

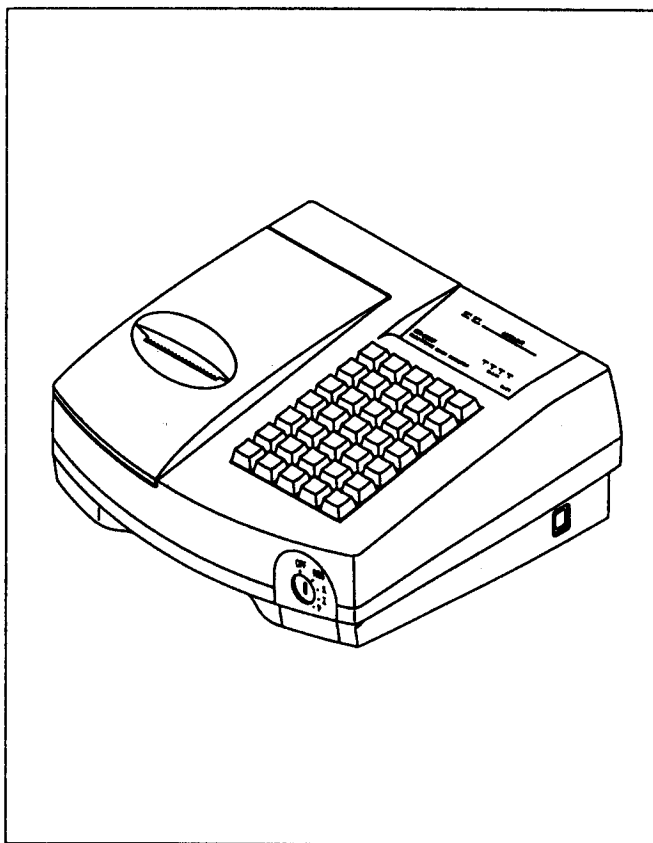
SAMSUNG

Portable Electronic Cash Register

ER-700/ER-700P/ER-700F
ER-700FP/ER-700RF

SERVICE Manual

ELECTRONIC CASH REGISTER



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About this Manual

This service manual describes how to perform hardware service maintenance for the Samsung ER-700 Series Electronic Cash Register.

Acronym	Definition
ASSY	Assembly
ASIC	Application for Specific Integrated Circuit
ECR	Electronic Cash Register
EPROM	Electric Programmable ROM
ESD	Electrostatically Sensitive Device
Ext.	Extension
F	Fiscal
FP	Fiscal and PC interface
GND	Ground
IC	Integrated Circuit
N.C.	Not Connected
PCB	Printed Circuit Board
R..	Receive
RAM	Random Access Memory
ROM	Read Only Memory
SRAM	Static Random Access Memory
T..	Transmission
R	Right
L	Left

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 applies to this part component.

 indicates the part or component is an electrostatically sensitive device. Use caution when handling these parts.

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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 nonmetallic 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 ECR. 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 overheating, 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, ($\triangle$), or ($\triangle$). 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 turn off the power s/w on the rear side of lower case 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 the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts 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

1 Precaution Statements

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 unpacked 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 Product Specifications

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

2-1 General Specifications

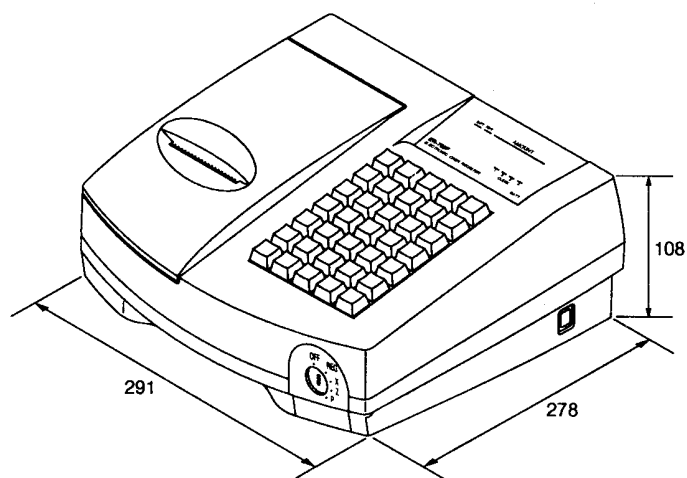
Item	Description	Remarks
AC Adaptor	Input Output AC120V $\pm$ 15%,60Hz DC 17V $\pm$ 5% 1.3A AC230V $\pm$ 15%,50Hz DC 17V $\pm$ 5%1.3A	USA Europe
Rechargeable Battery	DC 12V 2.2AH (Lead-Calcium Battery)	
Power Consumption	9W(Regulality) , 22W(Peak)	
Printer	8-pin Dot matrix Printing speed: 2.5($\pm$ 15%) lines per second	M-190(EPSON)
Processor	Winbond(78C32)	
Memory	SRAM (KM62256*1): 32kbyte EPROM (27C010*1): 128Kbyte Fiscal EPROM(27C512*1): 64Kbyte	ER-700F/700FP
Data Storage	60 Days	When back-up battery fully charged
Battery (Back-up)	Ni-cd, 60mA, Life : 2 years Charging time: 24 hours	
Displays	Front: 9 digit V.F.D Rear: 9 digit V.F.D	Option
Keyboard	35-key: Membrane type 4-key of 35: Department key	
Interface	RS-232C: 1 port	Option
RS232C Cable	9p/9p Interface cable	Option
Drawer / Compulsory drawer	Drawer Solenoid : 10.5~15V Compusory : micro-S/W	Option Option
Body	Weight: 3.2kg Dimensions: 291 (W) x 278 (L) x 108 (H)	millimeters

Item	Description	Remarks
Packing Carton	Weight: 5.4Kg Dimensions: 375 (W) x 204 (L) x 419 (H)	millimeters
Recommended Operating Temperature	0°C ~ +40°C	

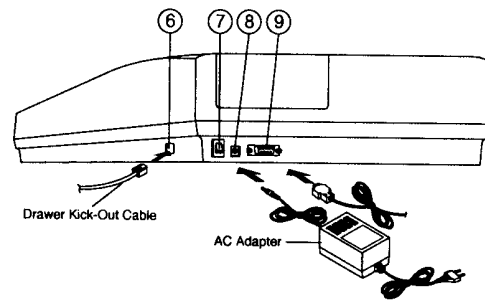
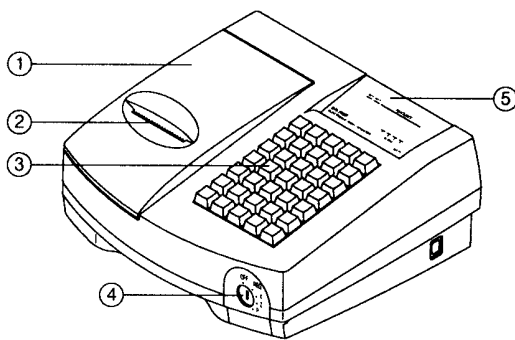
2-2 Printer Specifications

Item	Description		Remark
Model	M-190		
Print Method	Impact dot matrix type		
Print Direction	Uni-directional		
Print Speed	2.5(± 15%) lines per second		
Print Format			
Dot Interval	Horizontal:0.33mm	Vertical:0.37mm	(H) x (V)
Print Font	5x7		
Printing Columns	24		
Character Size	1.7mmx2.6mm		
Column Interval	2.6mm		
Line Interval	1.11 mm		
Paper Feed	Automatically fed every dot line		
Paper	Roll; Width: 57.5 ± 0.5mm		
Power Supply Voltage	5 V Printer Solenoid 5 V Solenoid and Printer Motor 5 V Timing and Reset detector		
Reliability(M.C.B.F)	Approx. 1.5 million lines		Not for Printer life
Printer Life	Approx. 2.25 million characters		
Weight	Approx. 100 g		

2-3 Dimensions



2-4 Feature Locations



- (1) Printer Cover
- (2) Impact Dot Printer
- (3) Keyboard
- (4) Mode Switch
- (5) Window Display

- (6) Drawer Kick-out
- (7) Power S/W
- (8) AC Adaptor
- (9) RS-232C Port

2-5 Communication Interfaces

2-5-1 Serial Interfaces, Pin Descriptions

Table 2-1. Serial Interface Cable Pin Descriptions

Computer (9-pin, Female Connector) ECR (9-pin, Male Connector)		
Signal		Signal
Txd	3 ← → 2	Rxd
Rxd	2 ← → 3	Txd
S.G.	5 ← → 5	S.G.
DSR	4	DTR
F.G.	CON FRAME CON FRAME	F.G.

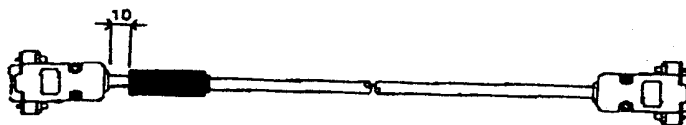


Figure 2-1 Serial Interface cable

2-5-2 Printer Terminal, Pin Descriptions

Table 2-2. Pin Descriptions

Pin No.	Specification
1	Fast paper feed trigger solenoid(+)
2	Fast paper feed trigger solenoid(-)
3	Reset detector(-)
4	Reset detector(+)
5	Motor(+)
6	Motor(-)
7	Printer solenoid(B)
8	Printer solenoid (C)
9	Printer solenoid(D)
10	Printer solenoid(E)
11	Printer solenoid(F)
12	Printer solenoid(G)
13	Printer solenoid(H)
14,15	Common for printer solenoids
16	printer solenoid(A)
17	Timing detector
18	Timing detector

2-5-3 Drawer Kick-Out Cable Pin Description

Table 2-3. Drawer Kick-Out Assignments and Signal Function

Pin No.	Signal Name	Signal Direction	Function
1	Frame GND	-	-
2	Drawer Kick-Out Drive Signal	Output	Drawer Signal
3	Drawer Open/Close Signal	Input	This Signal is a compulsory function.
4	+11~15V	-	-
5	N.C	-	-
6	Signal GND	-	-

* Ferrite core 1 turn(OP-18E:18.2X12.5X25.5)

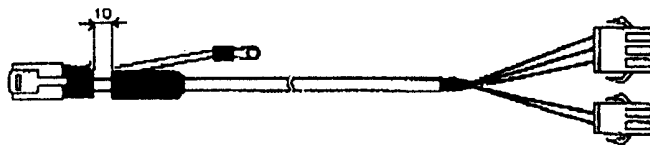


Figure 2-2 Drawer Kick-Out Cable



Figure 2-3 Drawer Kick-Out Connector

3 Operating Instructions and Installation

This chapter details the method for installing the ECR system and preparing it for use.

3-1 Installation

3-1-1 Interface Installation

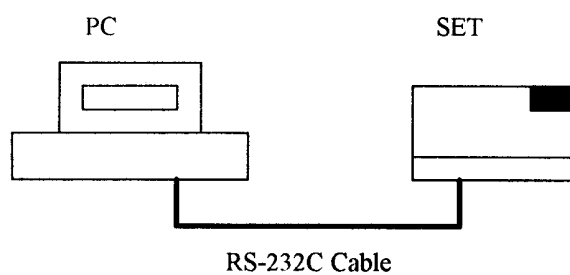


Figure 3-1. Interface Configuration

3-1-2 Cable Specifications

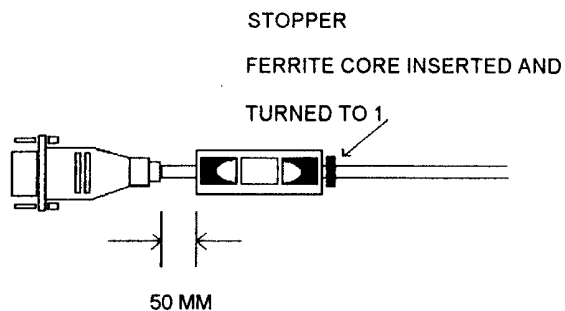


Figure 3-2 Cable for Serial Port

3-1-3 Keyboard Installation

WARNING: When connecting the keyboard to the Main PCB, make sure the membrane sheet is shaped as in Figure 3-3 (a), below. If the membrane is shaped as in Figure 3-3 (b), the keyboard may malfunction.

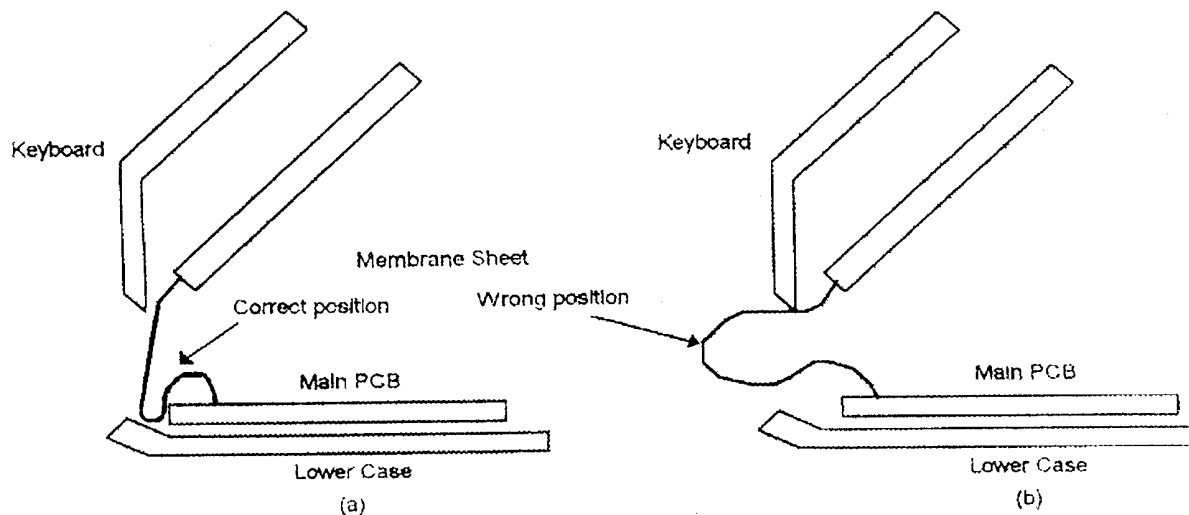


Figure 3-3. Membrane Shape

3-1-4 Ribbon Cassette Installation

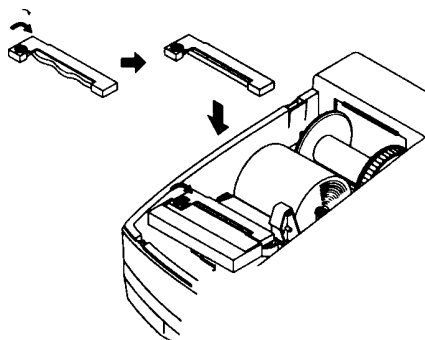


Figure 3-4. Ribbon Cassette

1. Before inserting the ribbon cassette, turn the knob (see Figure 3-4) clockwise to prevent twisting the ribbon.
2. Insert the ribbon cassette as shown in Figure 3-6. Pay particular attention to the placement of the ribbon behind the Print Head.
3. After inserting the ribbon cassette, turn the knob clockwise again to make sure the ribbon moves freely in the cassette.

3-1-5 Receipt Paper Insertion

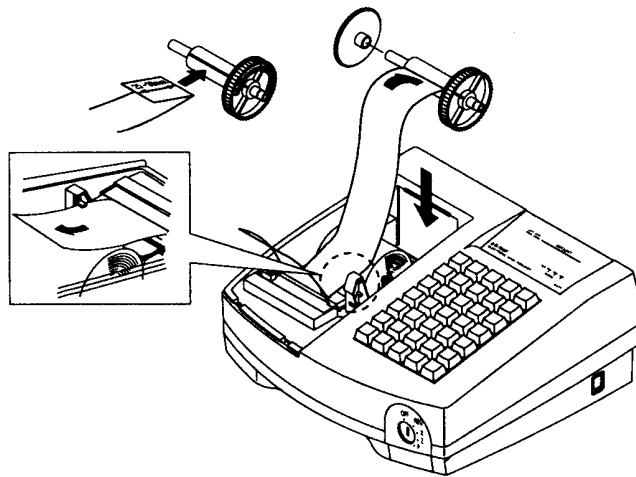


Figure 3-5. Preparing Paper for Insertion and Inserting the Paper

1. Using a new roll of paper, unroll the paper and cut the end as shown in Figure 3-5.
2. Place rolled paper in the Paper Holder. Insert the folded paper into the Paper Slot and through the Paper Sensor.
3. Press the Feed key (or turn the manual knob clockwise) until the paper comes out from the Printer.
4. Insert the paper in the notch in the Rewind Spindle as shown in Figure 3-5. Wind the Spindle three or four times to secure the paper on it.
5. If the paper is loose, wind the Rewind Spindle to tighten the paper.

