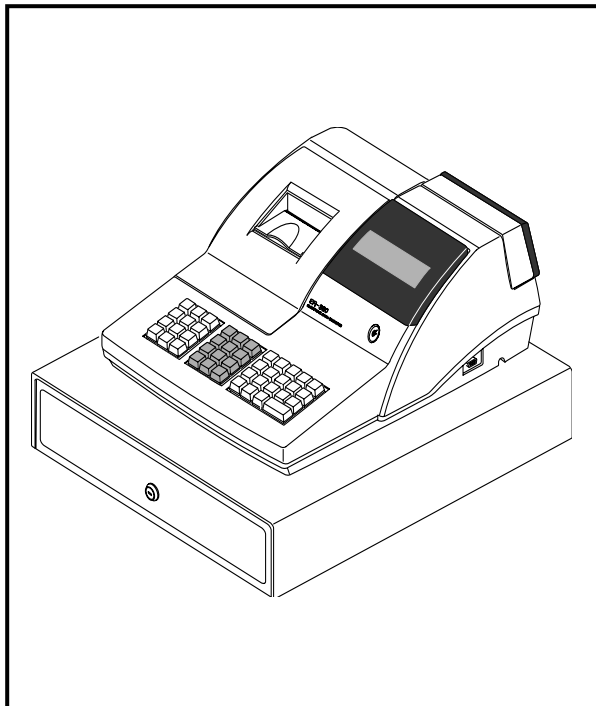


SAM4S

ELECTRONIC CASH REGISTER
ER-350 / ER-350F
ER-350FP / ER-250RF

***SERVICE* Manual**

ELECTRONIC CASH REGISTER



C O N T E N T S

1. Precaution Statements
2. Product Specifications
3. Installation and Operation
4. Disassembly and Assembly
5. Alignment and Adjustment
6. Troubleshooting
7. Exploded Views and Parts List
8. Block Diagram
9. PCB Parts List
10. Schematic Diagrams

About this Manual

This service manual describes how to perform hardware service maintenance for the SAM4S ER-350 Series Electronic Cash Register.

Notes

Notes may appear anywhere in the manual. They describe 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.

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SAM4S ER-350M/F SERIES

Service Manual First edition.

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Overview of this ECR

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 Shin Heung Precision .

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-MH battery, which maintains the memory of the ECR while the power is off, to charge completely.

“Proper disposed of batteries is required. Refer to your local codes for disposed requirements.”

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 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 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 Precaution Statements

1-2 Servicing Precautions

WARNING: 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: 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 Electrostatic Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatic 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 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

2-1-1 General Specification

Item	Description	Remark
AC Power Source	AC 120V $\pm$ 15%, 60Hz AC 230V $\pm$ 15%, 50Hz	USA Europe
Power Consumption	25W maximum	USA and Europe
Printer	ERP-200N 9-pin Dot matrix Printing speed: 2.6line per second	See printer Specification, page 2-2
Processor	INTEL 80C32 / 8032 / 80C52 / 8052 / 78C32B	
Memory	SRAM : KM62256 EPROM: 27C512	
Data Storage	60 Days	When battery fully charged
Battery	Ni-cad, 60mA Charging time: 24 hours	Battery backup
Display	Front: 10/9 digits Rear: 10/9 digits	
Key Board	44-key : Membrane type 8-key : Department key	
Interface	External: RS-232C: 1ports	
RS-232C Cable	9P / 9P , Interface Cable	Option
Drawer	4B/8C, 5B/5C, 7B/8C Weight: 9.0 Kg Dimensions 400(W) $\times$ 450(L) $\times$ 111(H)	When packed Millimeters
Body	Weight: 12.2 Kg Dimensions 400(W) $\times$ 450(L) $\times$ 266(H)	Millimeters
Packing Carton	Weight: 15.2 Kg Dimensions 504(W) $\times$ 555(L) $\times$ 365(H)	Millimeters

Table2-1 General Specifications

2-1 General Specifications

2-1-2 Printer Specifications

Item	Description		Remark
Model	ERP-200N		
Print Method	Serial impact, dot matrix type		
Print Direction	Bi-directional		
Print Speed	2.6 lines per second		
Print Format	Horizontal: 0.354 mm 9×9 22 1.7 mm × 3.1 mm 2.12 mm 5.00 mm	Vertical: 0.360 mm 7×9 26 1.4 mm×3.1mm 1.77mm 5.00mm	(H) × (V)
Dot Interval			
Print Font			
Printing Columns			
Character Size			
Column Interval			
Line Interval			
Paper Feed	Electric solenoid Operation		
Paper	Roll: Width: 57.5 mm		
Power Supply Voltage	28V ± 10% Printer head 24V ± 10% Solenoid and Printer Motor 5V ± 6% Encoder sensor and Reset Sensors (left and right)		
Reliability	Approx. 1.5 million lines		Not for Head life
Weight	Approx. 700g		

Table2-2 Printer Specifications

This specification is subject to change without notice.

2-2 Appearance

2-2-1 Appearance Dimensions (mm)

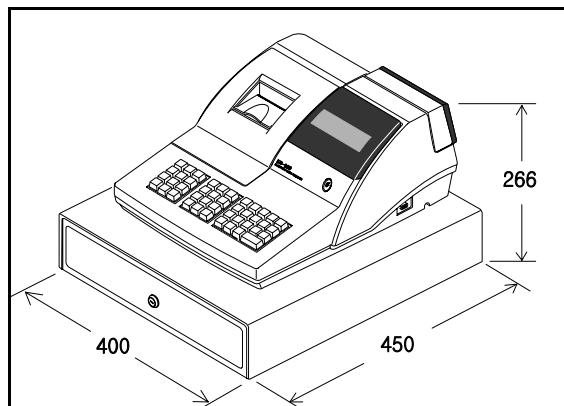


Figure2-1 Dimensions

2-2-2 Feature Locations

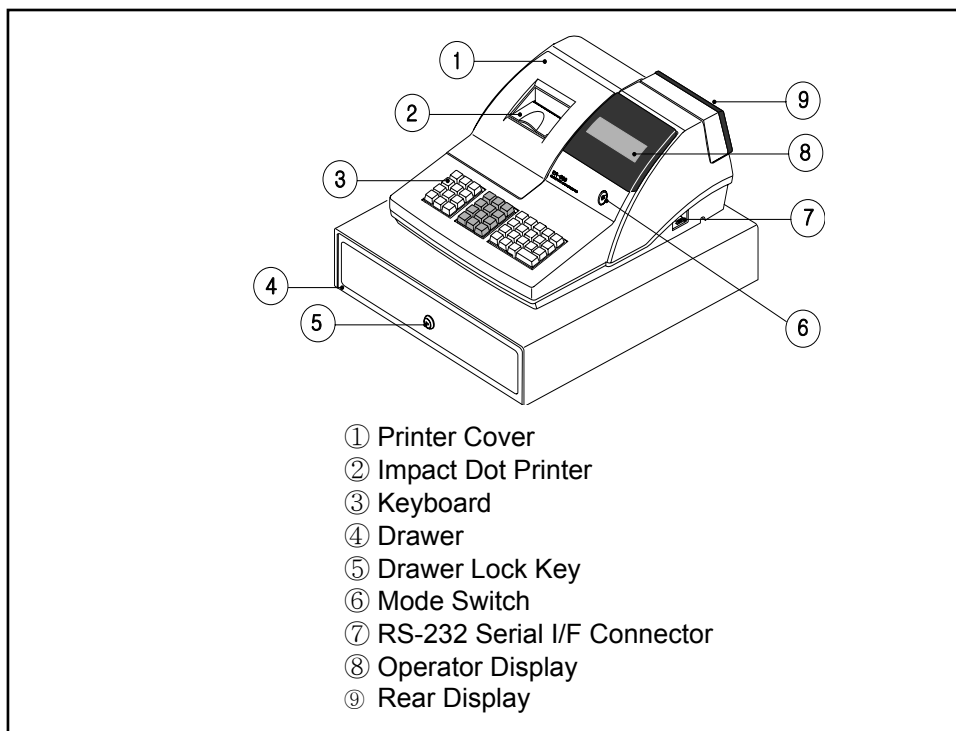


Figure2-2 Feature Locations

2-3 Communication Interfaces

2-3-1 Serial Interfaces, pin Descriptions

Computer (9-pin, Female)			ECR (9-pin, Male)	
Signal	Pin		Pin	Signal
RXD	2		3	TXD
TXD	3		2	RXD
S.G.	5		5	S.G.
DTR			4	DTR
Frame Ground	Frame		Frame	Frame Ground

Table2-3 Serial Interface Cable Pin Description

2-3-2 Printer Terminal, Pin Descriptions

Pin No.	Specification
1	GROUND
2	VCC (+5 V)
3	GROUND
4	SOLENOID CONTROL SIGNAL (+)
5	SOLENOID (-) (+24 V)
6	MOTOR (+) (+24 V)
7	MOTOR CONTROL SIGNAL (-)
8	ENCODER SIGNAL
9	RESET SIGNAL (LEFT)
10	RESET SIGNAL (RIGHT)
11	PRINT SILENOID #3
12	PRINT SILENOID #7
13	PRINT SILENOID #9
14	PRINT SILENOID #5
15	PRINT COMMON LINE (+28 V)
16	PRINT COMMON LINE (+28 V)
17	PRINT COMMON LINE (+28 V)
18	PRINT SILENOID #8
19	PRINT SILENOID #6
20	PRINT SILENOID #2
21	PRINT SILENOID #4
22	PRINT SILENOID #1

Table2-4. Pin Descriptions

3 Installation and Operation

3-1 System Configuration

3-1-1 Interface Installation

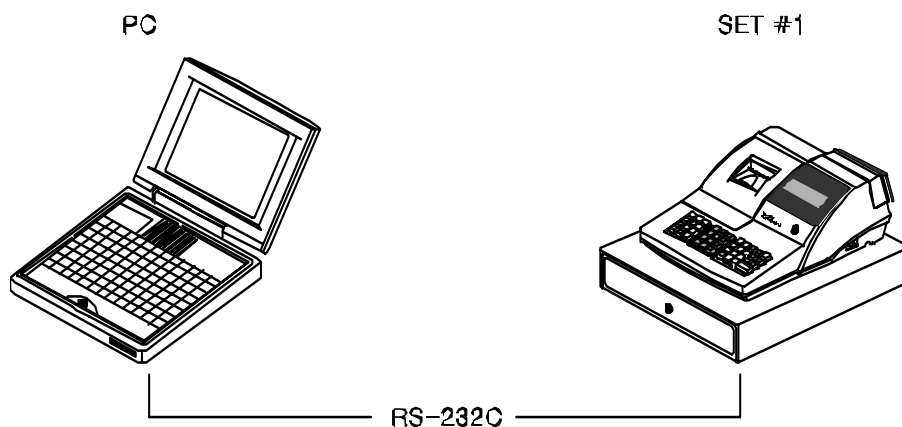


Figure 3-1. Interface Configuration

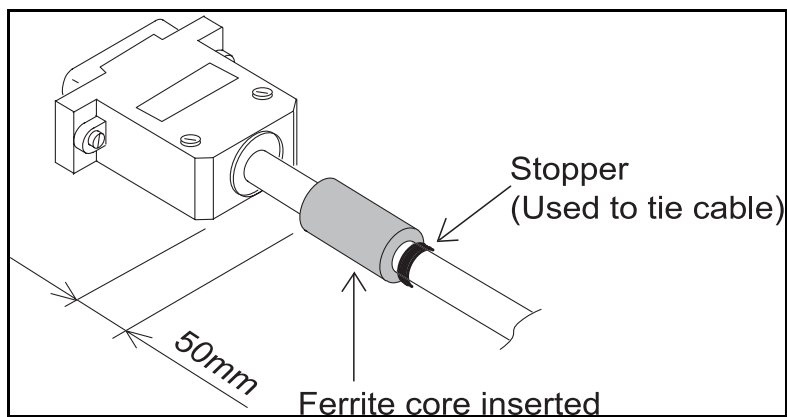


Figure 3-2. Cable for Serial Port

3-1 System Configuration

3-1-1 Interface Installation

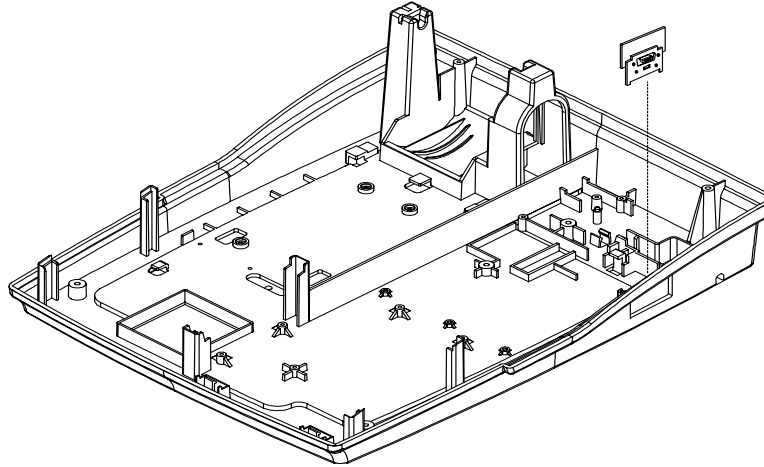


Figure 3-3. Interface Board Installation

1. Disconnect the ECR from the external power outlet.
2. Lift off the printer Cover(A).(Page7-1)
3. Remove the two screws on Upper Case and lift it up(B).(Page7-1)
4. Remove connectors from the red and white connectors on lift it up.
5. Remove the Upper Case(B) and Key-Board(D).(Page7-1)
6. Insert the Interface Board on the Lower Case and insert connector(5P) CN17 on Main PCB.
7. Replace the connections at the red and white connectors on Main PCB.
8. Reposition Upper Case(B) and key-Board(D) on Lower Case and replace two screws.(Page7-1)
9. Replace the Printer Cover(A).(Page7-1)
10. Re-connect the ECR to the power outlet.

3-1-2 Interface Installation

WARNING: When connecting the keyboard to the Main PCB, make sure the membrane sheet is shaped as in Figure 3-4(a), below. If the membrane is shaped as in Figure 3-4(b), the keyboard may malfunction.

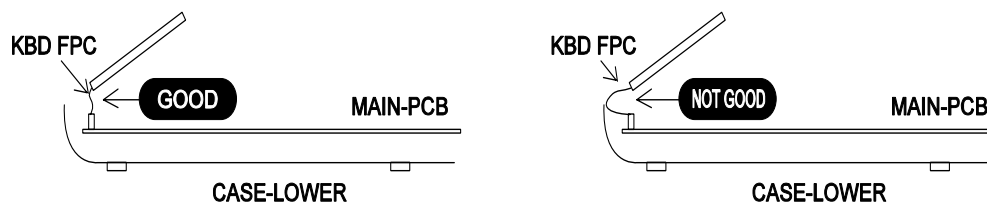


Figure 3-4. Membrane Shape

3-1 System Configuration

3-1-3 Drawer Installation

1. Position the Lower Case on top of the Drawer as shown in Figure 3-5.
2. Tighten the screw that secures the Drawer and Lower Case together. Refer to the Exploded Diagram for other parts of the ECR.

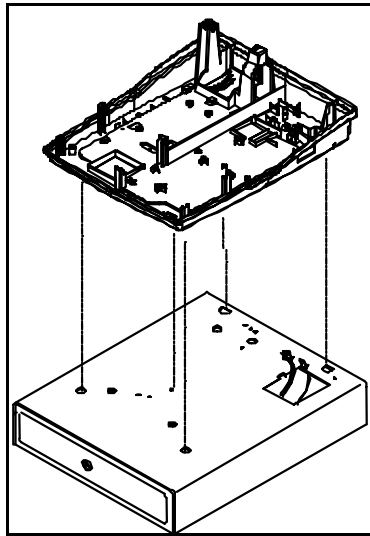


Figure 3-5. Drawer Installation

1. Before inserting the ribbon cassette, turn the knob (see Figure 3-6) counterclockwise 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 the Print Head.
3. After inserting the ribbon cassette, turn the knob counterclockwise again to make sure the ribbon moves freely in the cassette.

