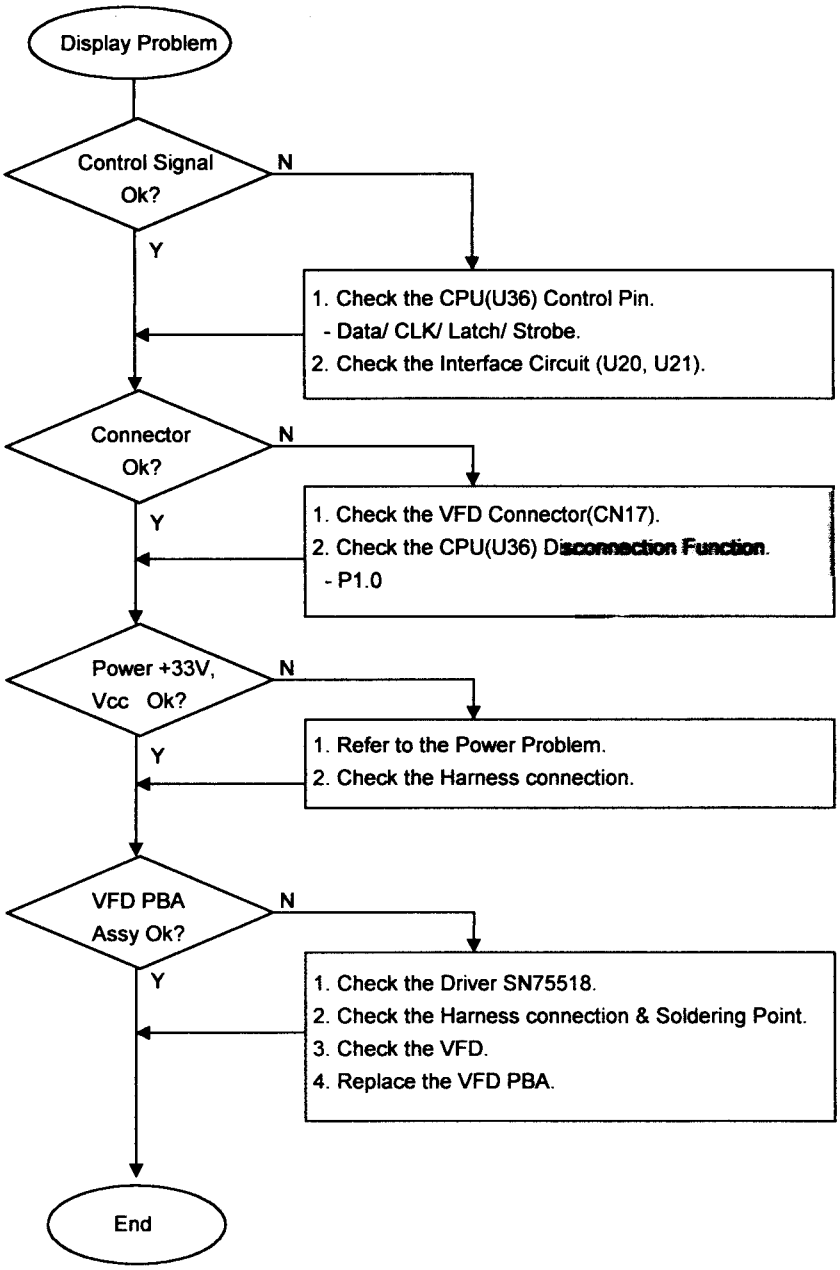
8-1. Power Problem



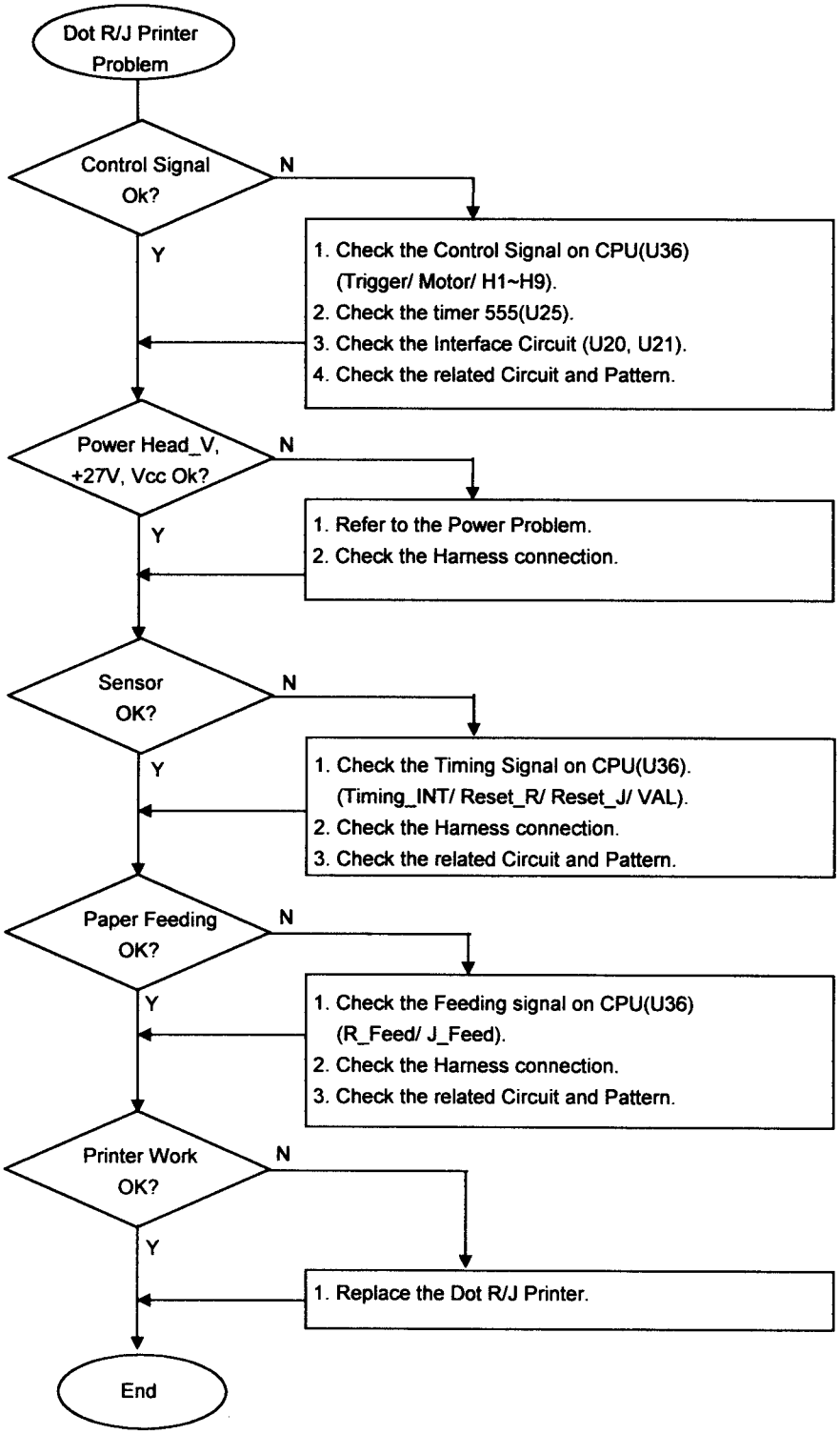
8-2 System Problem



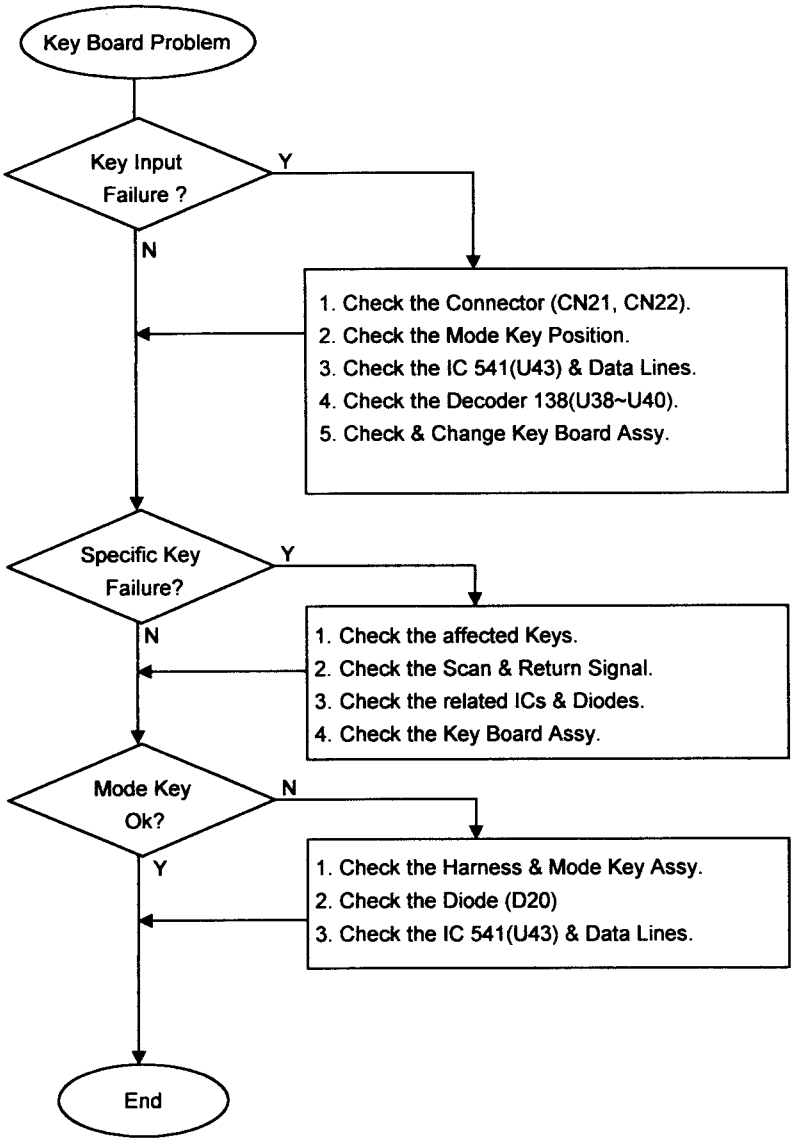
8-3 Display Problem



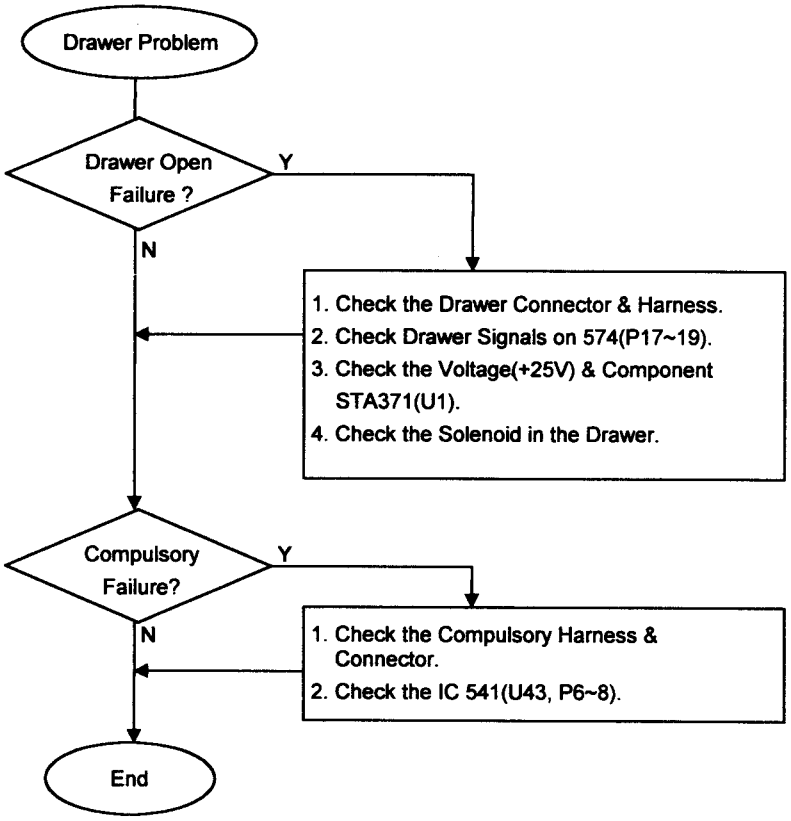
8-4 Dot R/J Printer Problem

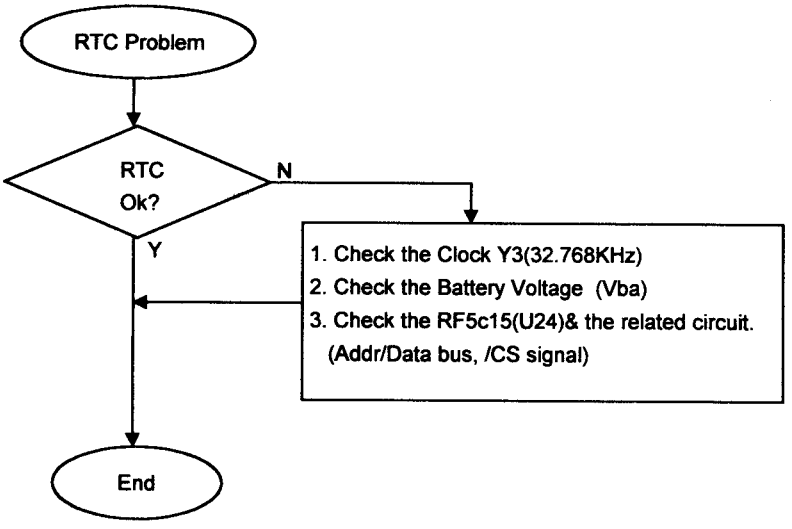


8-5 Keyboard / Mode Key Problem

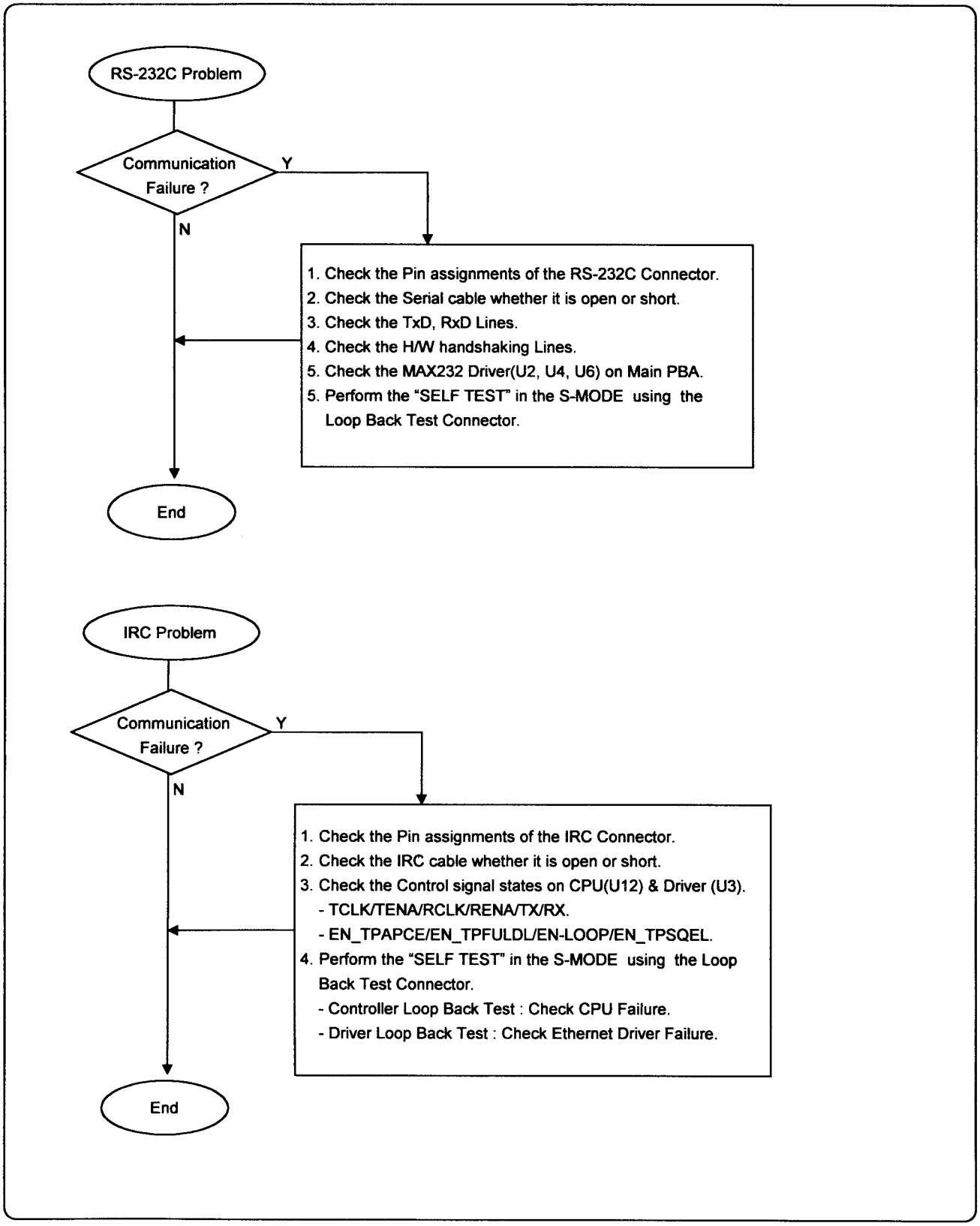


8-6 Drawer and RTC(Real Time Clock) Problem





8-7 RS-232C & IRC Communication Probem



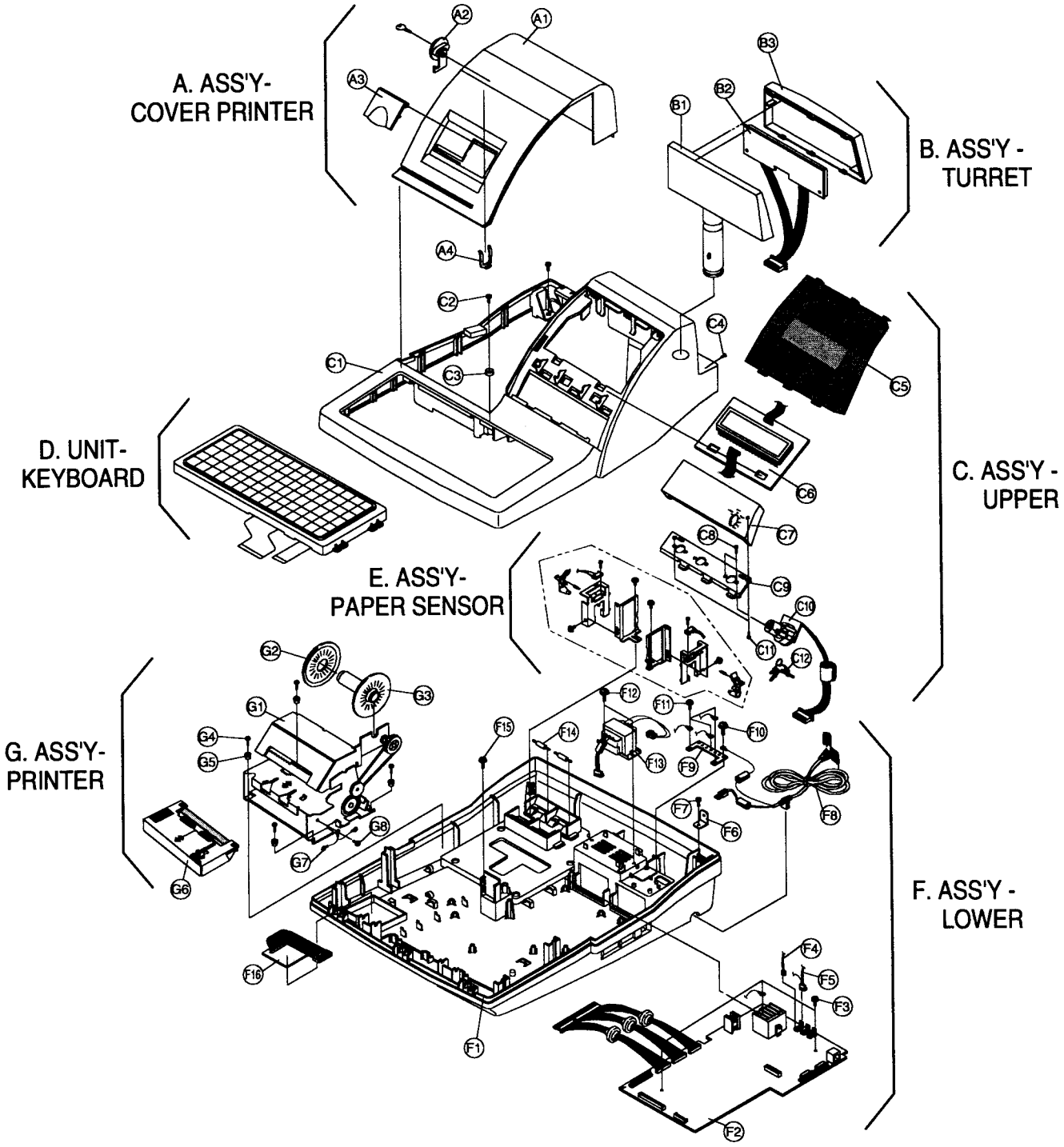
Appendix Information

Edition date : 29.02.00

NO.	DESCRIPTION	SEC CODE	BUYER MODEL
01	MAIN BOARD	JK92-00977A	XEU,FIT,GOD,ROC,STD
		JK92-00977B	CRN/CRS
02	TRANS POWER	JK26-30102A	FIT/GOD/ROC/STD/XEU
		JK26-30103A	CRN/CRS
03	POWER COARD	JK39-10002A	GOD
		JK39-10003A	CRN
		JK39-10008A	XEU/ROC
		JK39-10501A	FIT/STD

