

# SERVICE MANUAL & PARTS LIST

(without price)

## SF-8350(LX-572)

JUNE 1993



SF-8350

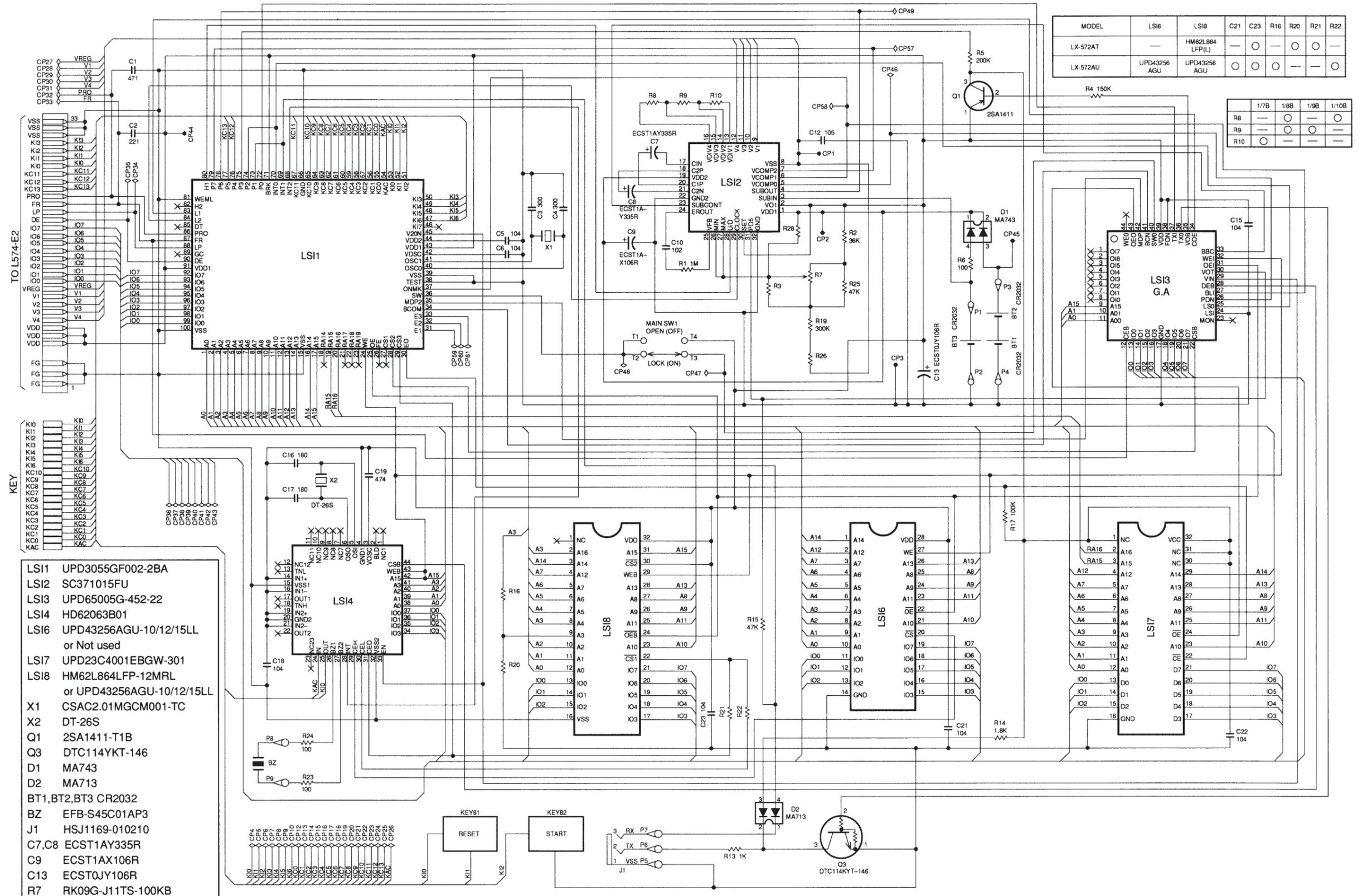
# CASIO®