3-2 Battery (Lead-Calcium) Installation

3-2-1 Battery Specification

1. Specification : DC12V 2.2AH
2. Charging Volt. : 13.75V
3. Charging Time : 10 HR min (at rating voltage)
4. Charging Current : 0.66A max.
5. Operating Time (at 25 °C)
 - 1)Continuous Printing : 3.5HR
 - 2)Stand-by : 15HR

3-2-2 Replacement

1. Turn the power s/w off. And then unplug the adaptor.
2. Unpack the screw on the cover of battery.
And then disconnect battery wire.
3. Replace to new battery in the battery holder.
And then connect battery wire correctly.

(RED : + , BLACK : -)

*** Pay particular attention to the replacement of battery.**

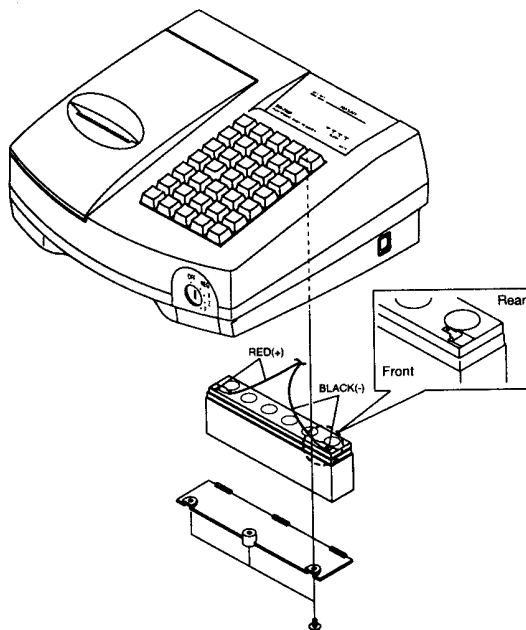


Figure 3-6. Battery Replacement

3-2-3 Charging & Handling Precaution

3-2-3(A) Charging

1. Always charge batteries in an open, well-ventilated area.
2. Do not charge batteries near equipment which may produce sparks.
3. Do not charge near an open flame.
4. Do not use smoking materials in battery charging area.
5. Electrolysis may cause hydrogen and oxygen to be released toward the end of a charging cycle or in the event the battery is overcharged.

3-2-3(B) Handling

1. Never place or dispose of the battery near or in a fire.
2. Never short the terminals.
3. Never disassemble the battery.
4. Never clean ABS battery cases with organic solvents.
5. Valve Regulated Lead Acid(VRLA) batteries contain diluted sulfuric acid.

In the event of contact to skin or clothing, thoroughly rinse the contact area with water.

If acid should come in contact with the eyes or mucous membrane, flush generously with water and seek medical attention.

3-3 Operation

Do the following steps to prepare the ECR for use.

Note: Before using this Electronic Cash Register (ECR) for the first time, leave it powered ON in the "REG" mode for at least twenty-four hours. This allows the Ni-Cad battery to fully charge, so that it can maintain the ECR's memory while the power is OFF.

3-3-1 Mode Switch

The position of the Mode Switch determines the action of the ECR. The modes are as shown in Table 3-1, below.

Table 3-1. ECR Modes

Mode	Function
VOID(VD)	Cancel operation
OFF(OFF)	Operation stop
REGISTER(REG)	Sales operation
MANAGER(X)	X-level report generation
CLEAR TOTALS(Z)	Z-level report generation
PROGRAM(P)	Program mode
SERVICE MODE(S)	Manager control

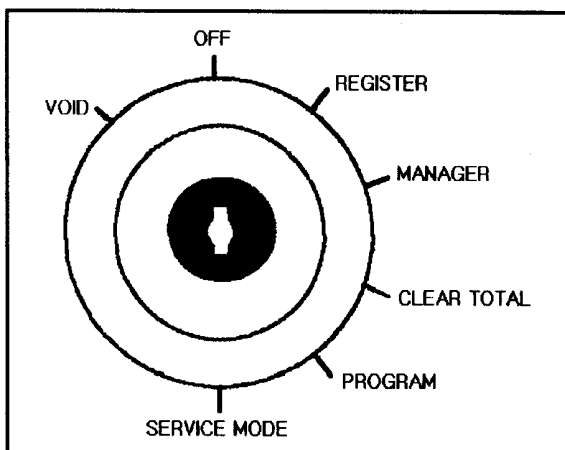


Figure 3-7. Mode Switch

3-3-2 Initial Clear

The Initial Clear procedure clears keyboard lock-ups and clears most error conditions. This procedure finishes the current transaction/ operation and clears the temporary memory buffers. An Initial Clear does not affect register programming, nor does it erase totals previously stored in RAM memory.

PROCEDURE

1. Turn the Mode key to the SERVICE MODE position.
2. Turn on power S/W while pressing the "00" key (All clear s/w , CN8 : ON)
3. After clearing all RAM memory, the register prints the following line:

INITIAL RAM ALL CLEAR

Caution: An Initial Clear causes balancing discrepancies if it is performed while in the middle of a transaction.

3-3-3 Service Mode Diagnostics

The Samsung ER-700, -700P, -700F, -700FP, -700RF ECRs offer several diagnostic routines while in the "Program Mode." Each of these tests requires that the Mode key be in the "Program Mode" position.

3 Operating Instructions and Installation

3-3-3 (A) PRINTER/DISPLAY TEST

PROCEDURE

1. Type #/NS in Program Mode. The register cycles completely through the printer character set while it tests the display.

3-3-3 (B) KEYBOARD TEST

PROCEDURE

1. Press the 2 key 4 times, and then press the **CHARGE** key in Program Mode.
2. After step 1, press each key on the keyboard, one key at a time. As you press each key, the display shows the key's location code(Except for C key)
3. Press the C key to exit the routine.

3-3-3 (C) MODE KEY TEST

PROCEDURE

1. Press the 3 key 4 times, and then press the **CHARGE** key.
2. Rotate the Mode key from SERVICE mode to VOID mode.
3. Each mode position displays its code.

3-3-3 (D) FISCAL MEMORY TEST

PROCEDURE

1. The Fiscal Memory test requires that the Mode Key be in the SERVICE MODE position.
2. Press the 1 (2 or 3) key ,and then press the **CHARGE** key. The printer prints(on a receipt) the FISCAL EPROM checksum data in the format shown beside: **FISCAL CHECK SUM = XXXX**

3-3-3(E) INTERFACE TEST

PROCEDURE

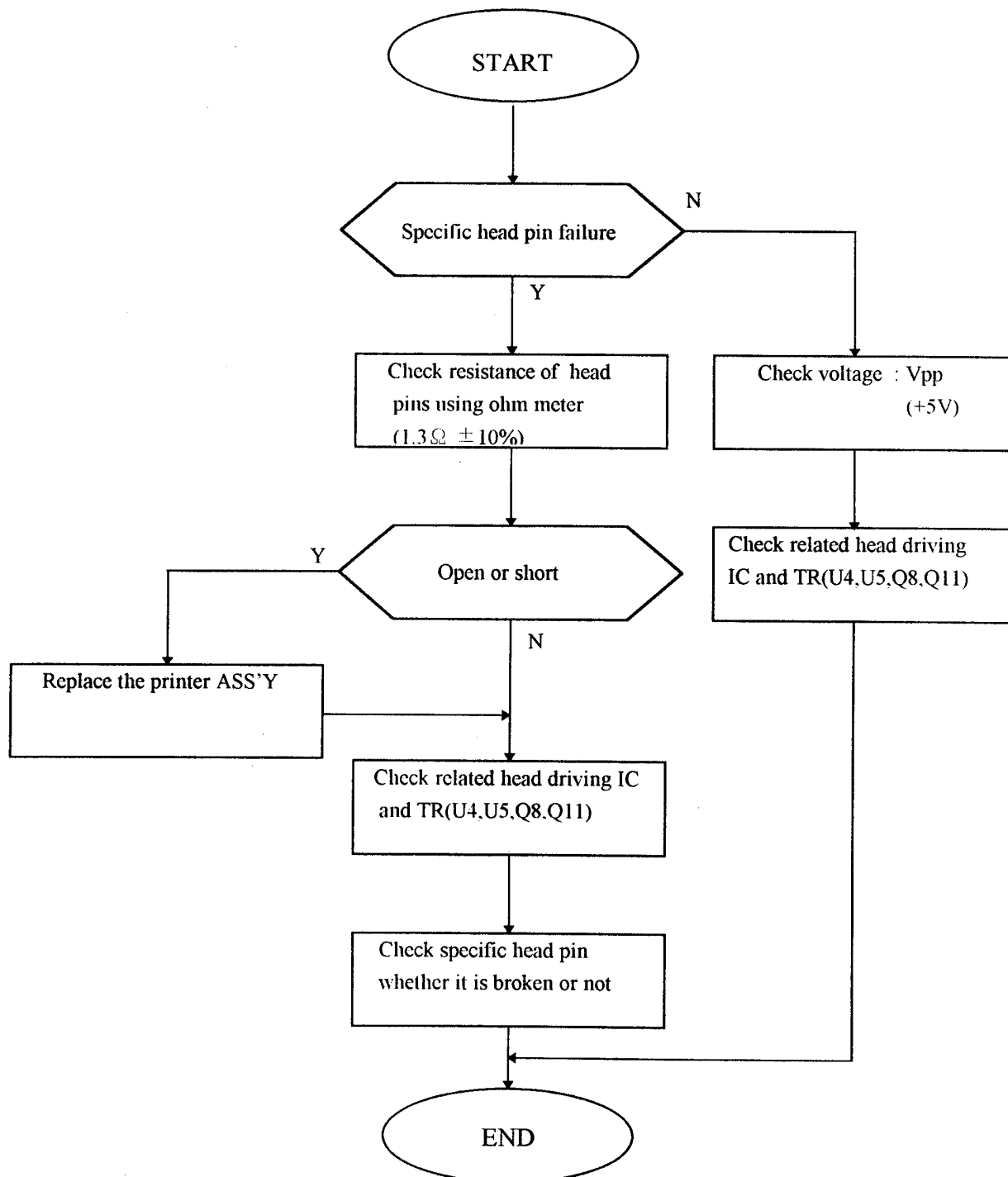
1. Make a short circuit NO.2 and NO.3 of the interface connector with a wire.
2. Press the "1000" key ,and then press the **CANCEL** key.
3. If the interface functions, the display will show **PASS**.

4 Troubleshooting

4-1 Flow chart

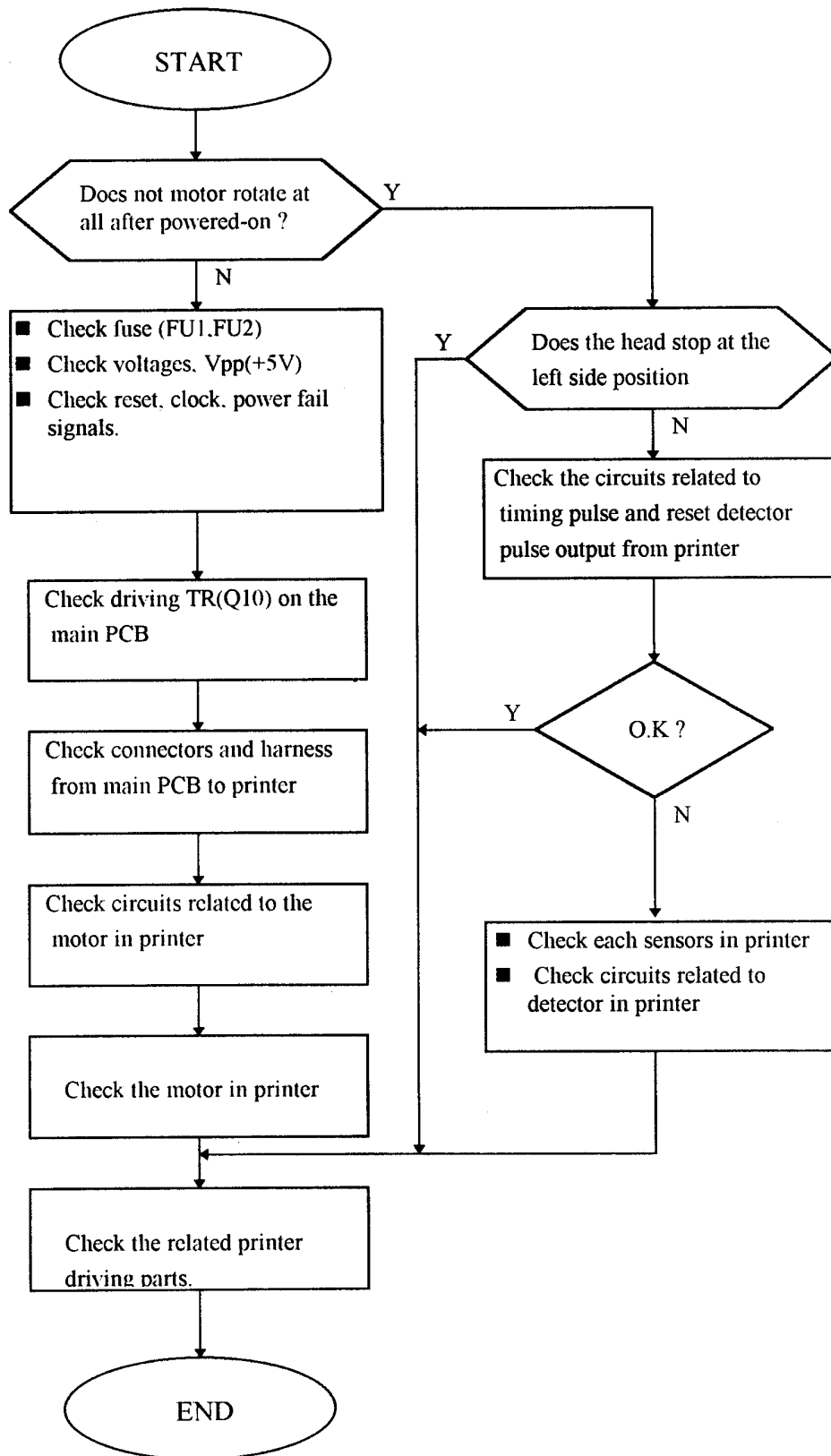
4-1-1 Printer problem 1

Head failure



4-1-2 Printer problem 2

Printer failure (Motor/Reset/Timing pulse)