9 Exploded Views and Parts list

9-1. Whole Set Exploded View



9-1-1. Parts List of Whole Set

A. ASS'Y-COVER PRINTER

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
A1	JK97-01065A	MEA-COVER PRINTER	1	Y	SAMSUNG
-	JK72-40221A	PMO-COVER PRINTER	1	N	
-	JK70-10007A	IPR-PLATE CUTTER PAP	1	N	
A2	JK75-10391A	MEC-LOCK	1	Y	
A3	JK72-40223A	PMO-WINDOW JOURNAL	1	Y	
A4	JK70-10323A	IPR-PLATE CLIP	1	Y	

B. ASS'Y-TURRET

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
B1	JK72-40224A	PMO-TURRET BODY	1	Y	
B2	JK96-00198A	ELA UNIT-TURRET	1	Y	
B3	JK72-40225A	PMO-WINDOW TURRET	1	Y	

C. ASS'Y-UPPER

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
C1	JK72-40220A	PMO-CASE UPPER	1	Y	
C2	6002-000172	SCREW-TAPPING(PH,M4*L15)	2	Y	
C3	JK70-40304B	ICT-SHAFT MOLDING	1	Y	FISCAL
C4	6001-000367	SCREW-MACHINE(FH,M4*L10)	1	Y	
C5	JK72-40226B	PMO-WINDOW DISPLAY	1	Y	
C6	JK96-00135A	ELA-DISPLAY	1	Y	
C7	JK72-00041A	PMO-COVER MODE S/W	1	Y	SER-6500II
C8	6002-000319	SCREW-TAPPING(PH,M3*L8)	2	Y	
C9	JK70-10006A	IPR-BRKT MODW S/W	1	Y	
C10	JK96-00115A	ELA-MODE S/W	1	Y	
-	3406-000116	SWITCH-ROTARY	1	N	
-	JK39-40023A	CBF-HARNESS	1	N	
C11	6003-000165	SCREW-TAPTITE(PH,M3*L6)	2	Y	
C12	JK64-40206A	DOOR KEY-MODE	1	Y	
C13	JK96-00114A	ELA-CLERK LOCK	1	Y	OPTION
-	3406-000001	SWITCH-ROTARY	1	N	
-	JK39-40305E	CBF-HARNESS	1	N	
C14	JK64-40200A	KEY-CLERK,01	1	Y	OPTION
C15	JK64-40200B	KEY-CLERK,02	1	Y	OPTION

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
C16	JK64-40200C	KEY-CLERK,03	1	Y	OPTION
C17	JK64-40200D	KEY-CLERK,04	1	Y	OPTION
C18	JK64-40200E	KEY-CLERK,05	1	Y	OPTION
C19	JK64-40200F	KEY-CLERK,06	1	Y	OPTION
C20	JK64-40200G	KEY-CLERK,07	1	Y	OPTION
C21	JK64-40200H	KEY-CLERK,08	1	Y	OPTION
C22	JK64-40200J	KEY-CLERK,09	1	Y	OPTION
C23	JK64-40200K	KEY-CLERK,10	1	Y	OPTION
C24	JK64-40200L	KEY-CLERK,11	1	Y	OPTION
C25	JK64-40200M	KEY-CLERK,12	1	Y	OPTION
C26	JK64-40200N	KEY-CLERK,13	1	Y	OPTION
C27	JK64-40200P	KEY-CLERK,14	1	Y	OPTION
C28	JK64-40200Q	KEY-CLERK,15	1	Y	OPTION

D. ASS'Y-KEY BOARD

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
D1	JK59-10116A	UNIT-KEYBOARD(160KEY)	1	Y	STANDARD(ENGLISH)
	JK59-10117A	UNIT-KEYBOARD(90KEY)	1	Y	STANDARD(ENGLISH)

F. ASS'Y-LOWER

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
F1	JK72-40219B	PMO-CASE LOWER	1	Y	
F2	-	PBA MAIN-BOARD	1	Y	Appendix table ref.
F3	6002-000174	SCREW-TAPPING(PWH,M3*L10)	4	Y	
F4	JK39-40302C	CBF HARNESS-COMPULSORY	1	Y	OPTION
F5	JK39-40200A	CBF HARNESS-DRAWER	1	Y	
F6	JK70-10002A	IPR-BRKT CASING	1	Y	
F7	6002-000171	SCREW-TAPPING(PH,M4*L10)	1	Y	
F8	-	CBF-POWER/CORD	1	Y	Appendix table ref.
F9	JK70-10417A	IPR-PLATE GROUND	1	Y	
F10	6006-000199	SCREW-ASS'Y TAPT(PWH,M4*L8)	1	Y	
F11	6002-000174	SCREW-TAPPING(PWH,M3*L10)	4	Y	
F12	6002-000171	SCREW-TAPPING(PH,M4*L10)	2	Y	
F13	-	TRANS-POWER	1	Y	Appendix table ref.
F14	JK72-40330A	PMO-ROLLER PAPER/END	2	Y	
F15	6003-001149	SCREW-TAPTITE(PWH,M4*L10)	1	Y	

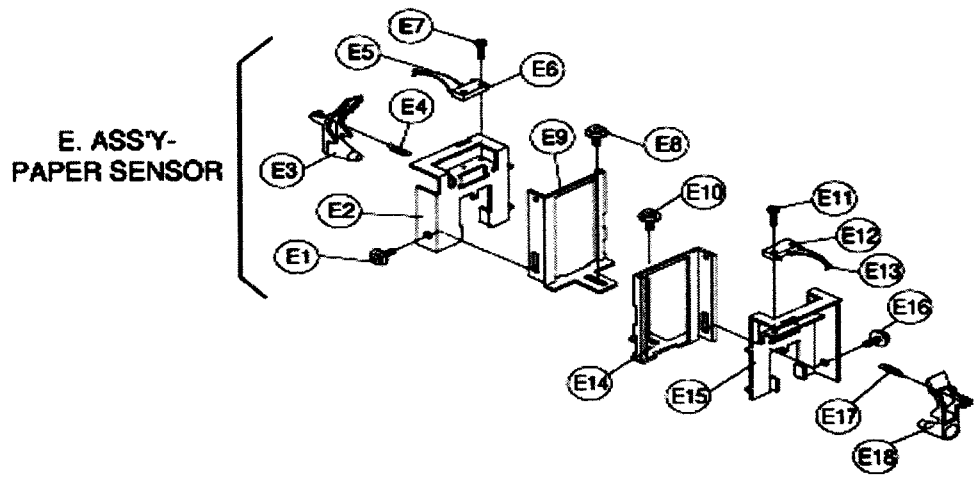
F16	JK92-00130A	PBA SUB-FISCAL BOARD	1	Y	FISCAL

G. ASS'Y-PRINTER

Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
G1	JK59-10511A	UNIT-PRINTER	1	Y	
G2	JK81-10513F	DISK	1	Y	
G3	JK81-10513E	SPOOL ASS'Y	1	Y	
G4	6002-000209	SCREW-TAPPING(PWH,M3*L17)	4	Y	
G5	JK73-40201A	RMO-PRINTER	4	Y	
G6	JK75-10383A	UNIT/RIBBON-CASSETTE	1	Y	
G7	JK39-40021A	CBF HARNESS-PRINTER	1	Y	
G8	6001-000618	SCREW-MACHINE	1	Y	

E. ASS'Y-PAPER SENSOR

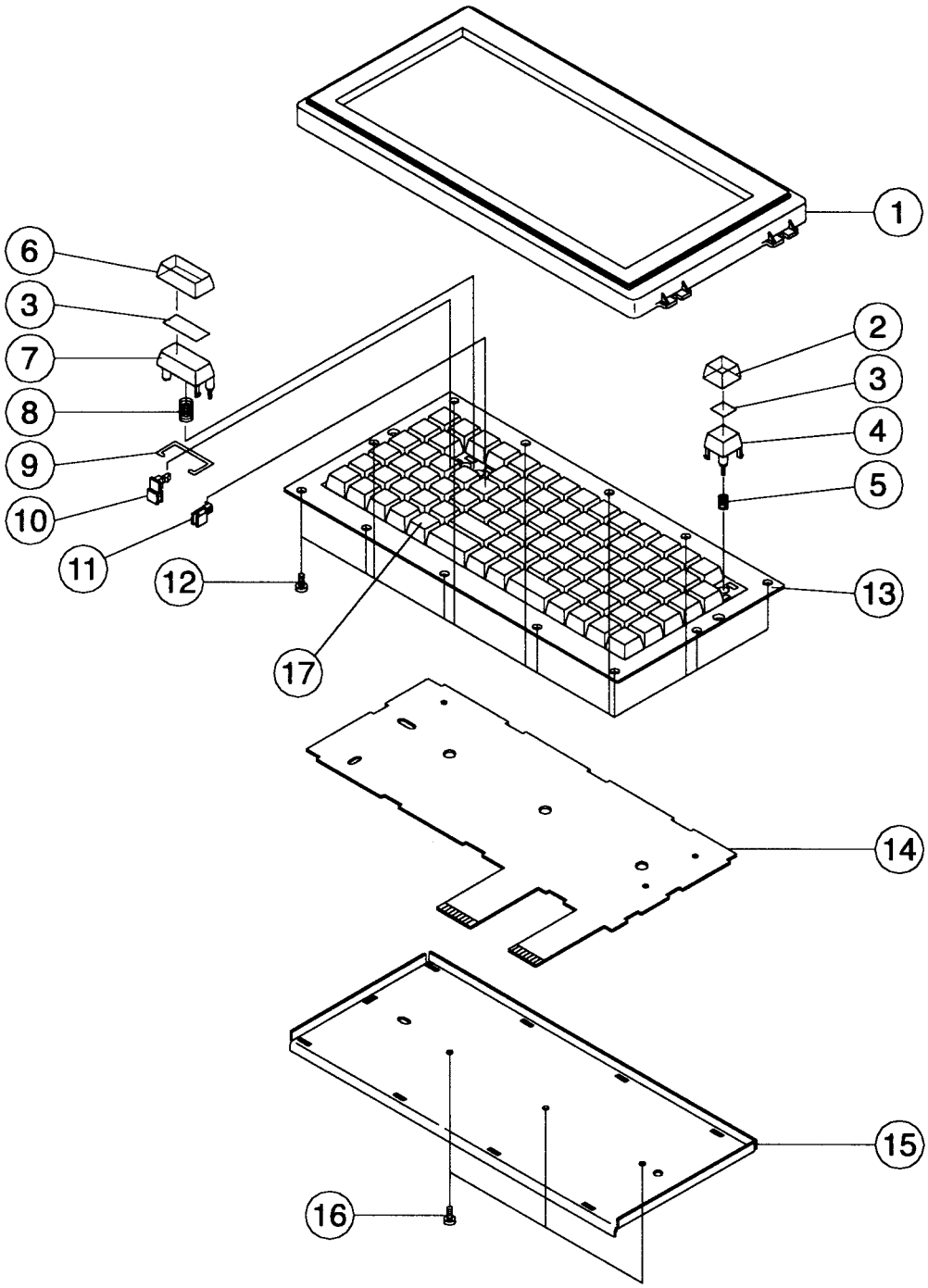
Lo.No.	Code No.	Description	Q'ty	Rank	Remarks
E	JK96-00450A	ELA-PAPER END SENSOR	1	Y	
E1	6003-000221	SCREW-TAPTITE(PWH,M4*L8)	1	Y	
E2	JK70-10384A	IPR-BRKT PAPER/END	1	Y	
E3	JK64-10301A	KNOB-PAPER/END	1	Y	
E4	6107-000127	SPRING-ES	1	Y	
E5	JK39-40303M	CBF-HARNESS	1	Y	
E6	3405-000103	SWITCH-MICRO	1	Y	
E7	6001-000496	SCREW-MACHINE	1	Y	
E8	6002-000174	SCREW-TAPPING(PWH,M3*L10)	1	Y	
E9	JK70-10385A	IPR-BRKT SLIDE	1	Y	
E10	6002-000174	SCREW-TAPPING(PWH,M3*L10)	1	Y	
E11	6001-000496	SCREW-MACHINE	1	Y	
E12	3405-000103	SWITCH-MICRO	1	Y	
E13	JK39-40303G	CBF-HARNESS	1	Y	
E14	JK70-10384A	IPR-BRKT PAPER/END	1	Y	
E15	JK70-10385A	IPR-BRKT SLIDE	1	Y	
E16	6003-000221	SCREW-TAPTITE	1	Y	
E17	6107-000127	SPRING-ES	1	Y	
E18	JK64-10301A	KNOB-PAPER/END	1	Y	



9-2. Keyboard Exploded View

9-2-1. Keyboard Exploded View and Parts Lists (90 Key)
9-2-2. Keyboard Exploded View and Parts Lists (160 Key)

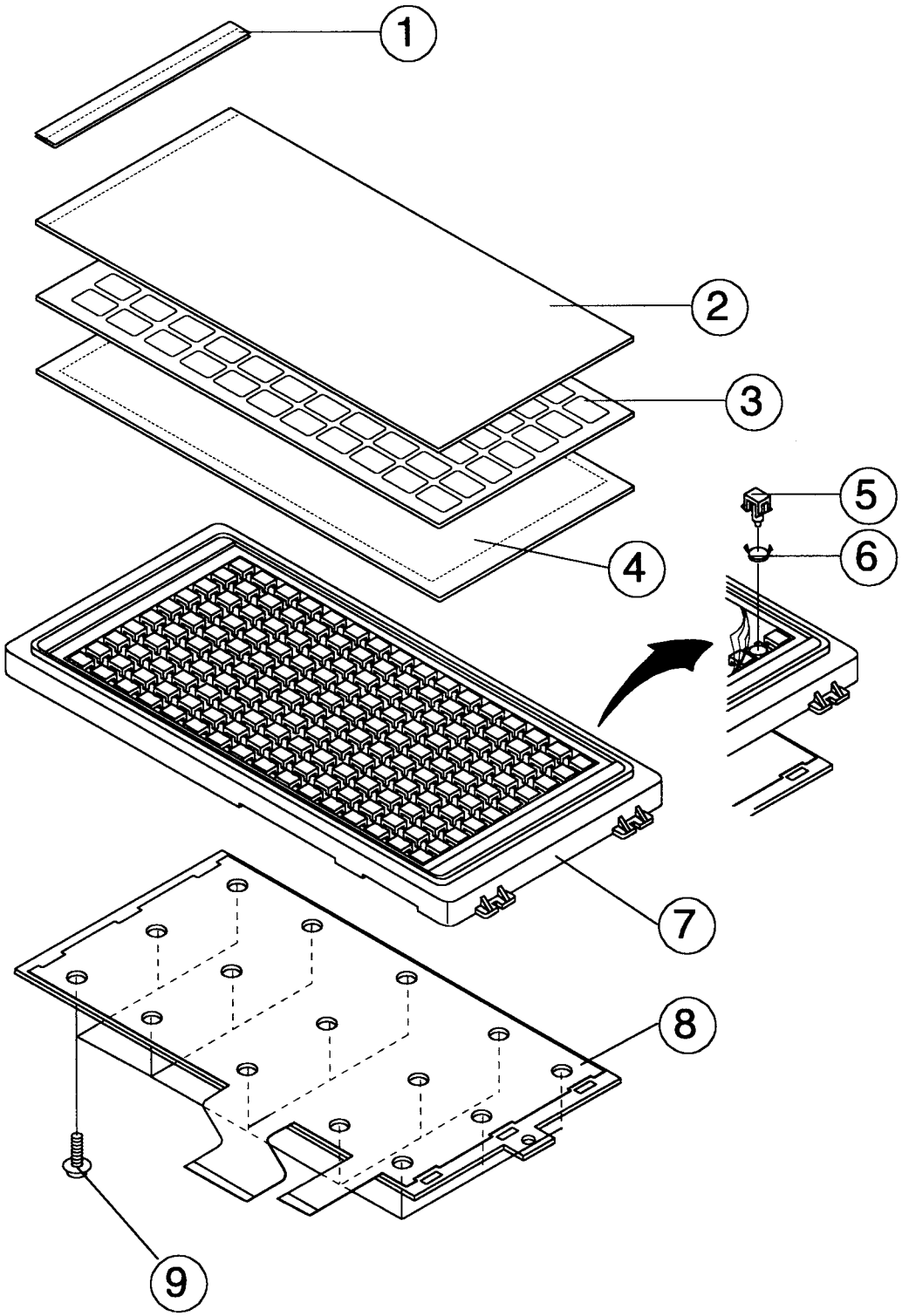
9-2-1. Keyboard Exploded View and Parts Lists (90 Key)



Parts Lists (90KEY)