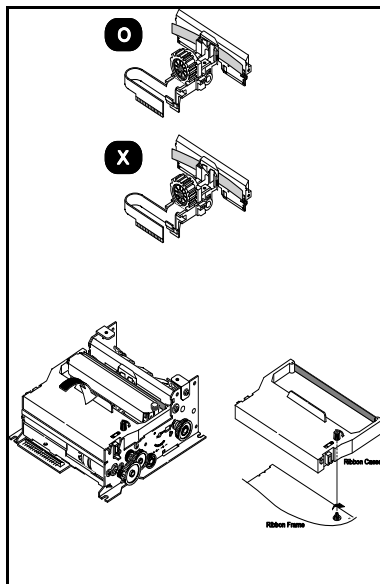


Figure 3-6. Ribbon Cassette

3. Installation and Operation

3-2 Receipt Paper Insertion

1. Using a new roll of paper, unroll the paper and cut the end as shown in Figure 3-7.
2. Place rolled paper in the Holder. Insert the folded paper into the paper Slot and through the Paper Sensor.
3. Press the Feed key until the paper comes out from the Printer. If you get an E8 error message on the display, check the paper sensor and press the C key.
4. Insert the paper in the notch in the Rewind Spindle as shown in Figure 3-8. 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

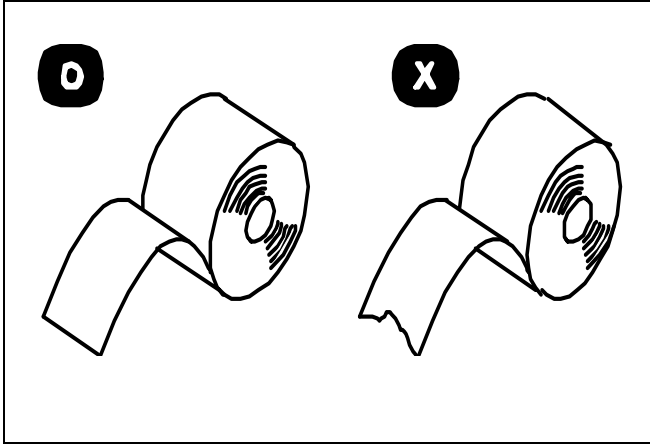


Figure 3-7. Preparing Paper for Insertion

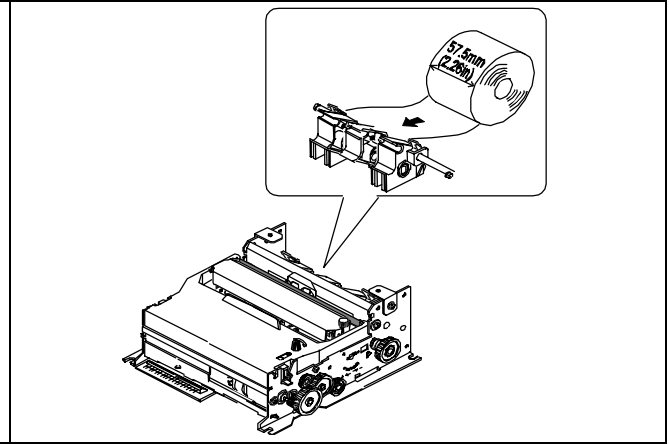


Figure 3-8. Inserting the Paper

3-3 Operation

Note: Before using this Electronic Cash Register(ECR) for the first time, leave it powered ON in the REG mode for a at least 24 hours. This allows the Ni-Cad battery, which maintains the ECR's memory while the power is OFF, to fully charge.

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

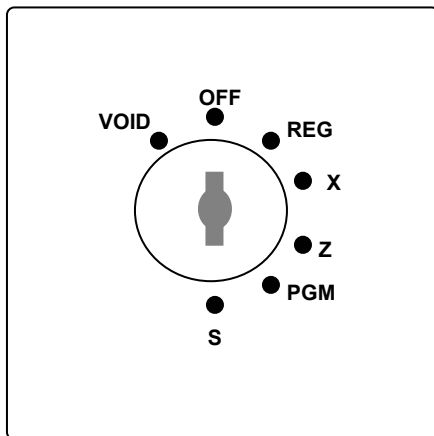


Figure3-9 Mode Switch

Mode	Key	Function
VOID	VD	Use to void (correct) items outside of a sale.
OFF	-	The Register is inoperable.
REG	REG	Use for normal registrations.
X	X	Use to read register reports and perform other manager functions.
Z	Z	Use to read register reports and reset totals to zero.
PGM	P	Use to program the register
S	C	Use for H/W tests and special setting.

Table3-1 Mode Switch Function

The mode keys can be used to access the following key lock positions

Mode	Accessible Position	Remark
VOID	Void, Off, Register, Manager	
X	Off, Register, Manager	
Z	Off, Register, Manager, Clear Totals	
PGM	Void, Off, Register, Manager, Clear Totals, Program	
S	Void, Off, Register, Manager, Clear Totals, Program, Service Mode	

Table3-2 Key Function

Note : The Key can be removed from the key lock in the OFF or REGISTER position.

3-3 Operation

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 stored in RAM memory

PROCEDURE

1. Turn the Mode key to the “S” position.
2. Connect the AC Power Plug into a power outlet while pressing the +%, VD and TAX keys.
3. After clearing all RAM memory the register prints the following line:
- 4.

INITIAL RAM ALL CLEAR

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

WARNING: if you ‘Power ON’ the ECR while the display connector on the PCB is open, the initial burst of current may harm the system. The CPU is especially sensitive to power surges.

WARNING: Do an Initial Clear once only. Doing an Initial Clear more than once erases all programming and Totals.

3-3-3 Service Mode Diagnostics

The Sam4s ER-350, ER-350P, ER-350F, and ER-350FP ECR offer several diagnostic routines while in the “P mode” Each of these tests requires that the Mode key be in the “P Mode” position.

3-3-3-(a) Printer/Display Test

Procedure

1. Press the # / NS key. The register cycles completely through the Printer character set while it tests the display.

3-3-3-(b) EPROM Checksum Test

Procedure

1. Press the 1 key 4 times and press the CHARGE key. The printer prints (on a receipt) the software version and the checksum data in the format shown below.

EP-ROM CHECK SUM = XXXX

3-3-3-(c) Keyboard Test

Procedure

1. Press the 2 key 4 times then press the CHARGE key.
2. Press each key on the keyboard one key at the time. As you press each key. The Display shows the key’s location code.
3. Press the C key to exit the routine.

3-3 Operation

3-3-3 Service Mode Diagnostics(Continued)

3-3-3-(d) Mode Key Test

Procedure

1. Press the 3 key 4 times. Then press the CHARGE key. Rotate the Mode key from P mode VD mode.
2. Position to show on the display each Mode's code.
3. Press the C key to exit the routine.

3-3-3-(e) Fiscal Memory Write Test

Procedure

1. Fiscal Memory test requires that Mode Key be in the "MC Mode" position.
2. Press the 3 key. Then press the CHARGE key. The Printer prints (on a receipt) the Fiscal EPROM checksum data in the format shown below:

ffc	5a
ffd	3c
ffe	c3
fff	a5

FISCAL CHECK SUM = fe02

3. Installation and Operation

MEMO

4 Disassembly and Assembly

Caution :

- Before installation, be sure to turn off the power switch.
- Use gloves to protect your hand from being cut by the angle and the chassis.
- Connect all the cables correctly. When connecting or disconnecting the cables, be careful not to apply stress to the cables. (It may cause disconnection)
- Be careful not to bind interface cables and AC power cord together.

4-1 Disassembling the Case Upper Block

4-1-1 Upper Case Disassembling

1. Lift off Printer Cover(A).(Page7-1)
2. Remove two screws (B5 and B1) on Upper Case and lift it up.(Page7-1)
3. Remove connectors from the red the white connectors on Main PCB.(Page7-1)
4. Remove Upper Case.

4-1-2 ERP-200N Printer Disassembling

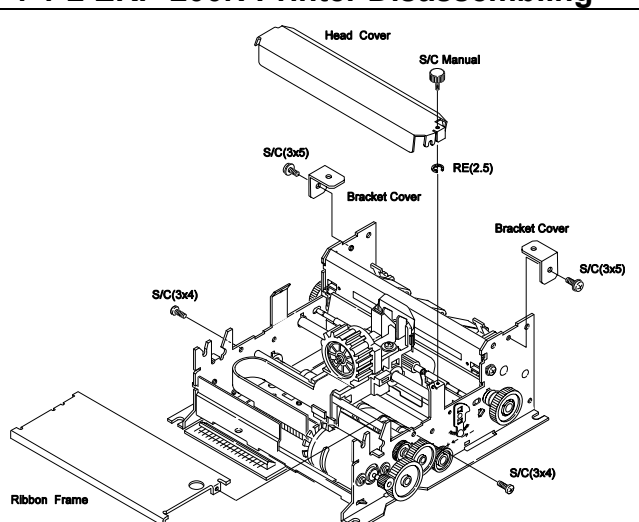


Figure 4-1. Separating Head Cover and Ribbon Frame

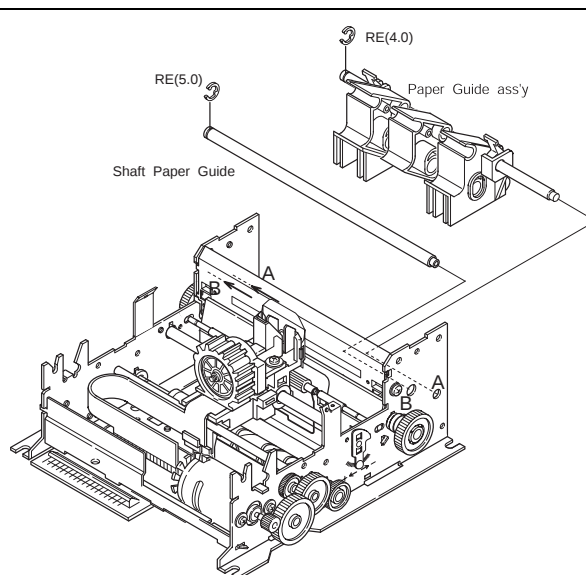


Figure 4-2. Separating paper Guide Block

1. Remove 4 screws in the Frame Assembly to separate to the Head Cover and Ribbon Frame.(Figure4-1)
2. Separate the E-Ring (RE5.0) to separate the Shaft Paper Guide from the Frame Assembly. (Figure4-2)
3. Separate the E-Ring(RE4.0) Remove the screws to separate the Paper Guide Assembly from the Frame Assembly. (Figure4-2)

4-1 Disassembling the Case Upper Block

4-1-2 ERP-200N Printer Disassembling

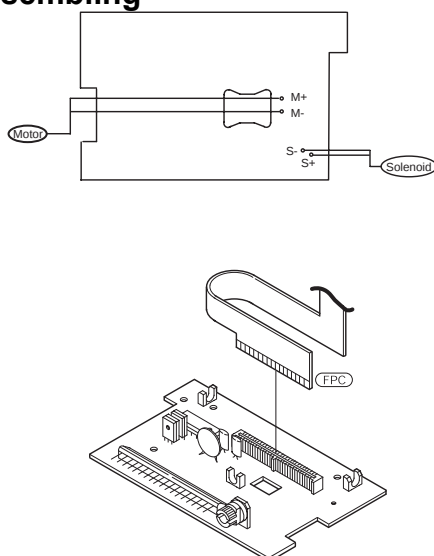


Figure 4-3

4. Separate the FPC of head from the connector on the Printer PCB.(Figure4-3)
5. Separate the Motor Wire and Solenoid Wire under the Printer PCB. (Figure4-3)
6. Remove the 3 screws under the Printer PCB for separating the PCB from the Frame Assembly. (Figure4-3)

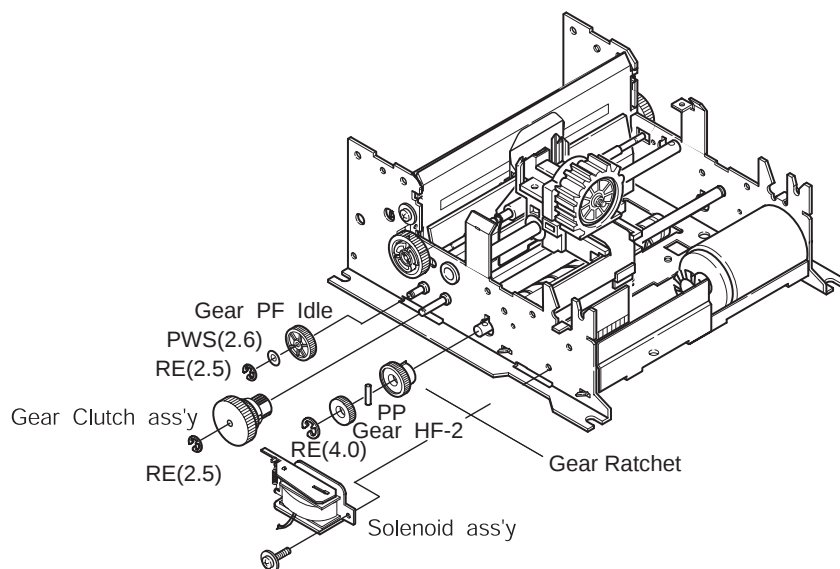


Figure 4-4 Disassembling Clutch Assembly

7. Disassemble the Gear Clutch ass'y and the Gear PF idle from the Shafts.(Figure4-4)
8. Disassemble the Solenoid ass'y from the Frame Assembly. (Figure4-4)
9. After disassembling the Gear HF-2, disassemble the PP in the Lead Cam Hole. (Figure4-4)
10. Disassemble the Gear Ratchet from the “L” part of the Lead Cam. (Figure4-4)

4-1 Disassembling the Case Upper Block

4-1-2 ERP-200N Printer Disassembling

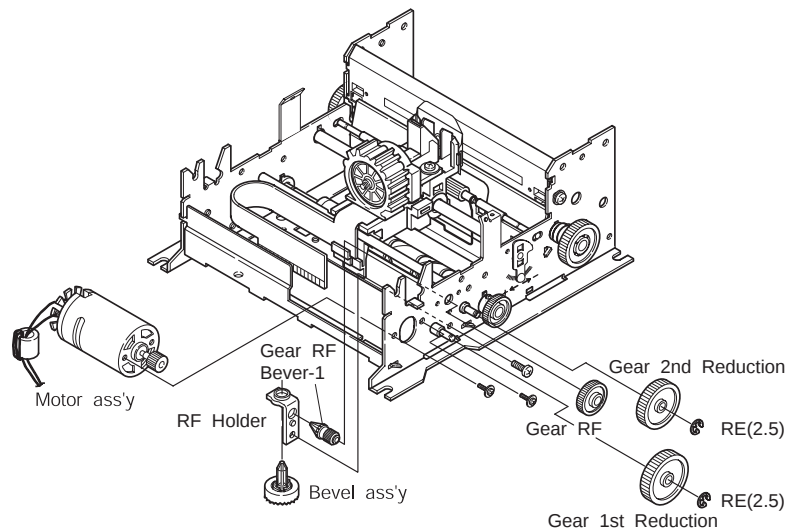


Figure 4-5 Separating Ribbon Feed Block

11. Disassemble the Gear 1st Reduction. The Gear 2nd Reduction. Disassemble the Gear RF and the Motor Assembly from the Frame Assembly. (Figure 4-5)
12. Remove the screws to separate the Bevel Assembly and disassemble the Gear RF Bevel-1 through the hole in the Frame Assembly. (Figure 4-5)