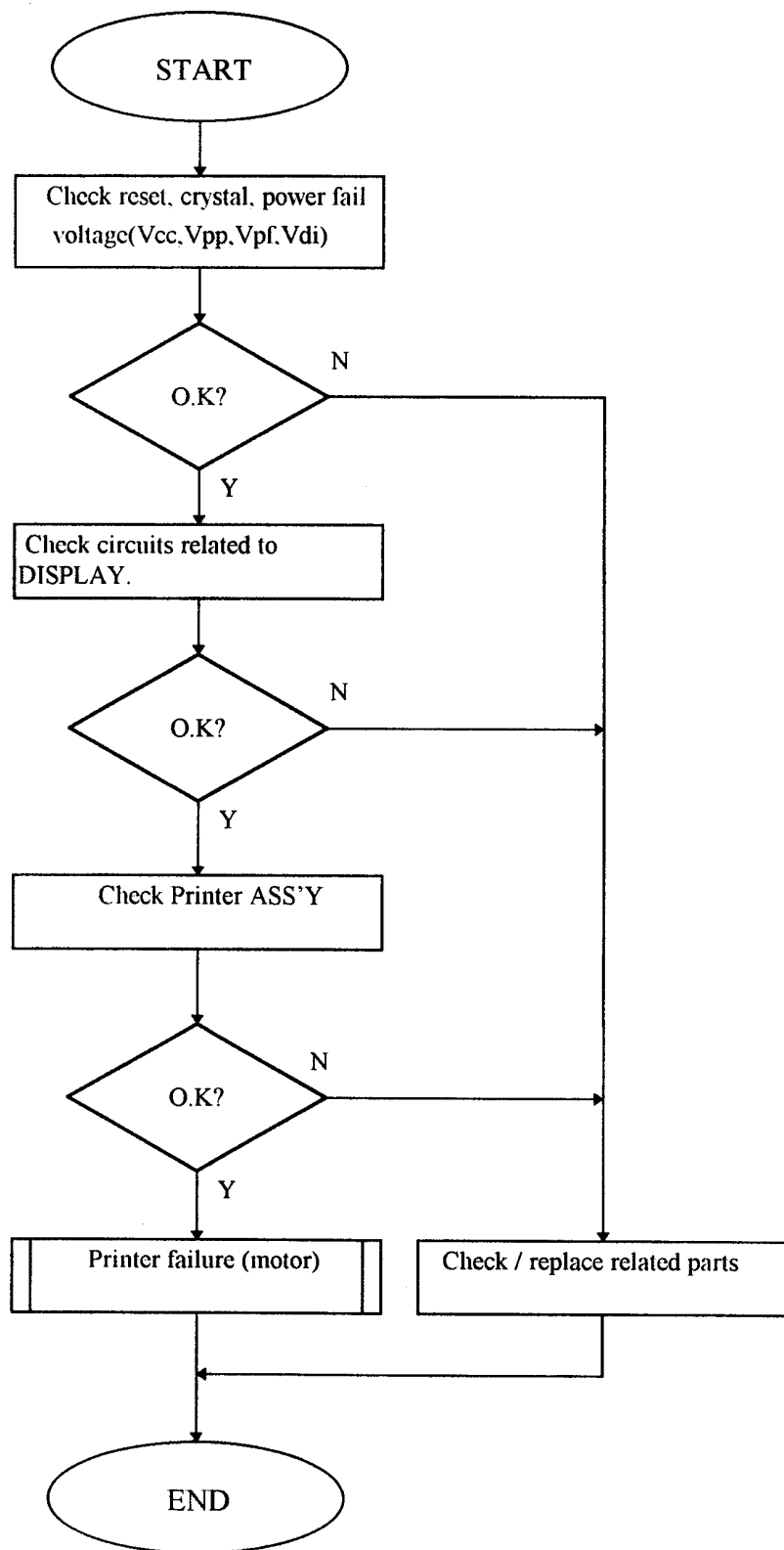


4-1-3 System problem

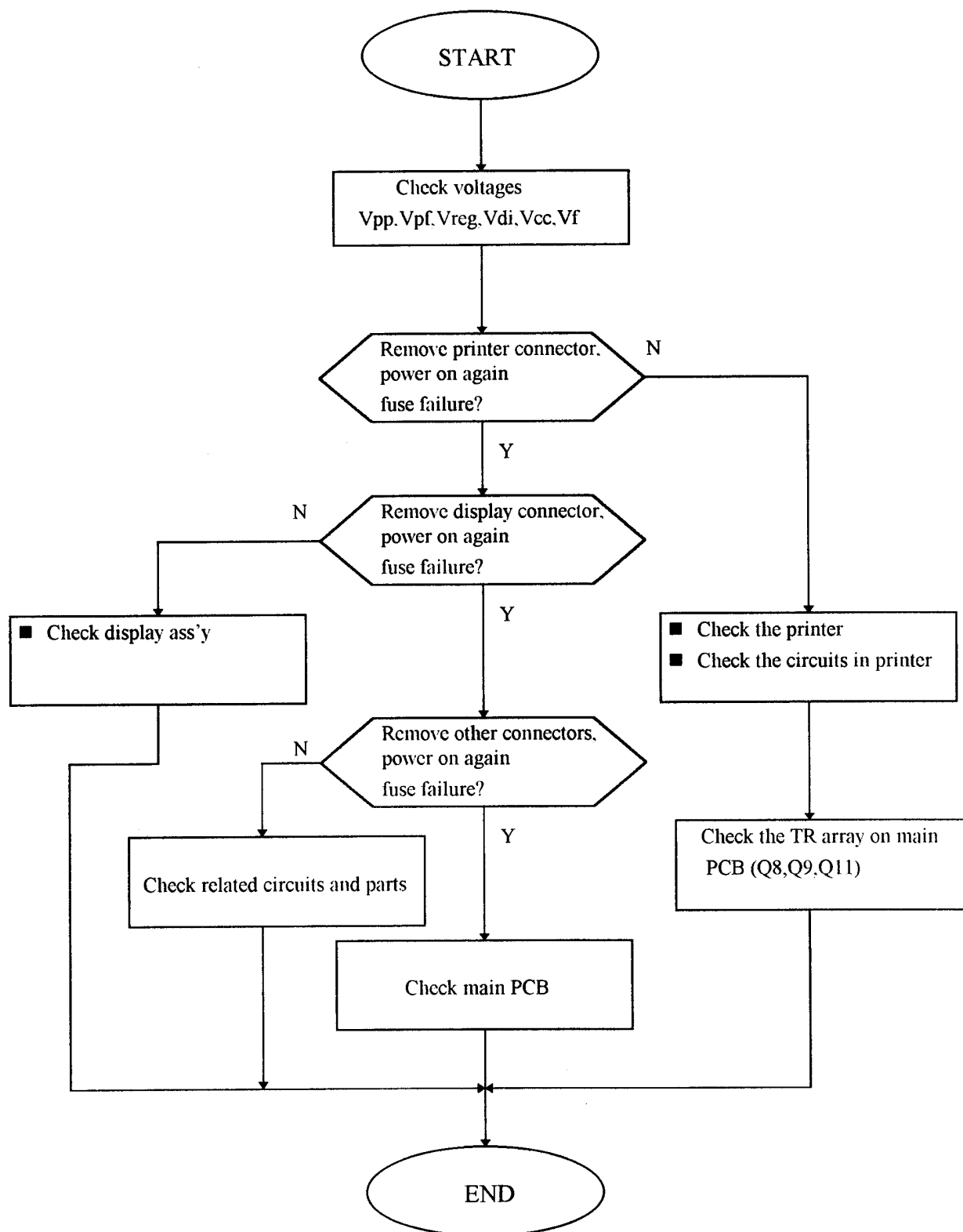
Initial failure

Printer motor will initiate only if the DISPLAY check is O.K

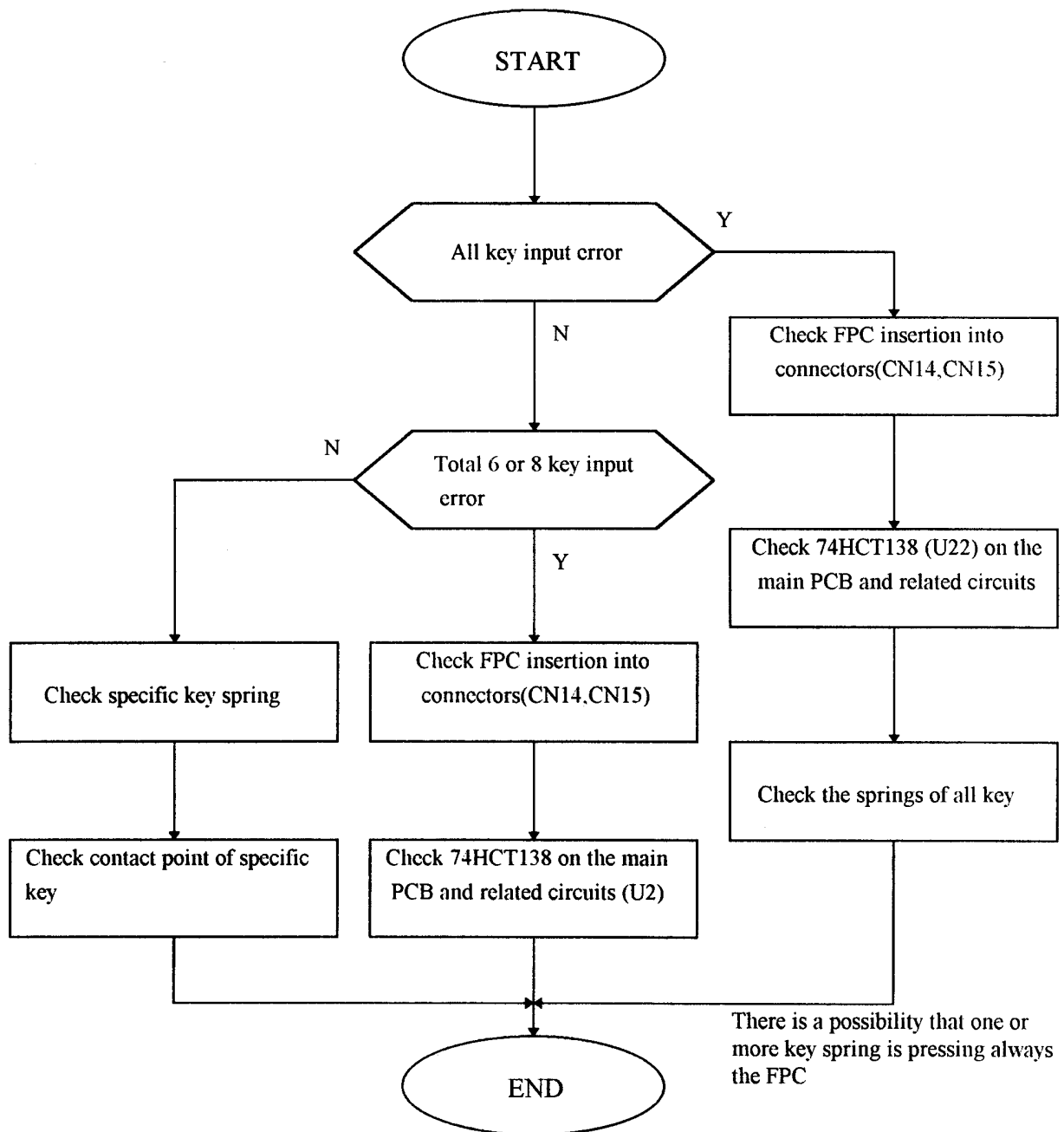
Refer to the printer problem 2



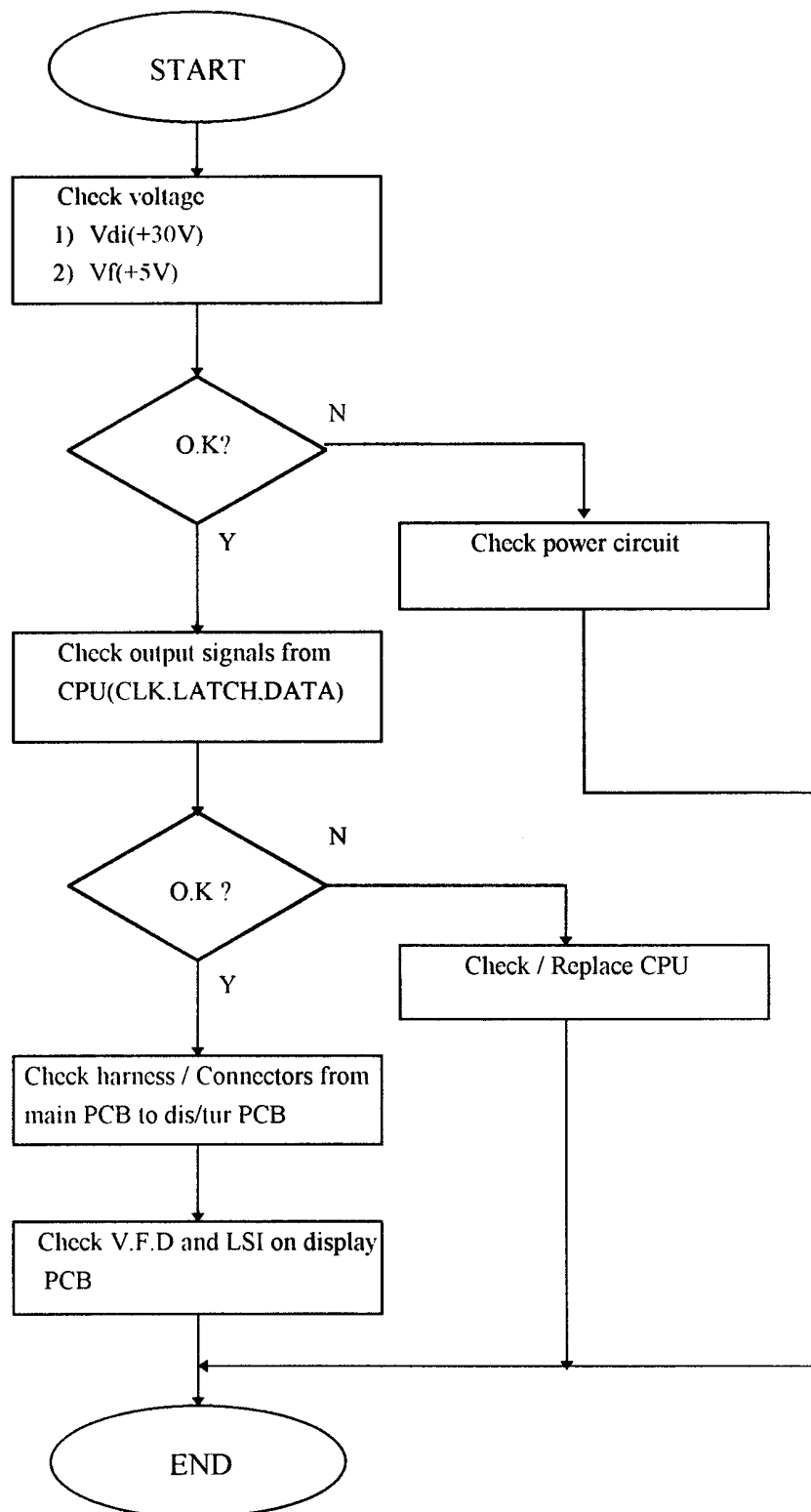
Fuse failure



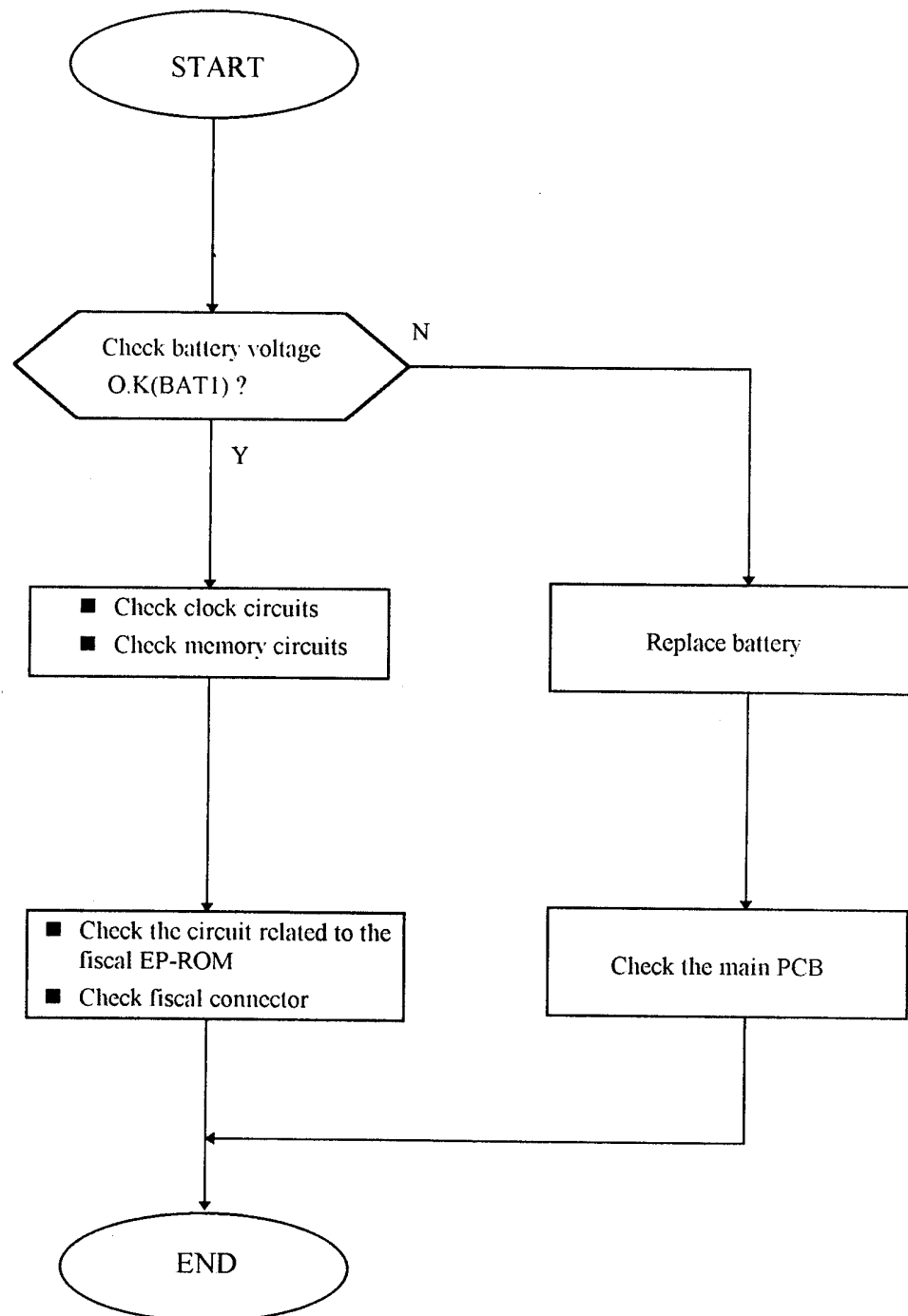
Key input failure



Display/Turret failure

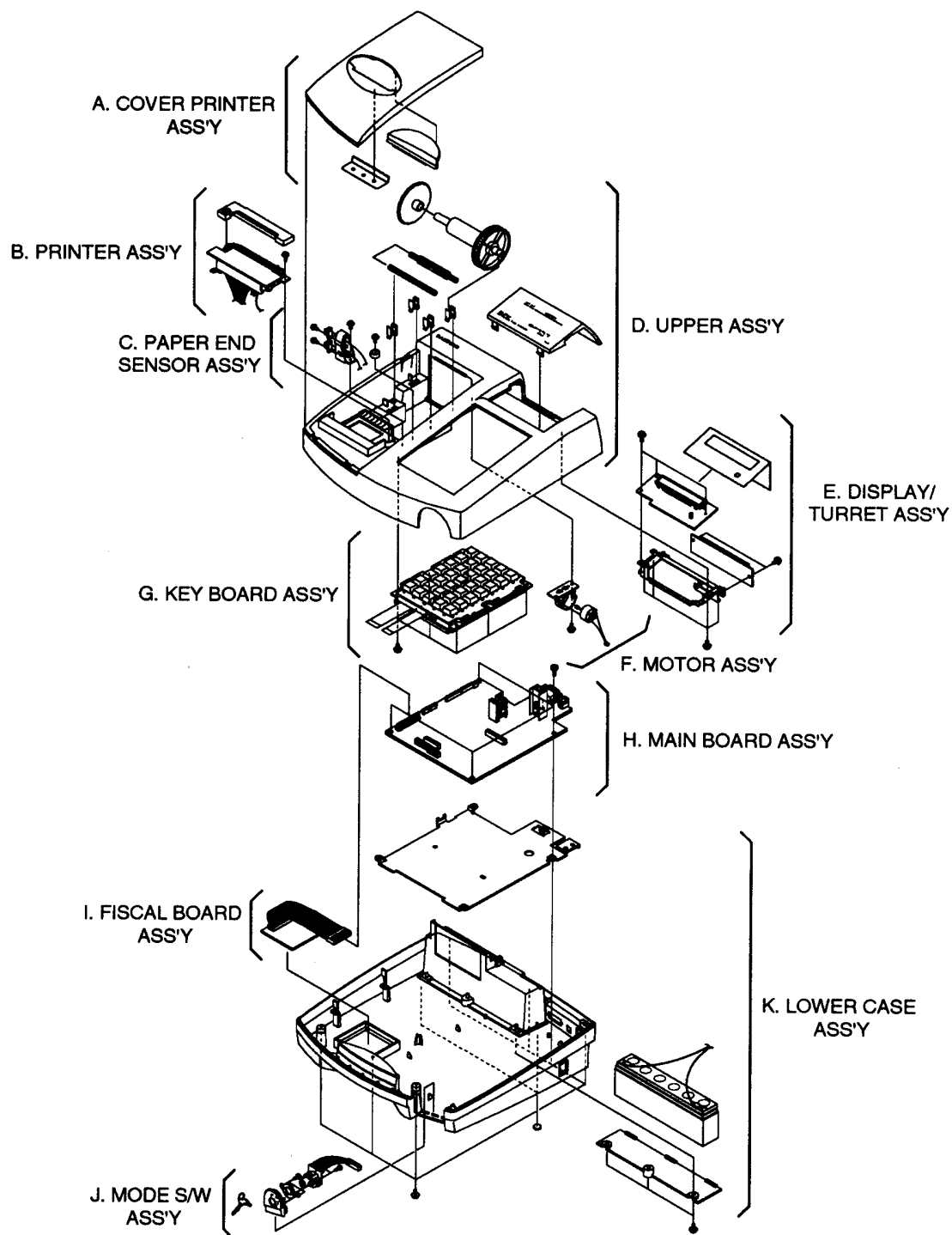


Clock / memory / fiscal data failure



5. Exploded Views and Parts Lists

5-1. Assembly Exploded Views

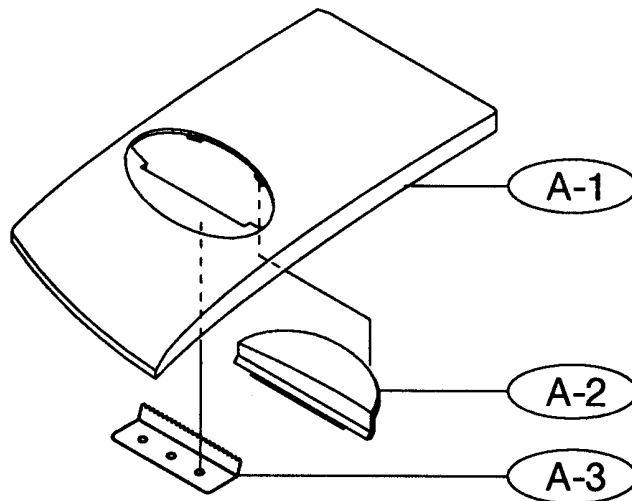


5 Exploded Views and Parts List

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
A	JK97-01028A	COVER PRINTER ASS'Y	1		Y
B	JK96-01003A	PRINTER ASS'Y	1		N
C	JK96-01005A	PAPER/END SENSOR ASS'Y→1EA	1		Y
	JK96-01006A	PAPER/END SENSOR ASS'Y→2EA	1		Y
D	JK97-01017A	UPPER CASE ASS'Y	1		N
E	JK96-00987A	DISPLAY ASS'Y	1		Y
	JK96-00988A	TURRET ASS'Y	1		Y
F	JK96-00185A	MOTOR ASS'Y	1		Y
G	JK96-00999A	KEY BOARD ASS'Y	1		N
H	JK92-01050A	MAIN PCB ASS'Y	1		Y
I	JK92-00131A	FISCAL ASS'Y	1		Y
J	JK97-01000A	COVER MODE S/W ASS'Y	1		N
K	JK97-01019A	LOWER CASE ASS'Y	1		N

* RANK : Y = Replaceable item at service, N = Not a replaceable item at service

5-2 Cover Printer Assembly



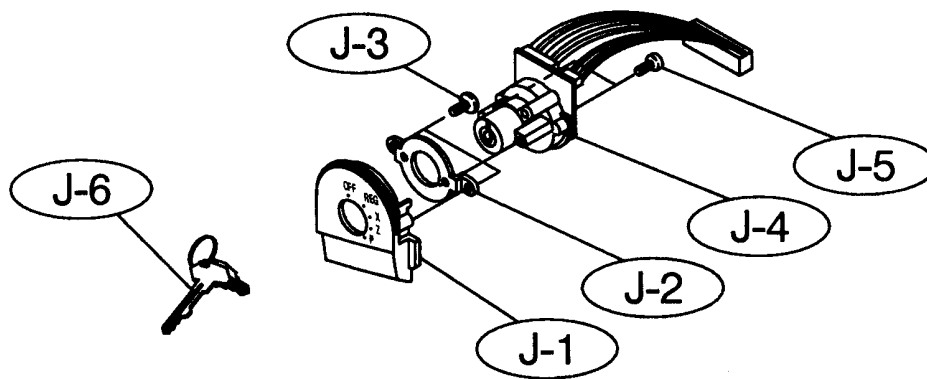
5 Exploded Views and Parts List

(COVER PRINTER ASS'Y PART LIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
A-1	JK72-40968A	COVER PRINTER,ABS,HB	1		Y
A-2	JK72-40979A	WINDOW JOURNAL,PMMA,TRP	1		Y
A-3	JK70-10320A	CUTTER-PAPER,STS304,T0.3	1		Y

Note: * RANK: Y = Serviceable, N = Not serviceable

5-3 Cover Mode Switch Assembly

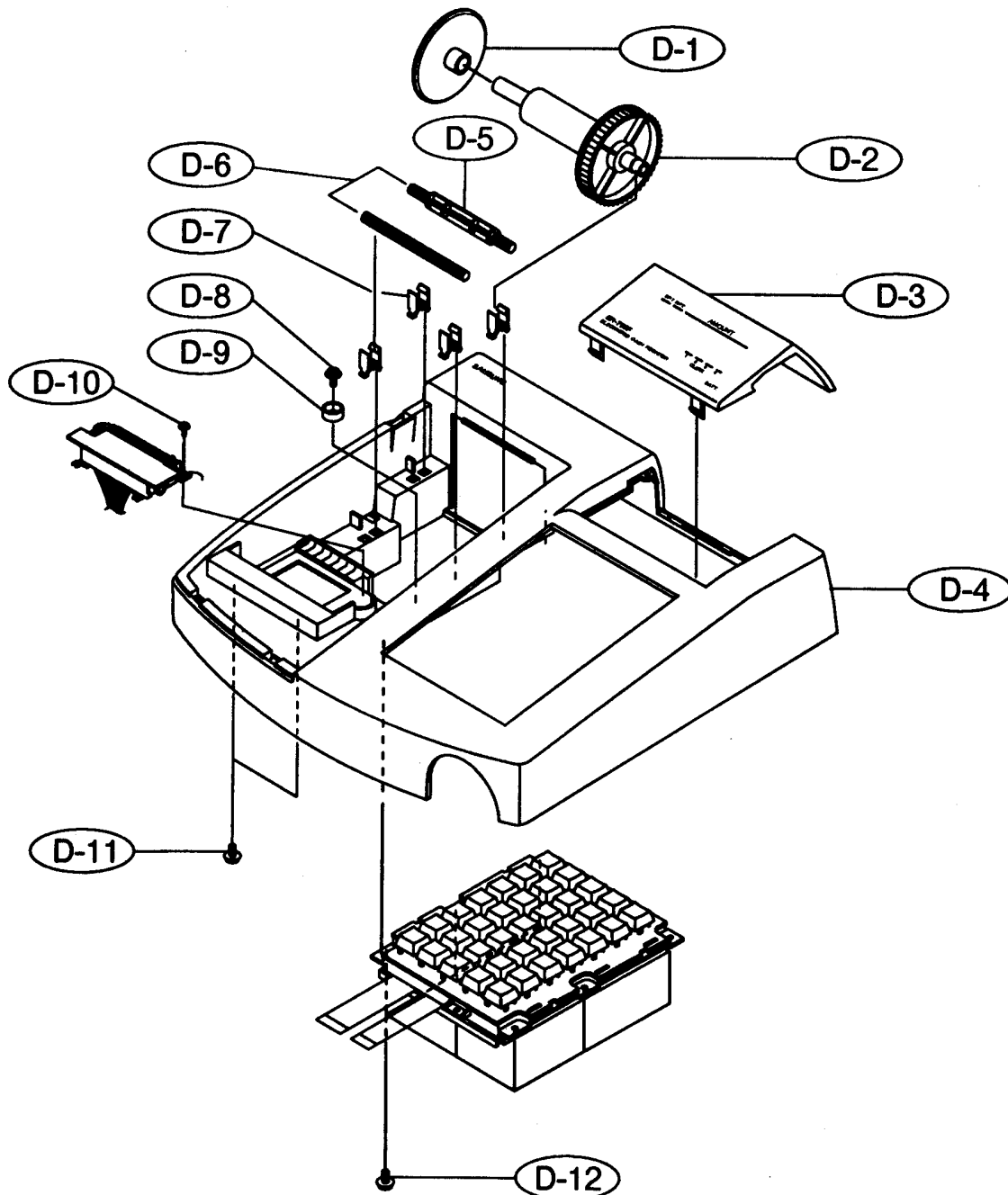


(COVER MODE SWITCH ASS'Y PART LIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