Lo.No.	Code No.	Description	Specification	Q'ty	Remarks	Rank
1	JK72-40231A	PMO-CASE KBD/HOUSING	ABS,V0,IV16,90KEY	1		Y
2	JK81-10286D	AS-KEY CAP S(1*1)	PC 1*1,S-Z0513-71 #01	1		Y
3	-	KEYBOARD-LABEL	SER-6540,ENGLISH	1		N
4	JK75-00029A	MEC-KEY TOP S	1*1,CONTACT SPRING	1		Y
	JK81-10286C	AS-KEY TOP S(1*1)	ABS,V0,IV16,1*1,302KAS-014-01	1		N
	JK81-10286B	AS-SPRING CONTACT	SUS CONTACT,601KAS-001-01	1		N
5	JK81-10286A	AS-SPRING RETURN	SWPA RETURN 1*1U,601KAS	1		Y
6	JK81-10286E	AS-KEY CAP L(1*2)	PC 1*2,S-Z0513-75 #01	1		Y
7	JK75-00030A	MEC-KEY TOP L	1*2,CONTACT SPRING	1		Y
	JK72-40327A	PMO-KEY TOP L(1*2)	ABS,V0,IV16,302KAS-014-01	1		N
	JK81-10286B	AS-SPRING CONTACT	SUS CONTACT,601KAS-001-01	1		N
8	JK61-70301A	SPRING-TS RETURN	SWP-A1,601KAS-016-01	1		Y
9	JK70-10382A	IPR-SPACER KEYBOARD	SUS304,D0.8,321KAS-019-90	1		Y
10	JK72-40324A	PMO-HOLDER HOOK(A)	POM,-,BLK,T1.5,541KAS-001-01	1		Y
11	JK72-40325A	PMO-HOLDER HOOK(B)	POM,-,BLK,T1.5,541KAS-002-01	1		Y
12	6002-000175	SCREW-TAPPING	PWH,+,2,M3,L8,ZPC(YEL),SM20C	12		Y
13	JK72-40312A	PMO-FRAME KEYBOARD	POM,HB,BLK,T1.6,90KEY	1		Y
14	JK41-10100K	PCB-FPC	ER-4640,POLYMIDE	1		Y
	JK41-10100N	PCB-FPC,A	90KEY,POLYMIDE	1		N
	JK41-10100R	PCB-FPC,B	90KEY,POLYMIDE	1		N
15	JK70-10380A	IPR-PLATE BASE	ER-4640,SECC T0.8	1		Y
16	6002-000147	SCREW-TAPPING	PH,+,2,M3,L10,ZPC(YEL),SM20C	3		Y
17	JK75-00028A	MEC-KEY TOP ASSY	ECR,1*1,00,0,1,~9,.	1		Y
	JK72-40250A	PMO-KEY CAP/1	ECR/ALL,ABS,V0,302KAS-017-21	1		Y
	JK72-40251A	PMO-KEY CAP/2	ECR/ALL,ABS,V0,302KAS-017-22	1		Y
	JK72-40252A	PMO-KEY CAP/3	ECR/ALL,ABS,V0,302KAS-017-23	1		Y
	JK72-40253A	PMO-KEY CAP/4	ECR/ALL,ABS,V0,302KAS-017-24	1		Y
	JK72-40254A	PMO-KEY CAP/6	ECR/ALL,ABS,V0,302KAS-017-26	1		Y
	JK72-40255A	PMO-KEY CAP/7	ECR/ALL,ABS,V0,302KAS-017-27	1		Y
	JK72-40256A	PMO-KEY CAP/8	ECR/ALL,ABS,V0,302KAS-017-28	1		Y
	JK72-40257A	PMO-KEY CAP/9	ECR/ALL,ABS,V0,302KAS-017-29	1		Y
	JK72-40258A	PMO-KEY CAP/00	ECR/ALL,ABS,V0,302KAS-017-31	1		Y
	JK72-40259A	PMO-KEY CAP/.	ECR/ALL,ABS,V0,302KAS-017-32	1		Y
	JK72-40261A	PMO-KEY CAP/5	ECR/ALL,ABS,V0,302KAS-018-05	1		Y
	JK72-40262A	PMO-KEY CAP/0	ECR/ALL,ABS,V0,302KAS-019-05	1		Y
	JK72-40310A	PMO-COVER BLANK	1*1,HIPS,V0	1	OPTION	Y
	JK72-40311A	PMO-COVER BLANK	1*2,HIPS,V0	1	OPTION	Y

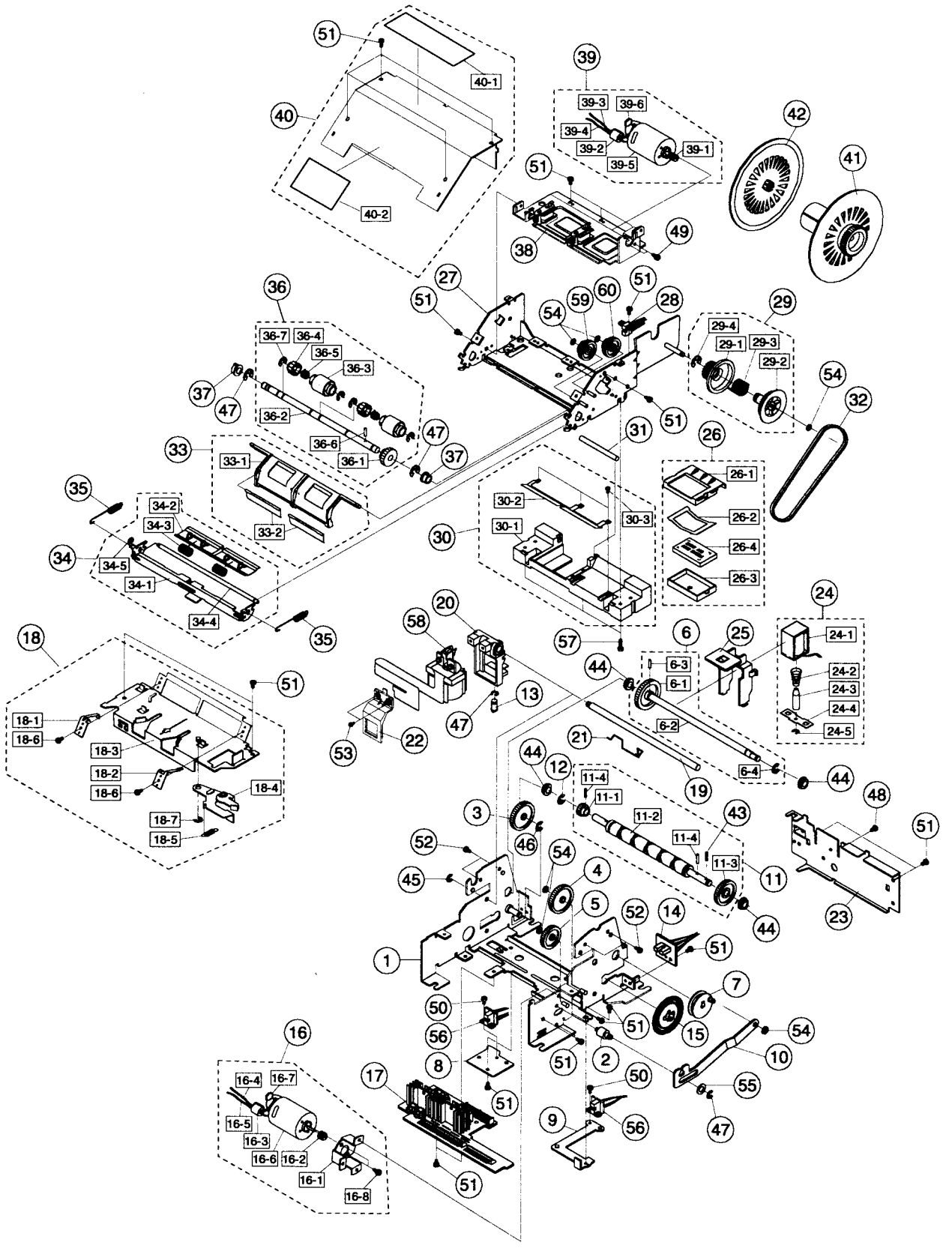
9-2-2. Keyboard Exploded View and Parts Lists (120 Key)



Parts Lists(160 Key)

Lo.No.	Code No.	Description	Specification	Q'ty	Remarks	Rank
1	JK72-10308A	PPR-SHEET KBD/GUIDE	PC,-,TRP,T0.5	1		Y
2	JK72-10304A	PPR-SHEET KBD/A	PC,-,TRP,T0.5	1		Y
3	-	KEYBOARD SHEET	ART PAPER 100g	1		N
4	JK72-10306A	PPR-SHEET KBD/B	PC,-,TRP,T0.5	1		Y
5	-	PMO-KEY TOP	ABS,HB,350KFS-003-90	160		Y
6	JK70-10383A	IPR-BRKT METALDOM	SUS304,D0.1,341KFS-008-91	160		Y
7	JK72-40313A	PMO-FRAME KEYBOARD	ABS,V0,IV01,T3	1		Y
8	JK41-20301H	PCB-FPC ASSY	ER-4800,POLYMIDE	1		Y
	-	PCB-FPC(A)	402KFS-59B-01R(1)	1		N
	-	PCB-FPC(B)	402KFS-60B-01R(1)	1		N
	-	IPR-PLATE BASE	501KFS-278-01R(1)	1		N
	-	-	J-F3000-12#01(2)	2		N
9	6002-000147	SCREW-TAPPING	PH,+,2,M3,L10,ZPC(YEL),SM20C	16		Y

9-3. Printer Ass'y(ERV-400)Exploded View and Parts Lists



Printer Ass'y (ERP-400) Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
-	UNIT PRINTER, ERP-400	JK59-10511A	1	O	
1	MAIN FRAME CAULKING ASS'Y	JK81-10511Z	1	O	
2	SHAFT LEVER SUPPORT	JK81-10131A	1	O	
3	GEAR REDUCTION_2	JK81-10506G	1	O	
4	GEAR HEAD IDLE_2	JK81-10506Q	1	O	
5	GEAR HEAD IDLE_1	JK81-10506P	1	O	
6	GEAR REDUCTION_3 ASS'Y	JK81-10512A	1	O	
6-1	GEAR REDUCTION_3	JK81-10054A	1	O	
6-2	SHAFT REDUCTION_3	JK81-10055A	1	O	
6-3	SPRING PIN (2x10)	JK81-10513G	1	O	
6-4	E-RING (RE5.0)	JK81-10511M	1	O	
7	ROLLING CAM ASS'Y	JK81-10512B	1	O	
8	R-DETECTOR PLATE L	JK81-10057A	1	O	
9	R-DETECTOR PLATE R	JK81-10058A	1	O	
10	RIBBON DRIVING LEVER	JK81-10510J	1	O	
11	LEAD CAM ASS'Y	JK81-10512E	1	O	
11-1	GEAR REDUCTION_1	JK81-10059A	1	O	
11-2	LEAD CAM	JK81-10060A	1	O	
11-3	GEAR_HEAD_FEEDING	JK81-10286A	1	O	
11-4	SPRING PIN (2X10)	JK81-10513G	2	O	
12	E-RING (RE5.0)	6044-000231	1	O	
13	SHAFT_TRACER	JK81-10099A	1	O	
14	ENCODER SENSOR ASS'Y	JK81-10063A	1	O	
15	ENCODER	JK81-10508A	1	O	
16	HEAD MOTOR ASS'Y	JK81-10064A	1	O	
16-1	MOTOR HEAD BRACKET	JK81-10065A	1	O	
16-2	GEAR HEAD MOTOR	JK81-10066A	1	O	
16-3	CORE	JK81-10067A	1	O	
16-4	WIRE (L140, BLU)	JK81-10068A	1	O	
16-5	WIRE (L140, RED)	JK81-10069A	1	O	
16-6	MOTOR (RS-380PH)	JK81-10070A	1	O	
16-7	CONDENSOR (104)	JK81-00118A	1	O	
16-8	SCREW (PS 2.6x4)	JK81-10513H	2	O	
17	MAIN PCB ASS'Y	JK81-10072A	1	O	
17-1	MAIN PCB	JK81-10073A	1	O	
17-2	HEAT SINK	JK81-10074A	2	O	
17-3	SCREW-M (PH3x4)	JK81-10075A	2	O	
17-4	TR (TIP41C)	JK81-10076A	1	O	
17-5	TR (TIP42C)	JK81-10077A	1	O	
17-6	JUMP WIRE	JC39-40511A	7	O	
17-7	RESISTOR (12K)	JK81-10079A	1	O	
17-8	RESISTOR (18K)	JK81-10080A	1	O	
17-9	RESISTOR (2K)	JK81-10081A	1	O	
17-10	RESISTOR (220)	JK81-10082A	1	O	
17-11	RESISTOR (6.2K)	JK81-10083A	2	O	
17-12	RESISTOR-CEMENT (7)	JK81-10084A	1	O	
17-13	RESISTOR-CEMENT (10)	JK81-10085A	1	O	
17-14	RESISTOR-SEMI (2K)	JK81-10086A	2	O	

SA. : Service Available

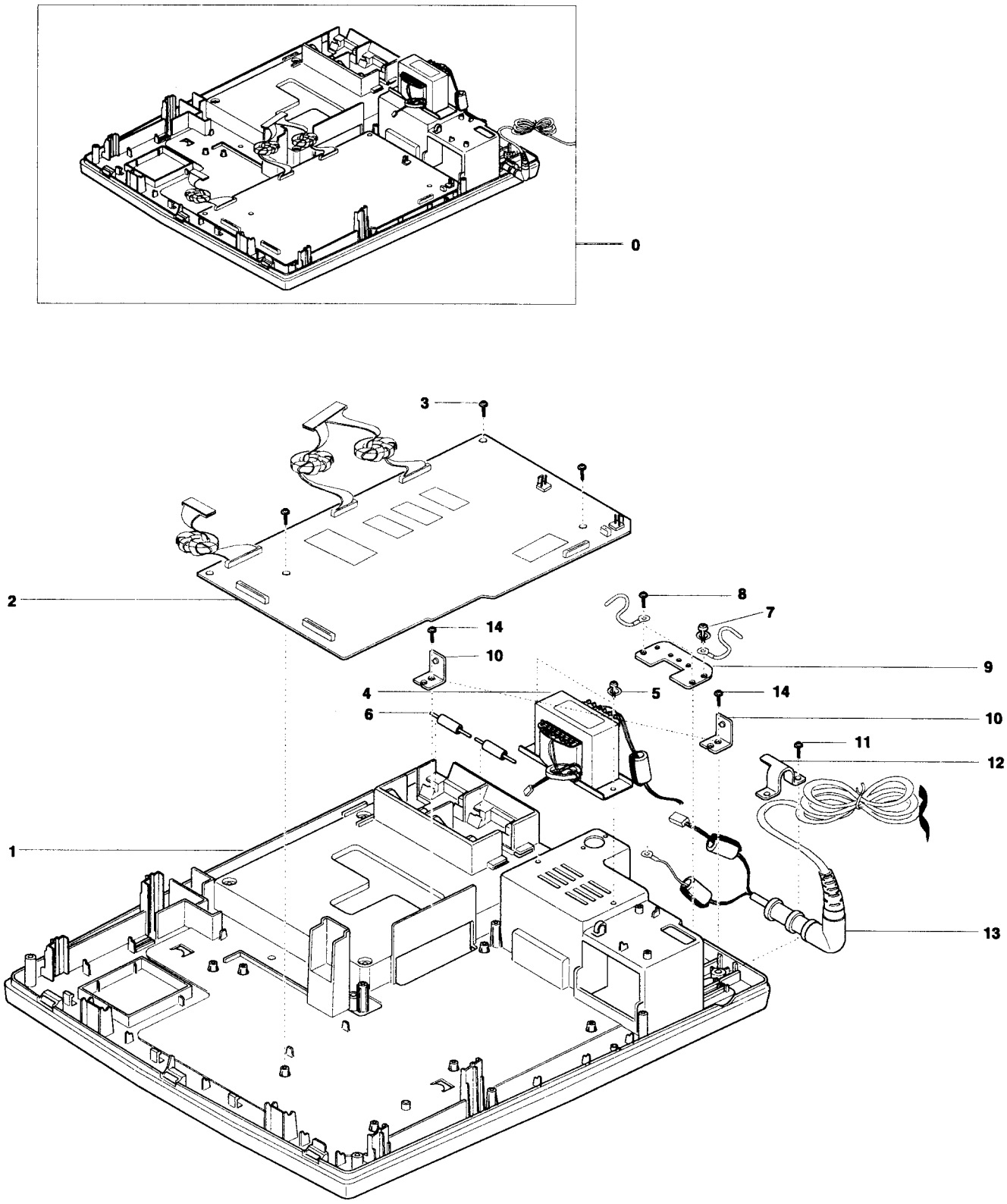
Location No.	Description	SEC. Code	Q'ty	SA	Remark
17-15	CAPACITOR-E (50V, 47UF)	JK81-10087A	2	O	
17-16	IC (L200)	JK81-10088A	2	O	
17-17	CONNECTOR (12PIN)	JK81-10089A	1	O	
17-18	CONNECTOR (13PIN)	JK81-10090A	1	O	
17-19	CONNECTOR (22PIN)	JK81-10091A	1	O	
18	RIBBON FRAME ASS'Y	JK81-10092A	1	O	
18-1	RIBBON GUIDE PLATE L	JK81-10093A	1	O	
18-2	RIBBON GUIDE PLATE R	JK81-10094A	1	O	
18-3	RIBBON FRAME CAULKING ASS'Y	JK81-10095A	1	O	
18-4	RIBBON FEED LEVER ASS'Y	JK81-10096A	1	O	
18-5	SPRING RIBBON FEEDING	JK81-10097A	1	O	
18-6	SCREW (T/T PH 3X4)	JK81-10511D	2	O	
18-7	E-RING (RE4.0)	JK81-10511L	1	O	
19	SHAFT HEAD GUIDE	JK81-10098A	1	O	
20	HEAD CARRIAGE ASS'Y	JK81-10512M	1	O	
21	SPRING CARRIAGE LOAD	JK81-10100A	1	O	
22	HEAD COVER	JK81-10507A	1	O	
23	BACK COVER	JK81-10512Q	1	O	
24	SOLENOID STAMP ASS'Y	JK81-10512R	1	O	
24-1	SOLENOID STAMP	-	1	X	
24-2	STAMP COIL SPRING	-	1	X	
24-3	STAMP PLUNGER	-	1	X	
24-4	STAMP SPRING	-	1	X	
24-5	E-RING (RE3.0)	-	1	X	
25	STAMP PUSER	JK81-10512S	1	O	
26	STAMP ASS'Y		1	X	
26-1	STAMP COVER	JK81-10510M	1	O	
26-2	PLATE STAMP SPRING	JK81-10510N	1	O	
26-3	STAMP CASE	JK81-10101A	1	O	
26-4	RPR-STEAMP RUBBER	JK73-10204A	1	O	
27	UPPER FRAME ASS'Y	JK81-10512T	1	O	
28	VALIDATION SENSOR ASS'Y	JK81-10102A	1	O	
29	PAPER ROLLING ASS'Y	JK81-10512V	1	O	
29-1	GEAR PAPER ROLLING	JK81-10103A	1	O	
29-2	PULLEY PAPER ROLLING	JK81-10104A	1	O	
29-3	SPRING PAPER ROLLING	JK81-10105A	1	O	
29-4	E-RING (RE6.0)	JK81-10106A	1	O	
30	STAMP PAPER GUIDE ASS'Y	JK81-10512W	1	O	
30-1	STAMP PAPER GUIDE	JK81-10107A	1	O	
30-2	PLATEN PAPER GUIDE	JK81-10108A	1	O	
30-3	SCREW (T/T CH 2x4)	JK81-10109A	3	O	
31	SHAFT PAPER ROLLER	JK81-10110A	1	O	
32	TIMMING BELT	JK81-10509Y	1	O	
33	PAPER GUIDE ASS'Y	JK81-10512Y	1	O	
33-1	PAPER GUIDE	JK81-10111A	1	O	
33-2	GUIDE	JK81-10112A	2	O	