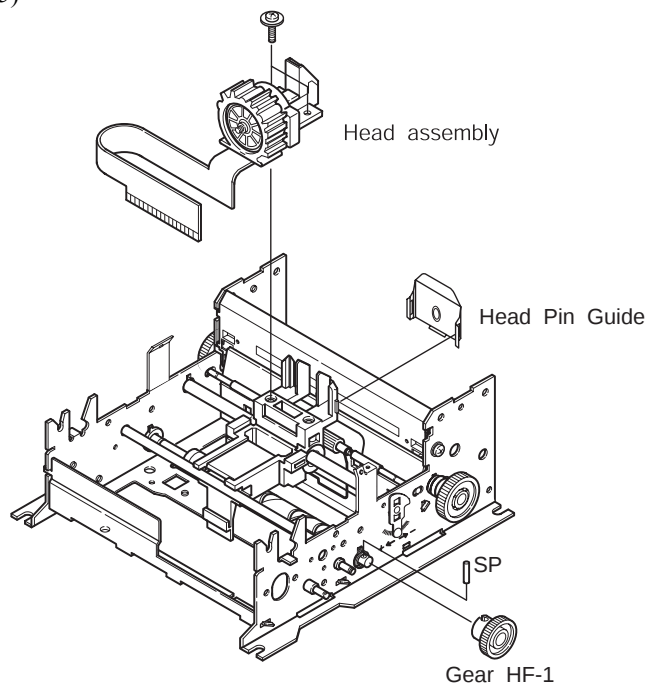


Figure 4-6. Separating Head Feed Block

13. Remove the 2 screws of the Head Assembly. Lever and disassemble the Head Assembly. (Figure 4-6)
14. After remove the screws disassemble the spacer and the Head Pin Guide in the Head Carriage Assembly. (Figure 4-6)
15. After separating the Gear HF-1. remove the SP in the right side hole in the Lead Cam. (Figure 4-6)

4-1 Disassembling the Case Upper Block

4-1-2 ERP-200N Printer Disassembling

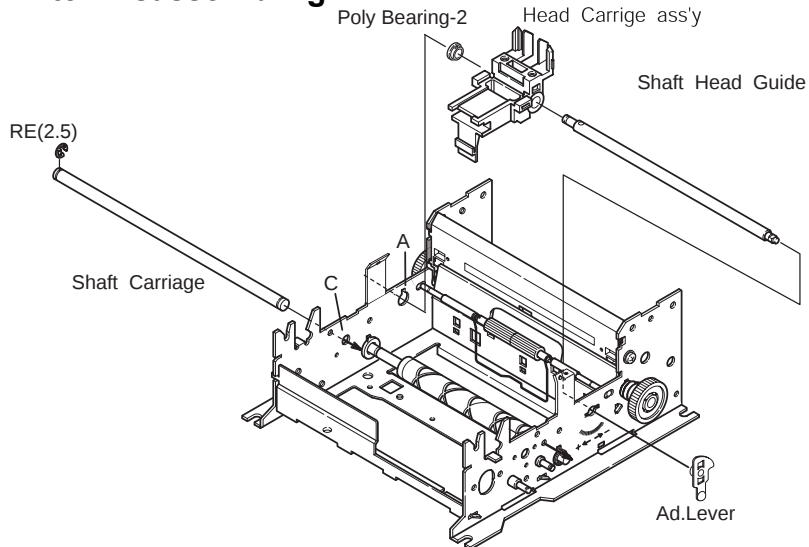


Figure 4-7. Separating Head Feed Block-1

16. Disassemble the E-Ring (R2.5) and remove the Shaft Carriage through the hole "C" in the Frame Assembly (Figure4-7).
17. Remove the Poly Bearing-2 in hole "A" in the shaft head Guide(Figure4-7)
18. Move the Shaft Head Guide through the Head Carriage Assembly the hole "A" in the Frame Assembly(Figure4-7)

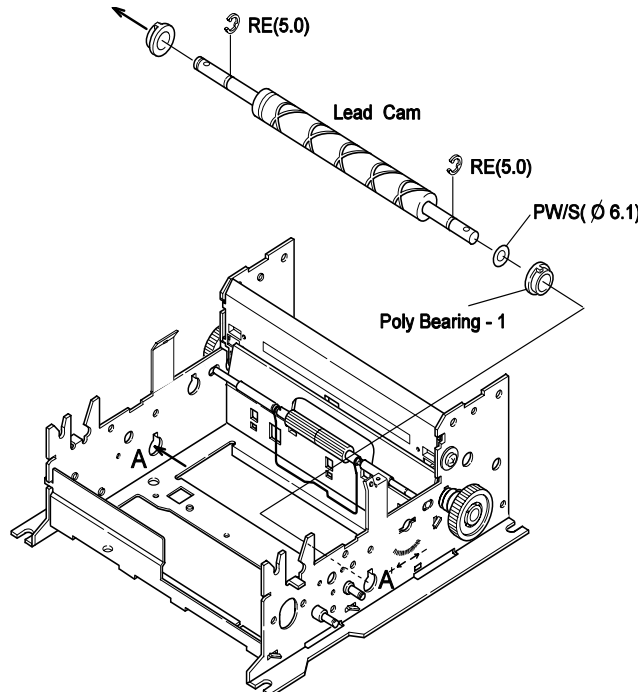


Figure 4-8, Separating Lead Cam

19. After removing the Lead Cam from the Frame Assembly, remove the Poly Bearing-1.(Figure4-8)
20. Remove the PW and RE(5.0) 2PCS from the Lead Cam. (Figure4-8)

4-1 Disassembling the Case Upper Block

4-1-2 ERP-200N Printer Disassembling

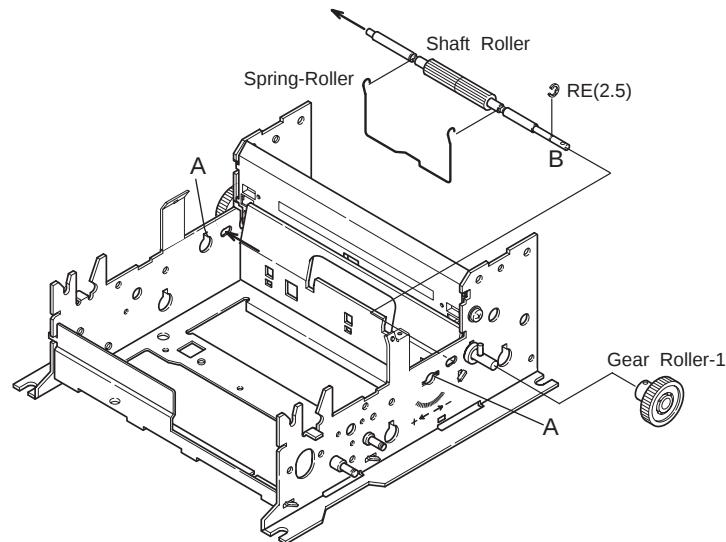


Figure 4-9. Separating Paper Feed Block-2

21. Remove Gear Roller-1 from the Rubber Roller.(Figure4-9)
22. Remove Gear PF from the Rubber Roller.(Figure4-10)
23. Remove the SP from hole “B” on the Shaft Roller from the Frame Assembly. (Figure4-10)
24. Remove the Spring Roller and the Shaft Roller from the Frame Assembly. (Figure4-10)
25. Remove the RE(2.5). (Figure4-10)

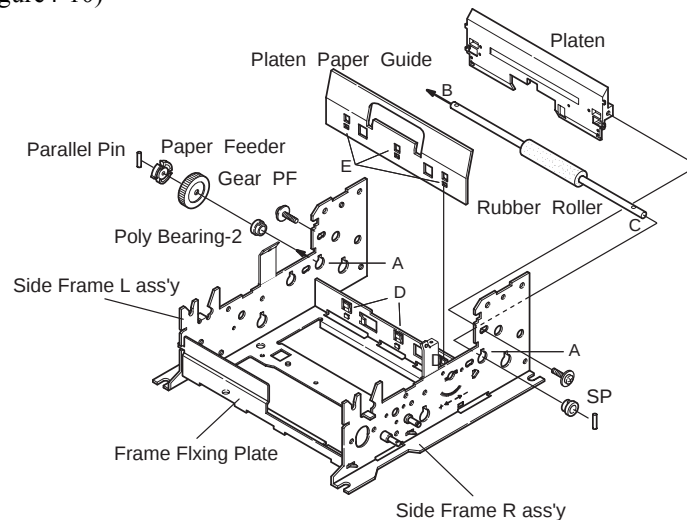


Figure 4-10. Separating Paper Feed Block

26. After disassembling the Platen Paper Guide From Hook “D” of the Frame Fixing Plate, disassemble the Platen from the Frame Assembly.(Figure4-10)
27. Disassemble the Spring Pin in the hole “C”. (Figure4-10)
28. Disassemble the Parallel Pin in the hole “B”, the Paper Feeder and Gear PF from the Rubber Roller. (Figure4-10)
29. After disassemble the Poly Bearing-2, disassemble the Rubber Roller in the hole “A” of the Frame Assembly. (Figure4-10)
30. Disassemble the Side Frame “L”. “R” Assembly from the Frame Fixing Plate. (Figure4-10)

4 Disassembly and Assembly

4-2 Reassembling

4-2-1 ERP-200 Printer Reassembling

When you reassemble the Printer do the reverse sequence of the Disassembling procedure.

4-2-2 Upper Case Reassembling

1. Position Upper Case so that connectors are within reach of Main PCB. Replace the red and the white connectors.(Page7-1)
2. Position Upper Case on Lower Case and replace two screws (B5 and B11).(Page7-1)
3. Replace printer Cover(A).(Page7-1)

5 Alignments and Adjustments

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

5-1 Printer Adjustments

5-1-1 Head Gap Adjustment

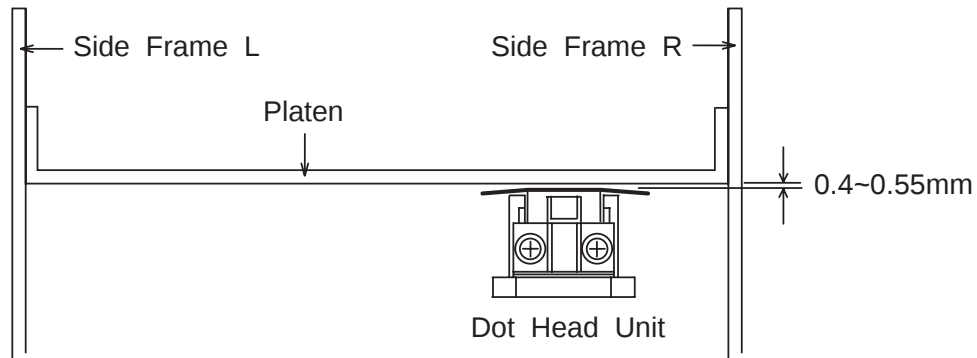


Figure 5-1 Head Gap Adjustment

1. Remove the Ad. Lever screw.
2. Rotate the Gear 1st Reduction to move Head to the left end of Platen Guide.
3. Insert Gap Gauge (thickness 0.5 mm)
Between Head and Platen. Adjust the gap while rotating the Shaft Head Guide.
Tolerance = 0.4 to 0.55 mm
4. Wind Ad. Lever screw again and move
Head to the center of the Platen Guide
5. Insert Gap Gauge (0.5 mm) and tighten the Shaft Head Guide.
Tolerance = 0.4 to 0.55 mm
6. Repeat steps 4 and 5 moving the Head to the right end of the Platen Guide.
7. Replace the Ad. Lever screw.

MEMO

6 Troubleshooting

This chapter describes the methods for determining the source of malfunctions in this ECR.

6-1 Keyboard Problems

1. Check FPC of Keyboard.
2. Check Mode Key Lock.
3. Check Keyboard Connector and Mode Key Connector.
4. Check all voltage states.
5. Check /change circuit related to Main PCB. (CPU, IC10, IC14)
6. Check / RD signal for enabling IC14.
7. Check the enabling signal for IC14 from IC11. (Decoder/74LSI39)

6-2 Printer Failure

6-2-1 Printer Head Failure

1. Check Printer Head Pin and Coil.
2. Check the enabling signal for IC7 from IC10. (Decoder/74LSI39)
3. Check the enabling signal for enabling IC7.
4. Check /change circuit related to Printer Head. (IC3(NE555),IC6,IC7(74HCT574),IC9,IC10(74LSI4) and TRA1.2.3(STA471))
5. Check Printer Connector Harness. (PRT12P)

6-2-2 Printer motor, Solenoid Failure

1. Check motor in Printer
2. Check Solenoid in Printer.
3. Check Power Fail Signal for enabling IC6.
4. Check the enabling for IC6 from IC10. (Decoder/74LSI39)
5. Check /change circuit related to Printer Driving. (IC6,Q9,TRA3)
6. Check Printer Connector Harness. (PRT10p)

6-2-3 Encode, Left and right Sensor Failure.

1. Check Sensors in Printer
2. Check /change circuit related to Encode left and right sensor. (IC4,IC5,CPU)
3. Check Printer Connector Harness. (PRT10)

6-3 Display and Rear Display Failure

1. Check /change Display PBC solder Points. Connection Harness. IC1(SN75518)
2. Check Connector(CN6) and CPU on Main PCB.
3. Check VF(+4V), VDI(+30V) and VCC
4. Check the enabling signal(STROBE) for ICI(SN75518)

6. Troubleshooting

6-4 Drawer Failure

1. Check Drawer Solenoid and Harness. (Both ECR side and Drawer side)
2. Check circuit related to Drawer circuit. (IC6, D4)

6-5 Clock Failure

1. Check IC13, X1

6-6 Buzzer Failure

1. Check circuit related to Buzzer. (CPU, Buzzer, Q3)

6-7 Paper Sensor Failure

1. Check Sensor and Connector Harness.
2. Check circuit related to Paper Sensor. (IC5)

6-8 Fiscal Memory Failure

1. Check the enabling signals for IC17(8255) from CPU.
2. Check A0, A1 /RD /WR and RESET.
3. Check state of voltages. (VPP, VCC)
4. Check Connector Harness of Fiscal Board.

6-9 System Failure

1. Check input voltage are 230V and 120V.
2. Check Fuse on Main PBC and cash output voltages.
3. Check Encoder signal and Power Fail Signal.
4. Check Reset Signal and Power Fail Signal.
5. Check contact of Mode Switch Connector state.
6. Check FPC of key Board.

6-10 Error Message

1. E1: Key input error
2. E7: Disconnection of display error.
3. E8: Paper sensing error.
4. E9: Disconnection of printer and paper jam.