J-1	JK72-40978A	COVER MODE SWITCH,ABS(V0),ER-700	1	ENGLISH	Y
	JK72-40978B	COVER MODE SWITCH,ABS(V0),ER-700F	1	ENGLISH	Y
	JK72-40990A	COVER MODE SWITCH,ABS(V0),ER-700FR	1	RUSSIAN	Y
J-2	JK70-10004A	IPR-BRKT MODE S/W,SECC,T1.0	1	ER-350	Y
J-3	6002-000175	SCREW-TAPPING,PWH,M3,L8	2		Y
J-4	3406-000116	SWITCH ROTARY,12V30mA,ST9T	1		Y
J-5	6002-000319	SCREW-TAPPING,PH,M3,L8	2		Y
J-6	JK64-40202A	DOOR KEY-MODE/ECR:SPCC,REG,Z,P,C	1		Y
	JK64-40206A	DOOR KEY-MODE/ECR:SPCC,VD,REG,Z,P,C	1		Y
	JK70-10302A	IPR-KEY MODE/Z,T1.2	2	ER-700/700F	Y
	JK70-10303A	IPR-KEY MODE/C,T1.2	2	ER-700/700F	Y
	3406-000165	IPR-KEY MODE/VD,T1.2	2	ER-700	Y
	3406-000166	IPR-KEY MODE/P,T1.2	2	ER-700/700F	Y
	3406-000167	IPR-KEY MODE/REG,T1.2	2	ER-700/700F	Y

Note: * RANK: Y = Serviceable, N = Not serviceable

5-4 Upper Case Assembly

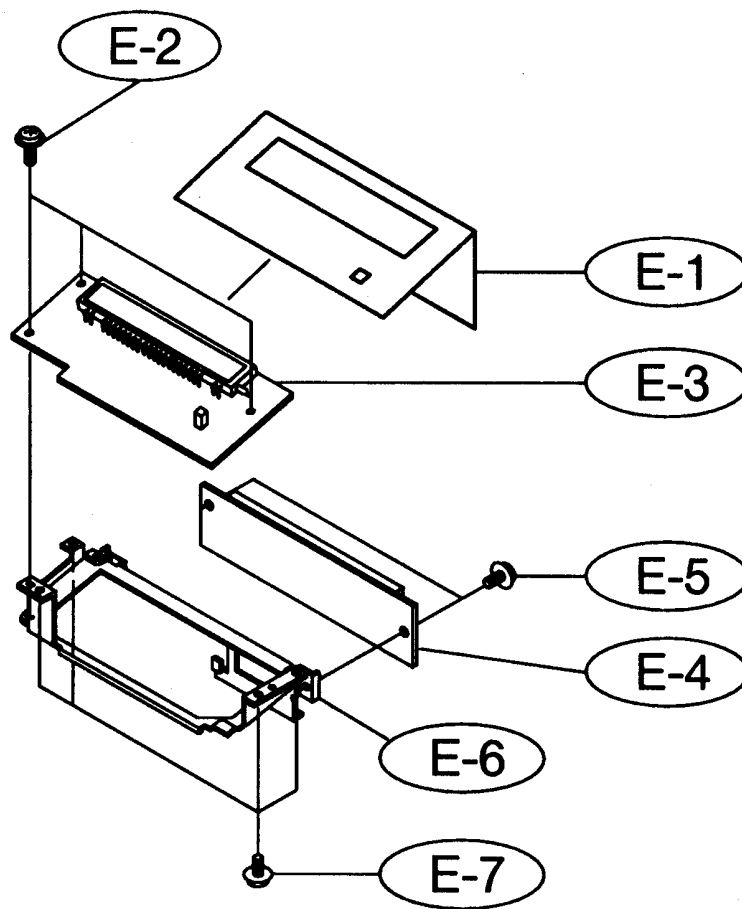


(UPPER CASE ASS'Y PART LIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
D-1	JK72-40972A	GUIDE WINDING,POM,BLK	1		Y
D-2	JK72-40971A	SPOOL WINDING,POM,BLK	1		Y
D-3-1	JK72-40999A	W/DISPLAY,BL06,ER-700,ENG	1	TURRET (NO)	Y
	JK72-40999B	W/DISPLAY,BL06,ER-700F,ENG	1	TURRET (NO)	Y
D-3-2	JK72-41000A	W/DISPLAY(R),BL06,ER-700,ENG	1	TURRET (YES)	Y
	JK72-41000B	W/DISPLAY(R),BL06,ER-700F,ENG	1	TURRET (YES)	Y
	JK72-41000C	W/DISPLAY(R),BL06,ER-700FR,ENG	1	TURRET (YES)	Y
D-4	JK72-40966A	CASE UPPER,ABS,V0,IV16,HB	1		Y
D-5	JK72-40973A	SHAFT PAPER(L),POM,BLK	1		Y
D-6	JK72-40974A	SHAFT PAPER(S),POM,BLK	1		Y
D-7	JK72-40976A	SHAFT-LOCK,POM,BLK	4		Y
D-8	6002-000271	SCREW-TAPPING,FH,M3,L12	1		Y
D-9	JK70-40304B	SHAFT-MOLDING,SUM24L,D19	1	ER-700F	Y
D-10	6003-000110	SCREW-TAPTITE,BH,M2.6,L8	1	C/UPPER+PRT ASSY	Y
D-11	6003-000110	SCREW-TAPTITE,BH,M2.6,L8	2	C/UPPER+PRT ASSY	Y
D-12	6002-00174	SCREW-TAPPING,PWH,M3,L10	7	C/UPPER+KBD	Y