Printer Ass'y (ERP-400) Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
34	RELEASE LEVER ASS'Y	JK81-10512Z	1	O	
34-1	RELEASE LEVER	JK81-10113A	1	O	
34-2	PAPER HOLD ROLLER PLATE	JK81-10114A	1	O	
34-3	PAPER HOLD ROLLER	JK81-10115A	2	O	
34-4	SHAFT HOLD ROLLER	JK81-10116A	1	O	
34-5	E-RING (RE2.5)	JK81-10117A	1	O	
35	SPRING RELEASE	JK81-10521A	2	O	
36	PAPER FEED ROLLER ASS'Y	JK81-10118A	1	O	
36-1	GEAR PAPER FEED	JK81-10119A	1	X	
36-2	SHAFT PAPER FEED	JK81-10120A	1	X	
36-3	PAPER FEED ROLLER ASS'Y	JK81-10121A	2	X	
36-4	RATCHET	JK81-10122A	2	X	
36-5	CLUTCH SPRING	JK81-10123A	2	X	
36-6	SPRING PIN (2X10)	JK81-10513G	1	X	
36-7	E-RING (RE4.0)	JK81-10511L	4	X	
37	POLY BEARING	JK81-10170A	2	O	
38	MOTOR FEEDING BRACKET ASS'Y	JK81-10513B	1	O	
39	PAPER MOTOR ASS'Y	JK81-10124A	1	O	
39-1	GEAR FEED MOTOR	JK81-10125A	1	O	
39-2	CORE	JK81-10067A	1	O	
39-3	WIRE (L340, BLU)	JK81-10126A	1	O	
39-4	WIRE (L340, RED)	JK81-10127A	1	O	
39-5	MOTOR (RS-380PH)	JK81-10070A	1	O	
39-6	CONDENSOR (104)	JK81-00118A	1	O	
40	COVER-1	JK81-10513D	1	O	
40-1	LABEL STICKER-1	-	1	X	
40-2	LABEL STICKER-2	-	1	X	
41	SPOOL ASS'Y	JK81-10513E	1	O	
42	DISK	JK81-10513F	1	O	
43	PARALLEL PIN (ø2x10)	JK81-10511Q	1	O	
44	OILLESS METAL_1	JK81-10510R	4	O	
45	E-RING (RE3.0)	JK81-10511K	1	O	
46	E-RING (RE4.0)	JK81-10511L	1	O	
47	E-RING (RE5.0)	JK81-10511M	4	O	
48	SCREW (PH 3x3)	JK81-10128A	1	O	
49	SCREW (PS 2.6x4)	JK81-10513H	2	O	
50	SCREW (T/T PH 3x4)	JK81-10511D	2	O	
51	SCREW (T/T BH 3x5)	JK81-10513J	20	O	
52	SCREW (CP 3x6)	JK81-10513K	4	O	
53	SCREW (T/P PH 3x10)	JK81-10513L	2	O	
54	PSW (ø3.6x6x0.5)	JK81-10511F	6	O	
55	PW (ø5x10x1.0)	JK81-10511H	1	O	
56	PHOTO SENSOR (SG-23FH)	JK81-10130A	2	O	
57	SCREW (PH+ 3X18)	JK81-10129A	3	O	
58	PRINTER HEAD	JK81-10038A	1	O	
59	GEAR FEED IDLE_1	JK81-10286H	1	O	
60	GEAR FEED IDLE_2	JK81-10286J	1	O	

9-4. Cover Lower Ass'y Exploded View and Parts Lists



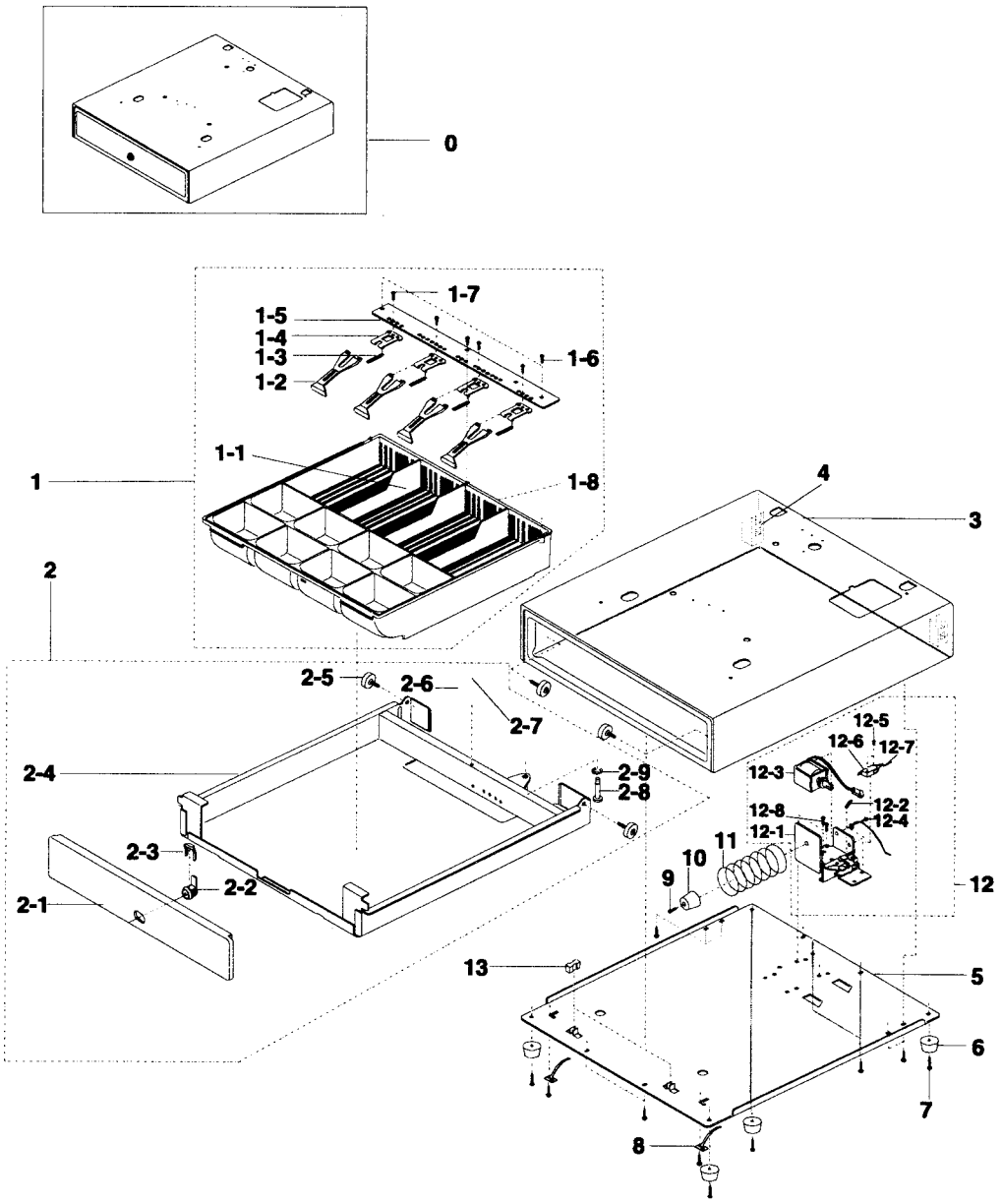
Cover Lower Ass'y Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	COVER LOWER ASS'Y	-	1	X	
1	PMO-CASE LOWER	JK72-40219A	1	O	
2	PBA-MAIN BOARD	-	1	O	Appendix
3	SCREW-TAPPING	6002-000174	3	O	
4	TRANS-POWER	-	1	O	Appendix
5	SCREW-ASS'Y TAPPING	6006-000195	2	O	
6	PMO-ROLLER PAPER/END	JK72-40330A	2	O	
7	SCREW-ASS'Y TAPPING	6006-000199	1	O	
8	SCREW-TAPPING	6002-000174	2	O	
9	GROUND-PLATE	JK70-10417A	1	O	
10	IPR-BRK CASING	JK70-10002A	2	O	
11	SCREW-TAPPING	6002-000174	2	O	
12	IPR-HOLDER CORD	JK70-10312A	1	O	
13	CBF POWER CORD(250V,7A)	-	1	O	Appendix
14	SCREW TAPPING	6002-000171	2	O	

O: Service available X: Service not available

9-5. Drawer Ass'y Exploded View and Parts Lists



Drawer Ass'y Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	DRAWER ASS'Y	JK75-00017A	1	O	
1	MEA UNIT-BILL COIN	JK97-00409A	1	O	
1-1	PMO-PANEL PARTETION	JK72-40269A	3	O	
1-2	PMO-LEVER PRESS	JK72-40267A	4	O	
1-3	SPRING-ES	6107-000134	4	O	
1-4	IPR-HOLDER LEVER	JK70-10314A	4	O	
1-5	IPR-PLATE HOLDER	JK70-10304A	1	O	
1-6	SCREW-TAPPING	6002-000175	3	O	
1-7	SCREW-TAPTITE	6003-000266	4	O	
1-8	PMO-BILL/COIN TILL	JK72-40291A	1	O	
2	MEA UNIT-TRAY TILL	JK97-01073A	1	O	
2-1	IPR-PLATE FRONT	JK70-10014A	1	X	
2-2	MEC-LOCK	JK75-10388A	1	O	
2-3	IPR-PLATE CLIP	JK70-10323A	1	O	
2-4	MEA-TRAY TILL	JK75-00025A	1	X	
2-5	MEC-ROLLER	JK75-10386A	2	O	
2-6	IPR-SUPPORT TRAY	JK70-10324A	1	X	
2-7	SCREW-TAPPING	6002-000207	1	X	
2-8	ICT-SHAFT PIN	JK70-40302A	1	X	
2-9	RING-E	6044-000124	1	X	
3	MEC-SUB HOUSING(BASIC)	JK75-00026A	1	O	
	IPR-HOUSING DRAWER	JK70-10309A	1	X	
	IPR-FRONT PLATE	JK70-10335A	1	X	
	IPR-CHANNEL LH	JK70-10330A	1	X	
	IPR-CHANNEL RH	JK70-10331A	1	X	
	IPR-SUPPORT CHANNEL	JK70-10345A	1	X	
	IPR-REAL PLATE	JK70-10336A	1	X	
4	REX-PAD DRAWER	JK73-20207A	2	O	
5	PLATE-BOTTOM	JK70-10938A	1	O	
6	FOOT-RUBBER	JK61-40200A	4	O	

O: Service available X: Service not available

Drawer Ass'y Parts Lists

SA. : Service Available

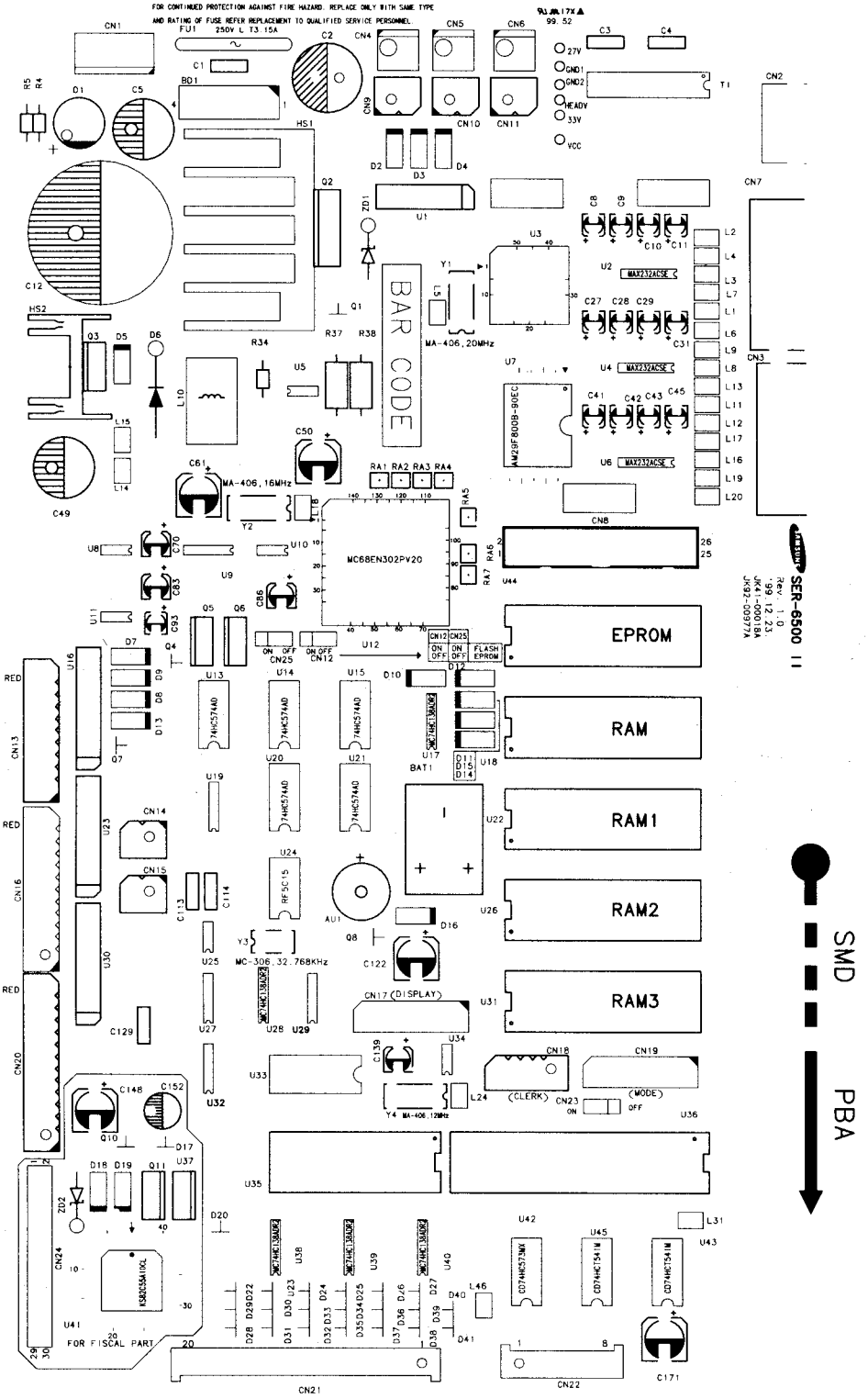
Location No.	Description	SEC. Code	Q'ty	SA	Remark
7	SCREW-TAPPING	6001-000702	4	O	
8	IPR-PLATE SPRING	JK70-10401A	2	O	
9	SCREW-MACHINE	6001-00702	1	O	
10	REX-BUMPER	JK73-20210A	1	O	
11	SPRING-PUSH	JK61-70100A	1	O	
12	MEA UNIT LOCK ASS'Y	JK97-01075A	1	O	
12-1	MEA UNIT-SUB LOCK	JK75-10027A	1	O	
12-2	SPRING-ES	6107-001014	1	O	
12-3	SOLENOID-DC	JK33-10500A	1	O	
12-4	SCREW-MACHINE	6001-000131	2	O	
12-5	SCREW-MACHINE	6001-000525	2	O	
12-6	SWITCH-MICRO	3405-001013	1	O	
12-7	CBF-HARNESS	JK39-40301R	1	O	
12-8	SCREW-TAPPING	6002-000161	3	O	
13	RMO-STOPPER	JK73-40200A	2	O	

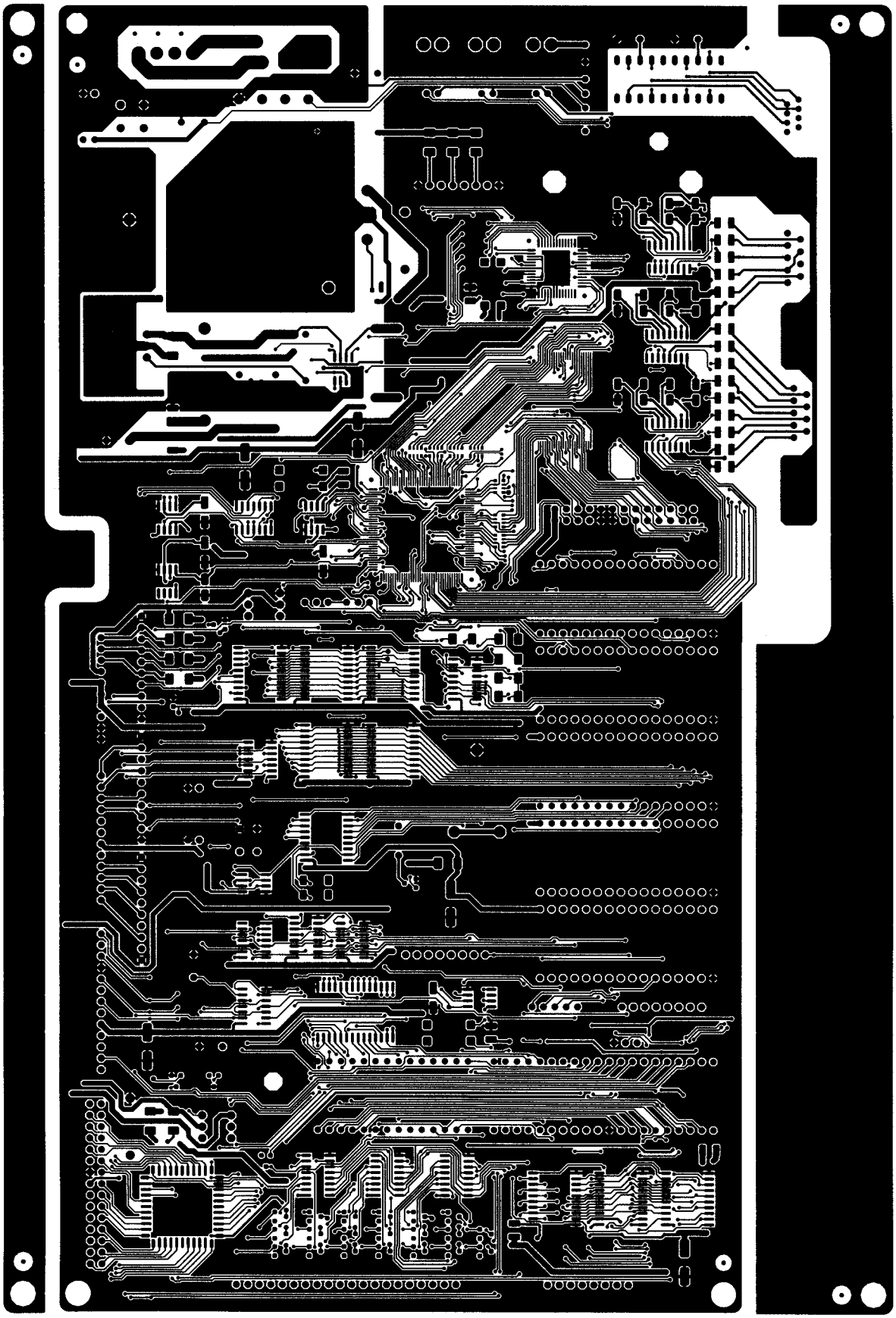
O: Service available X: Service not available