7 Exploded Views and Parts List

7-1 Assembly Exploded View

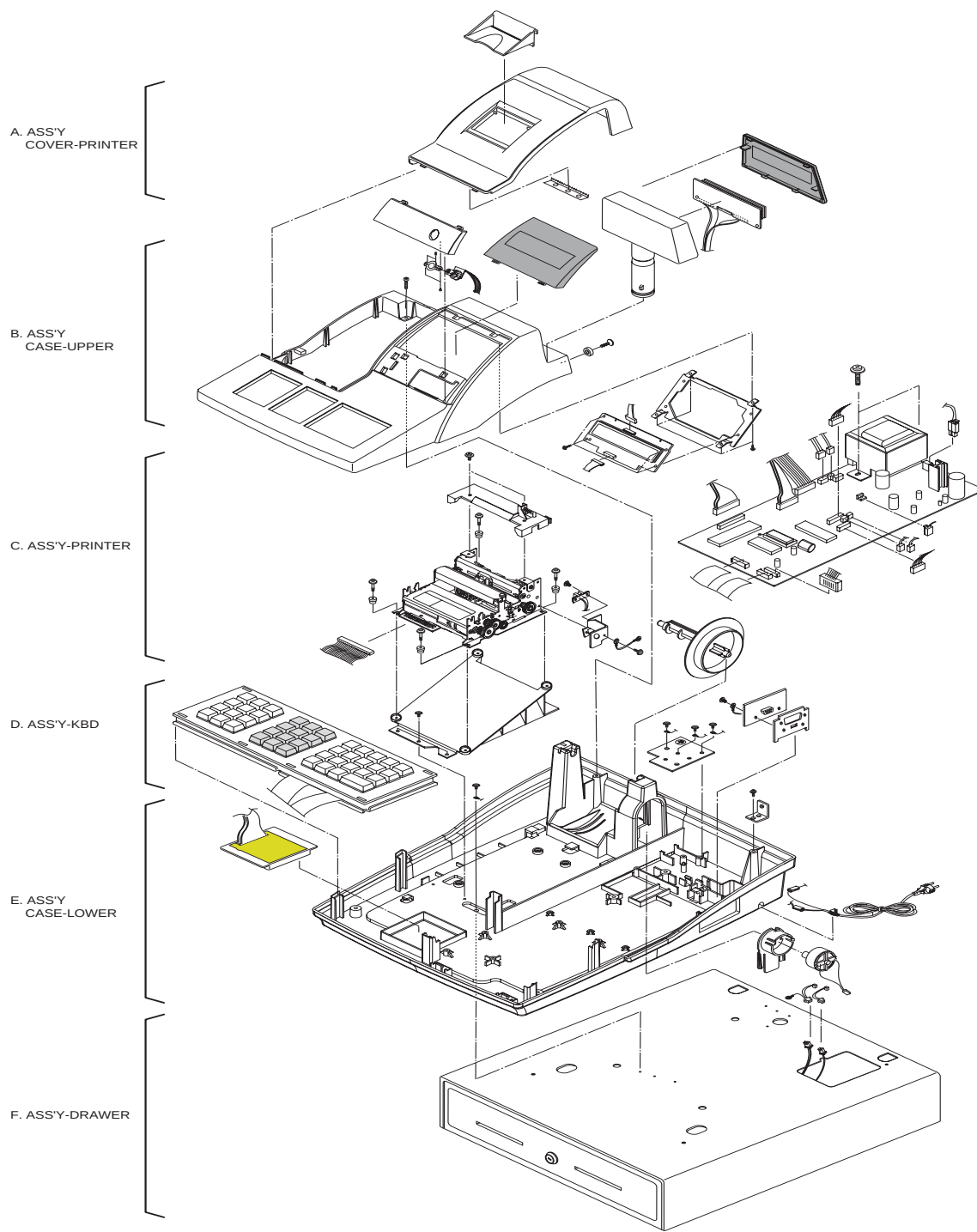


Figure7-1 Assembly Exploded View

7-2 Cover Printer Assembly

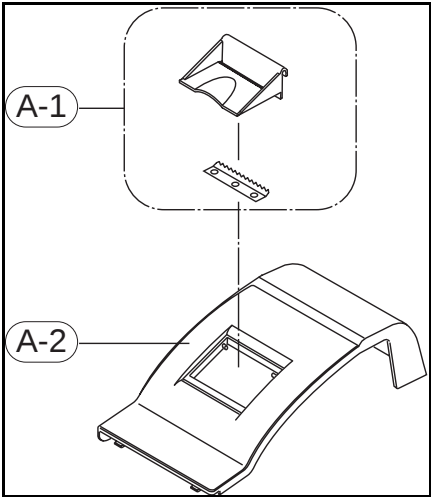


Figure7-2 Cover Printer Assembly

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
A-1	JK97-01060B	MEA-WINDOW JOURNAL	1		Y	
	JK70-00056A	IPR-CUTTER PAPER;SUS-304,T0.3	1		N	
	JK72-40204A	PMO-WINDOW JOURNAL;ACRYL	1		N	
A-2	JK72-00014A	PMO-COVER PRINTER;HIPS(V0)	1		Y	

7. Exploded Views and Parts List

7-3 Printer Assembly

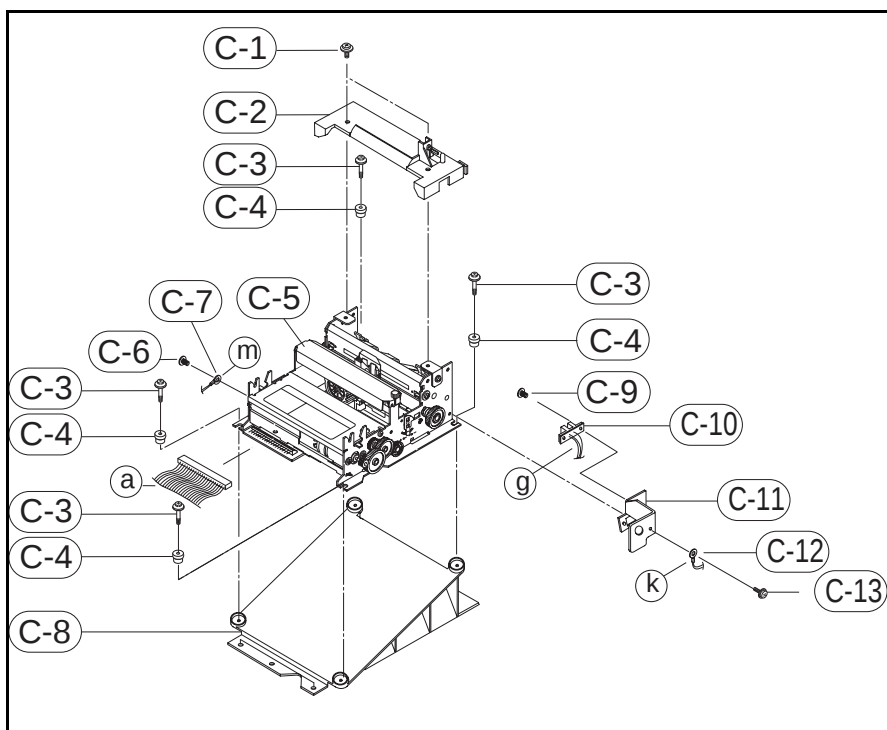


Figure7-3 Printer Assembly

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
C-1	6002-000175	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(YEL)	2	PRT ASS'Y+C/PRT HODLER	Y	
C-2	JK72-40217A	PM0-CASE PRINTER HOLDER;HIPS(V0)	1		Y	
C-3	6002-000209	SCREW-TAPPING;PH,+,2,M3,L17.5,ZPC(YEL)	4	PRT ASS'Y+HODLER PRINTER	Y	
C-4	JK73-40201A	RMO-PRINTER	4	PRT ASS'Y+HODLER PRINTER	Y	
C-5	JK59-10507A	UNIT-PRINTER	1		Y	
C-6	JK60-00001A	SCREW-ASSY TAPTITE;PWH,+,2,M3,L8	1	PRT ASS'Y+GND HARNESS	Y	
C-7	JK39-40011A	CBF-HARNESS;250MM	1	PRT ASS'Y+D/R CENTER GND	Y	
C-8	JK72-40208A	PMO-HOLDER PRINTER	1		Y	
C-9	6001-000568	SCREW-MACHINE:PH,+,M3,L8,NI PLT,SM20C,-	1	PHOTO- INTERRUPTER+B/SENSOR	Y	
C-10	JK96-00186A	ELA ETC-P/END SENSOR	1		Y	
C-11	JK70-10012A	IPR-BRKT SENSOR;SECC T1.2	1		Y	
C-12	JK39-40011A	CBF-HARNESS;250MM	1	SENSOR GND WIRE+G/PLATE	Y	
C-13	JK60-00001A	SCREW-ASSY TAPTITE;PWH,+,2,M3,L8	1	PRT ASS'Y+GND HARNESS	Y	

7-4 Upper Case Assembly

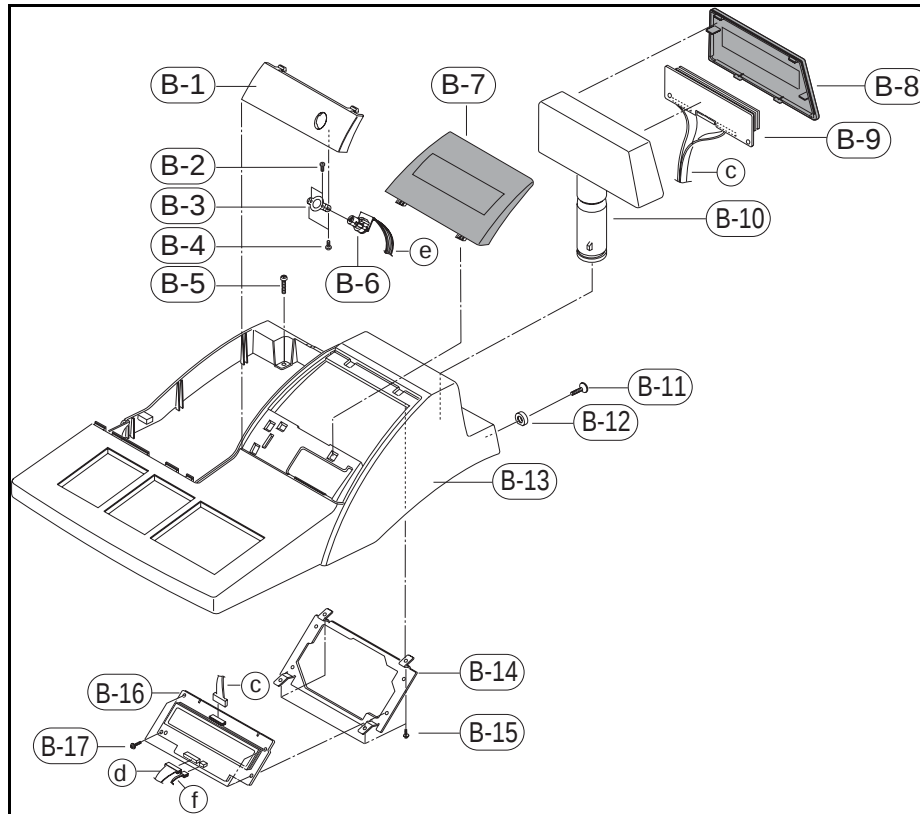


Figure7-4 Upper Case Assembly

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
B-1	JK72-40207A	PMO-COVER MODE S/W;HIPS(V0)	1		Y	
B-2	6002-000319	SCREW-TAPPING;PH,+,2,M3,L8,ZPC(YEL)	2	IPR-B/MODE+SWITCH ROTARY	Y	
B-3	JK70-10004A	IPR-BRKT MODE_S/W	1		Y	
B-4	6002-000319	SCREW-TAPPING;PH,+,2,M3,L8,ZPC(YEL)	2	IPR-B/MODE+PMO-C/MODE S/W	Y	
B-5	6002-000172	SCREW-TAPPING;PH,+,2,M4,L15	1	PMO-C/UPPER+PMO-C/LOWER	Y	
B-6	JK96-00187A	ELA ETC-MODE S/W	1		Y	
B-7	JK72-40901A	PMO-WINDOW DISPLAY;PC	1		Y	
B-8	JK72-40209B	PMO-WINDOW TURRET;PC	1		Y	
B-9	JK92-01231A	PBA TURRET	1		Y	
B-10	JK72-00015A	PMO-TURRET BODY;HIPS(V0)	1		Y	
B-11	6001-000367	SCREW-MACHINE;FH,+,M4,L10	1		Y	
B-12	JK70-40305A	ICT-SHAFT MOLDING;ER-350F,STD,SUM 24L	1	ER-350F,STD	Y	
B-13	JK72-00012A	PMO-CASE UPPER;ER-350,STD	1		Y	
	JK72-00012B	PMO-CASE UPPER;ER-350F(FISCAL),STD	1		Y	
B-14	JK70-10407A	IPR-BRKT WINDOW PCB;SECC T1.2	1		Y	
B-15	6002-000175	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(YEL)	4		Y	
B-16	JK92-01241A	PBA DISPLAY;ER-350,FUTABA,10G	1		Y	
B-17	6002-000175	SCREW-TAPPING;PWH,+,2,M3,L8,ZPC(YEL)	4		Y	

7-5 Lower Case Assembly

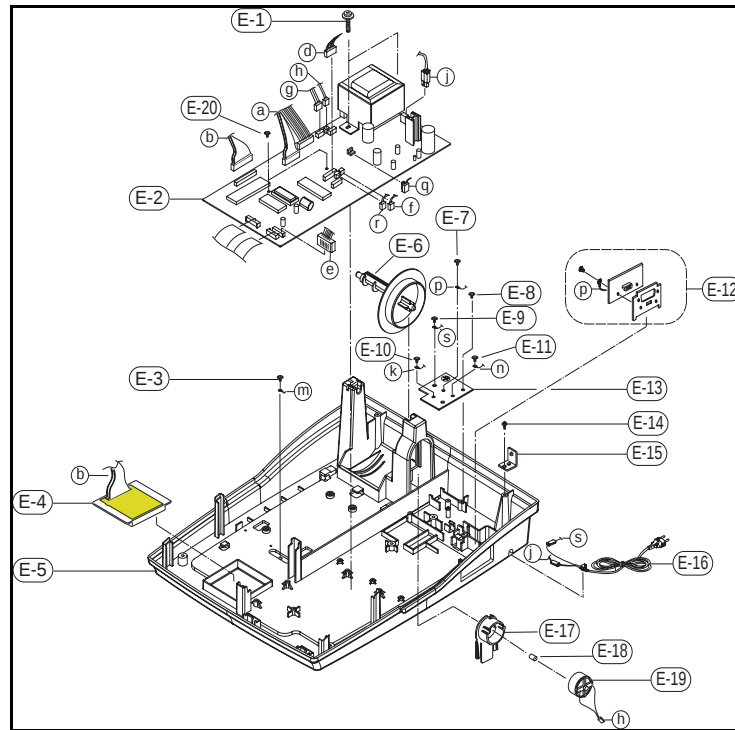


Figure7-5 Lower Case Assembly

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
E-1	6003-000014	SCREW-TAPTITE;+,S,M5,L14,ZPC(YEL)	2	C/LOWER+POWER TRANS	Y	
E-2	JK92-00901A	PBA MAIN B'D;ER-350,STD	1		Y	
E-3	6003-001149	SCREW-TAPTITE;+,S,M4,L10,ZPC(YEL)	1	C/LOWER+D/R CENTER GND	Y	
E-4	JK96-00190C	ELA ETC-PCB FISCAL;ER-350F	1		Y	
	JK72-40205A	PMO-CASE FISCAL BOARD;HIPS(V0)	1		Y	
E-5	JK72-00013A	PMO-CASE LOWER(NON SERIAL)	1		Y	
	JK72-00013B	PMO-CASE LOWER(SERIAL 1)	1		Y	
E-6	JK72-40215A	PMO-PULLEY WINDING	1		Y	
E-7	JK60-00001A	SCREW-ASSY TAPTITE;+,2,M3,L8	1	GND PLATE+I/F GND WIRE	Y	
E-8	6002-000174	SCREW-TAPPING;PWH;+,2,M3,L10,ZPC(YEL)	1	GND PLATE+C/LOWER	Y	
E-9	6006-000199	SCREW-ASS'Y TAPT:WT,BH;+,M4,L8,ZPC(YEL),	1	GND PLATE+POWER CORD GND WIRE	Y	
E-10	6002-000175	SCREW-TAPPING;PWH;+,2,M3,L8,ZPC(YEL)	1	GND PLATE+SENSOR GND WIRE	Y	
E-11	JK60-00001A	SCREW-ASSY TAPTITE;+,2,M3,L8	1	GND PLATE+D/R GND WIRE	Y	
E-12	JK92-00130A	PBA-SUB I/F BOARD	1		Y	
	6003-000266	SCREW-TAPTITE;PWH;+,S,M3,L6	1	BRKT-PORT+I/F GND	N	
	JK49-40011A	CBF HARNESS;250MM	1		N	
	JK70-10003A	IPR-BRKT PORT	1		N	
E-13	JK70-10001A	IPR-PLATE GROUND:ER-350,SBHG-1,T1.2,-	1		Y	
E-14	6002-000171	SCREW-TAPPING;PH;+,2S,M4,L10,ZPC(YEL)	1	C/LOWER+BRKT CASING	Y	
E-15	JK70-10002A	IPR-BRKT CASING:ER-380,SBHG-1,T1.6,-	1		Y	
E-16	JK39-10002A	CBF-POWER CORD;AUSTRALIA	1		Y	
	JK39-10003A	CBF-POWER CORD;USA	1		Y	
	JK39-10008A	CBF-POWER CORD;UK	1		Y	
	JK39-10501A	CBF-POWER CORD;EUROPE	1		Y	
E-17	JK72-40206A	PMO-HOLDER MOTOR	1		Y	
E-18	JK73-30200A	RCT-MOTOR	1		Y	
E-19	JK96-00185A	ELA ETC-MOTOR SPOOL	1		Y	
E-20	6002-000174	SCREW-TAPPING;PWH;+,2,M3,L10,ZPC(YEL)	2	C/LOWER+MIN B'D	Y	