Note:* RANK: Y = Serviceable, N = Not serviceable

5-5 Display/Turret Assembly

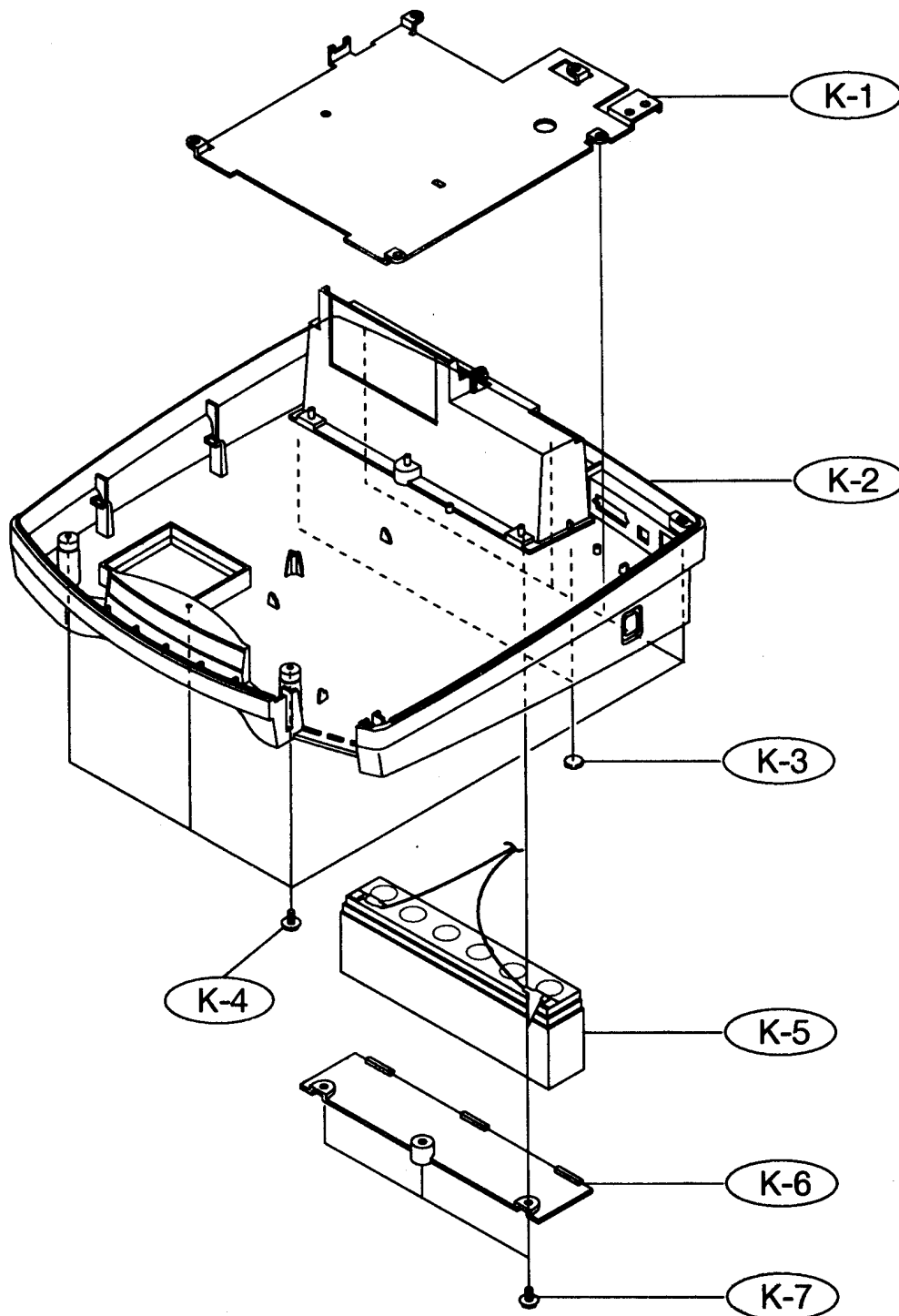


(DISPLAY/TURRET ASS'Y PART LIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
E-1	JK68-10918A	COVER SHEET,PE 0.05,BLK,127.5*122.5	1		Y
E-2	6002-000175	SCREW-TAPPING,PWH,M3,L8	3		Y
E-3	JK96-00987A	DISPLAY BOARD ASS'Y	1		Y
E-4	JK96-00988A	TURRET BOARD ASS'Y	1		Y
E-5	6002-000175	SCREW-TAPPING,PWH,M3,L8	2		Y
E-6	JK70-10942A	BRACKET DISPLAY,SECC,T1.0	1		Y
E-7	6002-000174	SCREW-TAPPING,PWH,M3,L10	4		Y

Note:* RANK: Y = Serviceable, N = Not serviceable

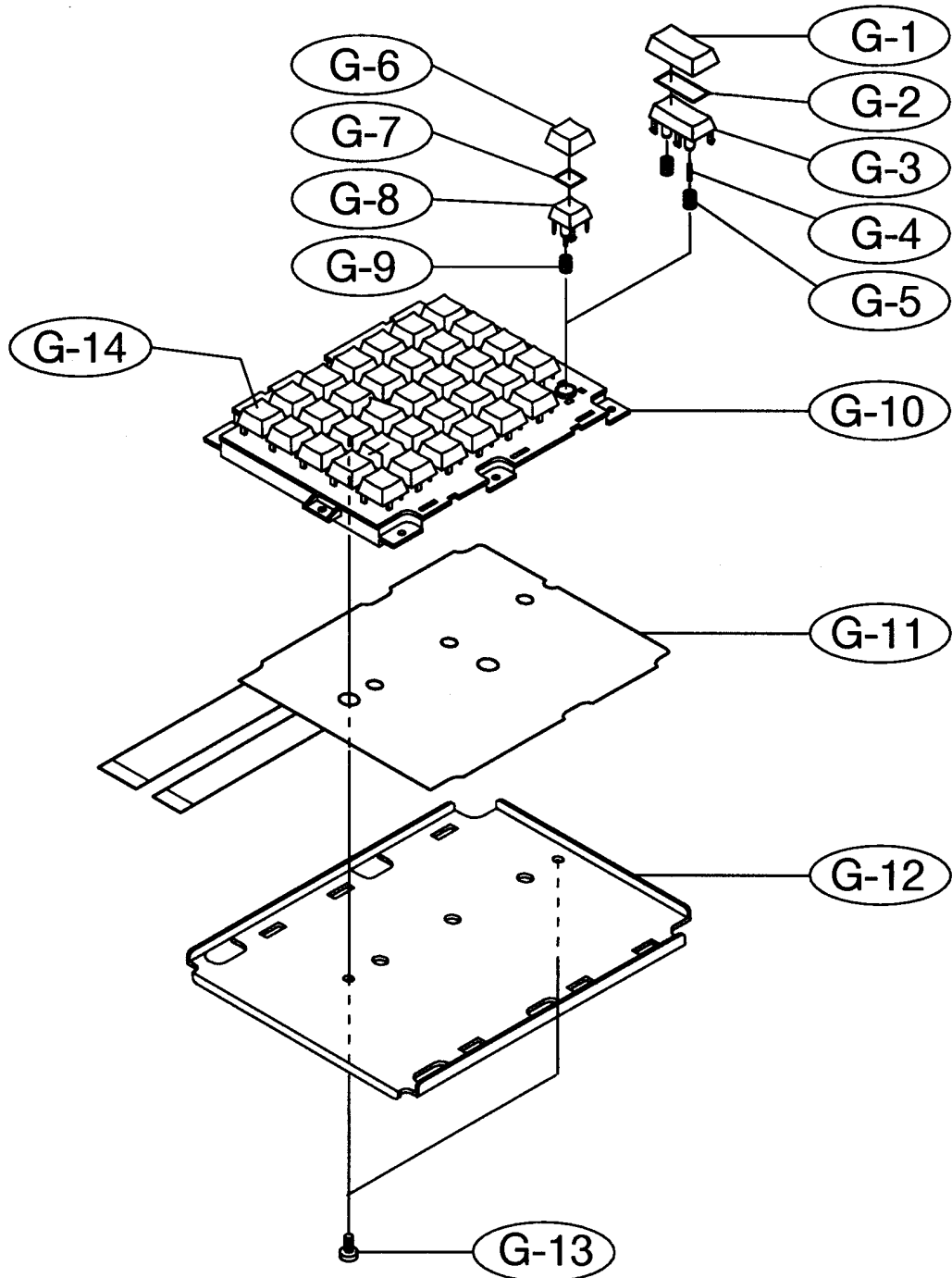
5-6 Lower Case Assembly



NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
K-1	JK70-10944A	IPR-BRACKET GROUND,SECC,T1.0	1		Y
K-2	JK72-40967A	CASE LOWER,ABS,IV0,IV16,HB,ER-700	1		Y
K-3	JK61-40902A	FOOT RUBBER,T3.5,BLK,70HB	2	SRP-300	Y
K-4	6002-000175	SCREW-TAPPING,PWH,M3,L8	5		Y
K-5	JK96-00992A	BATTERY,ASS'Y	1		Y
K-6	JK72-40969A	COVER BATTERY,ABS,V0,IV16,HB,ER-700	1		Y
K-7	6002-000174	SCREW-TAPPING,PWH,M3,L10	3		Y

Note: * RANK: Y = Serviceable, N = Not serviceable

5-7 Keyboard Assembly

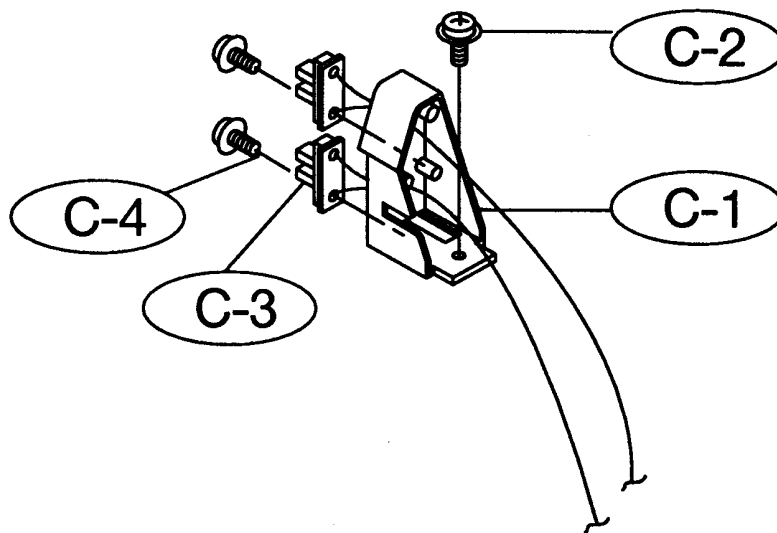


(KEY BOARD ASS'Y PART LIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
G	JK59-10533A	ER-700,KEY BOARD,35KEY,ENG	1	ENGLISH	Y
	JK59-10533B	ER-700,KEY BOARD,35KEY,RUSSIAN	1	RUSSIAN	Y
G-1	JK81-10946Q	AS-KEY/CAP,L,1*2	-		Y
G-2	-	LABEL KEY TOP SET,1*2	-		Y
G-3	JK81-10285R	AS-KEY/TOP,L,1*2	-		Y
G-4	JK81-10286B	SPRING-CONTACT	35		Y
G-5	JK81-10285T	SPRING RETURN 1*2	-		Y
G-6	JK81-10285P	AS-KEY/CAP,S,1*1	23		Y
G-7	-	LABEL KEY TOP SET,1*1	-		Y
G-8	JK81-10285S	AS-KEY/TOP,S,1*1	23		Y
G-9	JK81-10285T	SPRING RETURN 1*1	35		Y
G-10	JK72-40980A	KBD HOUSING,POM,BLK,HB,ER-700	1		Y
G-11	JK81-11148A	FPC(A/B) ASS'Y,ER-700	1		Y
G-12	JK70-10943A	KBD FRAME,ER-700,SECC,T0.8	1		Y
G-13	6002-00175	SCREW-TAPPING,BH,M3,L8	1		Y
G-14	JK81-10933A	COVER-KEY TOP,1:ABS	1		Y
	JK81-10934A	COVER-KEY TOP,2:ABS	1		Y
	JK81-10935A	COVER-KEY TOP,3:ABS	1		Y
	JK81-10936A	COVER-KEY TOP,4:ABS	1		Y
	JK81-10937A	COVER-KEY TOP,5:ABS	1		Y
	JK81-10938A	COVER-KEY TOP,6:ABS	1		Y
	JK81-10939A	COVER-KEY TOP,7:ABS	1		Y
	JK81-10940A	COVER-KEY TOP,8:ABS	1		Y
	JK81-10941A	COVER-KEY TOP,9:ABS	1		Y
	JK81-10942A	COVER-KEY TOP,0:ABS	1		Y
	JK81-10943A	COVER-KEY TOP,00:ABS	1		Y
	JK81-10944A	COVER-KEY TOP, . ,ABS	1		Y

Note:* RANK: Y = Serviceable, N = Not serviceable

5-8 Paper/End Sensor Assembly



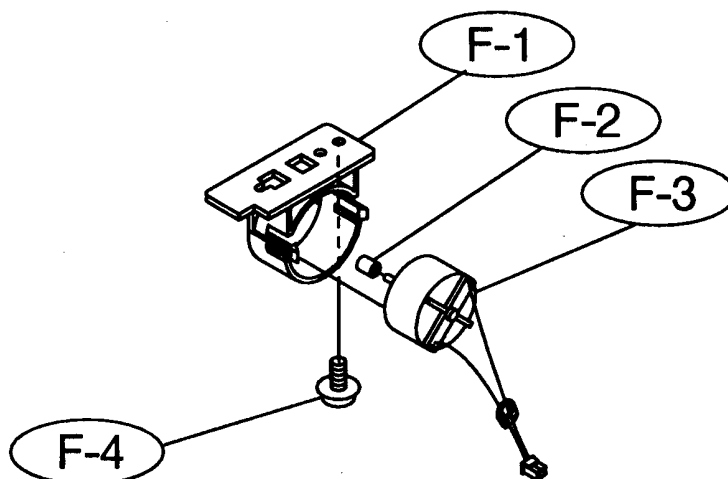
5 Exploded Views and Parts List

(P/END SENSOR ASS'Y PARTLIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
C-1	JK72-40977A	HOLDER SENSOR,ABS,IVR(C7425),HB	1		Y
C-2	6002-000174	SCREW-TAPPING,PWH,M3,L10	1		Y
C-3	0604-000157	PHOTO-INTERRUPTER	1		Y
	JK39-40003A	CBF-HARNESS;ER-350,UL1007,400mm	1		Y
	JK41-10304D	PCB-SUB;ER-250F(SENSOR),FR-1	1		Y
C-4	6002-000174	SCREW-TAPPING,PWH,M3,L10	2		Y

Note: * RANK: Y = Serviceable, N = Not serviceable

5-9 Motor Assembly



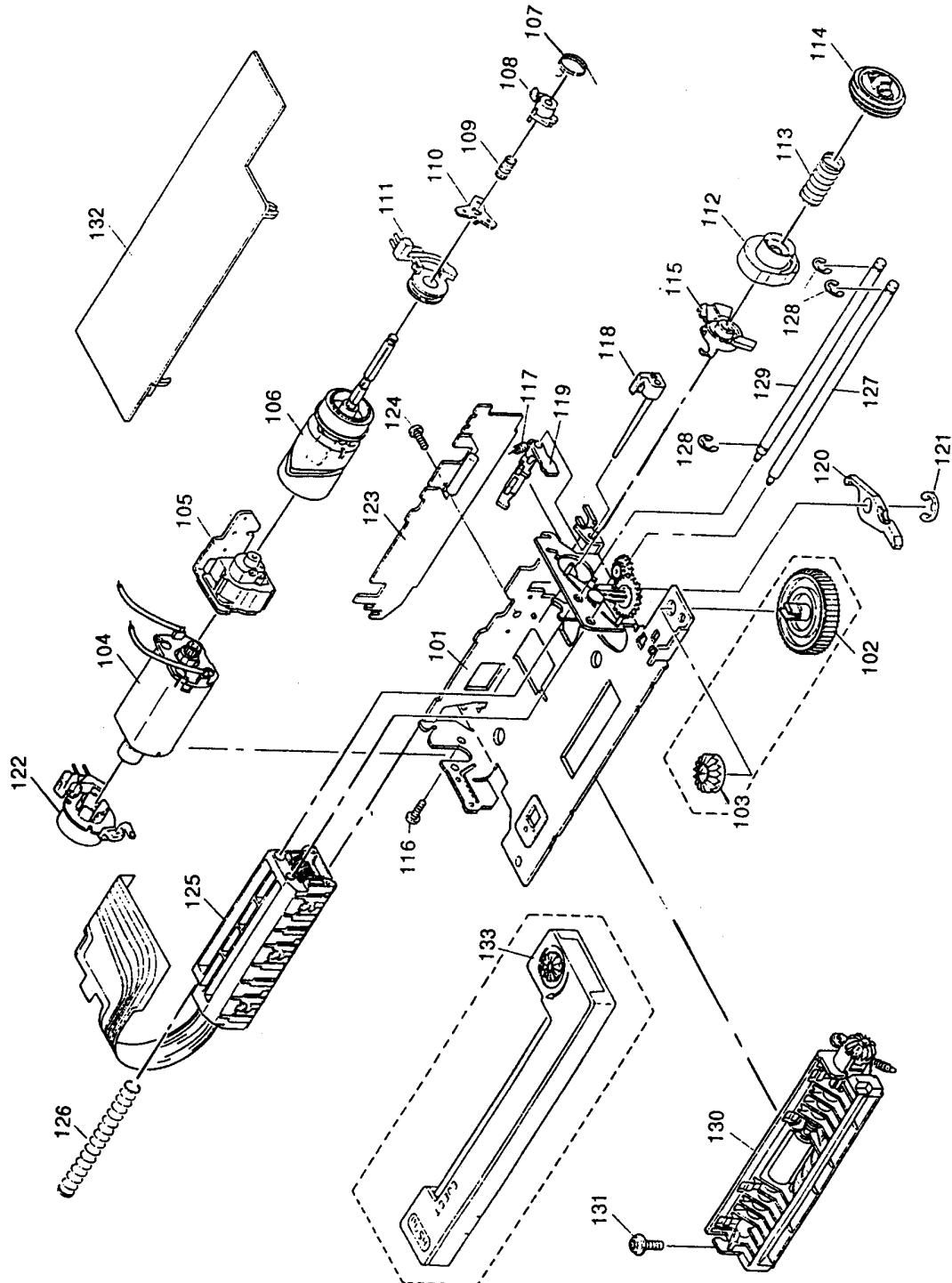
(MOTOR ASS'Y PARTLIST)