10 PCB Layout and Parts List

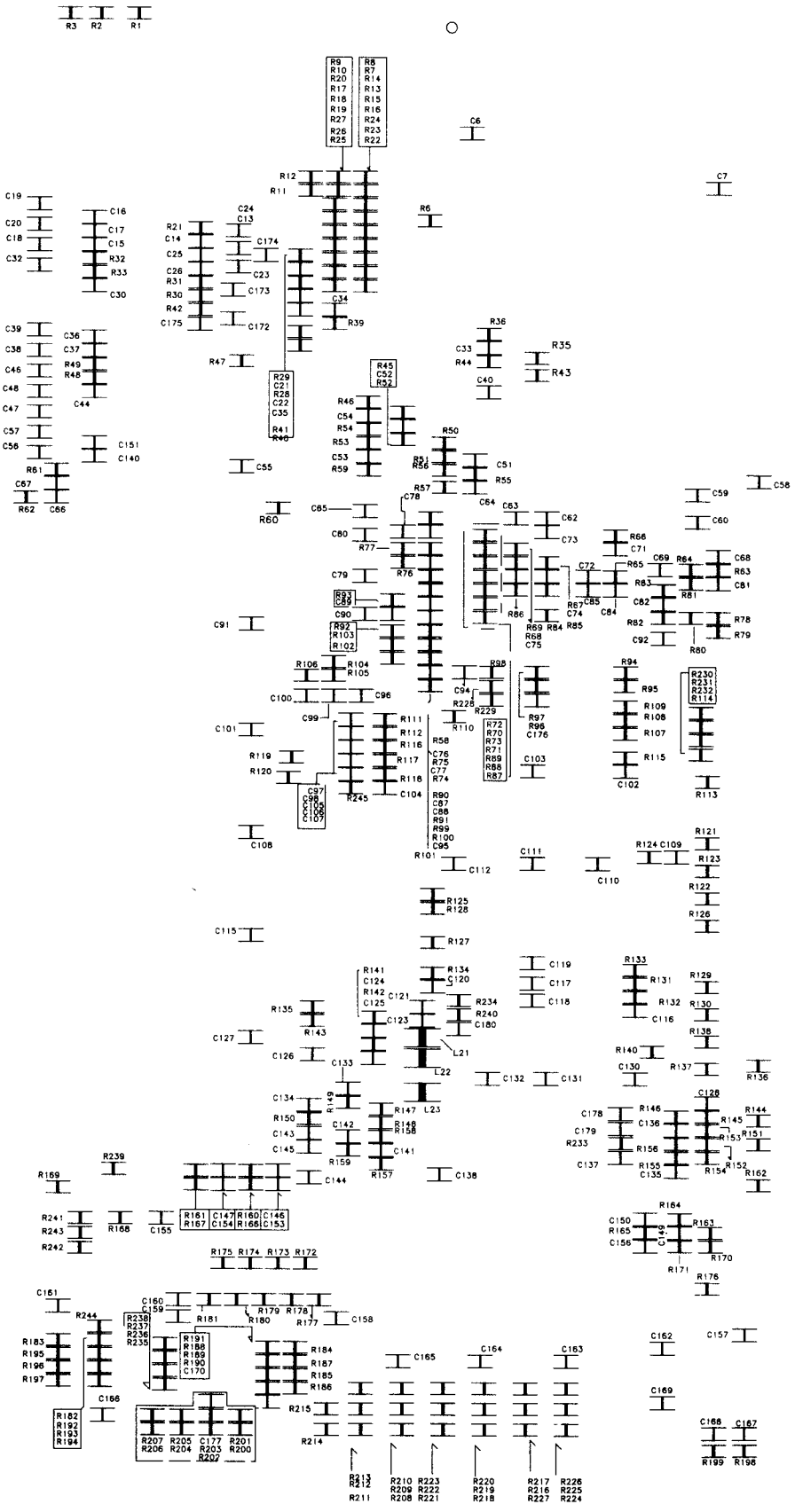
10-1 Main PCB Layout

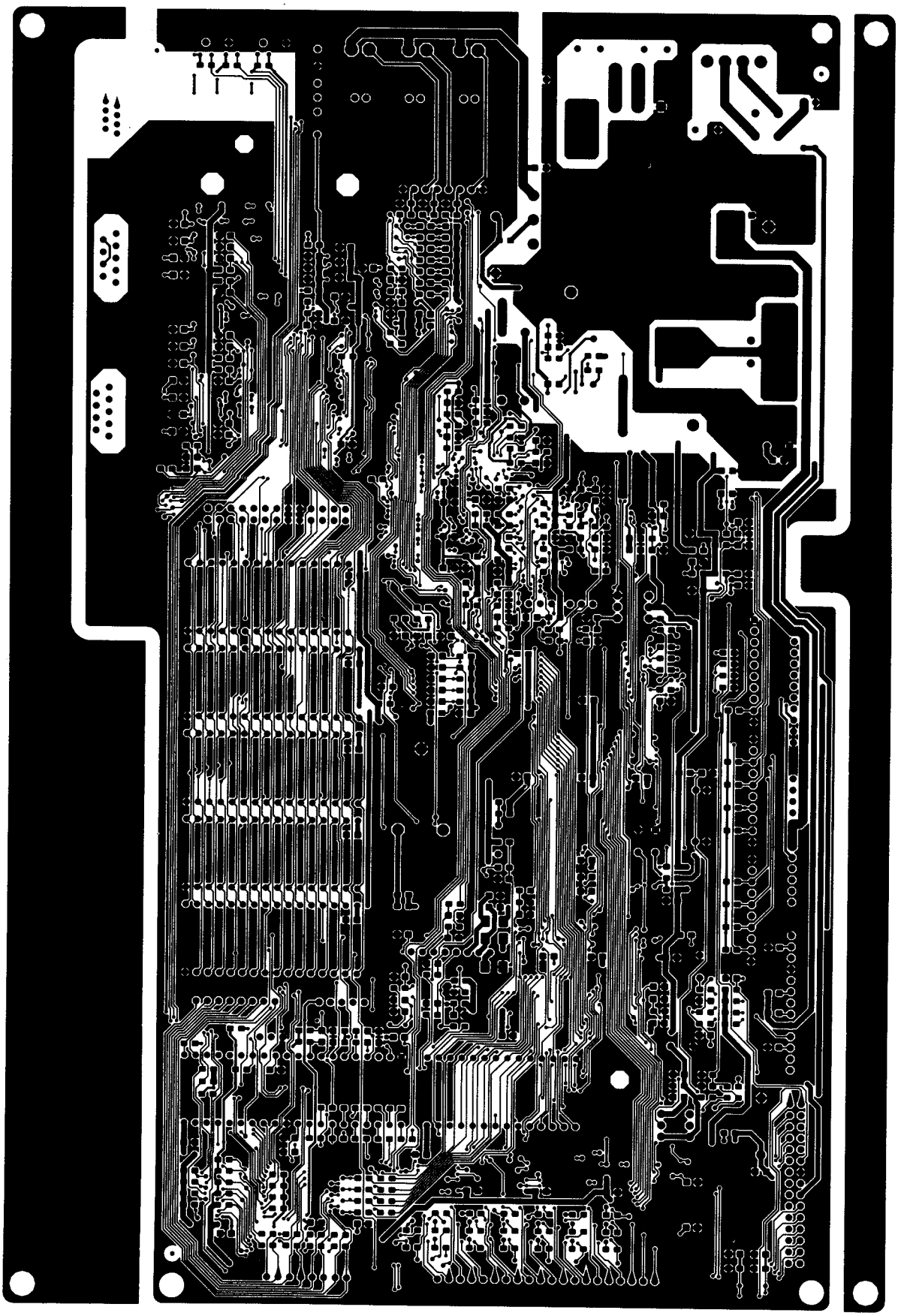
1) Component Side





2) Solder Side





10-1-1. Main Board Assembly Parts List (Manual Part)

Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK92-00977A	PBA MAIN;SER-6600,BAS	1		Y
0402-000119	DIODE-BRIDGE;W02G,200V,1.5A,-,	1	D1	Y
0402-000168	DIODE-RECTIFIER;1N5822,40V,3A,	1	D6	Y
0402-000290	DIODE-BRIDGE;KBU6B,100V,6A,-,B	1	BD1	Y
0502-000238	KSA473-Y,PNP,10W,TO-220	1	Q11 : for fiscal	Y
0502-000288	2SD288-Y,NPN,25W,TO-220	1	Q5 : for A_C	Y
0503-000117	2SD560-R,NPN,1.5W,TO-220	1	Q6 : for A_C	Y
0506-001019	TR-ARRAY;STA471A,NPN,4,4W,SIP-	3	U16,U23,U30	Y
0506-001026	TR-ARRAY;STA371A,NPN,3,3W,SIP-	1	U1	Y
0903-001083	IC-MICROCONTROLLER;78C32B,8BIT	1	U36	Y
1102-000173	IC-EPROM;27C512,64Kx8BIT,DIP,2	1	U35	Y
1106-000245	IC-SRAM;684000,512Kx8BIT,DIP,3	1	U18	Y
1203-000242	MC7812,3P,PLASTIC,11.5,TO-220	1	U37 : for fiscal	Y
2401-000022	C-AL;6800uF,20%,50V,GP,-,30x35	1	C12	Y
3002-001027	BUZZER-PIEZO;85DB,1.5V,24Ma,2.	1	AU1	Y
3601-000261	FUSE-FERRULE;250V,3.15A,TL,GLA	1	FU1	Y
3701-000232	CONNECTOR-DSUB;9P,2R,FEMALE,AN	2	CN3, CN7	Y
3704-000235	SOCKET-IC;28P,DIP,SN,2.54mm	1	U35	Y
3704-000255	SOCKET-IC;32P,DIP,SN,2.54mm	5	U18,U22,U26,U31,U44	Y
3708-000215	CONNECTOR-FPC/FC/PIC;20P,2.54m	1	CN21	Y
3708-000327	CONNECTOR-FPC/FC/PIC;8P,2.54mm	1	CN22	Y
3710-000111	CONNECTOR-SHUNT;2P,1R,2.54mm,-	3	CN12,CN23,CN25	Y
3711-000041	CONNECTOR-HEADER;BOX,8P,1R,2.5,(R)	1	CN17	Y
3711-000183	CONNECTOR-HEADER;1WALL,2P,1R,3	3	CN4~6	Y
3711-000242	CONNECTOR-HEADER;1WALL,4P,1R,3	1	CN1	Y
3711-000775	CONNECTOR-HEADER;BOX,26P,2R,2.	1	CN8	Y
3711-001011	CONNECTOR-HEADER;BOX,5P,1R,2.5	1	CN18	Y
3711-001133	CONNECTOR-HEADER;BOX,8P,1R,2.5,(W)	1	CN19	Y
3711-001475	CONNECTOR-HEADER;NOWALL,3P,1R,	3	CN12,CN23,CN25	Y
3711-001962	CONNECTOR-HEADER;NOWALL,30P,2R	1	CN24 : for fiscal	Y
3711-003969	CONNECTOR-HEADER;BOX,2P,1R,2.5	5	CN9~11,CN14,CN15	Y
3722-000212	JACK-MODULAR;8P/8C,-,AU50U,GRY	1	CN2	Y
4302-000126	BATTERY-NICD(2^{ND});3.6V(1.2Vx3)	1	BAT1	Y
JK27-60100D	COIL FILTER-;ER-350,140 UH,-,-	1	L10	Y
JK39-40306C	CBF-HARNESS;ER-4615FP,-,UL1007	1	CN20	Y
JK39-40306D	CBF-HARNESS;ER-4615FP,-,UL1007	1	CN13,16	Y
JK96-01103A	ELA ETC-HEAT SINK;SER-6600,ALL	1		
0502-000234	TR-POWER;KSA1010Y,PNP,40W,TO-2	1	Q3	Y

Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
0503-000139	TR-DARLINGTON;TIP142,NPN,125W,	1	Q2	Y
6002-000174	SCREW-TAPPING;PWH,+,2,M3,L10,Z	1	H/SINK+TIP142	Y
6002-000175	SCREW-TAPPING;PWH,+,2,M3,L8,ZP	1	H/SINK+KSA1010	Y
6203-000106	HEAT SINK;NONE,T2,W17,L22,H30,	1	KSA1010	Y
6203-000114	HEAT SINK;NONE,T4,W27,L42,H40,	1	TIP142	Y
JK61-70200A	SPRING;ECR,-,-,20,L24,-	1	H/SINK+TIP142	Y

10-1-2. Main Board Assembly Parts List (Auto Part)

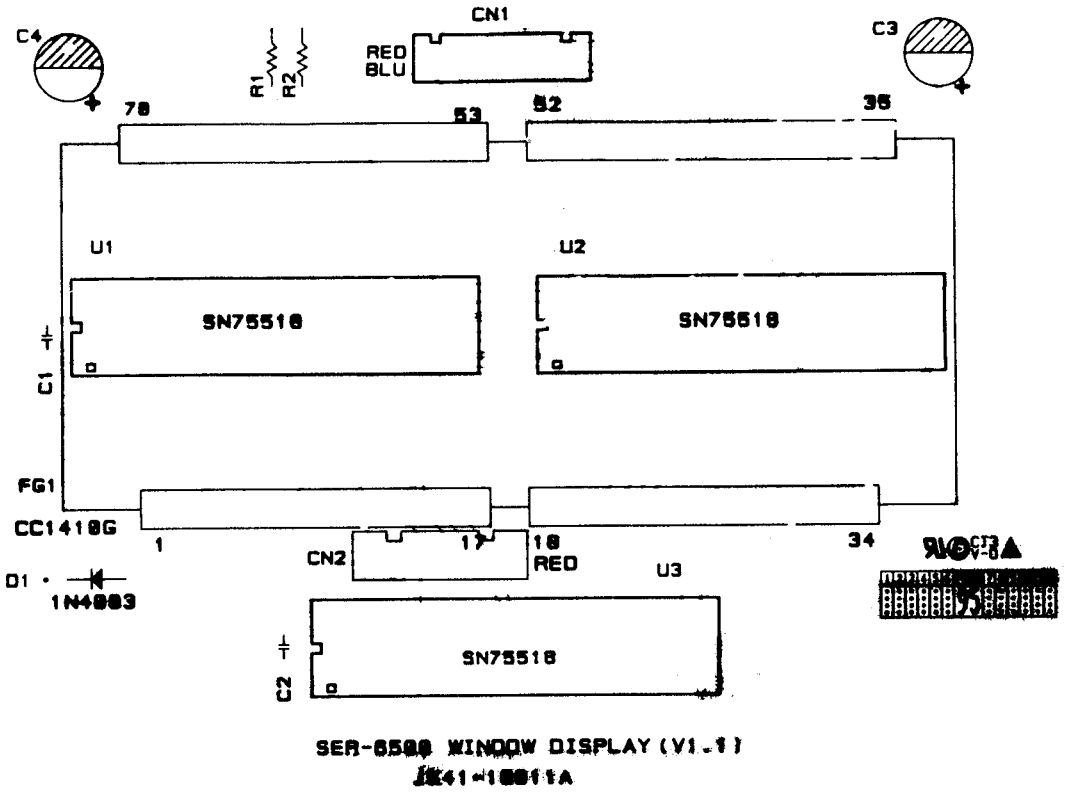
Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK94-00037A	PHANTOM AU JK92-00977A	1		N
0401-001003	DIODE-SWITCHING;MMBD6050LT1,70	22	D20,D22~41 / D17 : for fiscal	Y
0402-001189	DIODE-RECTIFIER;M4,400V,1A,SMD	8	D2~5,D7~9,D13	Y
0403-000141	DIODE-ZENER;1N4735A,6.2V,5%,1W	1	ZD2 : for fiscal	Y
0403-000753	DIODE-ZENER;MTZJ27D,27V,26.29-	1	ZD1	Y
0404-001051	DIODE-SCHOTTKY;SK14,40V,1A,DO-	8	D10~12,D14~16 / D18,D19 : for fiscal	Y
0501-000457	TR-SMALL SIGNAL;MMBT2222A,NPN,	5	Q1,Q4,Q7,Q8 / Q10 : for fiscal	Y
0801-000002	IC-CMOS LOGIC;74HC573,D LATCH,	1	U42	Y
0801-000523	IC-CMOS LOGIC;74HCT541,BUFFER/	2	U43, U45	Y
0801-000642	IC-CMOS LOGIC;74HC138,3-TO-8 D	5	U17,U28,U38~40	Y
0801-000718	IC-CMOS LOGIC;74HC574,D FLIP-F	5	U13~15,U20,U21	Y
0801-000887	IC-CMOS LOGIC;74HCT08,AND GATE	1	U27	Y
0801-000891	IC-CMOS LOGIC;74HCT32,OR GATE,	1	U29	Y
0801-001063	IC-CMOS LOGIC;74HCT05,INVERTER	2	U9,U19	Y
0801-001090	IC-CMOS LOGIC;74HC14,SCHIMITT	1	U32	Y
0902-001134	IC-MICROPROCESSOR;68EN302,16,T	1	U12	Y
0904-000411	KS82C55A,PLCC,8BIT,44P,10MHZ	1	U41 : for fiscal	Y
0909-000136	IC-REAL TIME CLOCK;5C15,16BIT,	1	U24	Y
1006-000133	IC-DRIVER/RECEIVER;232,SOP,16P	3	U2,U4,U6	Y
1106-001037	IC-SRAM;62256,32Kx8BIT,SOP,28P	1	U33	Y
1107-001046	IC-FLASH MEMORY;29F800,512Kx16	1	U7	Y
1202-000164	IC-VOLTAGE COMP.;393,SOP,8P,15	1	U11	Y
1203-000404	IC-DC/DC CONVERTER;34063,SOP,8	1	U5	Y
1203-000496	IC-VOL. SUPERVISORY;7705,SOP,8	1	U8	Y

Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
1205-001190	IC-TRANSCEIVER;MC68160FB,QFP,5	1	U3	Y
1206-000111	IC-TIMER;KA555D/T.R,SOP,8P,150	1	U25	Y
2001-000841	R-CARBON;51OHM,5%,1/4W,AA,TP,2	1	R4	Y
2001-000042	R-CARBON;1KOHM,5%,1/4W,AA,TP,2	1	R34	Y
2001-000065	R-CARBON;10KOHM,5%,1/4W,AA,TP,	1	R5	Y
2005-001001	R-WIRE WOUND;0.1ohm,5%,1W,AA,T	2	R37,R38	Y
2007-000028	R-CHIP;39OHM,5%,1/10W,DA,TP,20	2	R2,R3	Y
2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,201	1	R84	Y
2007-000030	R-CHIP;560OHM,5%,1/10W,DA,TP,2	4	R43,R68,R157,R162	Y
2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,	4	R95,R96,R115,R134	Y
2007-000282	R-CHIP;100KOHM,5%,1/10W,DA,TP,	1	R35	Y
2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2	33	R1,52,54,58~60,77,101,102,125, R128,146,155,156,172,~175, R177~181,184~191,229,234	Y
2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2	72	R13~16,21~24,29~31,42,47,50,51, R55~57,70~76,87~93,97~100, R103~106,110~112,114,116~118, R120,140,164,165,182,183,192~199 R235~245	Y
2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,20	2	R86,R158	Y
2007-000352	R-CHIP;12KOHM,1%,1/10W,DA,TP,2	1	R36	Y
2007-000355	R-CHIP;12KOHM,5%,1/10W,DA,TP,2	1	R83	Y
2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,20	15	R63,66,82,113,121~123,126,129, R130,133,137,138,171,176	Y
2007-000477	R-CHIP;1MOHM,5%,1/10W,DA,TP,20	1	R40	Y
2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,	3	R67,R79,R150	Y
2007-000572	R-CHIP;220OHM,5%,1/10W,DA,TP,2	35	R41,141,142,144,149,151,159, R200~227	Y
2007-000635	R-CHIP;270KOHM,5%,1/10W,DA,TP,2012	2	R131,R132	Y
2007-000686	R-CHIP;3.3KOHM,5%,1/10W,DA,TP,2012	7	R7,10,11,94,107~109	Y
2007-000728	R-CHIP;300OHM,5%,1/10W,DA,TP,2012	1	R28	Y
2007-000766	R-CHIP;330OHM,5%,1/10W,DA,TP,2	1	R136	Y
2007-000804	R-CHIP;36KOHM,5%,1/10W,DA,TP,2	1	R44	Y
2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,	31	R32,33,45,46,48,49,53,61,62,64,65, R69,78,81,85,124,127,145,147,148, R153,160,161,163,166~170,228,233	Y
2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2	2	R135,R143	Y
2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2	3	R119,R152,R154	Y
2007-000981	R-CHIP;5.6KOHM,5%,1/10W,DA,TP,	1	R80	Y

Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable

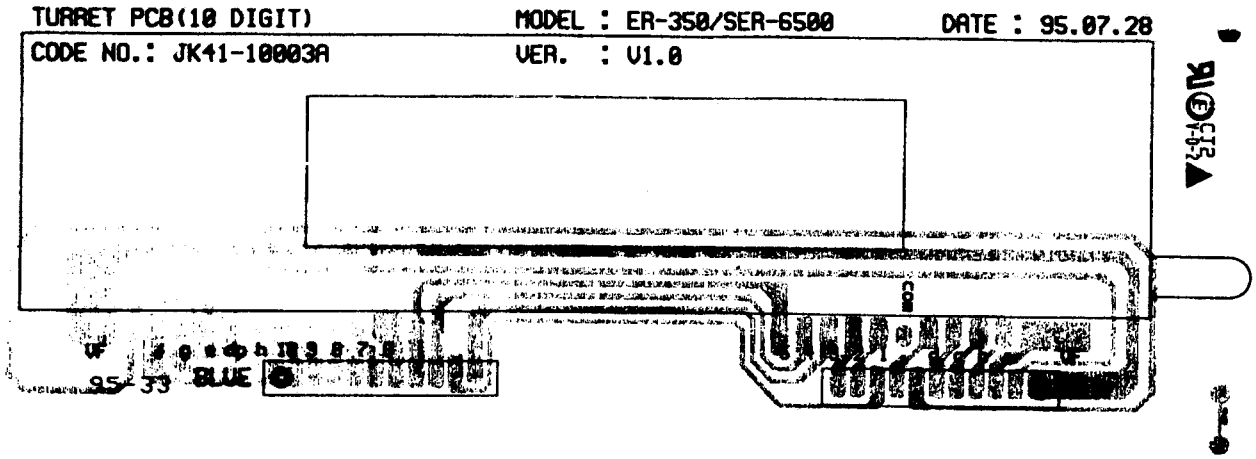
2007-001071	R-CHIP;6.8KOHM,5%,1/10W,DA,TP,	1	R6	Y
2007-001118	R-CHIP;680OHM,5%,1/10W,DA,TP,2	8	R17~20,R25~27,R39	Y
2011-001093	R-NETWORK;100ohm,5%,1/16W,L,CH	7	RA1~RA7	Y
2203-000192	C-CERAMIC,CHIP;100Nf,+80-20%,50V	75	C6,7,13,14,23~26,55,58~60,65,68,69 C72,75~82,85,87~92,101~104, C108~112,115,116,119,121,123, C126~128,130~132,137,138,141, C150,155~158,161~166,169,170, C172~175,177~180	Y
2203-000239	C-CERAMIC,CHIP;0.1Nf,5%,50V,NP	6	C95,C133,C142,C146,C153,C160	Y
2203-000260	C-CERAMIC,CHIP;10Nf,10%,50V,X7	2	C71,C84	Y
2203-000634	C-CERAMIC,CHIP;0.022Nf,5%,50V,	8	C34,35,62,63,73,134,143,144	Y
2203-000748	C-CERAMIC,CHIP;0.03Nf,5%,50V,N	17	C21,52~54,94,96~100,105~107, C117,118,159,176	Y
2203-000784	C-CERAMIC,CHIP;0.33Nf,5%,50V,N	1	C22	Y
2203-000938	C-CERAMIC,CHIP;0.47Nf,5%,50V,N	36	C15~20,30,32,33,36~40,44,46~48, C51,56,57,64,66,67,74,120,124,125 C140,145,147,149,151,154,167,168	Y
2203-000989	C-CERAMIC,CHIP;47Nf,10%,50V,X7	2	C135,C136	Y
2301-000335	C-FILM,PEF;10Nf,5%,50V,TP,6x3x	6	C1,C3,C4,C113,C114,C129	Y
2401-000230	C-AL;100Uf,20%,100V,GP,TP,12.5	1	C5	Y
2401-000310	C-AL;100Uf,20%,25V,GP,TP,6.3x1	1	C152 : for fiscal	Y
2401-001363	C-AL;470Uf,20%,16V,GP,TP,10x12	1	C49	Y
2401-001429	C-AL;470Uf,20%,50V,GP,TP,13x20	1	C2	Y
2402-000117	C-AL,SMD;10Uf,20%,35V,GP,TP,5x	4	C70,C83,C86,C139	Y
2402-000168	C-AL,SMD;100Uf,20%,16V,GP,TP,8	5	C50,C61,C122,C171 / C148:for fiscal	Y
2402-000170	C-AL,SMD;1Uf,20%,50V,GP,TP,4.3	13	C8~11,27~29,31,41~43,45,93	Y
2601-001023	TRANS-SMD,PULSE;-,-,-,25.65x7.	1	T1	Y
2801-000108	CRYSTAL-SMD;20MHz,50ppm,28-AAW	1	Y1	Y
2801-000111	CRYSTAL-SMD;32.768KHz,20ppm,28	1	Y3	Y
2801-001474	CRYSTAL-SMD;12MHz,50ppm,28-AAV	1	Y4	Y
2801-003315	CRYSTAL-SMD;16MHz,50ppm,28-AAV	1	Y2	Y
3301-000325	CORE-FERRITE BEAD;AB,3.2x2.5x1	25	L1~9,L11~24,L31,L46	Y
3602-000001	FUSE-CLIP;-,-,30mohm	2	FU1	Y
4701-001020	FREQ-ATTENUATOR;5-80MHz,15Db,-	2	U10,U34	Y
JK41-00018A	PCB;SER-6600 MAIN,FR-4,2L,T1	1		N

10-2 Operator Display PCB Layout



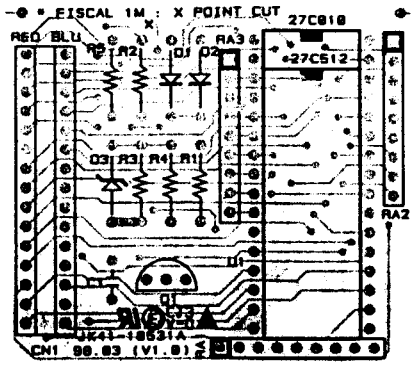
Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK96-00135A	ELA-DISPLAY	1		Y
1003-000265	IC-DISPLAY DRIVER;SN75518N,DIP	3	U1,U2,U3	Y
3711-001133	CONNECTOR-HEADER;BOX,8P,1R,2.5	1		Y
3711-002002	CONNECTOR-HEADER;-,22P,2R,2mm,	1	CN1	Y
JK07-20050A	DISPLAY LCD;-,-,B/GREEN,22DIG,	1		Y
JK39-00034A	CONNECT WIRE-350 DISPLAY;ER-35	1	CN2	Y
JK73-10207A	RPR-PAD;ER-220N,SPONGE,-,BLK,-	2		Y
JK96-00199A	ELA-DISPLAY	1		Y
0402-000129	DIODE-RECTIFIER;1N4003,200V,1A	1	D1	Y
2001-000055	R-CARBON;4.7KOHM,5%,1/4W,AA,TP	1		Y
2001-000065	R-CARBON;10KOHM,5%,1/4W,AA,TP,	2	R1,R2	Y
2201-000119	C-CERAMIC,DISC;100nF,+80-20%,5	2	C1,C2	Y
2401-000230	C-AL;100uF,20%,100V,GP,TP,12.5	1	C4	Y
2401-001363	C-AL;470uF,20%,16V,GP,TP,10x12	1	C3	Y
JK41-10011A	PCB-WINDOW;SER-6500,FR-4,2L,T1	1		N

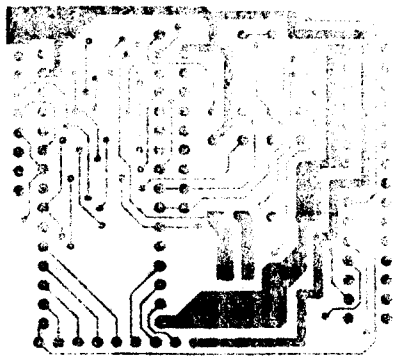
10-3 Customer Display PCB Layout



Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK96-00136A	ELA-TURRET	1		Y
JK72-40224A	PMO-TURRET BODY;SER-6500,ABS,I	1		Y
JK72-40225A	PMO-WINDOW TURRET;SER-6500,PC,	1		Y
JK96-00198A	ELA-TURRET	1		Y
3711-002812	CONNECTOR-HEADER;BOX,11P,1R,2m	2		Y
JK07-00004A	DISPLAY VFD-DC10G;ER-4615,SVE-	1	10DIGIT	Y
JK39-40002A	CBF-HARNESS;ER-220N,-,UL1061,4	1		Y
JK73-10207A	RPR-PAD;ER-220N,SPONGE,-,BLK,-	2	TU/PCB+DIGITRON	Y
JK41-10003A	PCB-TURRET(10DIG);ER-380,FR-1,	1	10DIGIT	N

10-4 Fiscal PCB Layout





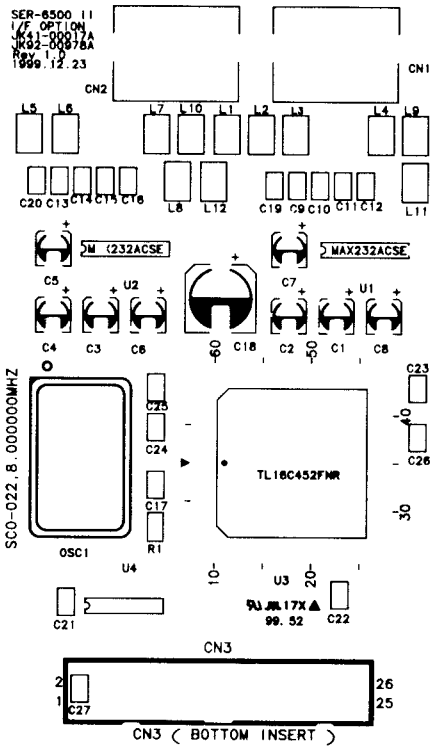
10-4-1. Fiscal (512Kbits) Assembly Parts List

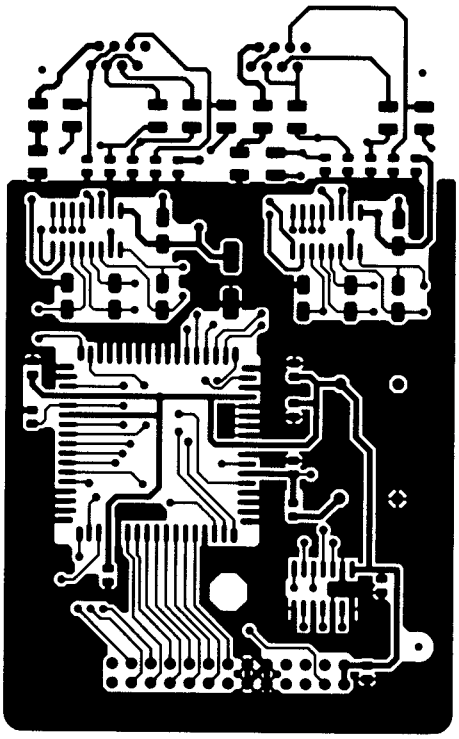
Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK92-00131A	PBA SUB-FISCAL BOARD	1		Y
1102-000173	IC-EPROM;27C512,64K*8BIT,DIP,28P	1	U1	Y
2011-000539	R-NETWORK,4.7Kohm,5%,1/8W,SIP,9P	1	RA1	Y
2201-000119	C-CERAMIC,DISC,100Nf,+80-20%,50V	1	C1	Y
JK39-40305B	CBF-HARNESS;UL 1007,120,WHT/BLU/RED	1	FISCAL HARNESS	Y
JK41-10531A	PCB-FISCAL,FR-4,2L,T1	1		N

10-4-2. Fiscal (1Mbits) Assembly Parts List

Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK92-00130G	PBA SUB-FISCAL BOARD	1		Y
1102-000109	IC-EPROM,27C010,128K*8BIT,DIP,32P	1	U1	Y
2011-000539	R-NETWORK,4.7KOHM,5%,1/8W,SIP,9P	1	RA1	Y
JK39-40305B	CBF-HARNESS;UL 1007,120,WHT/BLU/RED	1	FISCAL HARNESS	Y
0402-000208	DIODE-RECTIFIER,EK-04,40V,1.5A	2	D1, D2	Y
0403-000141	DIODE-ZENOR,1N4735A,6.2V,5%,1W	1	D3	Y
0501-000399	TR-SMALL SIGNAL,KSC945-G,NPN	1	Q1	Y
2001-000044	R-CARBON,1.2KOHM,5%,1/4W	1	R4	Y
2001-000055	R-CARBON,4.7KOHM,5%,1/4W	2	R1, R3	Y
2001-000855	R-CARBON,560OHM,5%,1/4W	1	R2	Y
2201-000119	C-CERAMIC,DISC,100Nf,+80-20%,50V	1	C1	Y
JK41-10531A	PCB-FISCAL,FR-4,2L,T1	1		N

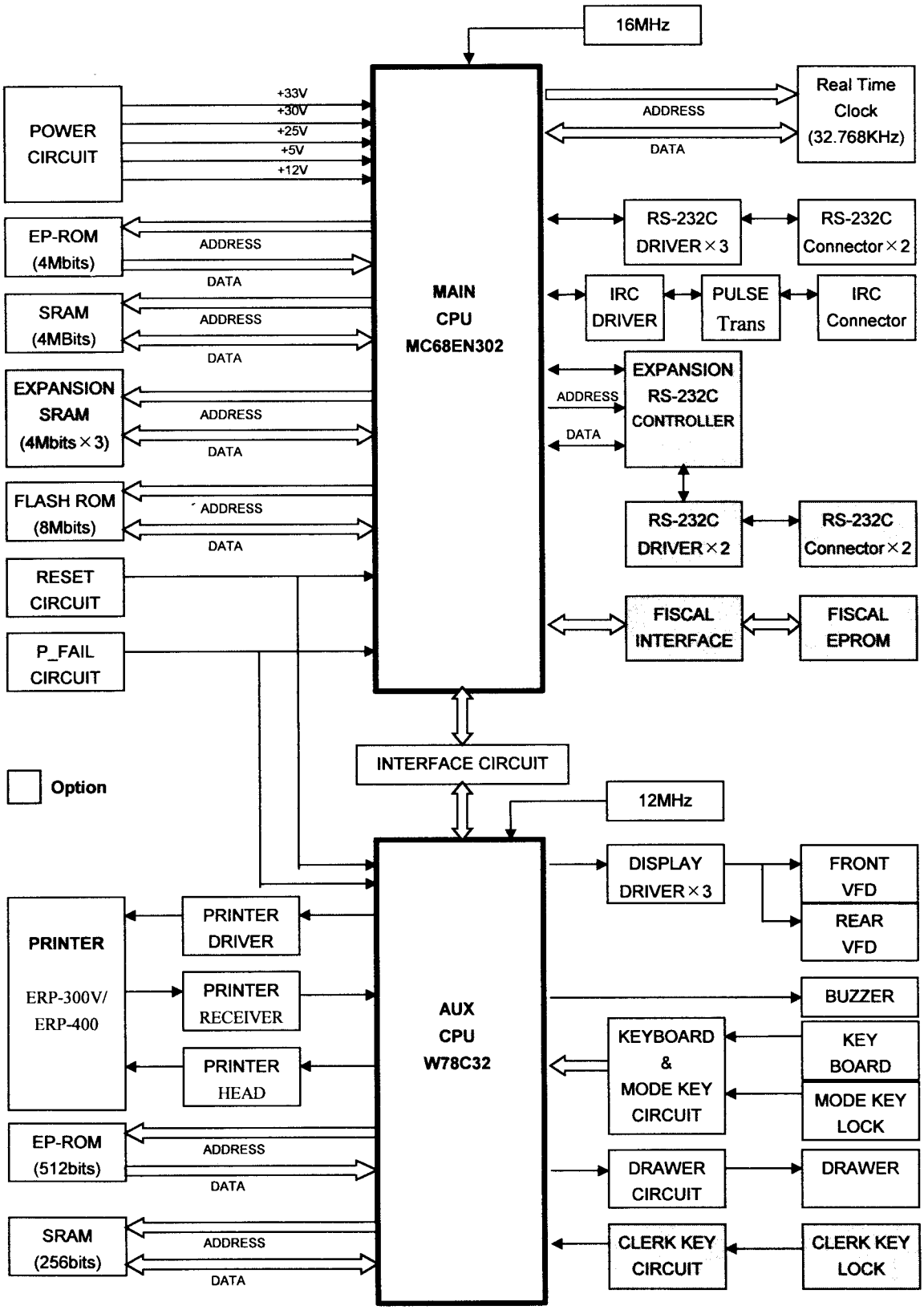
10-5 Option RS232C PCB Layout



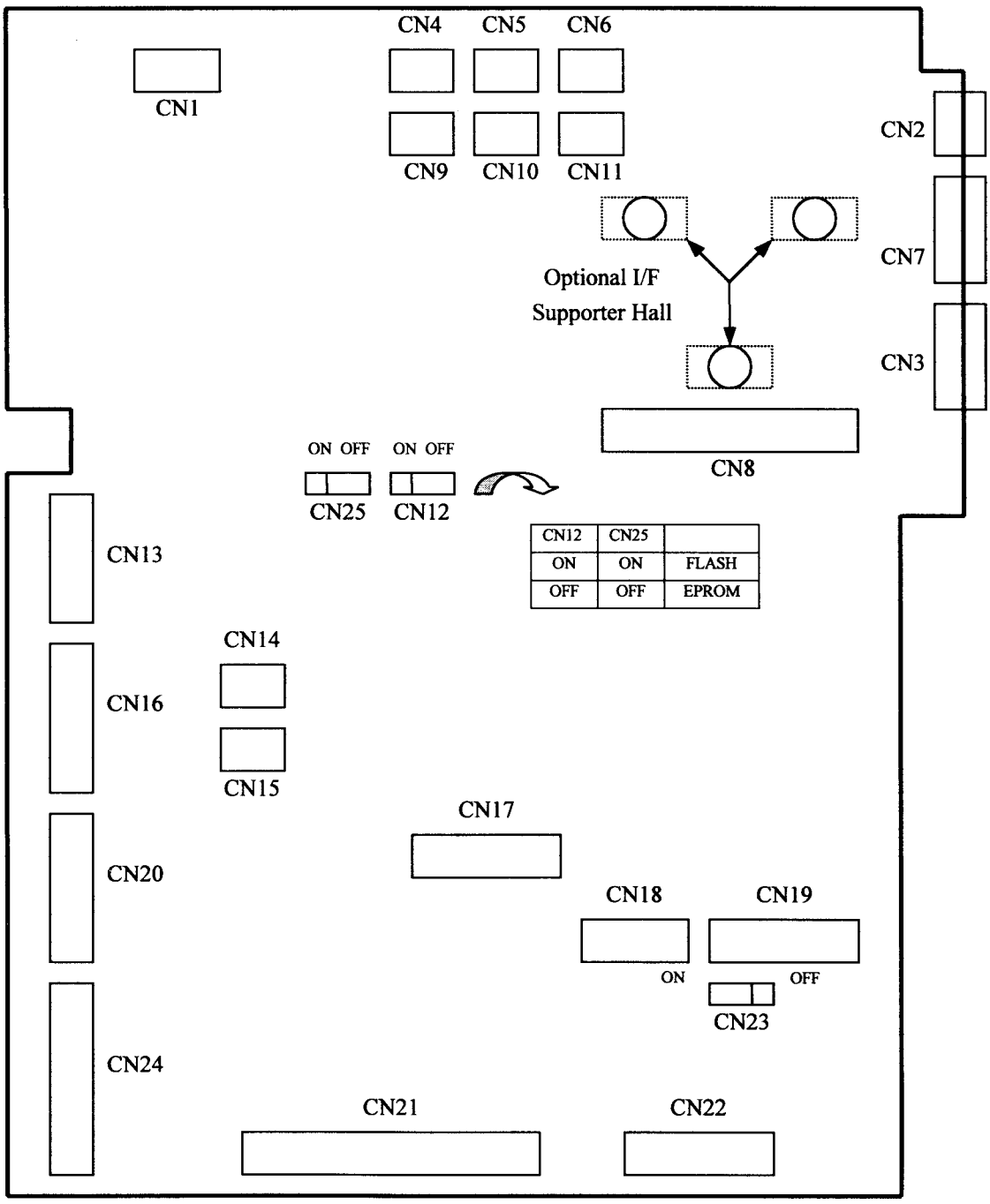


Code NO.	Descriptions / Specifications	Q'TY	Remarks	Serviceable
JK92-00978A	PBA SUB I/F-SER-6600 OPTION;SE	1		Y
2804-000377	OSCILLATOR-CLOCK;8MHz,100ppm,1	1	OSC1	Y
3710-000170	CONNECTOR-SOCKET;26P,2R,2.54mm	1	CN3	Y
3722-000212	JACK-MODULAR;8P/8C,-,AU50U,GRY	2	CN1,CN2	Y
6103-001043	SUPPORTER;DASS-T13N(LOCKING-TY)	3		Y
JK94-00038A	PHANTOM AU JK92-00978A	1		N
0801-001090	IC-CMOS LOGIC;74HC14,SCHIMITT	1	U4	Y
1006-000133	IC-DRIVER/RECEIVER;232,SOP,16P	2	U1,U2	Y
1205-001698	IC-DATA COMM.;TL16C452FN,PLCC,	1	U3	Y
2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2	1	R1	Y
2203-000192	C-CERAMIC,CHIP;100Nf,+80-20%,5	8	C23	Y
2203-000239	C-CERAMIC,CHIP;0.1Nf,5%,50V,NP	1	C17	Y
2203-000938	C-CERAMIC,CHIP;0.47Nf,5%,50V,N	9	C14	Y
2402-000168	C-AL,SMD;100Uf,20%,16V,GP,TP,8	1	C18	Y
2402-000170	C-AL,SMD;1Uf,20%,50V,GP,TP,4.3	8	C7	Y
3301-000325	CORE-FERRITE BEAD;AB,3.2x2.5x1	12	L2	Y
JK41-00017A	PCB;RS232 OPT,FR-4,2L,T1	1		N