7. Exploded Views and Parts List

7-6 Keyboard Assembly

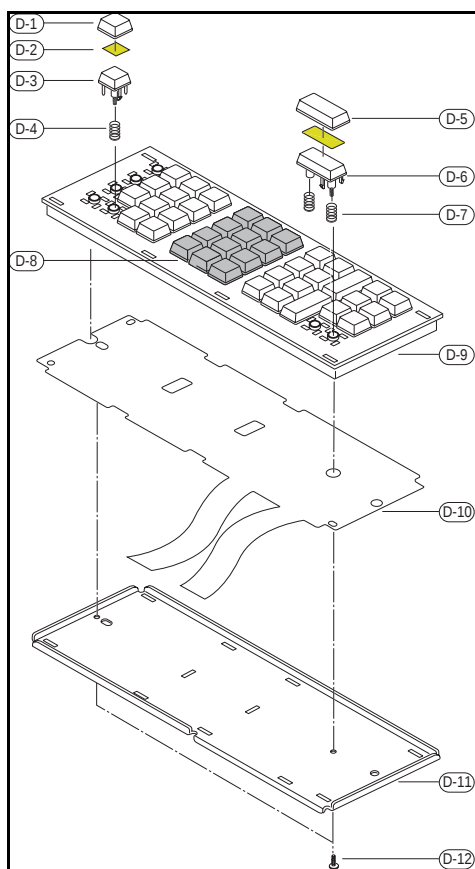


Figure7-6 Keyboard Assembly

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
D	JK59-10512A	UNIT-KEYBOARD;44KEY,ENGLISH	1		Y	
D-1	JK81-10945A	KEY-CAP(S);1X1	26		Y	
D-2	-	LABEL-KEY TOP SET	1		N	
D-3	JK81-20013A	KEY-TOP ASS'Y(S);1X1	26		Y	
D-4	JK81-10285T	SPRING RETURN;1X1	41		Y	
D-5	JK81-10946A	KEY-CAP(L);1X2	3		Y	
D-6	JK81-20014A	KEY-TOP ASS'Y(L);1X2	3		Y	
D-7	JK81-20001A	SPRING-RETURN;1X2	6		Y	
D-8	JK81-10933A	KEY-TOP,1	1		Y	
	JK81-10934A	KEY-TOP,2	1		Y	
	JK81-10935A	KEY-TOP,3	1		Y	
	JK81-10936A	KEY-TOP,4	1		Y	
	JK81-10937A	KEY-TOP,5	1		Y	
	JK81-10938A	KEY-TOP,6	1		Y	
	JK81-10939A	KEY-TOP,7	1		Y	
	JK81-10940A	KEY-TOP,8	1		Y	
	JK81-10941A	KEY-TOP,9	1		Y	
	JK81-10942A	KEY-TOP,0	1		Y	
	JK81-10943A	KEY-TOP,00	1		Y	
	JK81-10944A	KEY-TOP,●	1		Y	
D-9	JK72-60448A	HOUSING	1		Y	
D-10	JK81-10949A	FPC ASS'Y	1		Y	
D-11	JK70-10422A	FRAME(T0.8)	1		Y	
D-12	6002-000114	SCREW TAPPING;PH,+2,M3,L8,ZPC(YEL)	2		Y	

7-7 Drawer Assembly

7-7-1 Exploded View

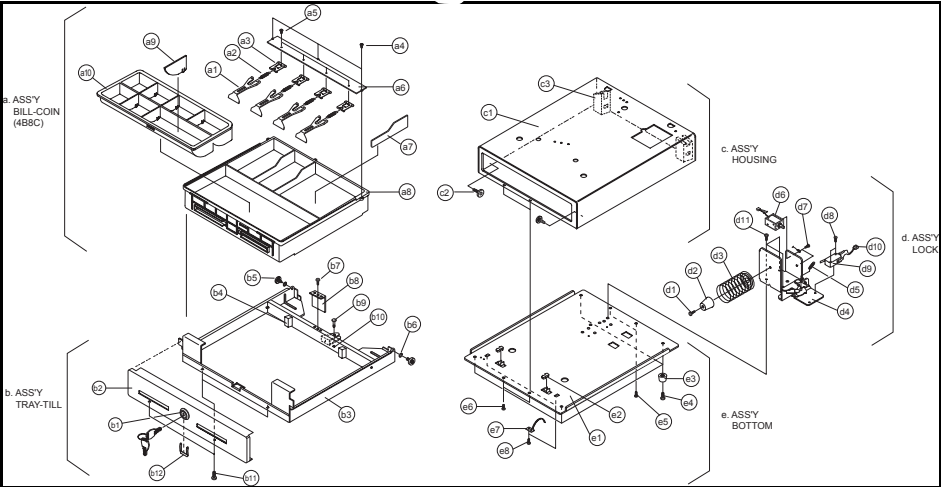


Figure7-7 Drawer (4B/8C)

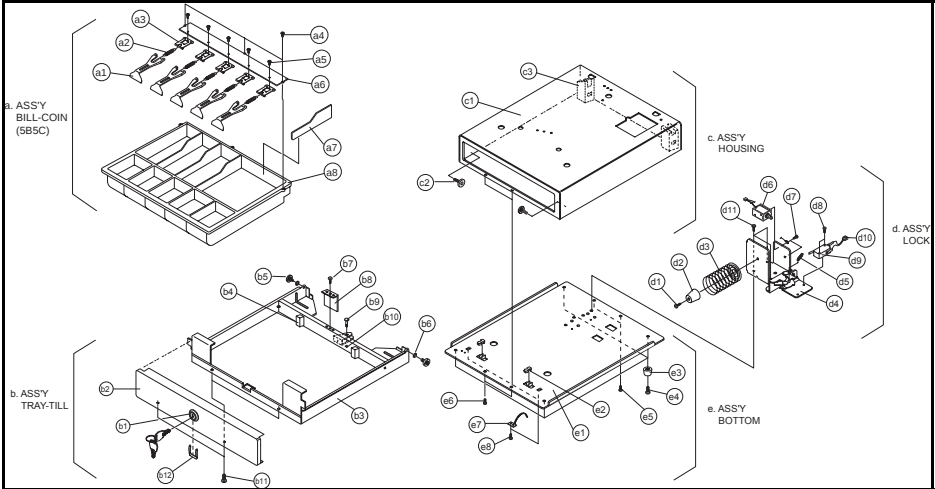


Figure7-8 Drawer (5B/5C)

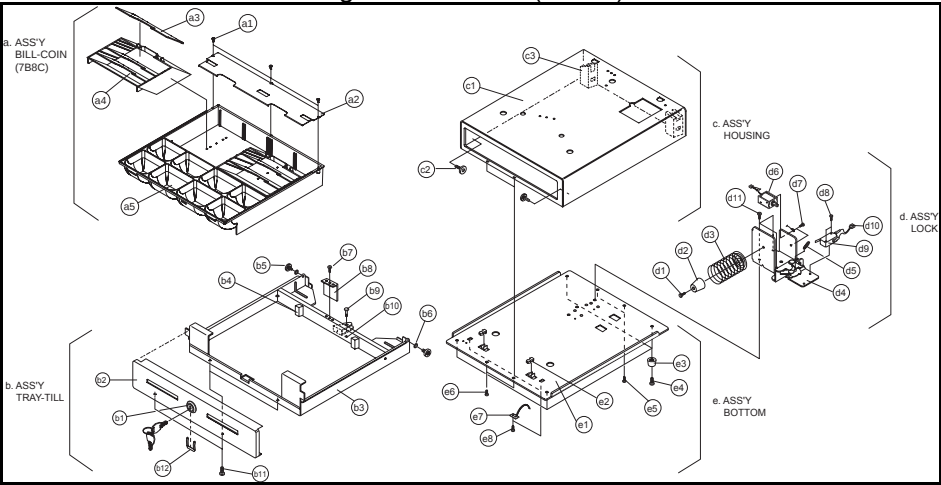


Figure7-9 Drawer (7B/8C)

7. Exploded Views and Parts List

7-7 Drawer

7-7-2 Parts List

7-7-2(a) ASS'Y BILL-COIN (4B/8C, 5B/5C)

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
a	JK97-20014A	MEA-UNIT BILL COIN: A-TYPE, 4B8C	1		Y	
	JK97-00407A	MEA-UNIT BILL COIN: A-TYPE, 5B5C	1		Y	
a-1	JK72-40267A	PMO-LEVER PRESS: A-TYPE,POM	4		Y	
a-2	6107-000134	SPRING ES: SUS304	4		Y	
a-3	JK70-10314A	IPR-HOLDER LEVER: A-TYPE,T1.2,ZPC	4		Y	
a-4	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-5	6002-001078	SCREW-TAPPING: PWH,+2,M3,L5	4		Y	
a-6	JK70-10304A	IPR-PLATE HOLDER: A-TYPE,SBHG-1,T1.2	1		Y	
a-7	JK72-40269A	PMO-PANEL PARTITION: A-TYPE,HIPS,BLK	3		Y	
a-8	JK72-20088A	PMO-BILL COIN TILL: A-TYPE,4B8C,HIPS,BLK	1		Y	
	JK72-40268A	PMO-BILL COIN TILL: A-TYPE,5B5C,HIPS,BLK	1		Y	
a-9	JK72-20090A	PMO-COIN PARTITION: A-TYPE,4B8C	6		Y	
a-10	JK72-20089A	PMO-COIN TILL: A-TYPE,4B8C,-	1		Y	

7-7-2(a) ASS'Y BILL-COIN (7B/8C)

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
a	JK97-01103A	MEA-UNIT BILL COIN: A-TYPE, 7B8C	1		Y	
a-1	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-2	JK70-00068A	IPR-HOLDER PLATE: A-TYPE,SBHG-1, T1.2	1		Y	
a-3	JK72-00083A	PMO-BILL PARTITION: A-TYPE,HIPS,BLK	5		Y	
a-4	JK72-00082A	PMO-BILL TILL: A-TYPE,HIPS,BLK	2		Y	
a-5	JK72-00084A	PMO-BILL COIN TILL: A-TYPE,HIPS,BLK	1		Y	

7-7-2(b) ASS'Y TRAY-TILL

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
b	JK97-01073B	MEA-UNIT TRAY TILL: A-TYPE,5B5C	1		Y	
	JK97-01073D	MEA-UNIT TRAY TILL: A-TYPE,4B8C,7B8C(EURO)	1		Y	
b-1	JK75-10389A	MEC-LOCK: DRAWER	1		Y	
b-2	JK70-10014A	IPR-PLATE FRONT: A-TYPE,SBC-1,T1.0	1		Y	
	JK70-10014B	IPR-PLATE FRONT: A-TYPE,4B8C,7B8C	1		Y	
b-3	JK75-00025A	MEA-TRAY TILL: A-TYPE,4B8C,7B8C	1		N	
	JK75-00025B	MEA-TRAY TILL: A-TYPE,5B5C	1		N	
b-4	JK73-10203A	RPR-TENSION: DRAWER,SPONGE,BLK	2		N	
b-5	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		Y	
b-6	6031-000549	WASHER-PLAIN: IDΦ6.5,ODΦ13, T1.0	2		Y	
b-7	6003-000221	SCREW-TAPTITE: PWH,+2,M4,L8,ZPC(YEL)	1		Y	
b-8	JK70-10324A	IPR-SUPPORT TRAY: DRAWER,SBHG-1,T1.2	1		N	
b-9	JK70-40302A	ICT,SHAFT PIN: A-TYPE	1		N	
b-10	6044-000124	RING-E: IDΦ3,ODΦ7, T0.6,ZPC(BLK),STSC	1		Y	
b-11	6002-001042	SCREW-TAPPING: FH,+2,M3,L6	2		Y	
b-12	JK70-10323A	IPR-PLATE CLIP: DRAWER,SWP,T0.5	1		Y	

7-7 Drawer

7-7-2 Parts List

7-7-2-(c) ASS'Y HOUSING

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
c	JK97-01074A	MEA-COVER HOUSING: A-TYPE,BASIC	1		Y	
	JK97-01074B	MEA-COVER HOUSING: A-TYPE,NONE HOLE,OPTION	1		Y	
c-1	JK75-00026A	MEA-SUB HOUSING: A-TYPE,BASIC	1		Y	
	JK75-00026B	MEA-SUB HOUSING: A-TYPE,NONE HOLE,OPTION	1		Y	
c-2	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		Y	
c-3	JK73-20207A	REX-PAD DRAWER: DRAWER,NR,BLK	2		N	

7-7-2-(d) ASS'Y LOCK

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
d	JK97-00985A	MEA-UNIT LOCK: A-TYPE,2-LATCH, LONG LEVER	1		Y	
	JK97-00987A	MEA-UNIT LOCK: A-TYPE,2-LATCH, SHORT LEVER	1		Y	
d-1	6002-000157	SCREW-TAPPING: PH,+2,M4,L14,ZPC(YEL)	1		Y	
d-2	JK73-20210A	REX-BUMPER: DRAWER,NR,BLK	1		Y	
d-3	JK61-70100A	SPRING-PUSH: DRAWER,FZN	1		Y	
d-4	JK75-00027A	MEC-LOCK LEVER: A-TYPE,2-LATCH, LONG LEVER	1		Y	
	JK75-00027B	MEC-LOCK LEVER: A-TYPE,2-LATCH, SHORT LEVER	1		Y	
d-5	6107-001014	SPRING-ES: Φ0.4,D4.8,L18	1		Y	
d-6	JK33-10500A	SOLENOID-DC: A-DRAWER	1		Y	
d-7	6001-000131	SCREW-MACHINE: BH,+2,M3,L6,ZPC(YEL)	2		Y	
d-8	6001-000525	SCREW-MACHINE: PH,+2,M3,L14,ZPC(YEL)	2		Y	
d-9	3405-001013	SWITCH-MICRO: 125V,5A	1		Y	
d-10	JK39-40301R	CBF-HARNESS: 2P,150MM,BRN,1007	1		Y	
d-11	6002-000161	SCREW-TAPPING: PH,+2,M4,L8,ZPC(YEL)	3		Y	

7-7-2-(e) ASS'Y BOTTOM

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
e	JK97-01976A	MEA-UNIT BOTTOM: A-TYPE	1		Y	
	JK97-01076B	MEA-UNIT BOTTOM: A-TYPE,UNIVERSAL	1		Y	
e-1	JK70-10938A	IPR-PLATE BOTTOM: A-TYPE,SBHG-1,T1.0	1		Y	
e-2	JK73-40200A	RMO-STOPPER: DRAWER,NR,BLK	2		Y	
	JK73-10902A	RMO-STOPPER: DRAWER,NR,BLK,UNIVERSAL	2		Y	
e-3	JK61-40200A	RMO-FOOT RUBBER: DRAWER,NR,GRAY,80HB	4		Y	
e-4	6002-000234	SCREW-TAPPING: TH,+2,M4,L16,ZPC(YEL)	4		Y	
e-5	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	6		Y	
e-6	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	2		Y	
e-7	JK70-10401A	IPR-PLATE SPRING: DRAWER,STS304,T0.3	2		Y	
e-8	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	4		Y	