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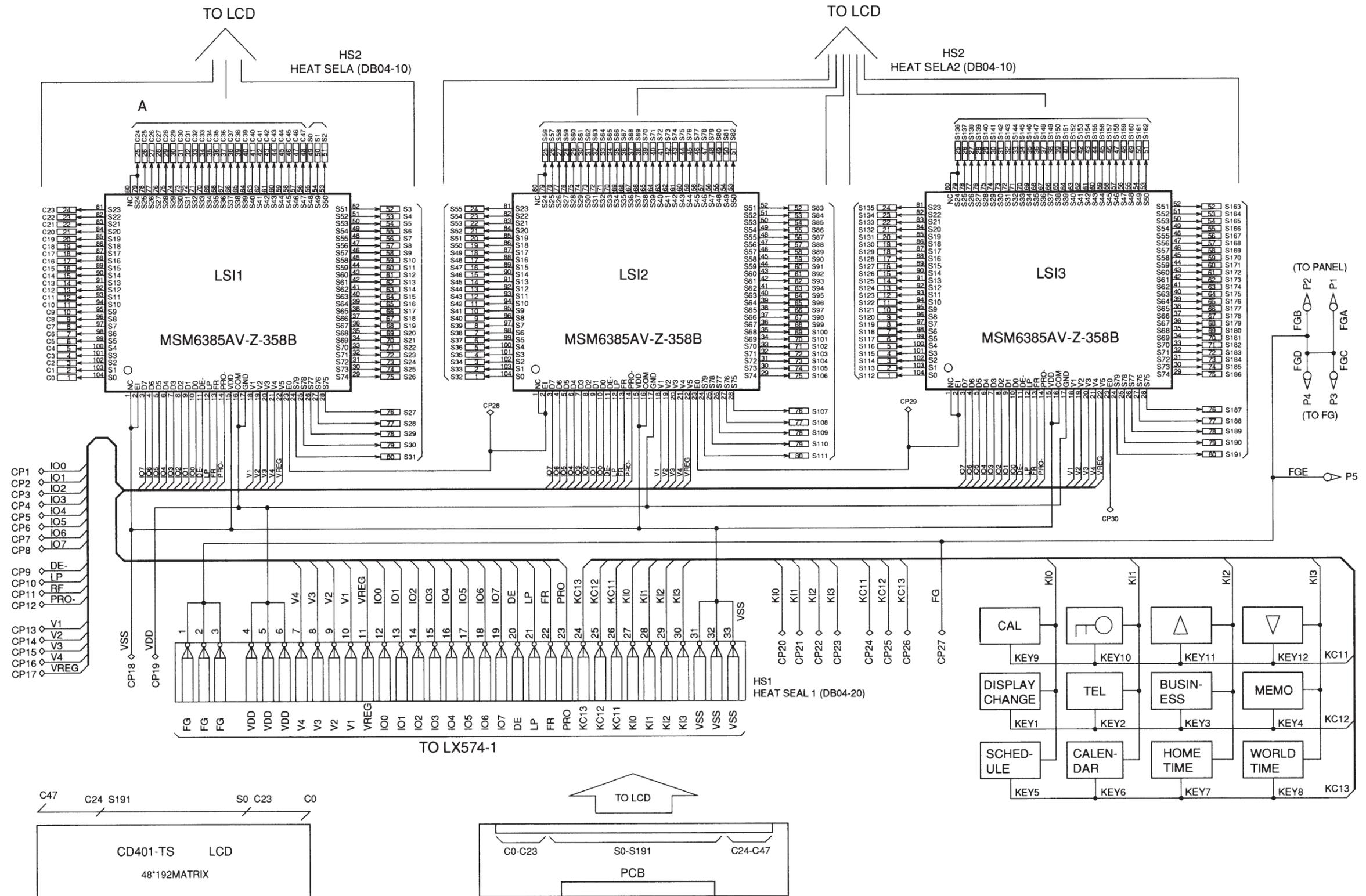
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# 1. SCHEMATIC DIAGRAM