11 Block Diagram



12 Main Board Wiring Diagram



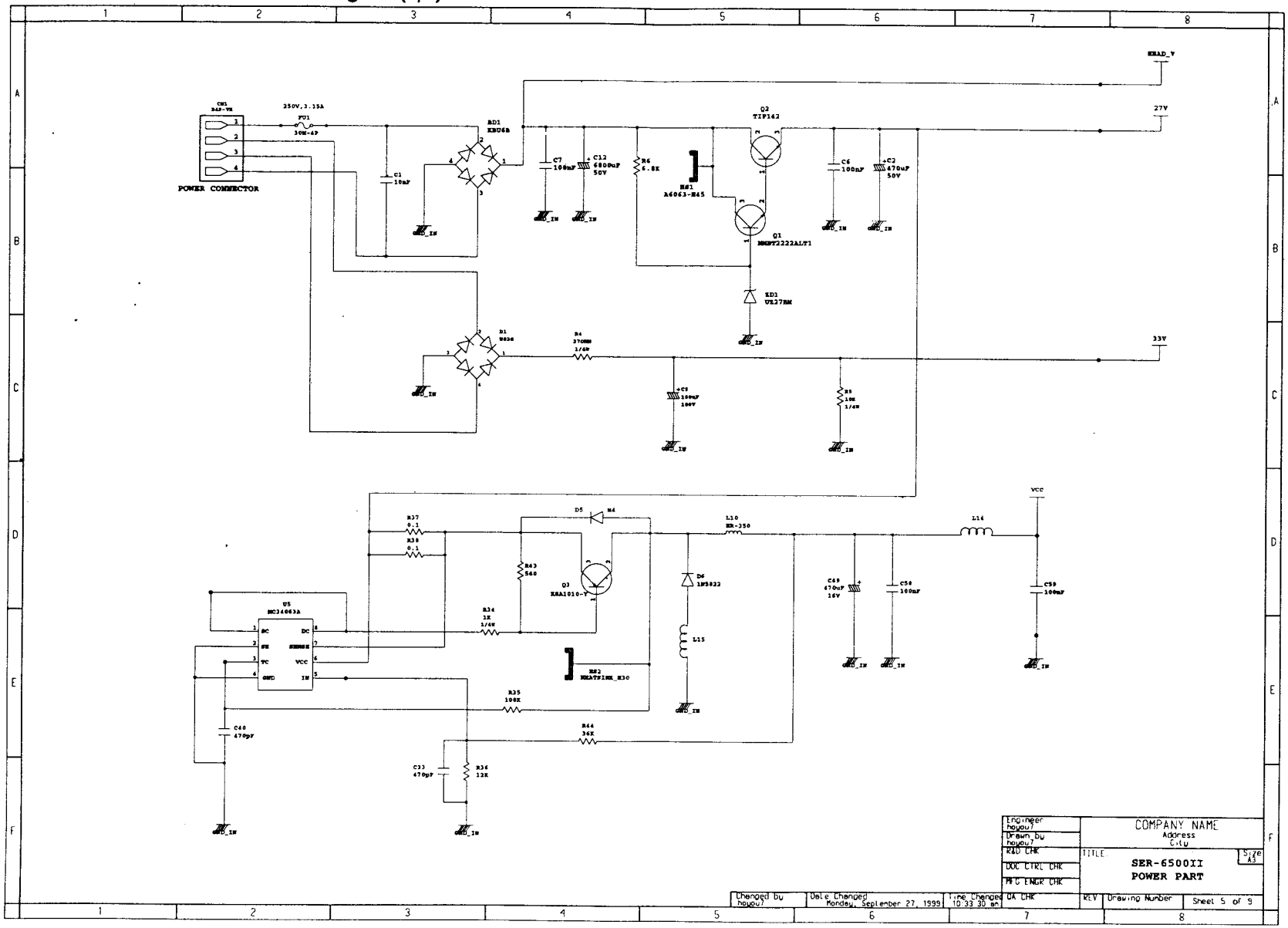
CN12	CN25	
ON	ON	FLASH
OFF	OFF	EPROM

Table 12-1. Wiring Connector Descriptions

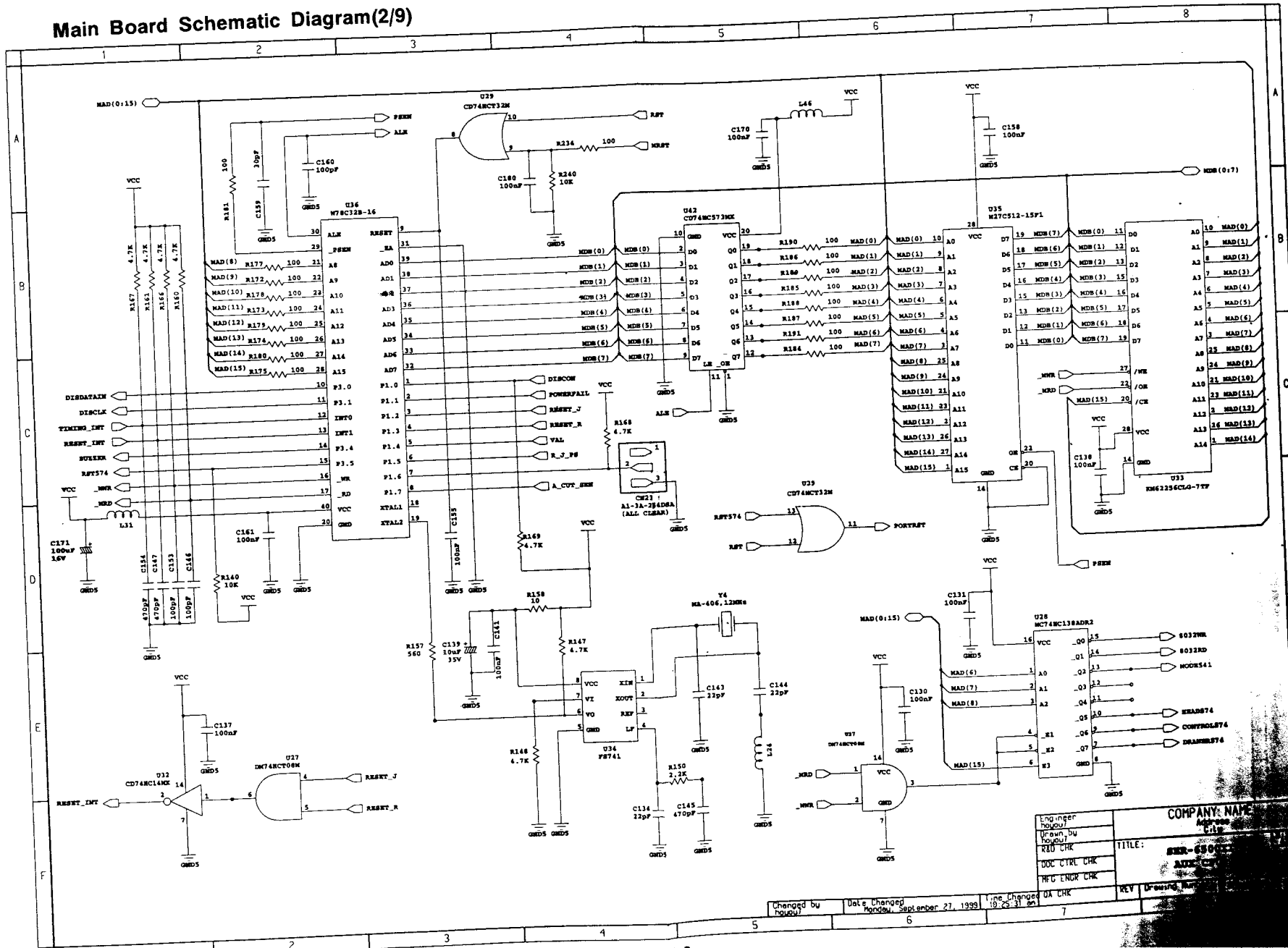
Name	Description	Pin #	Remark	Name	Description	Pin #	Remark
CN1	Power	4		CN14	Paper-end sensor 1	2	
CN2	IRC	8		CN15	Paper-end sensor 2	2	
CN3	Serial 1	9		CN16	Printer Head signal	12	
CN4	Drawer 1	2		CN17	Display	8	
CN5	Drawer 2	2		CN18	Clerk Lock	5	
CN6	Drawer 3	2		CN19	Mode Lock	8	
CN7	Serial 2	9		CN20	Printer Receiver	13	
CN8	Main ↔ Option I/F	26		CN21	Keyboard Scan	20	
CN9	Drawer Compulsory 1	2		CN22	Keyboard Return	8	
CN10	Drawer Compulsory 2	2		CN23	All Clear	3	
CN11	Drawer Compulsory 3	2		CN24	Fiscal	30	
CN12	FLASH or EPROM	3		CN25	FLASH or EPROM	3	
CN13	Printer Driver	10					

13. Schematic Diagrams

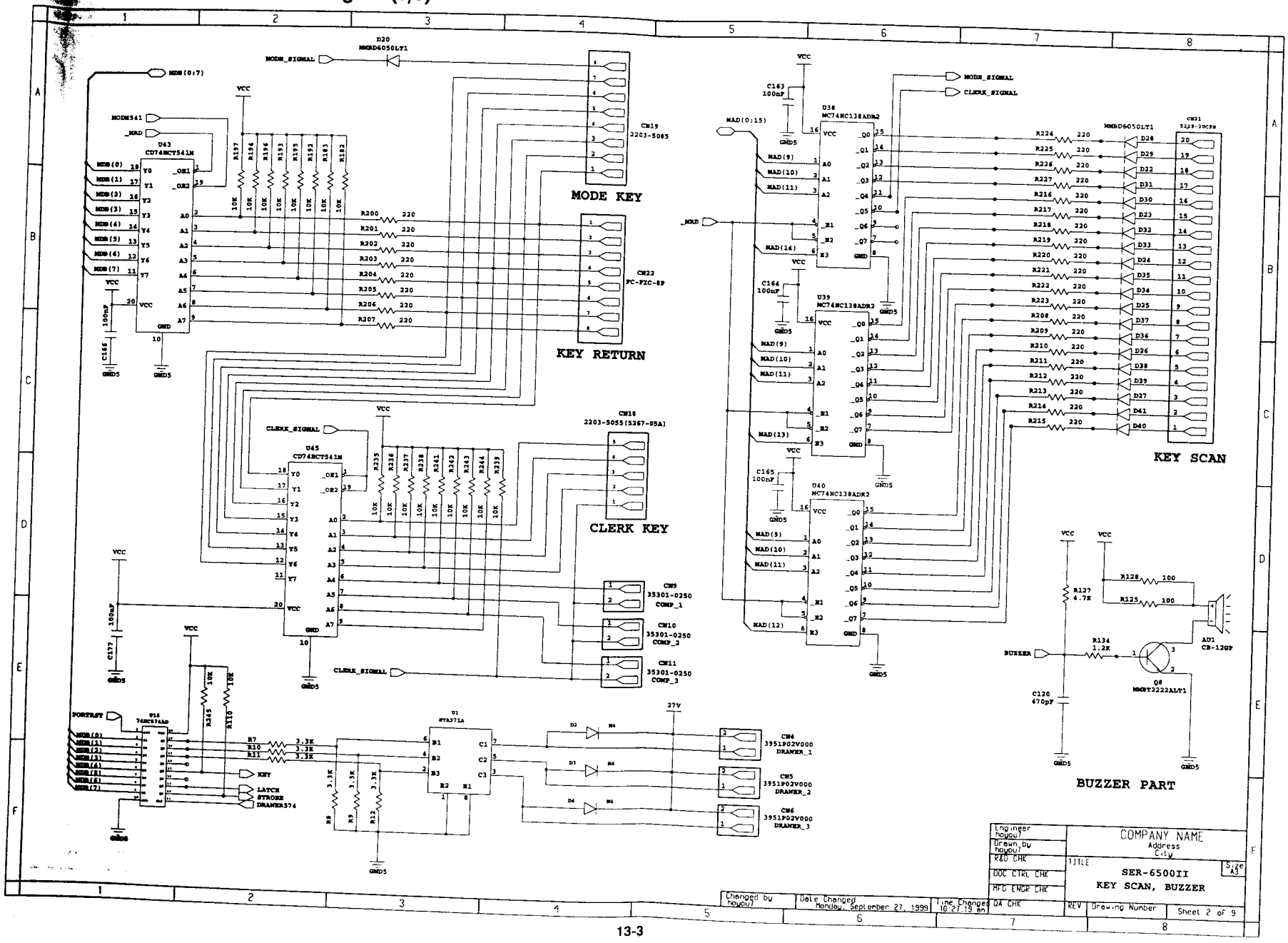
13-1 Main Board Schematic Diagram(1/9)



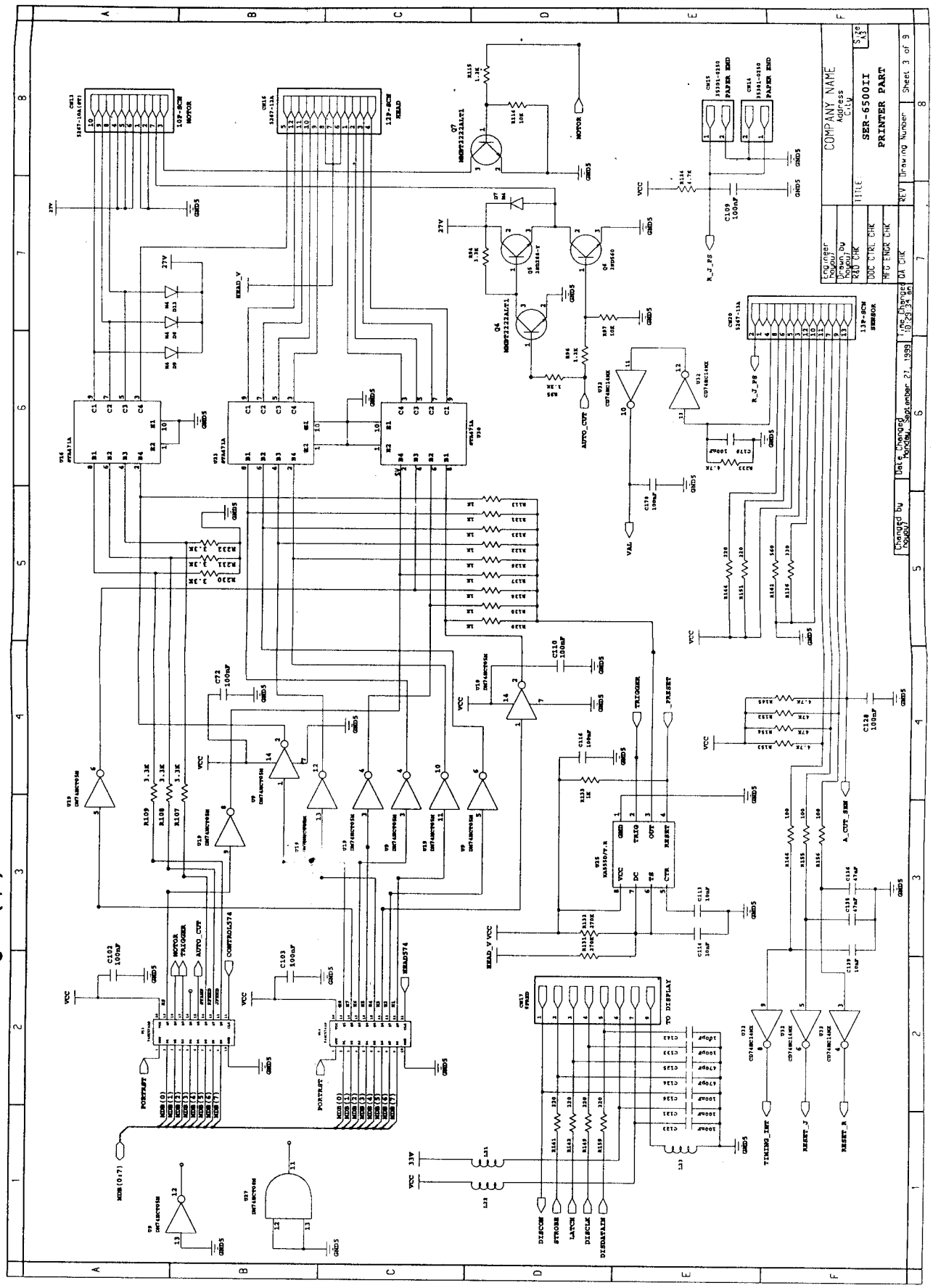
Main Board Schematic Diagram(2/9)



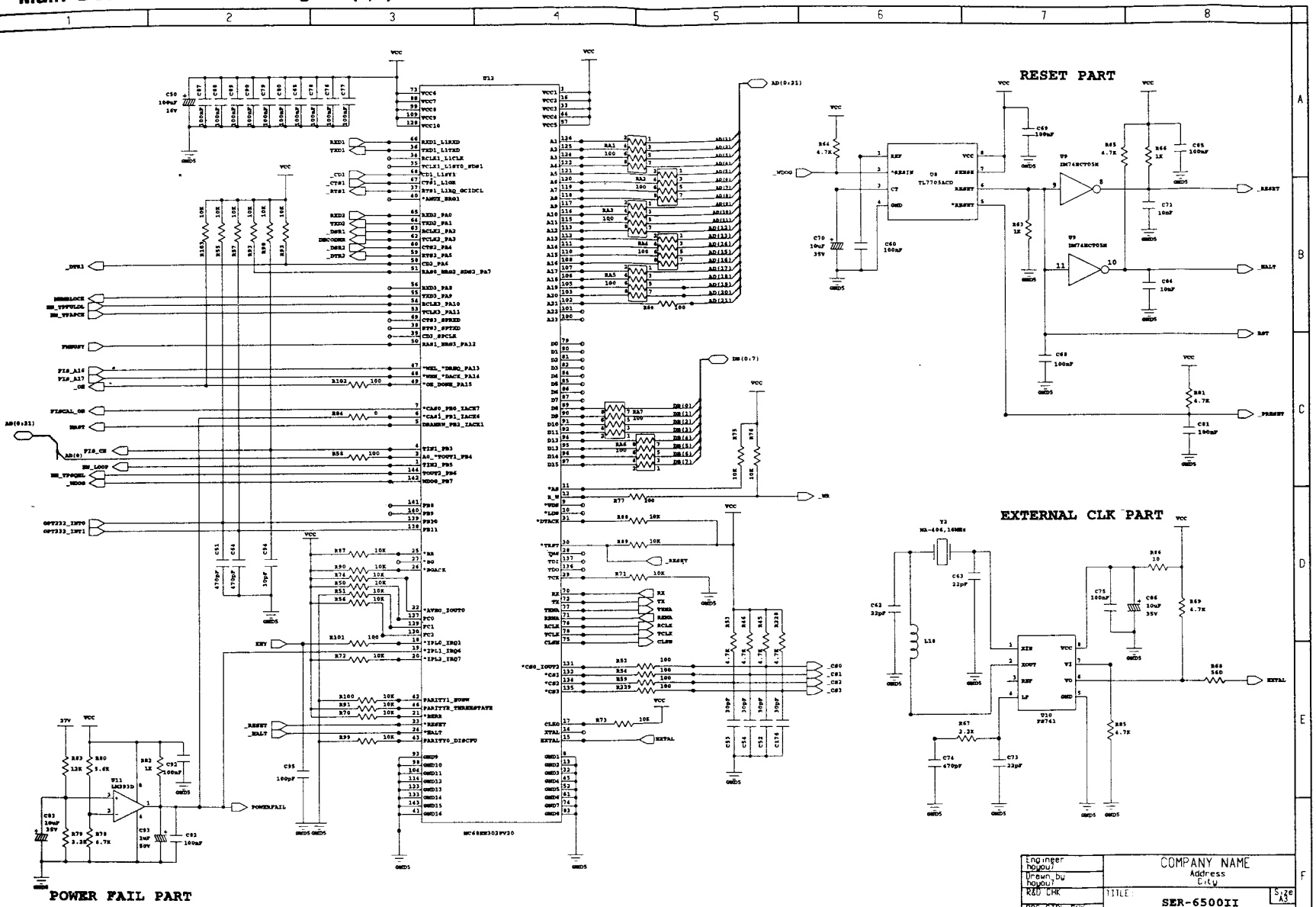
Main Board Schematic Diagram(3/9)