NO.	CODE NO.	DESCRIPTION/SPECIFICATION	Q'TY	REMARK	RANK
F-1	JK72-40975A	HOLDER MORTOR,ABS,IVR(C7425),HB	1		Y
F-2	JK73-30200A	RCT-MOTOR,URETAN,BLK	1		Y
F-3	3101-001071	MOTOR-DC;3270rpm,16g,9V,130mA	1		N
	JK39-40526A	CBF-HARNESS-MOTOR;FLAT,UL1007,180mm	1		Y
F-4	6002-000174	SCREW-TAPPING,PWH,M3,L10	1		Y

Note:* RANK: Y = Serviceable, N = Not serviceable

5-10 Printer(M-190) Assembly

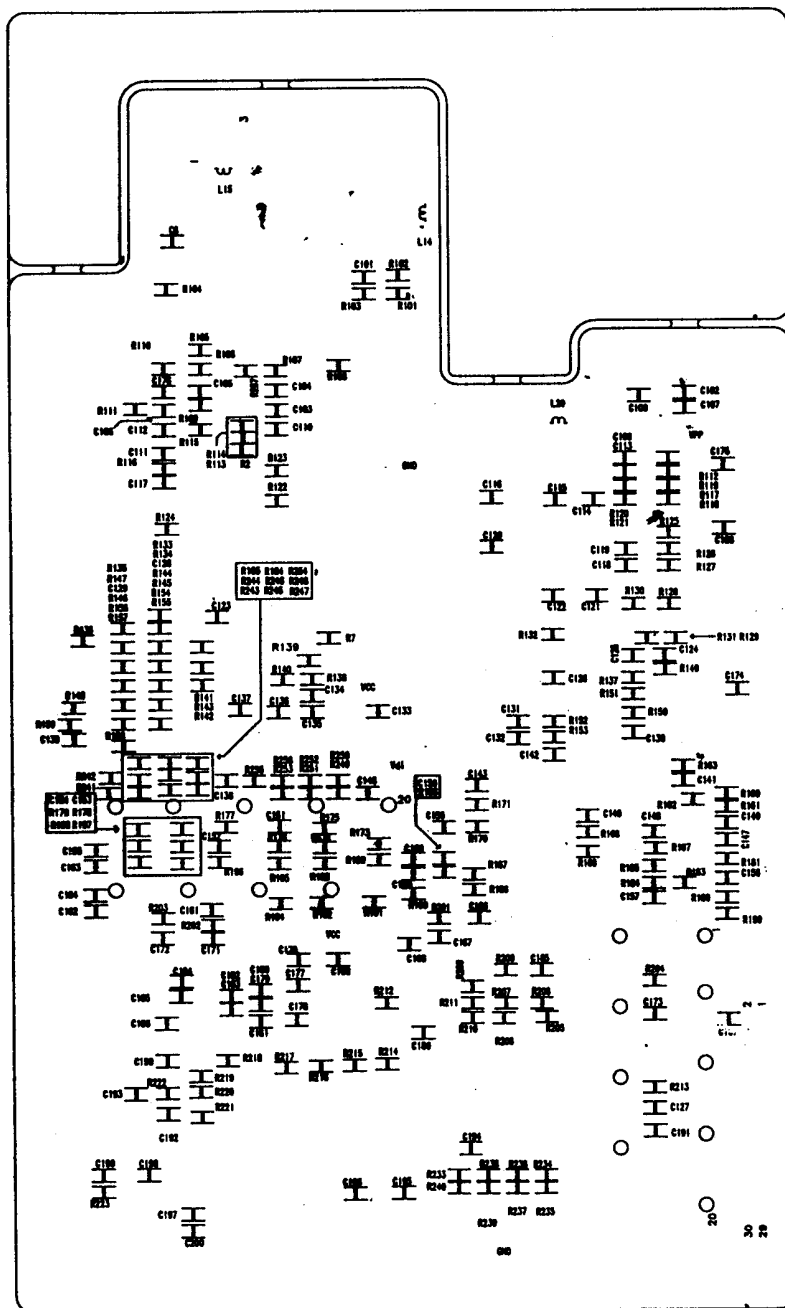
5-10-1 Exploded View



5-10-2 Parts List

NO	SAMSUNG CODE	EPSON CODE	DESCRIPTION/ SPECIFICATION	Q,TY	REMARK	RANK
101	JK81-11116A	1005529	FRAME UNIT	1		Y
102	JK81-11117A	F619001010	MANUAL PAPER FEEDING KNOB	1		Y
103	JK81-11118A	F621005010	KNOB GEAR	1		Y
104	JK81-11119A	2003212	MOTOR UNIT,DC0.65W	1		Y
105	JK81-11120A	1005537	REDUCTION UNIT	1		Y
106	JK81-11121A	1005553	CAM SUBUNIT	1		Y
107	JK81-11122A	F621102010	TRIGGER LEVER SPRING	1		Y
108	JK81-11123A	F621102020	TRIGGER LEVER	1		Y
109	JK81-11124A	F801205110	TRIGGER PLATE SPRING	1		Y
110	JK81-11125A	F801205100	TRIGGER PLATE	1		Y
111	JK81-11126A	F621102030	TRIGGER COIL	1		Y
112	JK81-11127A	F621106010	PAPER FEEDING CAM	1		Y
113	JK81-11128A	F621106020	PAPER FEEDING CAM SPRING	1		Y
114	JK81-11129A	1005525	RIBBON DRIVING GEAR	1		Y
115	JK81-11130A	F62107010	CAM SHAFT HOLDER	1		Y
116	JK81-11131A	B010152911	CPS(M1.6*2.5)	1		Y
117	JK81-11132A	F621108010	FAST FEED LEVER SPRING	1		Y
118	JK81-11133A	F621108020	FAST FEED LEVER SHAFT	1		Y
119	JK81-11134A	F621108030	FAST FEED LEVER	1		Y
120	JK81-11135A	F621109010	RELEASE LEVER	1		Y
121	JK81-11136A	B510350111	RETAINING RING,TYPE-E(2.3)	1		Y
122	JK81-11137A	F621151000	TIMING DETECTOR ASS'Y	1		Y
123	JK81-11138A	1005540	CIBCUIT BOARD ASS'Y	1		Y
124	JK81-11139A	B010152311	C.P SCREW(M1.6*3.5)	1		Y
125	JK81-11140A	1037734	PRINT HEAD UNIT	1		Y
126	JK81-11141A	1005524	RETURN SUPPORT SPRING	1		Y
127	JK81-11142A	F621204020	PRINTER HEAD GUIDE SHAFT P	1		Y
128	JK81-11143A	B150300311	RETAINING RING,TYPE(1.5)	3		Y
129	JK81-11144A	F621204030	PRINTER HEAD GUIDE SHAFT M	1		Y
130	JK81-11145A	1005541	PAPER FEEDING PLATEN UNIT	1		Y
131	JK81-11146A	B040300111	CCSCREW(M2*3)	1		Y
132	JK81-11147A	1005621	PRINTER COVER	1		Y

6-1-2 Main PCB Diagram (Bottom)



6-1-2 Main PCB Parts List

6-1-2(A) MAIN PCB

No.	Specification	Code No	EA	Location No
1	MAIN-B'd ASS'Y, ER-700	JK92-01050A	1	
2	CONN-BOX, 10P	3711-000592	1	CN16
3	CONN-BOX, 8P	3711-001133	1	CN4
4	CONN-NO WALL, 30P	3711-001962	1	CN12
5	CONN-BOX, 11P	3711-000631	1	CN9
6	CONN-BOX, 3P	3711-000037	3	CN7, CN10, CN11
7	CONN-BOX, 2P(RED)	3711-000033	1	CN5
8	CONN-BOX, 2P(BLK)	3711-000034	1	CN3
9	CONN-BOX, 8P	3711-001133	1	CN13
10	CONN-NO WALL, 3P	3711-001475	1	CN8
11	IC-SOCKET	3704-000256	1	U20
12	CONN-FPC, 6P	3708-000306	1	CN15
13	CONN-FPC, 8P	3708-000327	1	CN14
14	D-SUB, 9P	3701-000232	1	CN1
15	MODULAR-JACK, 6P	3722-001034	1	CN6
16	DC POWER-JACK, 3pP	3722-001035	1	CN2
17	IC-MPU, 78C32	0903-001083	1	U11
18	IC-EPROM, 27C010	1102-000109	1	U20
19	IC-RTC, RP5C15	0909-000111	1	U23
20	IC-FISCAL DRIVER, 82C55	0904-000251	1	U14
21	R-WW, 0.1, 2W	2005-001001	2	R3 R5
22	R-WW, 10, 5W	2005-001057	1	R6
23	R-MO, 150, 2W	2003-000172	1	R4
24	R-MO, 75, 2W	2003-000003	1	R1
25	C-AL, 25V 4700uF	2401-001303	1	C8
26	C-AL, 25V 6800uF	2401-001633	1	C15
27	C-AL, 16V 470uF	2401-001363	3	C10 C11 C14
28	FUSE-GLASS, 250V 2A	3601-000246	2	FU1 FU2
29	DIODE-ZEN, 15V, 1W	0403-000326	1	ZD2
30	DIODE-ZEN, 6.2V, 1W	0403-000395	3	ZD1 ZD4 ZD5
31	DIODE-ZEN, 13V, 1/2W	0403-000324	1	ZD3
32	DIODE-REC, 1N5822	0402-000168	4	D5 D7 D8 D9
33	TR-NPN, D288	0502-000288	2	Q4 Q12
34	TR-PNP, Z473	0502-000238	1	Q20
35	IC-REGULATOR, 7812	1203-000442	1	U10
36	TR-ARRAY, STA301	0506-001026	1	Q9
37	TR-ARRAY, STA401	0506-001019	2	Q8 Q11
38	COIL-CHOKE, 140uH	JK27-60100D	2	L6 L9
39	X-TAL, 12MHz	2801-000140	1	OSC1
40	X-TAL, 32.768kHz	2801-003376	1	OSC2
41	BUZZER, 85dB	3002-001027	1	AU1
42	BATTERY	4302-000126	1	BAT1

6 PCB Diagrams and Electrical Parts List

43	HEAT-SINK	JK62-30901A	2	HS1 HS2
44	TR-NPN, D73	0502-000395	1	Q3
45	TR-PNP, A1010	0502-000234	1	Q10

6-1-2(B) MAIN AUTO

No.	Specification	Code No	EA	Location No
1	PCB, ER-700, FR-4, 2L	JK41-10524A	1	MAIN PCB
2	IC-SRAM, 62256	1106-000197	1	U17
3	IC-TTL, 74HCT541	0801-000523	2	U6 U21
4	IC-TTL, 74HCT123	0801-000467	1	U7
5	IC-TTL, 73HCT32	0801-000891	1	U16
6	IC-TTL, 74HCT138	0801-000642	2	U15 U22
7	IC-TTL, 74HCT573	0801-000721	1	U19
8	IC-TTL, 74HCT574	0801-000719	2	U4 U5
9	IC-REGULATOR, KA34063	1203-000404	2	U2 U3
10	IC-DRIVER, MAX232	1006-000133	1	U1
11	IC-COMPRAOTR, LM393	1202-000164	2	U8 U9
12	FREQUENCY-ATTENUATOR, FS741	4701-001020	1	U13
13	R-CHIP, 51, 1/10W	2007-001013	1	R148
14	R-CHIP, 560, 1/10W	2007-000030	13	R174 R175 R176 R190 R191
				R192 R193 R194 R195 R200
				R123 R173 R163
15	R-CHIP, 10K, 1/10W	2007-000300	15	R101 R102 R108 R111 R116
				R132 R138 R140 R162 R183
				R209 R210 R211 R212 R221
16	R-CHIP, 10K, 1/10W, 1%	2007-000279	1	R2
17	R-CHIP, 15K, 1/10W	2007-000409	9	R139 R233 R234 R235 R236
				R237 R238 R239 R240
18	R-CHIP, 1K, 1/10W	2007-000468	10	R112 R118 R119 R126 R127
				R135 R168 R169 R184 R208 R164
19	R-CHIP, 2.2K, 1/10W	2007-000493	6	R103 R107 R113 R128 R188
				R205
20	R-CHIP, 2.7K, 1/10W	2007-000518	1	R154
21	R-CHIP, 4.7K, 1/10W	2007-000872	38	R105 R106 R130 R133 R144
				R145 R146 R150 R151 R152
				R153 R155 R156 R158 R159
				R160 R161 R165 R167
				R180 R213 R241 R242 R243
				R244 R245 R246 R247 R248
				R249 R250 R251 R252 R253
				R254 R255 R256
22	R-CHIP, 47K, 1/10W	2007-000941	4	R109 R122 R186 R201
23	R-CHIP, 6.8K, 1/10W	2007-001071	5	R141 R143 R170 R171 R185
24	R-CHIP, 680K, 1/10W	2007-001113	1	R147
25	R-CHIP, 68K, 1/10W	2007-000001	3	R134 R136 R157

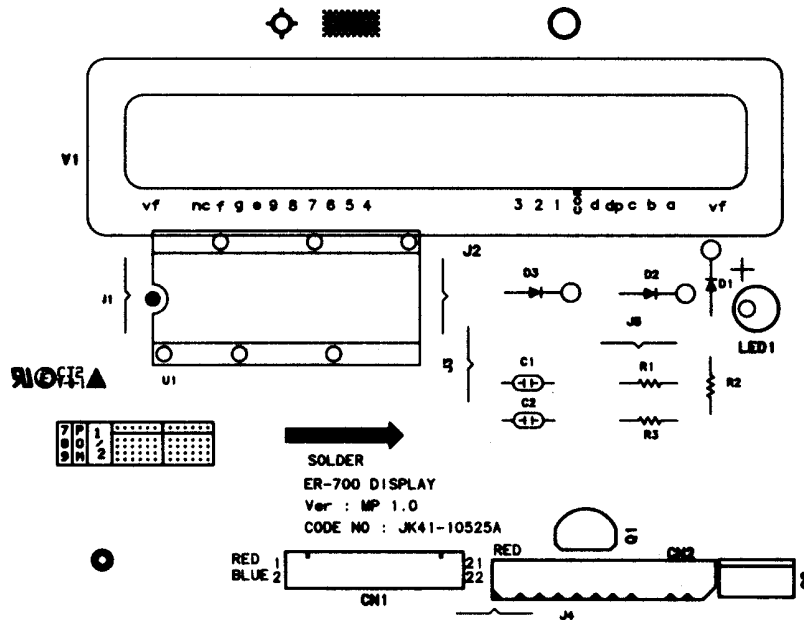
26	R-CHIP,200,1/10W	2007-000026	35	R114 R124 R177 R178 R179 R196 R197 R198 R202 R203 R214 R215 R216 R217 R218 R219 R220 R222 R117 R120 R121 R125 R129 R131 R137 R149 R181 R187 R189 R199 R110 R204 R206 R207 R223 R257
27	R-CHIP,2K,1/10W	2007-000671	2	R104 R115
28	R-CHIP,3.3K,1/10W	2007-000686	1	R142
29	C-CAP,0.1uF	2203-000192	61	C6 C101 C102 C104 C106 C107 C108 C109 C110 C111 C112 C113 C115 C116 C117 C118 C119 C120 C122 C123 C124 C126 C128 C130 C132 C133 C134 C138 C139 C140 C141 C142 C143 C146 C147 C148 C149 C156 C157 C162 C163 C164 C166 C167 C168 C170 C173 C174 C175 C176 C186 C188 C189 C190 C191 C192 C193 C194 C196 C198 C199
30	C-CAP,30pF	2203-000748	2	C197 C200
31	C-CAP,470pF	2203-000953	13	C103 C105 C114 C121 C125 C127 C129 C131 C136 C137 C165 C195 C135
32	C-CAP,100pF	2203-000239	19	C151 C152 C153 C154 C155 C158 C161 C169 C171 C172 C177 C178 C179 C180 C181 C182 C183 C184 C185
33	C-CAP,22pF	2203-000634	3	C160 C150 C159
34	DIODE-SIG,MMBD6050	0401-001003	11	D4 D16 D17 D19 D20 D21 D22 D23 D24 D25 D26
35	TR-NPN,KA2222	0501-000457	17	Q1 Q2 Q5 Q6 Q7 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q21 Q22 Q23 Q24 Q25
36	FERRITE-BEAD CORE(CHIP)	3301-000325	15	L1 L2 L3 L4 L5 L7 L8 L10 L11 L12 L16 L17 L18 L21 L22
37	FERRITE-BEAD CORE(RADIAL)	3301-000344	3	L14 L15 L20
38	R-CHIP,36K,1/10W,1%	2007-001662	1	R7
39	C-AL,CHIP,16V 22uF	2402-000139	3	C13 C16 C18
40	C-AL,CHIP,16V 47uF	2402-000179	1	C19
41	C-AL,CHIP,16V 10uF	2402-000110	4	C2 C4 C7 C21
42	C-AL,CHIP,35V 4.7uF	2402-000173	2	C1 C3