7. Exploded Views and Parts List

MEMO

8 Block Diagram

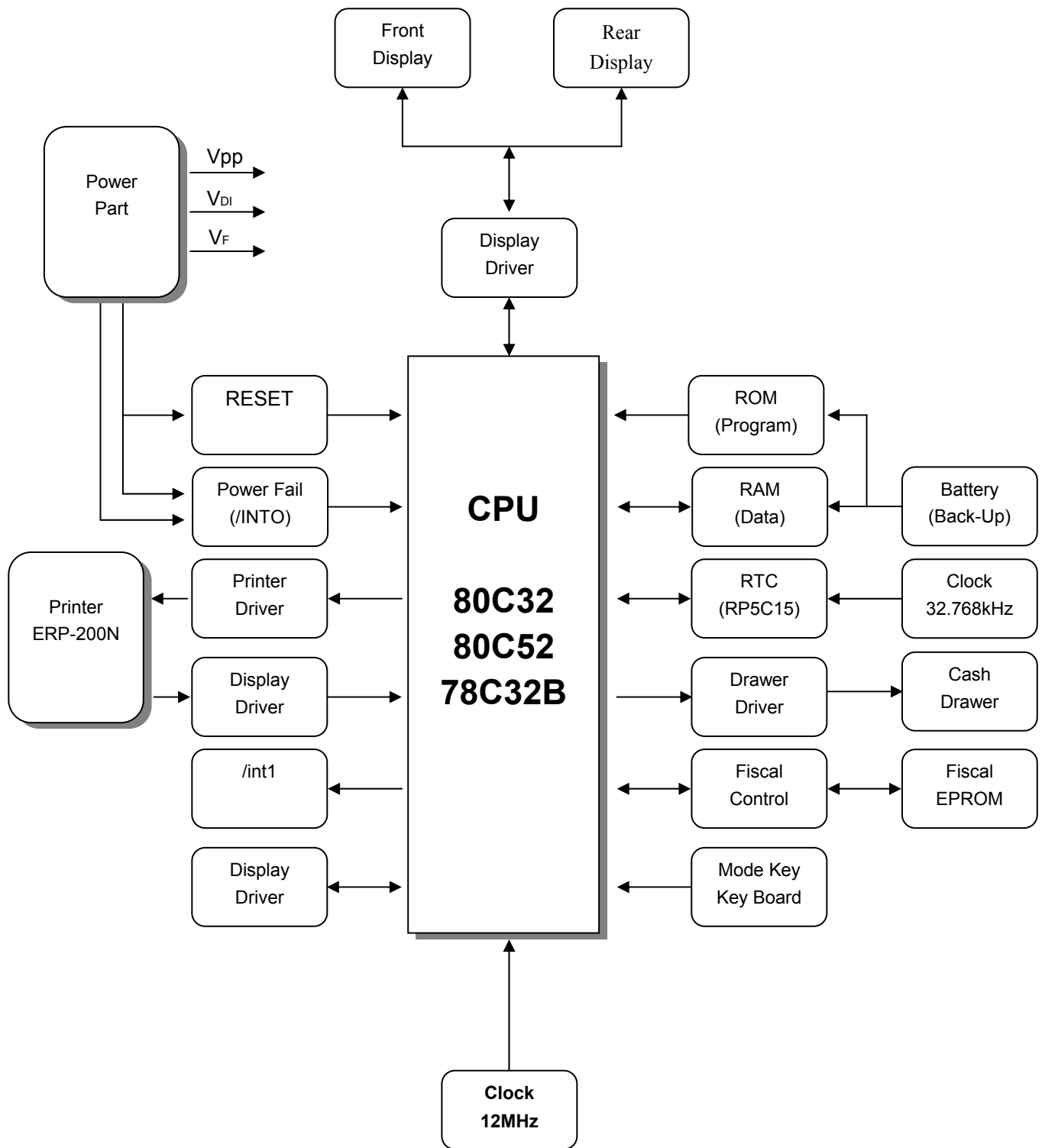


Figure8-1 System Block Diagram

8. Block Diagram

MEMO

9 PCB Parts List

9-1 Main PCB Parts List

No	Code-No	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
	JK94-00276B	PRA ETC-MPCB:ER-350F,RUSB,RUSSIA,SENSOR	1			
	JK92-00128L	PBA MAIN-MAIN BOARD:ER-350F,RUSB,RUSSIA,	1			
	0201-000008	ADHESIVE-HM:#3748,WHT,6500CPS,V2	1	TRANS		
	0201-000008	ADHESIVE-HM:#3748,WHT,6500CPS,V2	1			
	0202-000118	SOLDER-WIRE:KR-19 RMA,-,D0.8,-,-	1			
	0202-000216	SOLDER-BAR:S63S-B20,S63S,350X34,SN63/PB3	1			
	0202-001025	SOLDER-WIRE FLUX:KS-611,-,-,-,spray	1			
	0204-000004	ETHANOL:ISO-PROPYLEME,C2H5OH,99.8%, -	1			
	0402-000168	DIODE-RECTIFIER:1N5822,40V,3A,DO-201AD,T	1	D2		
	0402-000287	DIODE-BRIDGE:GBL01,100V,3A,SIP-4,ST	1	B.D1		
	0502-000240	TR-POWER:KSA614-Y,PNP,25W,TO-220,TP,120	1	Q11(FISCAL)		
	0502-000288	TR-POWER:KSD288,NPN,25W,TO-220,-,120-24	1	Q8		
	0506-001019	TR-ARRAY:STA471A,NPN,4,4W,SIP-10,ST,200	1	TRA1		
	0506-001019	TR-ARRAY:STA471A,NPN,4,4W,SIP-10,ST,200	2	TRA2,TRA3		
	0801-000522	IC-CMOS LOGIC:74HCT541,BUFFER/DRIVER,DIP	2	IC5,IC14		
	0801-000528	IC-CMOS LOGIC:74HCT574,D FLIP-FLOP,DIP,2	2	IC6, IC7		
	0801-000530	IC-CMOS LOGIC:74HCT573,D LATCH,DIP,20P,3	1	IC12		
	0801-000918	IC-CMOS LOGIC:74HCT139,1-TO-4 DECODER,DI	1	IC10		
	0803-001206	IC-TTL:74LS05,INVERTED GATE,DIP,14P,3	2	IC8,IC9		
	0803-001211	IC-TTL:74LS14,SCHMITT INVERTER,DIP,14P,3	1	IC4		
	0903-001083	IC-MICROCONTROLLER:78C32B,8BIT,DIP,40P,-	1	IC11(WINBOND,78B32		
	0904-000251	IC-PERIPHERAL:82C55,8BIT,DIP,40P,-,-,C	1	IC17(FISCAL)		
	0909-000111	IC-REAL TIME CLOCK:5C15,4BIT,DIP,18P,300	1	IC13		
	1102-000173	IC-EPROM:27C512,64Kx8BIT,DIP,28P,600MIL	1	IC15		
	1106-001095	IC-SRAM:62256,32Kx8BIT,DIP,28P,600MIL,	1	IC16		
	1202-000103	IC-VOLTAGE COMP.:393,DIP,8P,300MIL,DUAL,	1	IC2		
	1203-000391	IC-DC/DC CONVERTER:34063,DIP,8P,250MIL,P	1	IC1		
	1203-000442	IC-POSI.FIXED REG.:7812,TO-220,3P,-,PLAS	1	IC18(FISCAL)		
	1206-000139	IC-TIMER:NE555CN,DIP,8P,250MIL,PLASTIC,	1	IC3		
	2003-000502	R-METAL OXIDE(S):150ohm,5%,2W,AA,TP,4x12	1	R42		
	2011-000290	R-NETWORK:1KOHM,5%,1/8W,A,SIP,10P,BK	1	RA5		
	2011-000539	R-NETWORK:4.7KOHM,5%,1/8W,A,SIP,9P,ST	4	RA1,2,3,4		
	2201-000539	C-CERAMIC,DISC:4.7nF,20%,250V,Y5V,BK,16x	1	C1		
	2401-001312	C-AL:4700uF,20%,50V,GP,BK,22x40,10	1	CE1		
	2401-001363	C-AL:470uF,20%,16V,GP,TP,10x12.5,5	1	CE7		
	2401-001429	C-AL:470uF,20%,50V,GP,TP,13x20,5	1	CE6		
	2503-001030	C-NETWORK:100PFX8,20%,50V,X7R	6	CA1,3,4,5,6,7		
	2801-000140	CRYSTAL-UNIT:12MHz,50ppm,28-AAM,S,30ohm,	1	X2		
	2801-003376	CRYSTAL-UNIT:0.032768MHz,20ppm,28-AAY,12	1	X1		
	3002-001027	BUZZER-PIEZO:85dB,1.5V,24mA,2.048KHz,BK	1	BUZZER		
	3601-000246	FUSE-CARTRIDGE:250V,2A,TIME-LAG,GLASS,5.	1	FUSE		
	3704-000235	SOCKET-IC:28P,DIP,SN,2.54mm	1	IC15		
	3708-000306	CONNECTOR-FPC/FFC/PIC:6P,2.54mm,STRAIGHT	1	CN13		
	3708-000327	CONNECTOR-FPC/FFC/PIC:8P,2.54mm,STRAIGHT	1	CN14		
	3710-000111	CONNECTOR-SHUNT:2P,1R,2.54mm,-,AUF	1	CN11(ALL CLEAR)		
	3711-000033	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,STRAIGH	1	CN2(DISPLAY/VF),RE		
	3711-000034	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,STRAIGH	1	CN9(MOTOR),BLK		
	3711-000037	CONNECTOR-HEADER:BOX,3P,1R,2.5mm,STRAIGH	2	CN4,17(P/SENSOR),RED		
	3711-000041	CONNECTOR-HEADER:BOX,8P,1R,2.5mm,STRAIGH	1	CN6(DISPLAY),RED		
	3711-000183	CONNECTOR-HEADER:1WALL,2P,1R,3.96mm,STRA	1	CN16(DRAWER)		
	3711-000658	CONNECTOR-HEADER:BOX,12P,1R,2.5mm,STRAIG	1	PRT 12P		
	3711-000829	CONNECTOR-HEADER:BOX,2P,1R,6.2mm,STRAIGH	1	CN1(POWER CORD)		
	3711-001011	CONNECTOR-HEADER:BOX,5P,1R,2.5mm,STRAIGH	1	CN7(RS-232C),IVORY		
	3711-001133	CONNECTOR-HEADER:BOX,8P,1R,2.5mm,STRAIGH	1	CN12(MODE KEY),IVO		

9. PCB Parts List

9-1 Main PCB Parts List

No	Code-No	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
	3711-001475	CONNECTOR-HEADER:NOWALL,3P,1R,2.54mm,STR	1	CN11(ALL CLEAR)		
	3711-001962	CONNECTOR-HEADER:NOWALL,30P,2R,2.54mm,ST	1	CN15(FISCAL)		
	3711-003359	CONNECTOR-HEADER:BOX,10P,1R,2.5mm,STRAIG	1	PRT 10P		
	3711-003969	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,STRAIGH	1	CN5(COMPULSORY)IVO		
	4302-000126	BATTERY-NICD(2ND):3.6V(1.2Vx3),60mAH,CYL	1	BAT1		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	1	JP149(FISCAL)		
	JC68-10564A	LABEL(P)-PROTECTOR:SLB-3108H,ART,-,100(S	1	FISCAL BOARD		
	JC68-10564A	LABEL(P)-PROTECTOR:SLB-3108H,ART,-,100(S	1	IC15		
	JK26-30100A	TRANS POWER:ER-350,230V/50Hz,AWG#22	1	POWER TRANS		
	JK27-60100D	COIL FILTER:ER-350,140 UH,-,-	1	L1		
	JK39-40307D	CBF HARNESS:ER-4615FP,-,UL1007,310MM,RED	1	PRT 10P/12P		
	JK39-40550A	CBF HARNESS-JUMPER:ER-350F,WIRE,UL1007,1	1	A_TO_A		
	JK92-00133A	PBA MAIN-PCB AUTO:ER-350,SAMSUNG,BASIC,-	1	MAIN AUTO		
	JK96-00940A	ELA HOU-HEAT SINK:ER-4615,BASIC,WORLD,-,	1	Q1		
	0205-000003	OIL-SILICON:G746,-	0			
	0401-000005	DIODE-SWITCHING:1N4148,100V,200mA,DO-35,	12	D15,D24,D18,D21 D17,D16,D22,D19 D1,D10 D11,D20		
	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	7	D12,D5,D6,D3,D7,D8 D4		
	0402-000208	DIODE-RECTIFIER:EK-04,40V,1.5A,DO-41	4	D13,D9,D14,D25		
	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD4,5		
	0403-000343	DIODE-ZENER:UZ3.9B,3.9V,3.7-4.1V,500mW,D	1	R21		
	0403-000343	DIODE-ZENER:UZ3.9B,3.9V,3.7-4.1V,500mW,D	1	ZD3		
	0403-000537	DIODE-ZENER:1N4749A,24V,5%,1W,DO-41,TP	1	ZD1		
	0501-000399	TR-SMALL SIGNAL:KSC945-G,NPN,250mW,TO-92	8	Q10,Q4,Q3,Q6,Q5,Q7 Q2,Q9		
	0502-000395	TR-POWER:-,NPN,30W,TO-220,-,120-240	1			
	2001-000027	R-CARBON:100OHM,5%,1/4W,AA,TP,2.4X6.4MM	3	R33,34,35		
	2001-000032	R-CARBON:180OHM,5%,1/4W,AA,TP,2.4X6.4MM	2	R58,44		
	2001-000034	R-CARBON:220OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R53		
	2001-000036	R-CARBON:330OHM,5%,1/4W,AA,TP,2.4X6.4MM	3	R37,52,54		
	2001-000042	R-CARBON:1KOHM,5%,1/4W,AA,TP,2.4X6.4MM	12	R38,R24,R40,R48 R49,R45,R28,R13 R41,R22,R11,R39		
	2001-000047	R-CARBON:2.2KOHM,5%,1/4W,AA,TP,2.4X6.4MM	4	R26,7,25,60		
	2001-000055	R-CARBON:4.7KOHM,5%,1/4W,AA,TP,2.4X6.4MM	8	R10,R8,R2,R14,R50 R16,R15,R6		
	2001-000060	R-CARBON:6.8KOHM,5%,1/4W,AA,TP,2.4X6.4MM	2	R12,51		
	2001-000065	R-CARBON:10KOHM,5%,1/4W,AA,TP,2.4X6.4MM	7	R56,R29,R20,R23,R3 R43,R27		
	2001-000076	R-CARBON:47KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R19		
	2001-000113	R-CARBON:18KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R18		
	2001-000323	R-CARBON:120OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R55		
	2001-000395	R-CARBON:180KOHM,5%,1/4W,AA,TP,2.4X6.4MM	3	R30,31,32		
	2001-000561	R-CARBON:27KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R17		
	2001-000588	R-CARBON:3.3KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R36		
	2001-000841	R-CARBON:51OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R9		
	2004-000284	R-METAL:12Kohm,1%,1/4W,AA,TP,2.4x6.4mm	1	R5		
	2004-000825	R-METAL:36Kohm,1%,1/4W,AB,TP,2.4x6.4mm	1	R4		
	2005-000419	R-WIRE WOUND,NON:0.33ohm,1%,1W,AA,TP,4.3	1	R1		
	2201-000119	C-CERAMIC,DISC:100nF,+80-20%,50V,Y5V,TP,	25	C38,C32,C16,C17,C3 C23,C33,C15,C22,C8 C41,C37,C45,C28 C14,C46,C27,C21 C26,C4,C6,C29,C30 C40,C18		