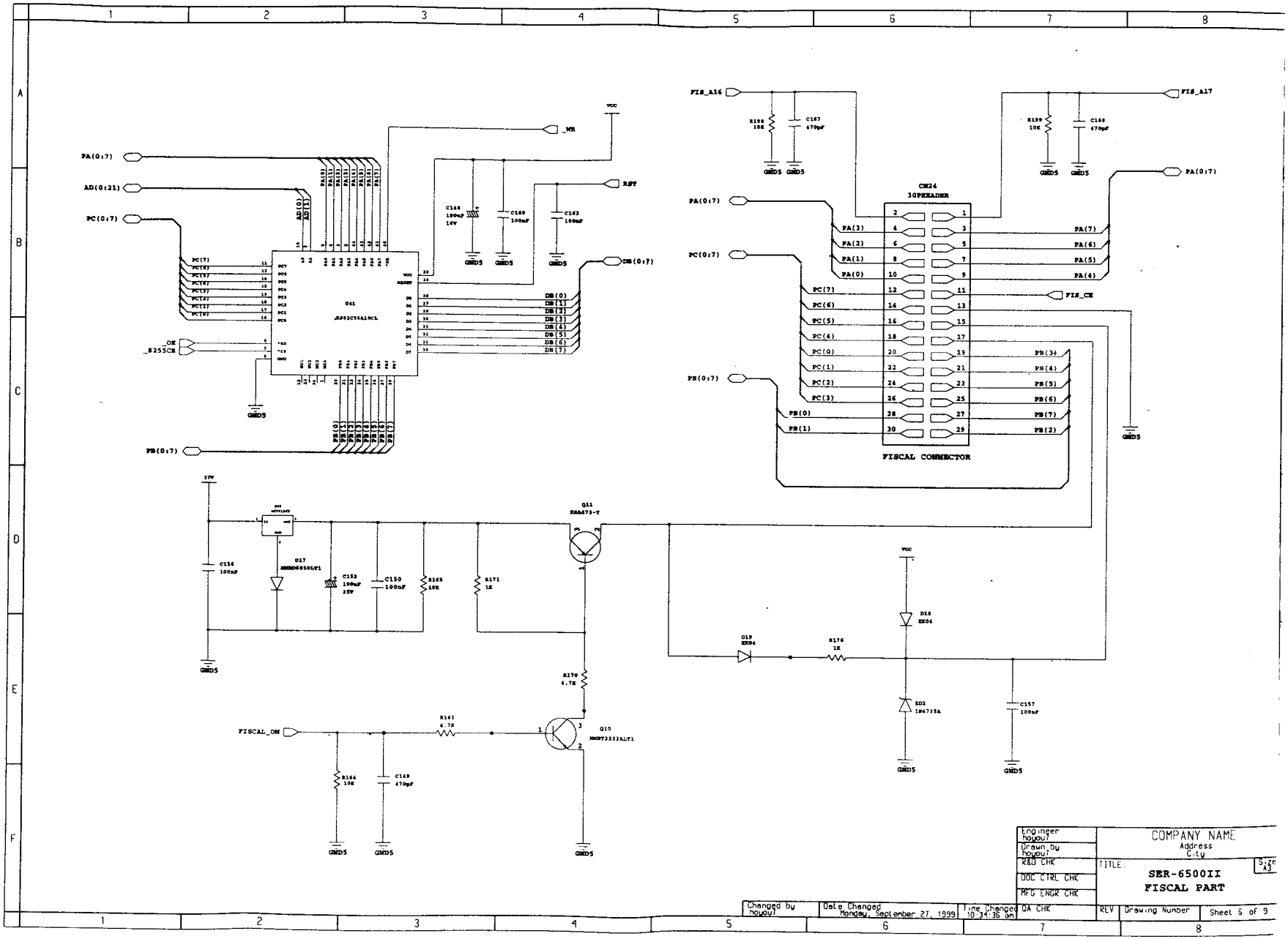
Main Board Schematic Diagram(4/9)



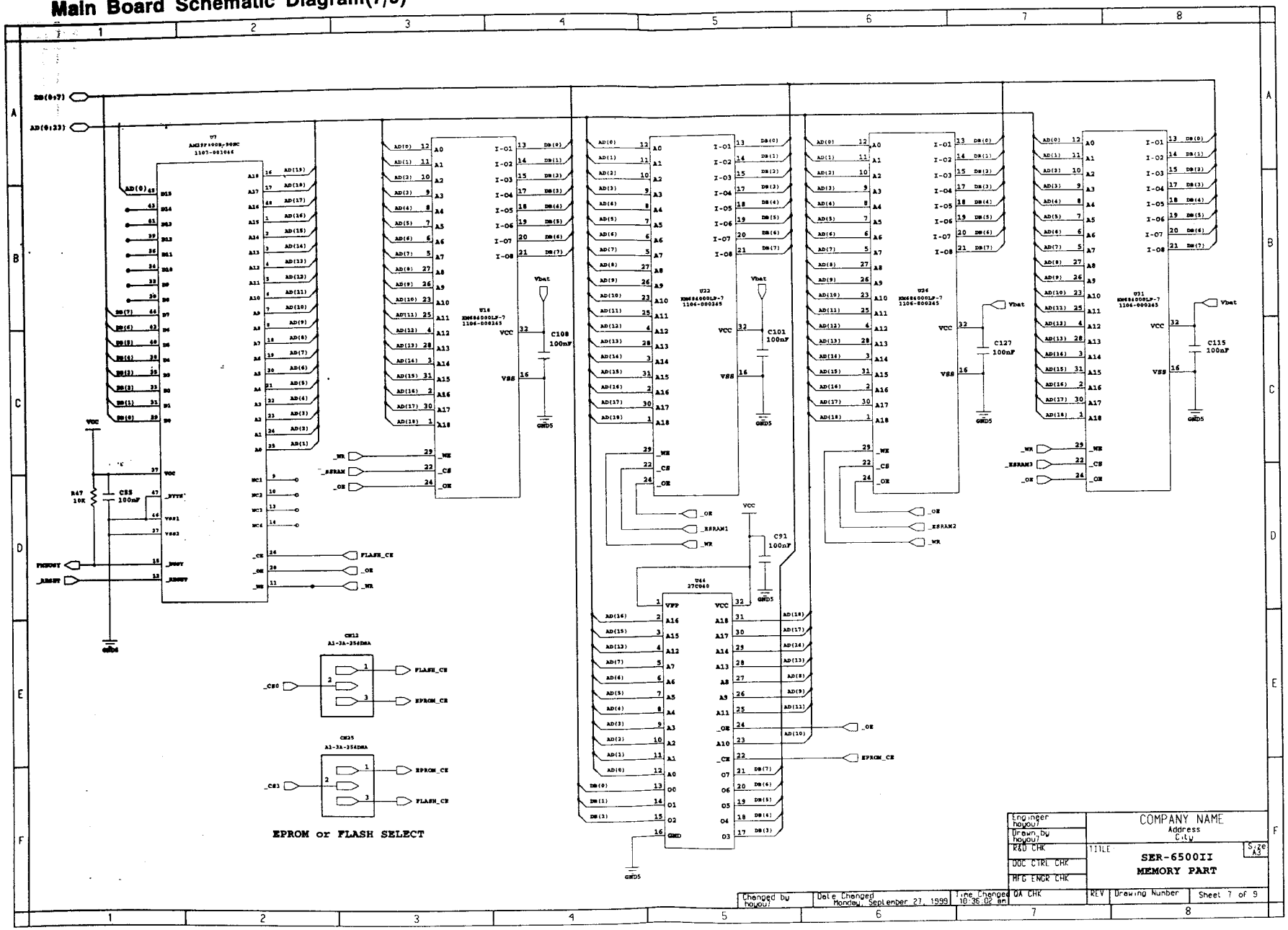
Main Board Schematic Diagram(5/9)



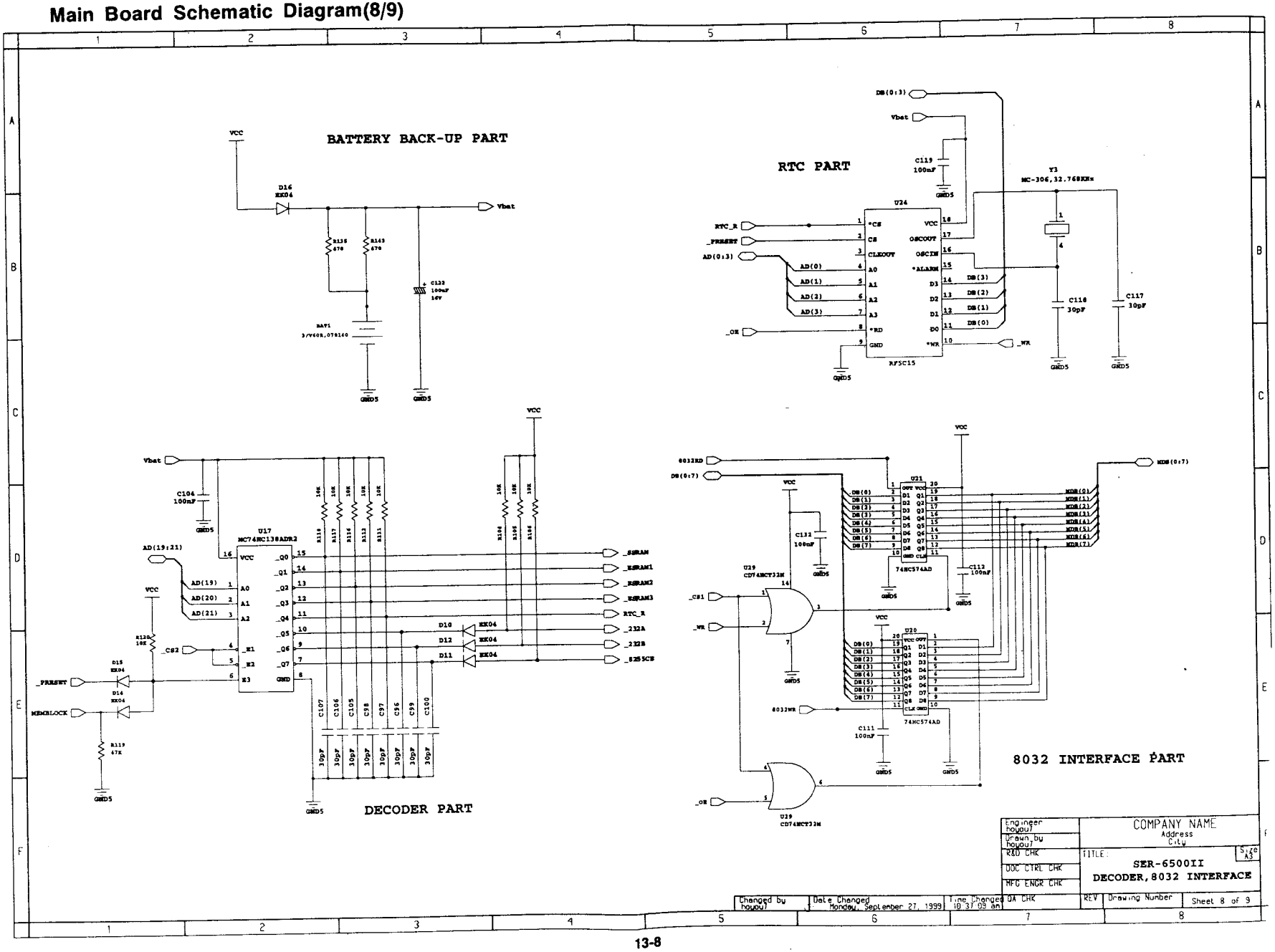
Main Board Schematic Diagram(6/9)



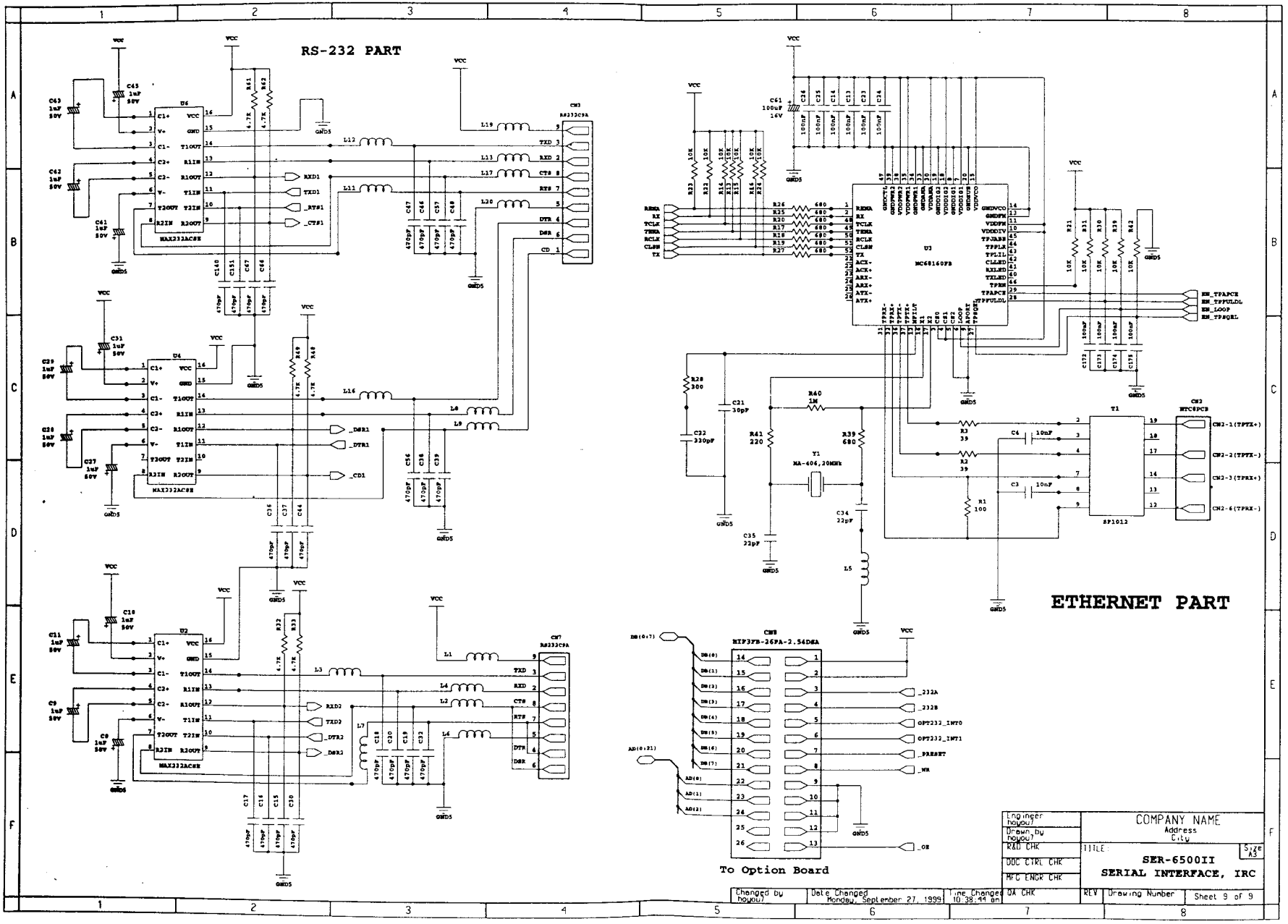
Main Board Schematic Diagram(7/9)



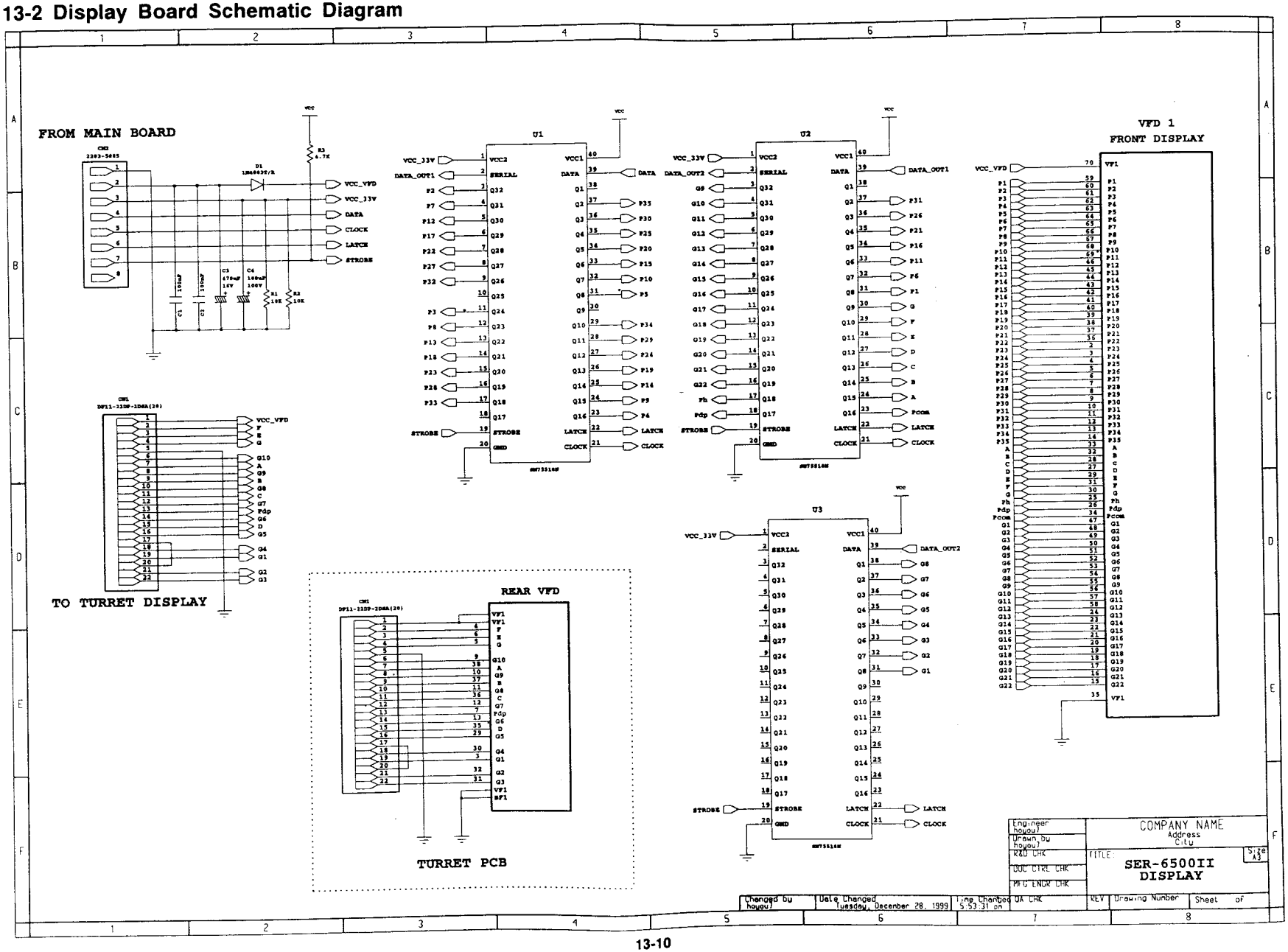
Main Board Schematic Diagram(8/9)



Main Board Schematic Diagram(9/9)



13-2 Display Board Schematic Diagram



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