6 PCB Diagrams and Electrical Parts List

44	C-AL,CHIP,16V 100uF	2402-000168	5	C17 C20 C22 C23 C24
45	C-AL,50V 100uF	2401-000032	3	C12 C5 C9
46	FUSE-HOLDER,30m ohm	3602-000001	4	FU1 FU2 FU3 FU4
47	DIODE-REC,SK14	0401-001051	4	D6 D14 D15 D18
48	DIODE-REC,M4	0402-001189	7	D1 D2 D3 D10 D11
				D12 D13

6-2 Front Display

6-2-1 Front Display PCB Diagram

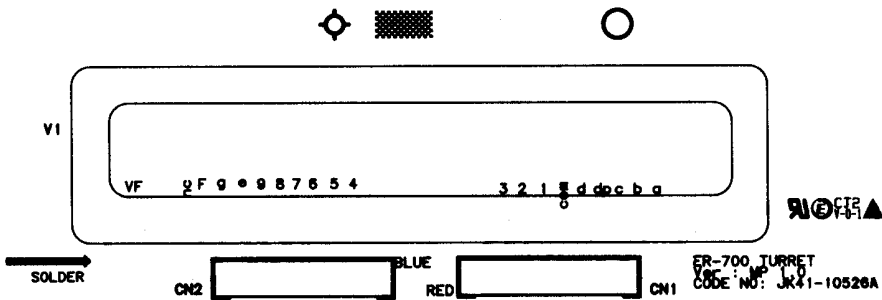


6-2-2 Front Display Parts List

No.	Specification	Code No	EA	Location No
1	DISPLAY-PCB,FR-1, 1L	JK41-10525A	1	DISPLAY PCB
2	VFD-9digit,V1	JK07-10100A	1	9 DIGIT
3	DIODE-REC, 1N4003	0402-000129	3	D1,D2,D3
4	CONN-BOX, 30P	3711-000766	1	CN1
5	IC-DRIVER, UCN5812	1003-001101	1	U1
6	LED	0601-000255	1	LED1
7	PAD-DIGITRON	JK73-10208A	1	under V.F.D
8	TR-NPN, C945	0501-000399	1	Q1
9	TR-A473	0502-000238	1	Q2
10	JUMP-WIRE	BH39-40305U	5	J1, J2, J3, J4, J5
11	R-CARBON, 1K, 1/4W	2001-000042	3	R1, R2, R3
12	C-CAP, 0.1uF, AXIAL	2202-000579	2	C1, C2
13	PAC-VINYL	JK69-90902A	10 Cm	on V.F.D

6-3 Rear Display

6-3-1 Rear Display PCB Diagram

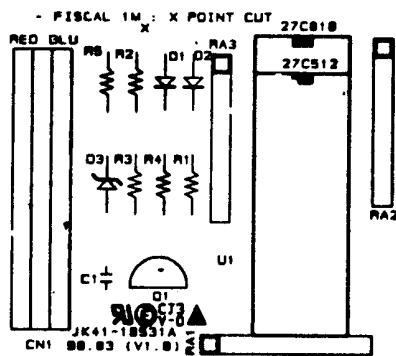


6-3-2 Rear Display Parts List

No.	Specification	Code No	EA	Location No
1	TURRET-PCB.FR-1.1L	JK41-10526A	1	TURRET PCB
2	VFD-9digit	JK07-10100A	1	V1
3	PAD-DIGITRON	JK73-10208A	1	under V.F.D
4	PAC-VINYL	JK69-90902A	0.1	on V.F.D

6-4 Fiscal PCB

6-4-1 Fiscal PCB Diagram



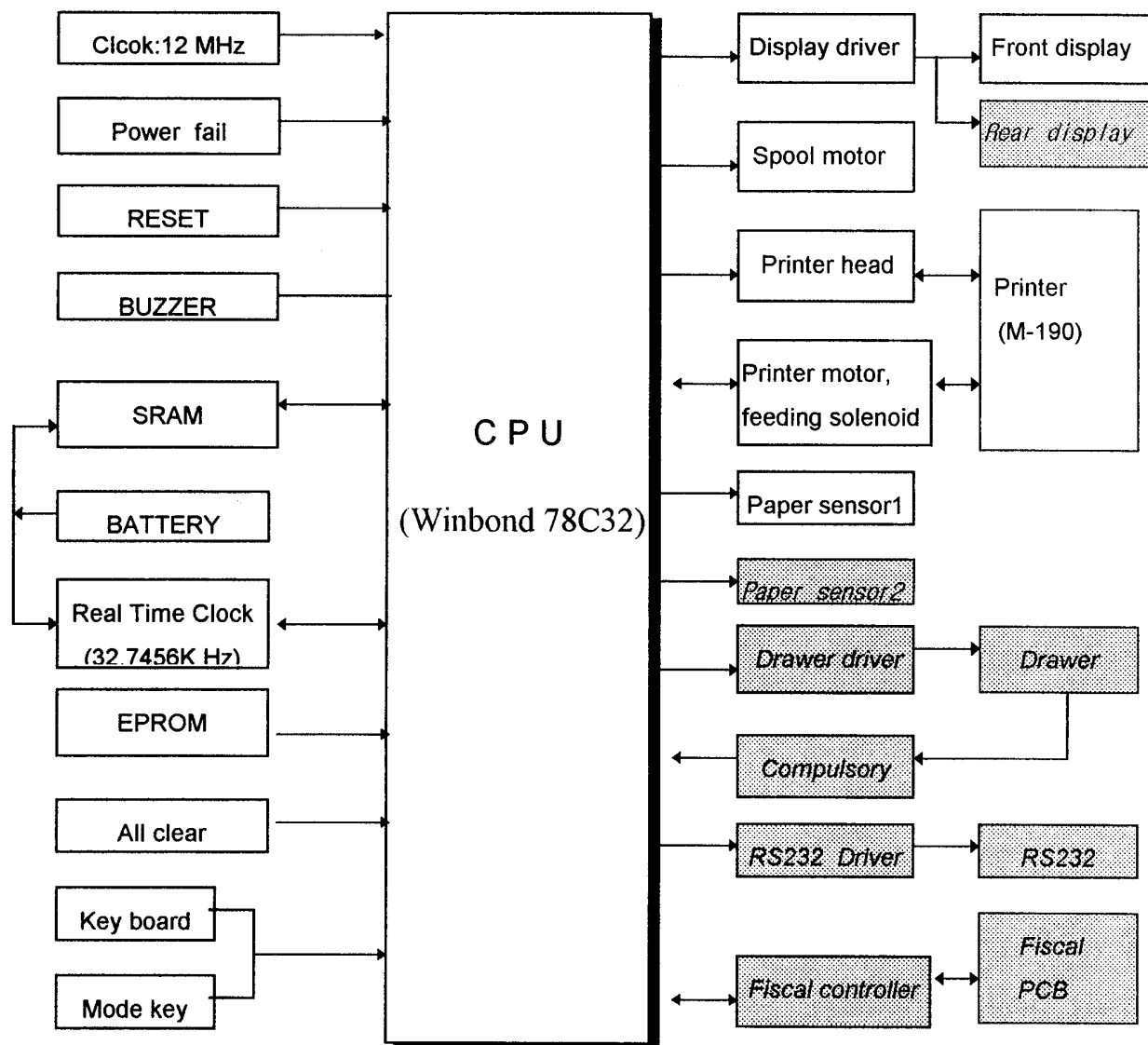
6-4-2 Fiscal PCB Parts list

6-4-2(A) EPROM(27C512)

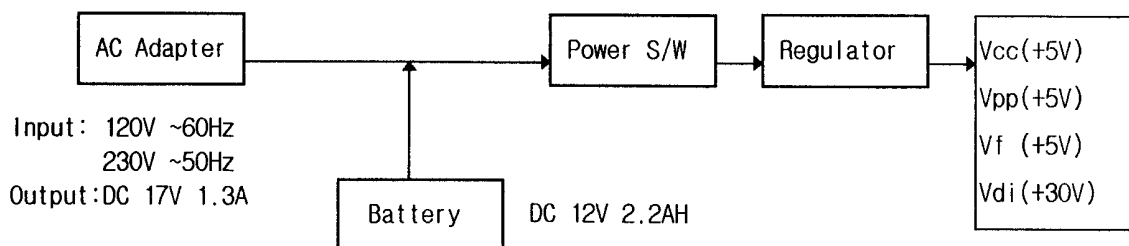
No.	Specification	Code No	EA	Location No
1	FISCAL-PCB,FR-4,2L	JK41-10531A	1	FISCAL PCB
2	IC-EPROM, 27C512	1102-000209	1	27C512
3	R-NETWORK 4.7K	2011-000539	1	RA1
4	C-CERAMIC, 0.1uF	2201-000021	1	C1

7 Block Diagram

7-1 Block diagram

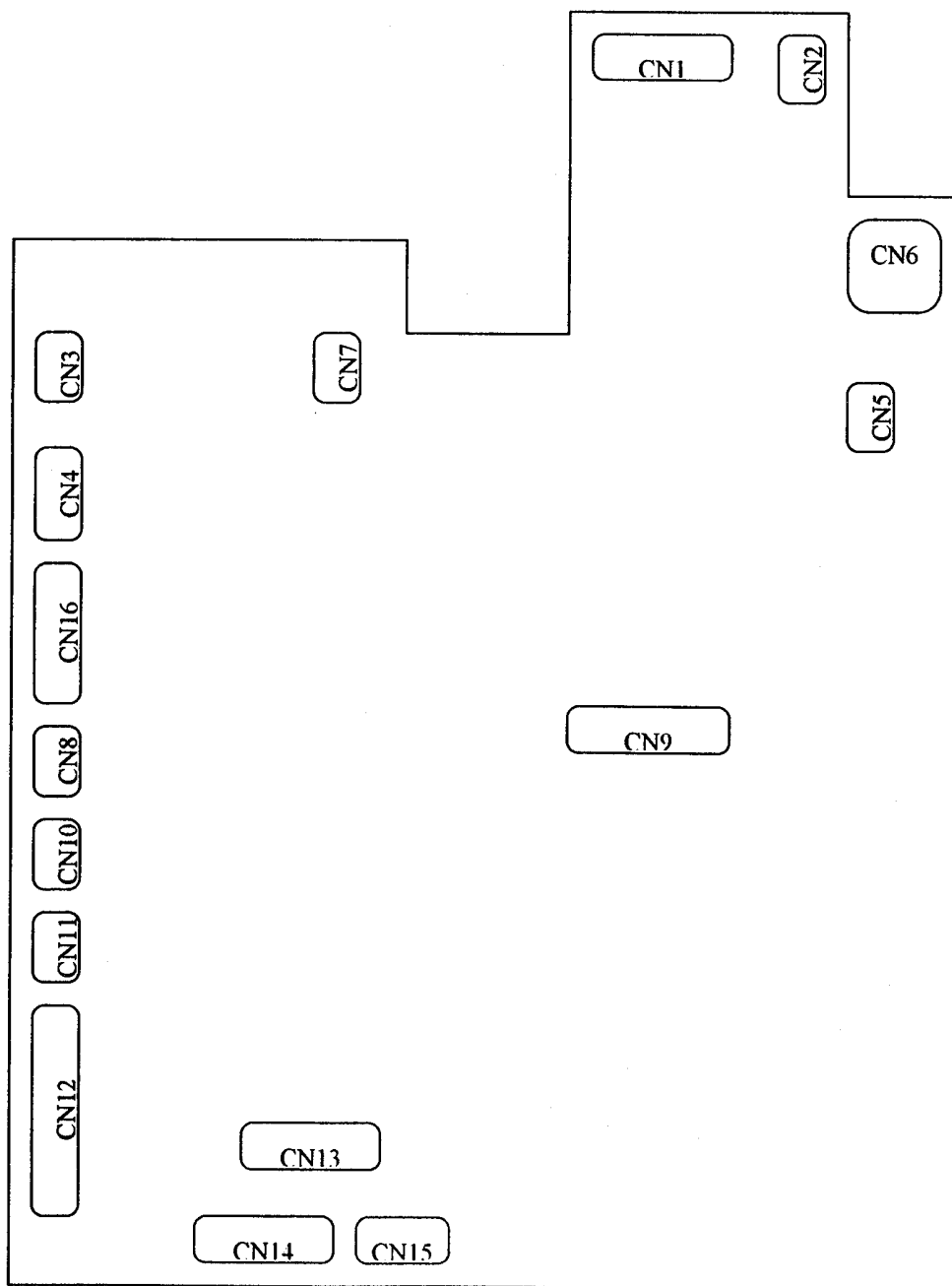


<POWER PART>



8 Wiring Diagram

8-1 Connector Locations

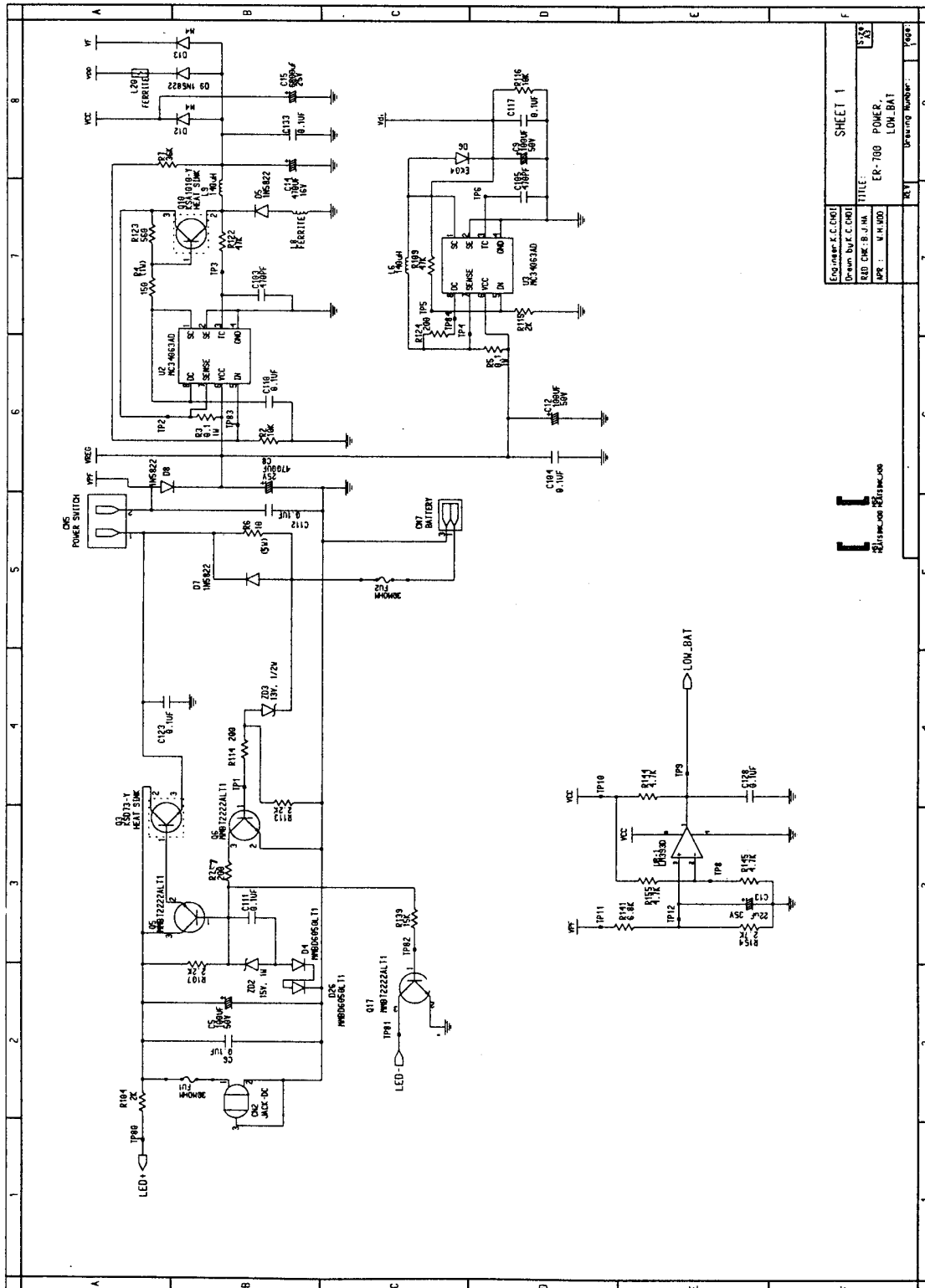


8-2 Connector Specifications

NO	Location	Pins	FUNCTION	COLOR	REMARK
1	CN 1	9	RS-232C	BLK	
2	CN 2	3	DC Power-jack	BLK	
3	CN 3	2	Spool motor	BLK	
4	CN 4	8	Printer(8 pin)	WHT	Harness with core
5	CN 5	2	Power S/W	RED	
6	CN 6	6	Modular jack	GRAY	
7	CN 7	3	Battery	RED	
8	CN 8	3	All clear S/W	BLK	
9	CN 9	11	Display and LED	WHT	
10	CN10	3	Paper end sensor	RED	
11	CN11	3	Paper end sensor	RED	
12	CN 12	30	Fiscal	BLK	
13	CN 13	8	Mode key	WHT	
14	CN 14	8	Keyboard(8 pin)	BLK	
15	CN 15	6	keyboard(6 pin)	BLK	
16	CN 16	10	Printer(10 pin)	WHT	Harness with core