9-1 Main PCB Parts List

No	Code-No	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
	2201-000162	C-CERAMIC,DISC:10nF,+80-20%,50V,Y5V,TP,7	3	C11,12,13		
	2201-000232	C-CERAMIC,DISC:0.15nF,10%,50V,Y5P,TP,4x3	1	C7		
	2201-000464	C-CERAMIC,DISC:0.03nF,5%,50V,SL,TP,5x3,5	4	C34,35,24,25		
	2201-000764	C-CERAMIC,DISC:0.082nF,5%,50V,NP0,TP,8x3	2	C42,36		
	2301-000010	C-FILM,PEF:100nF,5%,100V,TP,11.5x12.5mm,	3	C5,C9,C10		
	2401-000032	C-AL:100uF,20%,50V,GP,TP,8x12,5mm	1	CE2		
	2401-000042	C-AL:100uF,20%,16V,GP,TP,6.3x7,5	4	CE4,5,8,9		
	2401-000480	C-AL:10uF,20%,50V,GP,TP,5x11,5	1	CE3		
	2401-000603	C-AL:1uF,20%,50V,GP,TP,5x11,5	1	CE11		
	2401-002075	C-AL:4.7uF,20%,50V,GP,TP,5x11,5	1	CE10		
	3301-000299	CORE-FERRITE BEAD:AA,3.6x5.0mm,550,3100G	2	FB2,3		
	3301-000344	CORE-FERRITE BEAD:AA,-,3.5x0.6x6.5mm,-,-	4	FB1,4,5,6		
	3602-000001	FUSE-CLIP:-,30mohm	2	FH1		
	6002-000175	SCREW-TAPPING:PW,+,2,M3,L8,ZPC(YEL)	1			
	6203-000107	HEAT SINK:NONE,T2,W17,L22,H45,DEGRE,AL60	1			
	jb02-10501a	TAPE ETC-SEQ M/C:TESLA,-,T0.12,W6,L3000M	0			
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	16	JP1-JP16		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	131	JP18-JP148		
	JK41-10001A	PCB-MAIN:ER-380,FR-1,1L,T1.6,300X130XT1	1	MAIN PCB		

9-2 Font Display Parts List

No	Code-No	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
	JK92-01243A	PBA DISPLAY:ER-350F,FUTABA,RUSB	1			
	2401-001050	C-AL:3300uF,20%,10V,SHL,VB,12.5x20,5mm	1	C1		
	3711-001133	CONNECTOR-HEADER:BOX,8P,1R,2.5mm,STRAIGH	1	CN1		
	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN2		
	3711-003969	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,STRAIGH	1	CN3		
	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	V1		
	JK39-00034A	CONNECT WIRE-350 DISPLAY:ER-350,FLAT,UL1	1	8P		
	JK39-40006A	CBF HARNESS:ER-350,-,UL1007,350MM,WHT/RE	1	2P		
	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	T5.0		
	1003-001381	IC-VFD:HV5812P,DIP,28P,540MIL,-,-,ST,PLA	1	U1		
	JK69-90902A	PACKING-VINYL:PET,#2126,30X100000XT0.05,	0	DIGITRON		
	JK94-01120B	PHANTOM AU JK92-01243A	1			
	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	1	D1		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J1,J2,J3,J4,J5		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J6,J7,J8,J9,J10		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J11,J12,J13,J14,		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	4	J16,J17,J18,J20		
	JK41-10005B	PCB-DISPLAY(10G):ER-350F,FR-1,1L,T1.6,F	1			

9-3 Rear Display Parts List

No	Code-No	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
	JK92-01231A	PBA TURRET:ER-350F/5100/5200,10G	1			
	JK39-40002A	CBF HARNESS:ER-220N,-,UL1061,400MM,BLK/R	1	TURRET TO DISP.		
	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	10 DIGIT		
	3711-002812	CONNECTOR-HEADER:BOX,11P,1R,2mm,STRAIGHT	2	CN1,CN2		
	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	PAD		
	JK69-90902A	PACKING-VINYL:PET,#2126,30X100000XT0.05,	0	DIGITRON		
	JK94-00053A	PHANTOM AUTO ER-290 TURRET 10DIT	1			
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J1,J2,J3,J4,J5		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	1	J6		
	JK41-10548B	PCB-TURRET:ER-5100/5200,FR-1,1L,T1.6	1	10 DIGIT		

9. PCB Parts List

9-4 Fiscal Board Parts List(Memory Size=1Mbits)

No	Code No.	Description / Specification	Q'TY	Remarks	Serviceable	
	JK92-00132B	PBA SUB-FISCAL B/D;1MBITs	1	1MBITs ASSY	Y	
	1102-000109	IC-EPROM:27C010,128Kx8BIT,DIP,32P,600MI	1	U1	Y	
	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD1	Y	
	JK39-40305B	CBF HARNESS:-,UL 1007,120,WHT/BLU/RED,2	1	CN1	Y	
	JK94-00055A	PHANTOM AU JK92-00132B	1		N	
	2007-000029	R-CHIP:0OHM,5%,1/10W,DA,TP,2012	1	R3	Y	
	2007-000030	R-CHIP:560OHM,5%,1/10W,DA,TP,2012	1	R2	Y	
	2007-000221	R-CHIP:1.2KOHM,5%,1/10W,DA,TP,2012	1	R4	Y	
	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	10	R1,R5,R6,R7,R8,R9,R10,R11 R12,R13	Y	
	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	1	C2	Y	
	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	2	D1,D2	Y	
	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	1	Q1	Y	
	JK41-10531B	PCB-FISCAL:ER-5240F,FR-4,2L,T1.6mm,348X5	1		Y	

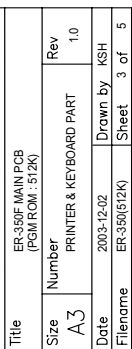
9-5 Interface Board Parts List

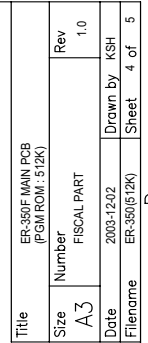
No	Code-No	Description / Specifications	Q'ty	Design-Location	Serviceable	Remark
	JK92-00105A	PBA MAIN-I/F BOARD:ER-350P,SAMSUNG,CE,-,	1			
	3701-000240	CONNECTOR-DSUB:9P,2R,FEMALE,STRAIGHT,AUF	1	CN2(18PCS)		
	1006-000137	IC-DRIVER/RECEIVER:232,DIP,16P,300MIL,DU	1	IC 1		
	JK39-40011A	CBF HARNESS:ER-350,-,UL1015,250MM,GRN/YE	1	GND WIRE		
	JK60-10500A	SCREW-SPECIAL:-,M2.6,L6,-,-,-,ZPC3,S	2	HEX,M3		
	6003-000266	SCREW-TAPTITE:PDH,+,S,M3,L6,ZPC(YEL),SWR	1	I/F BRKT + GND WIR		
	JK39-40305U	CBF HARNESS:-,UL 1007,200,RED/WHT/WHT/W	1	CN1(18PCS)		
	JK70-10003A	IPR-BRKT PORT:ER-380,SBHG-1,T1,-	1			
	SEGI-100047	EGI 1.0*47*33	1			
	JK92-00134A	PBA MAIN-I/F AUTO:ER-350,SAMSUNG,EUROPE,	1			
	JK41-10004A	PCB-INTERFACE:ER-380,FR-1,1L,T1.6,40X43X	1	PCB(6PCS)		
	3301-000292	CORE-FERRITE BEAD:AA,100ohm,3.5x0.6x6.5m	2	FB1,2(6PCS)		
	0501-000399	TR-SMALL SIGNAL:KSC945-G,NPN,250mW,TO-92	2	Q1,Q2		
	2001-000047	R-CARBON:2.2KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R2		
	2001-000055	R-CARBON:4.7KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R1		
	2001-000065	R-CARBON:10KOHM,5%,1/4W,AA,TP,2.4X6.4MM	2	R3,R4		
	2401-002075	C-AL:4.7uF,20%,50V,GP,TP,5x11,5	2	C4,5(6PCS)		
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	3	J1,2,3(6PCS)		
	2401-000480	C-AL:10uF,20%,50V,GP,TP,5x11,5	3	C1,C2,C3		

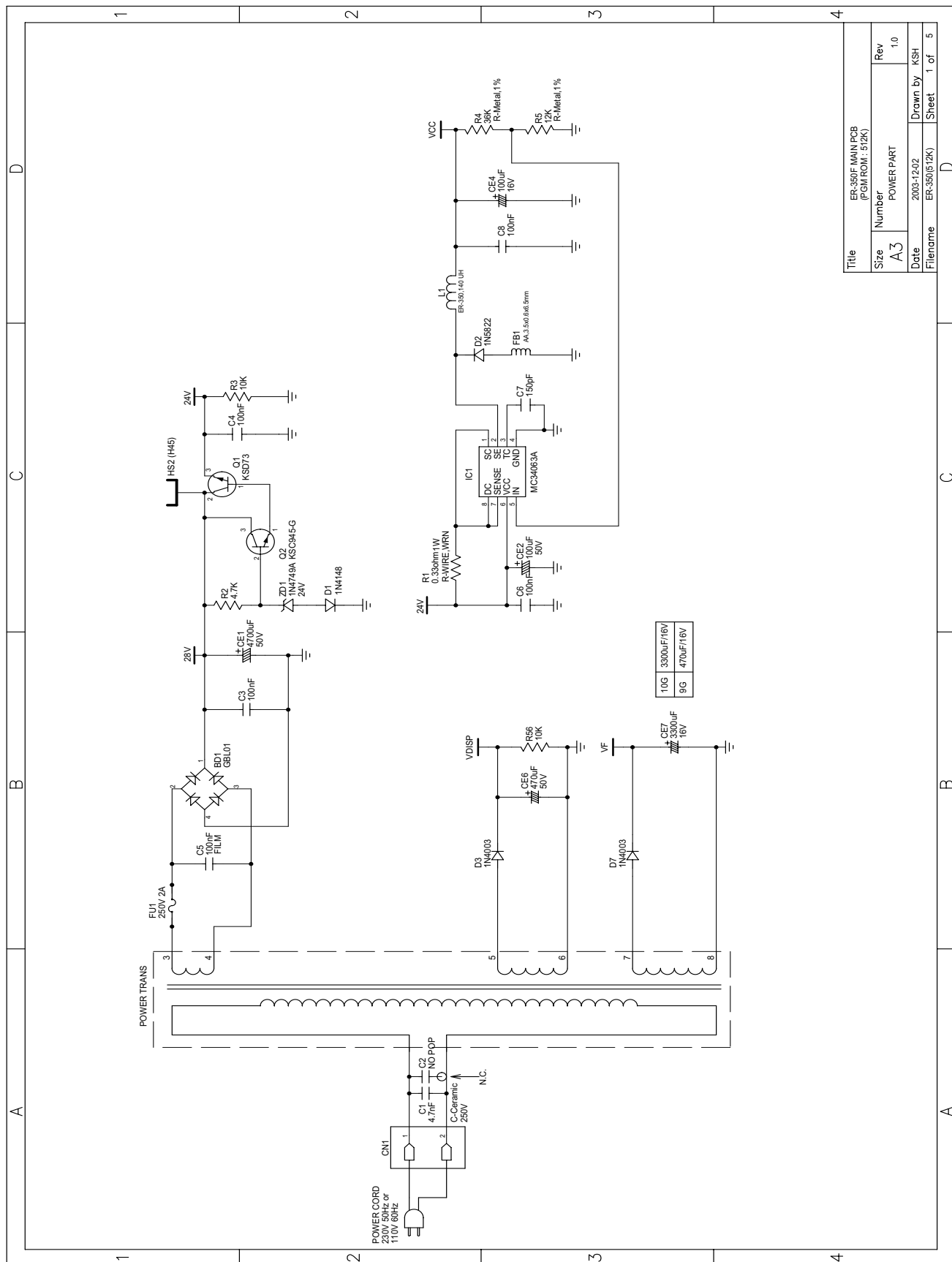
10 Schematic Diagrams

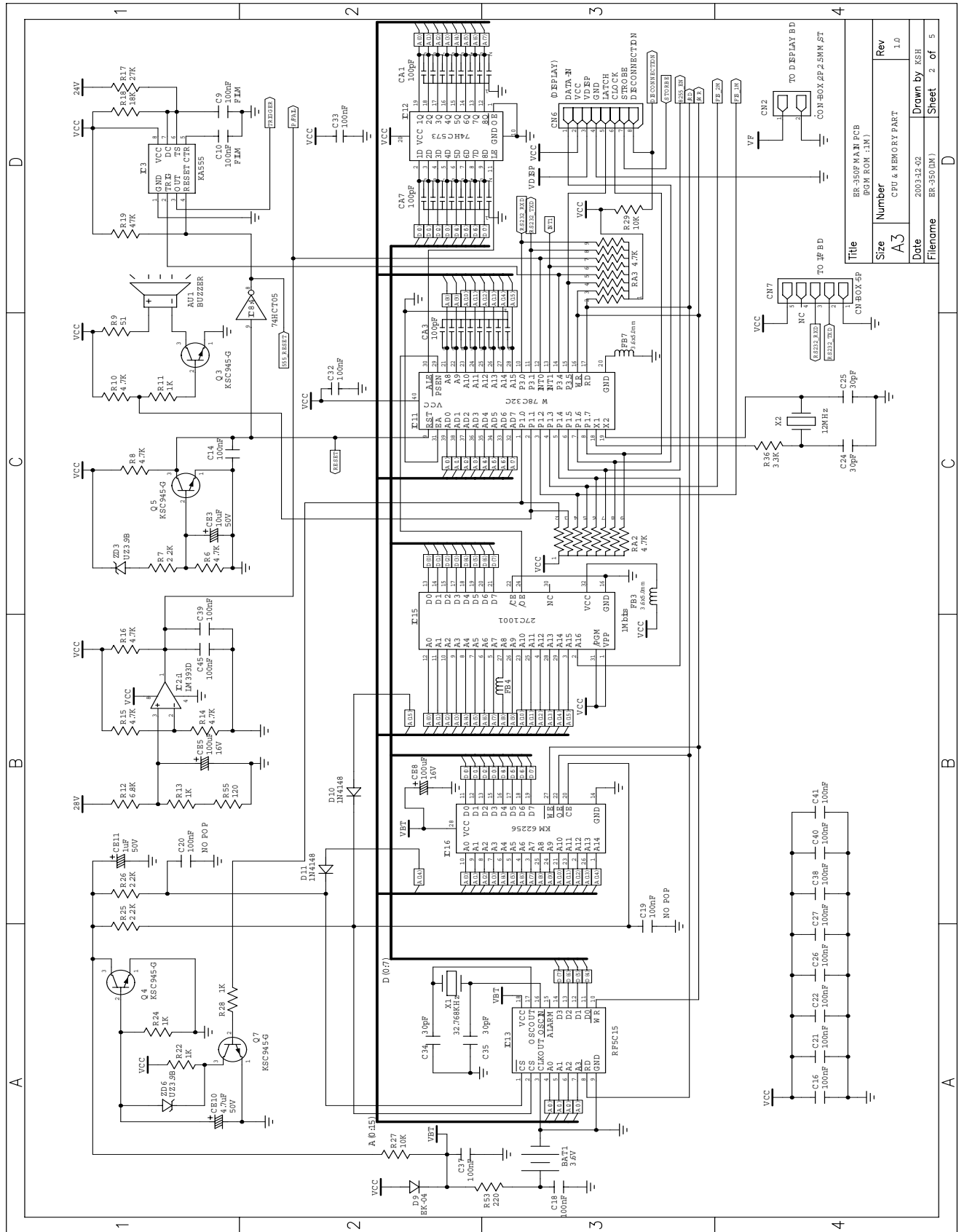
[Schematics Sheet Content]