9 Schematic Diagrams

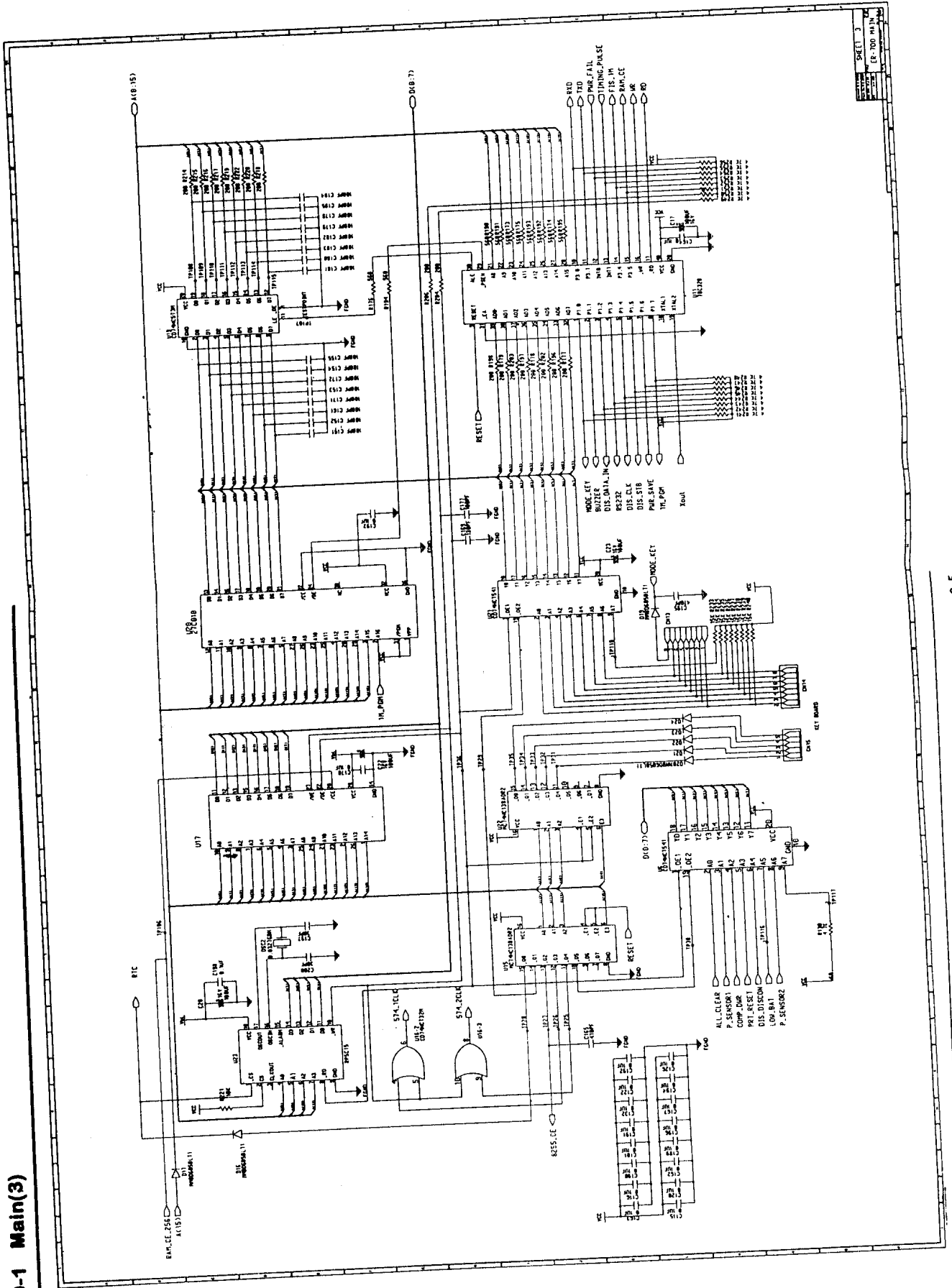
9-1 Main(1)



9-1 Main(2)



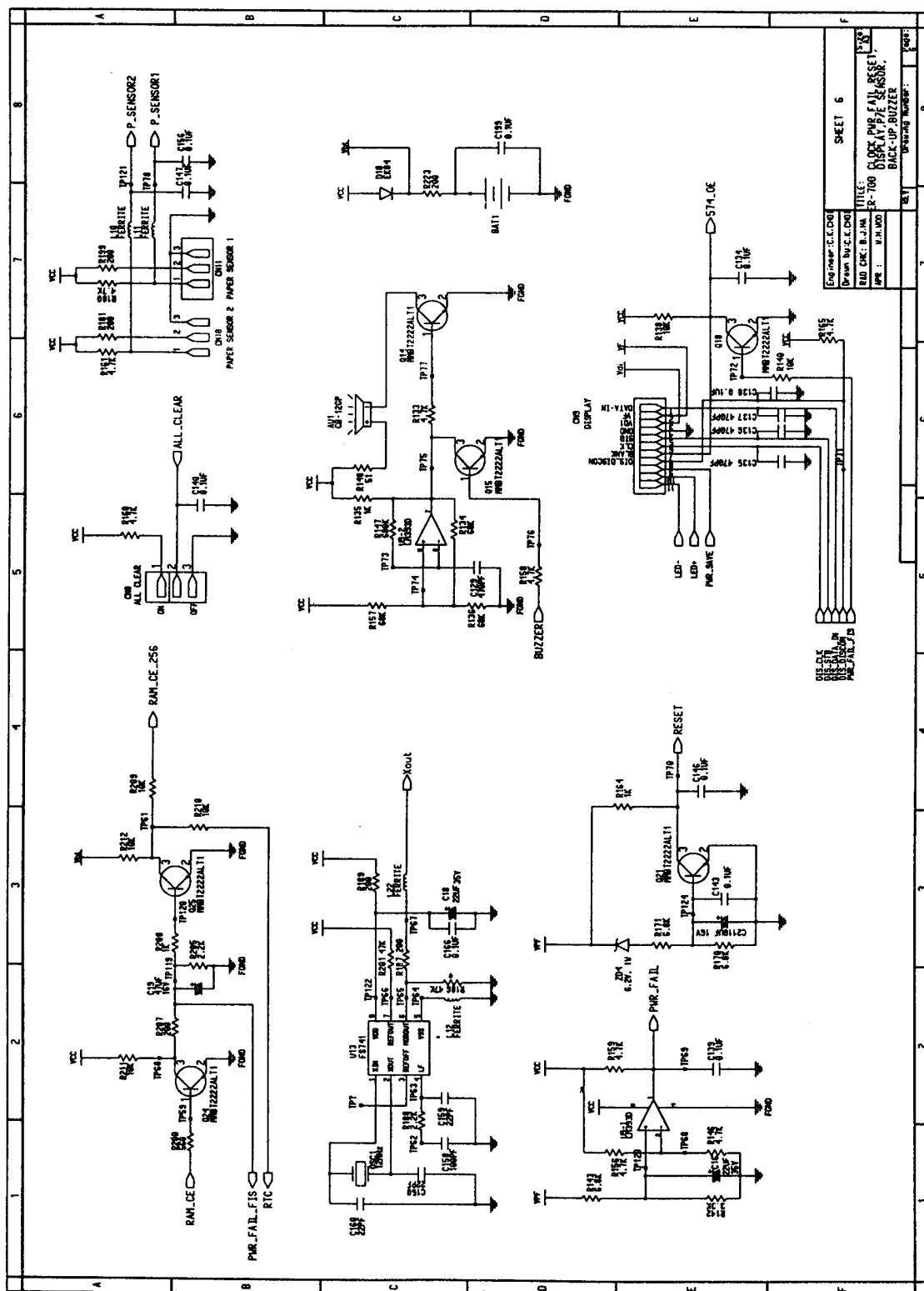
9-1 Main(3)



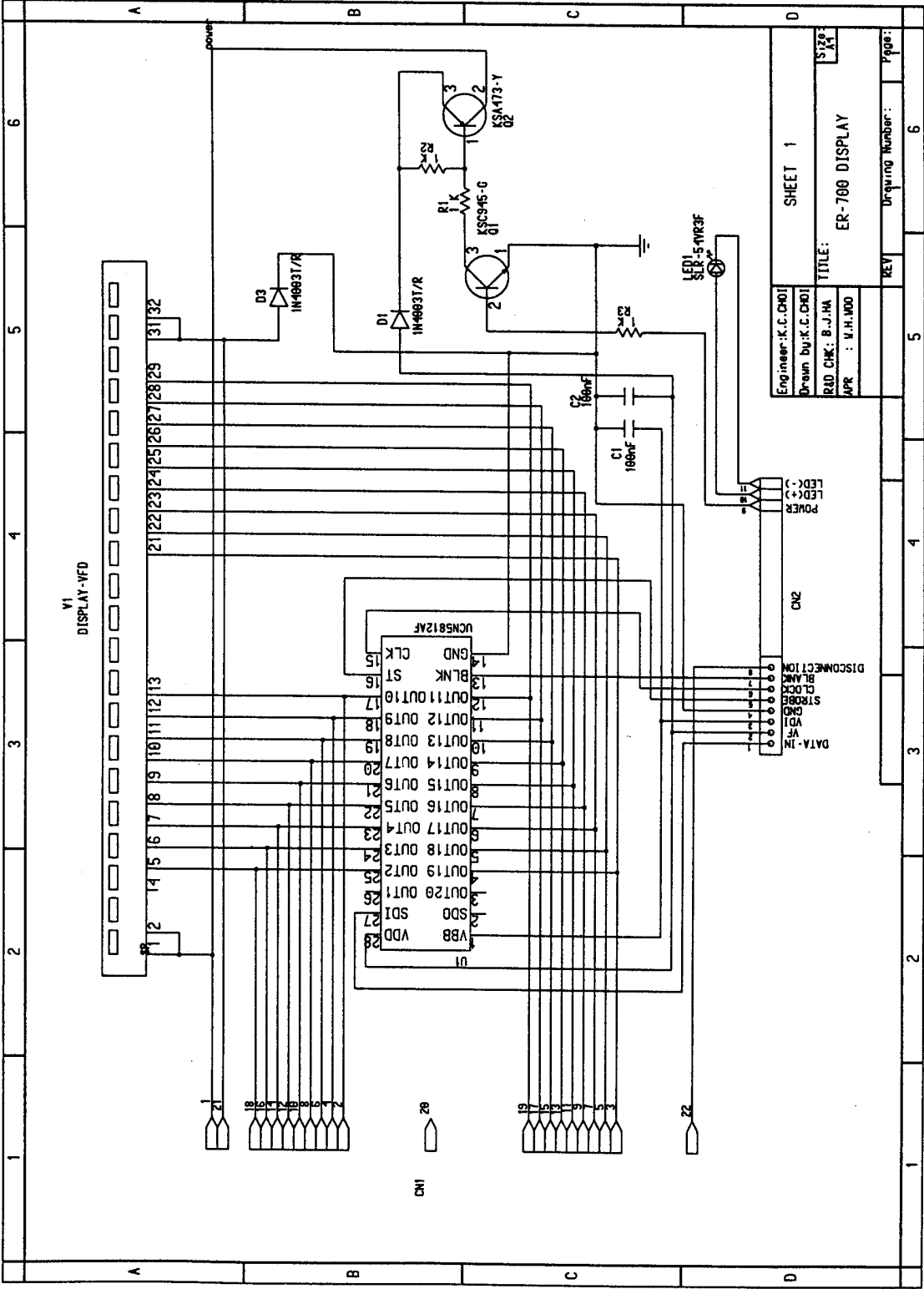




9-1 Main(6)



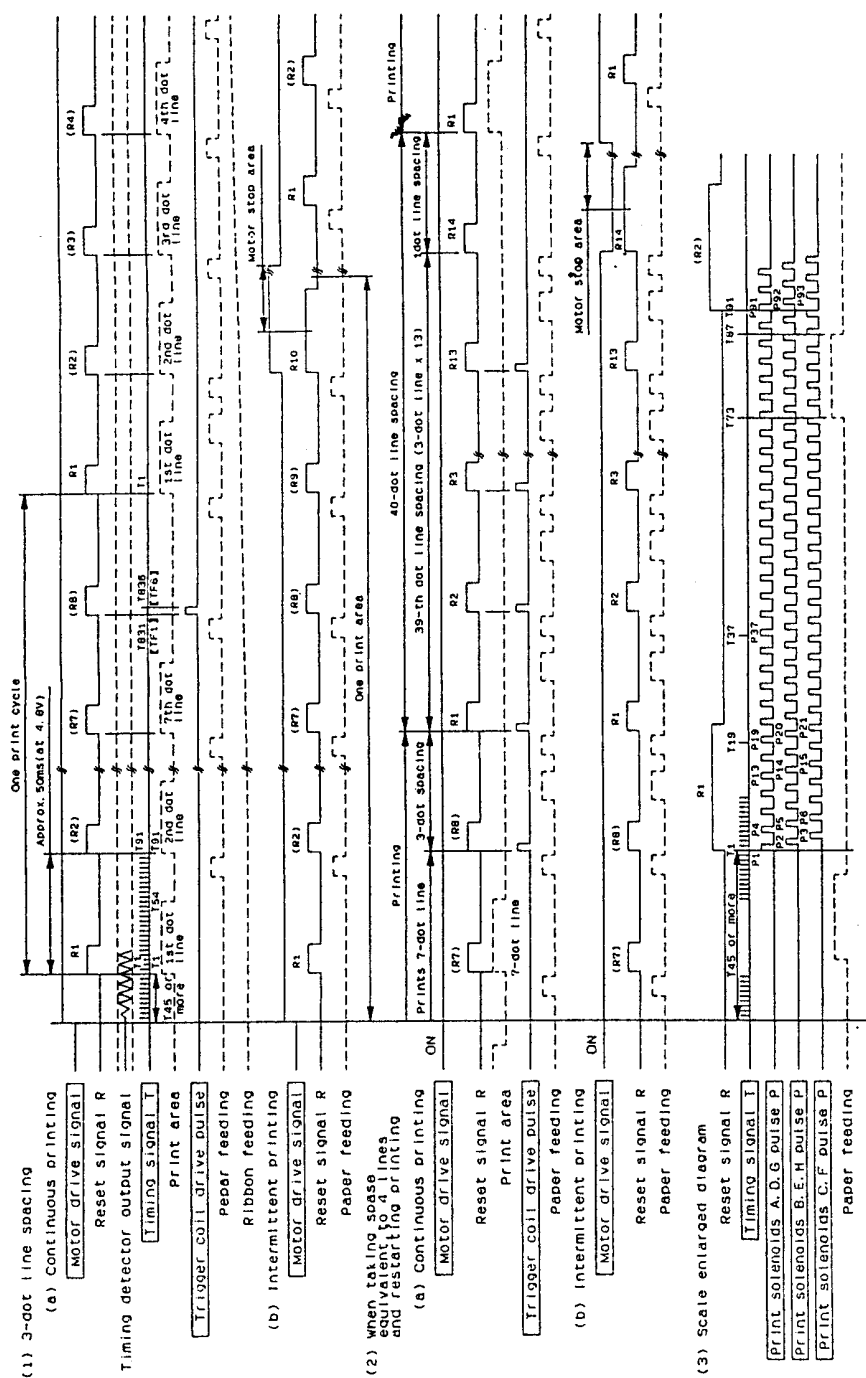
9-2 Front Display



Engineer: K.C. CHOI	SHEET 1
Drawn by: K.C. CHOI	Size: A4
Rev: 1	TITLE: ER-700 DISPLAY
Appr: N.H. WOO	Drawing Number: REV
Page: 6	

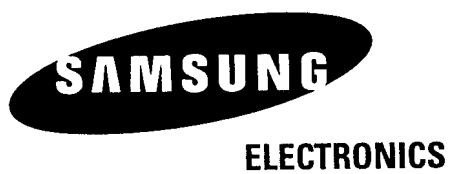


10-1 Printer Timing Chart



Notes:

1. The items in parenthesis are not required during normal printing.
2. Numbers in brackets indicate the timing signal when reset signal R8 is detected.
3. Signals in must be prepared by the user.



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