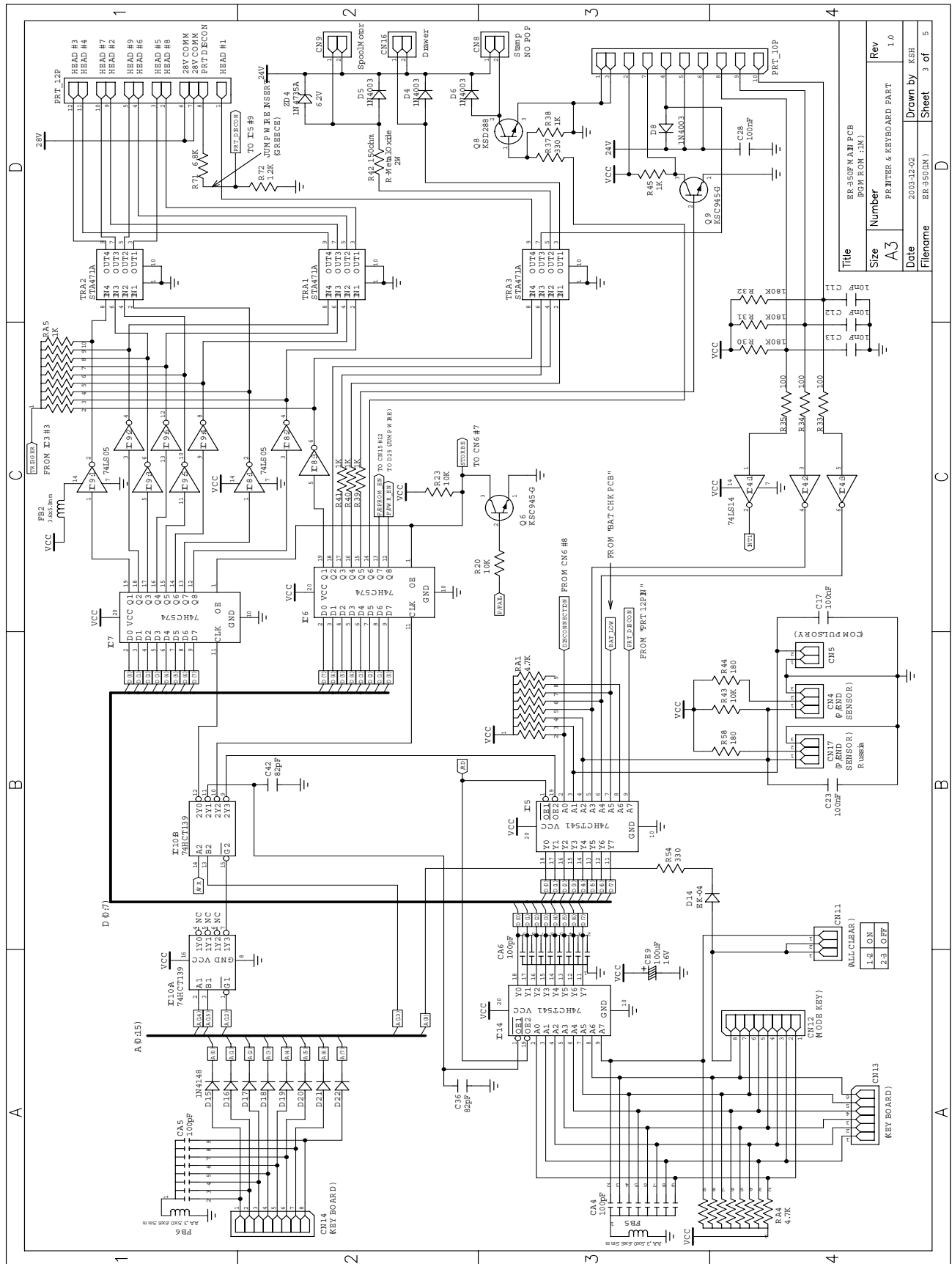
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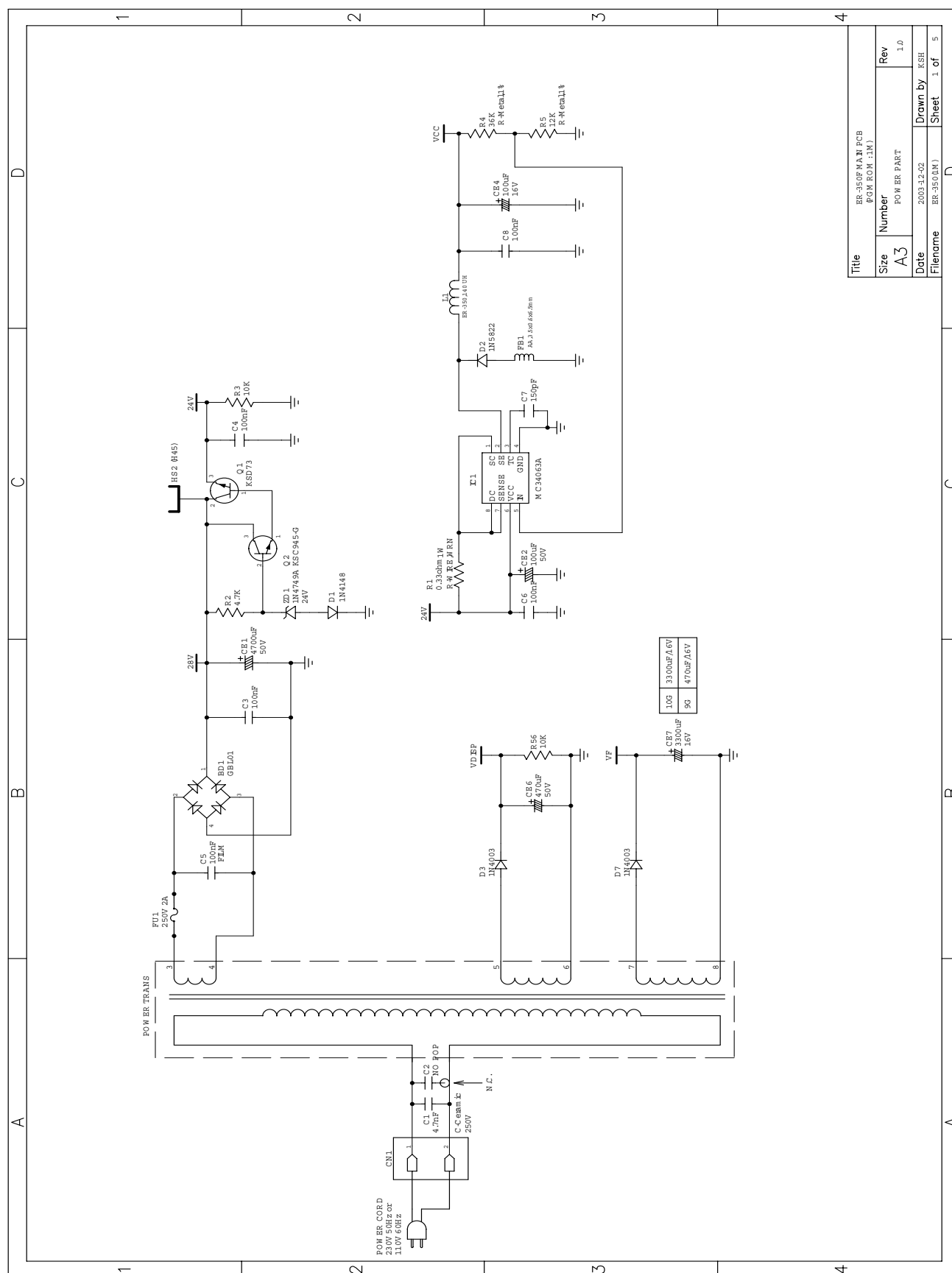


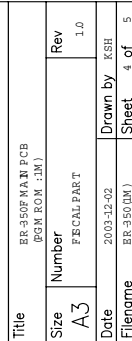


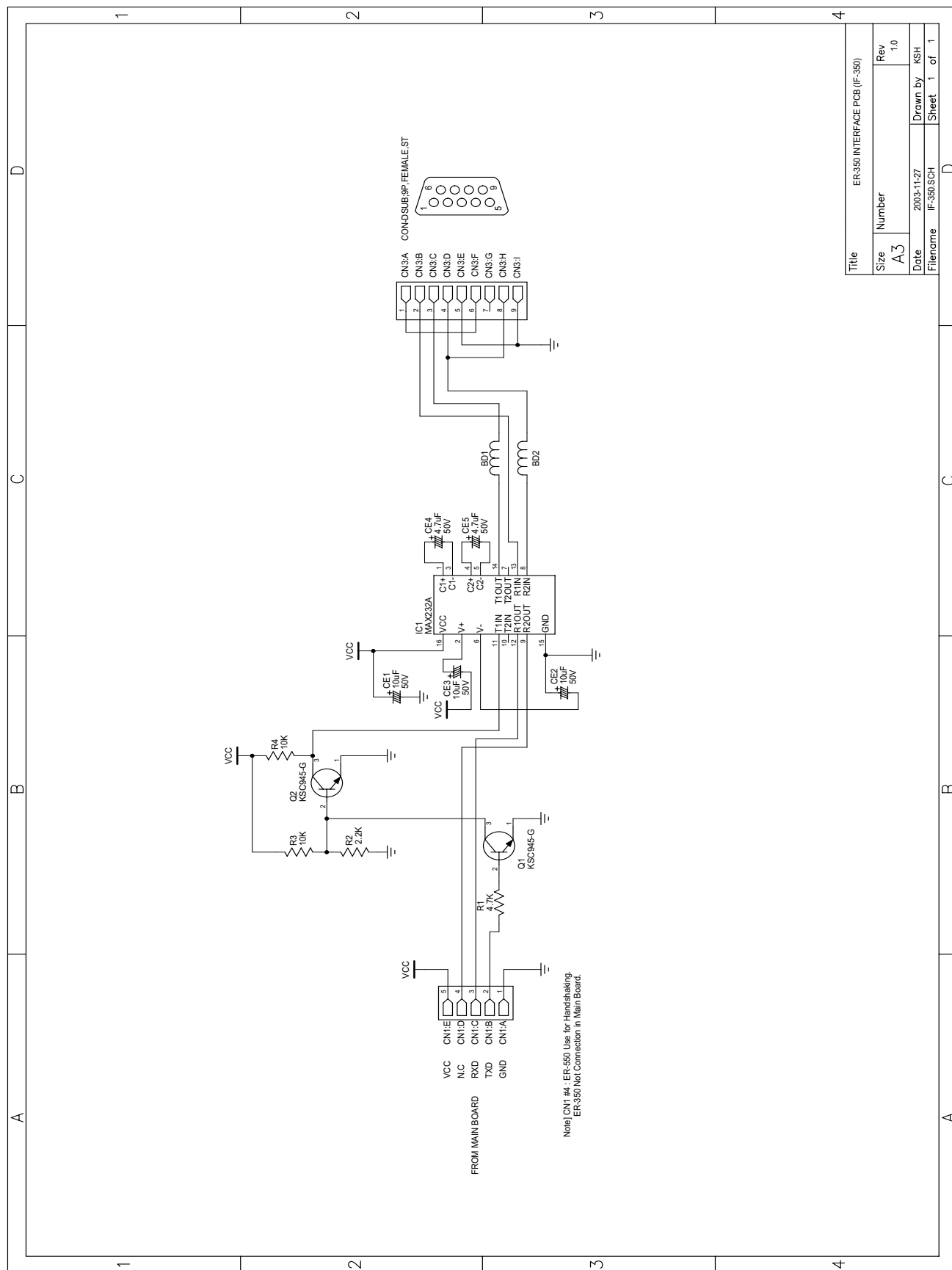




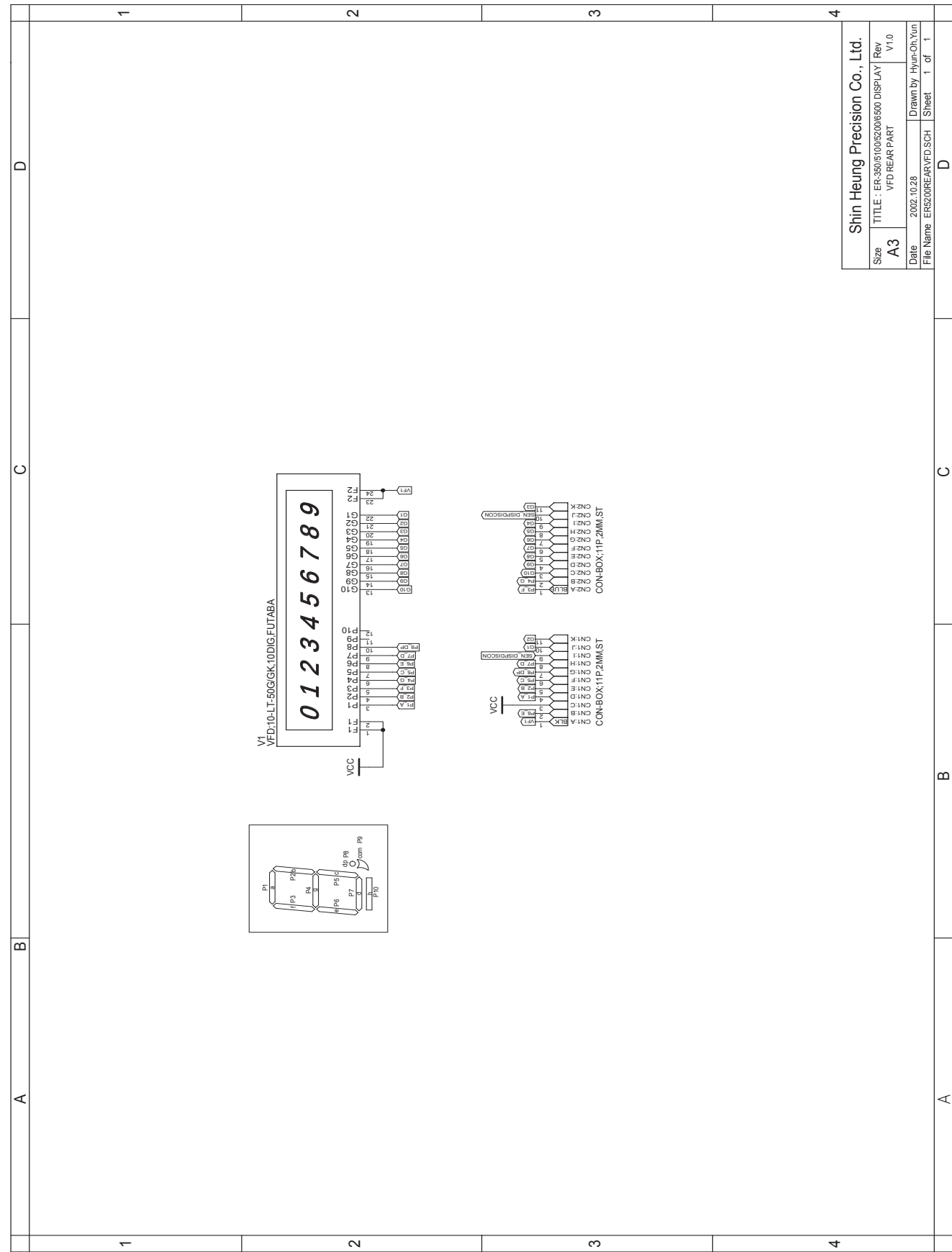












MEMO

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Use this page to record any special servicing information such as Service Bulletins or Supplements.
When possible, record changes to Code numbers directly on the actual Parts List. Always record Service Bulletin numbers and Application Dates on this log to ensure that your data is always as current as possible.

SAM4S

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