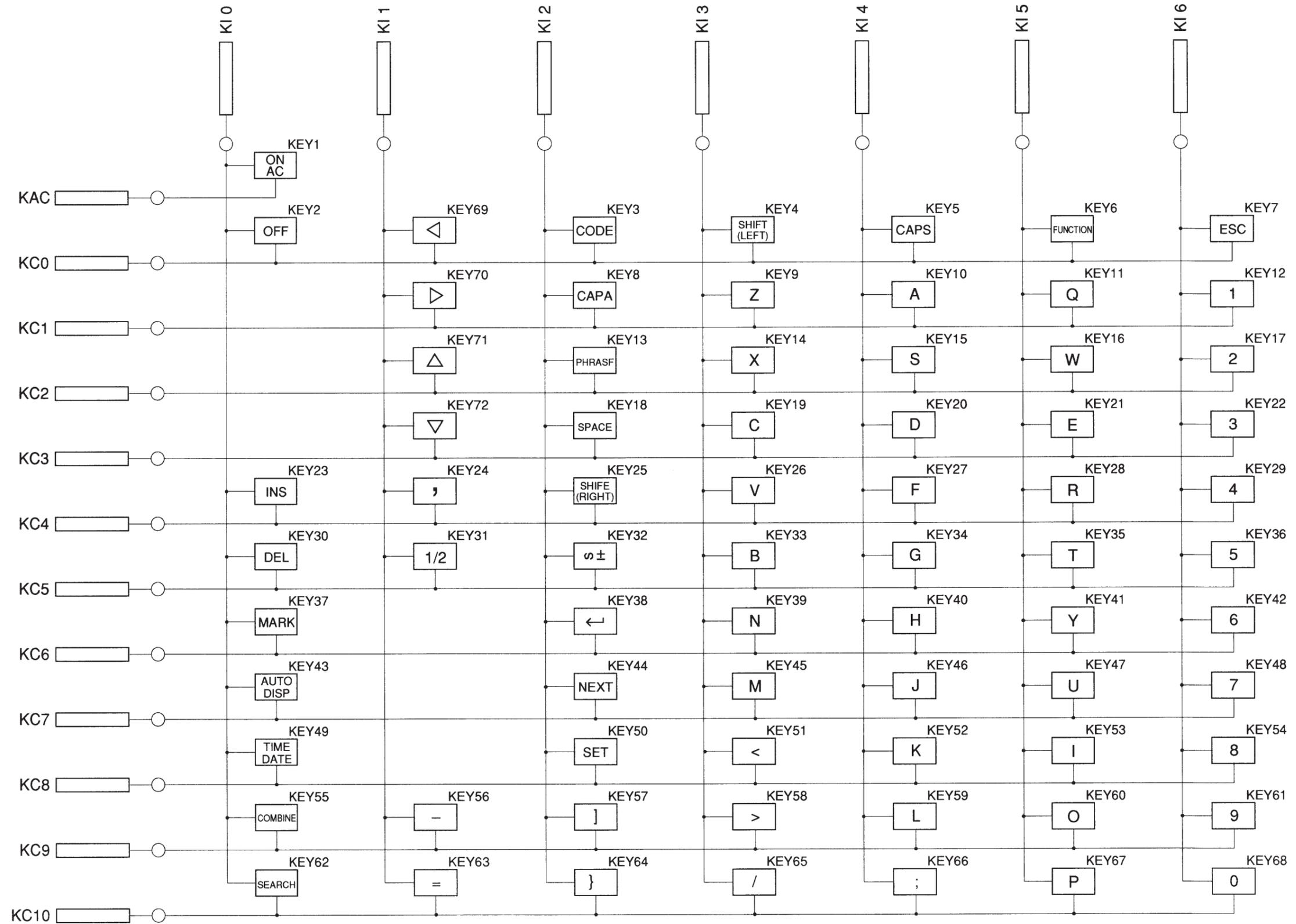
## 1-1. Main Block



## 1-2. Display Block



1-3. Key Matrix



## 2. SPECIFICATIONS

### Data storage:

Telephone/business card/memo/schedule data storage/recall, calendar display, marker, phrase memory, secret area, editing, capacity display, auto display

### Clock:

Average of accuracy  $\pm 3$  seconds per day under normal temperatures; worldtime, schedule alarm, daily alarm

### Calculation:

12-digit arithmetic calculations, constants for  $+/-/\times/\div$ , independent memory, percentages, square roots, 24-digit approximations, date calculations, other mixed calculations

### General:

**Display element:** 32-column  $\times$  6-line LCD

**Memory capacity:** 64 KB (56,006 bytes)

**Main component:** LSI

**Power supply:** Main Power Supply — Two CR2032 lithium batteries  
Backup Power Supply — One CR2032 lithium battery

**Power consumption:** 0.05W

**Battery life:** Main: Approximately 120 hours (Repeated cycle of 1-minute data input into Telephone Directory followed by 10-minute display. Operation temperature of 20°C)  
Approximately 150 hours (Continuous display in Telephone Directory. Operation temperature of 20°C)  
Backup: 5 years if main batteries are replaced as soon as they become weak.  
1 year if dead main batteries are left in the unit.

**Auto power off:** Approximately 6 minutes after last key operation

**Operating temperature:** 0°C ~ 40°C (32°F ~ 104°F)

**Dimensions:** Unfolded: 10.5H  $\times$  154W  $\times$  155.2mmD ( $3/8$ "H  $\times$  6"W  $\times$   $6\ 1/8$ "D)  
Folded: 17.9H  $\times$  154W  $\times$  78mmD ( $3/4$ "H  $\times$  6"W  $\times$   $3\ 1/16$ "D)

**Weight:** 152.5g (5.4 oz) including batteries

### Current consumption:

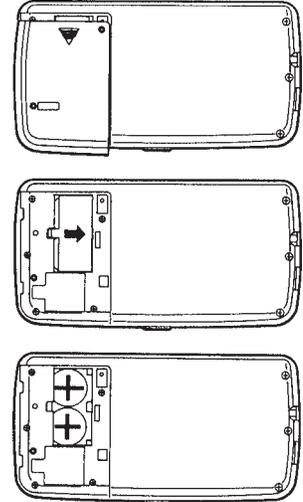
Power switch	TYP. [ $\mu$ A]	MAX [ $\mu$ A]
OFF	8	29
ON	1,447	13,258
ON (Operating)	6,707	19,958

### 3. TO REPLACE THE BATTERY

#### A) To replace the main batteries

Before replacing the main batteries, note the following precautions.

- Do not remove the back-up battery from the SF Unit while main batteries are removed.
  - Be sure to replace both batteries at the same time, and do not use an old battery with a new one.
1. Remove the screw that hold the battery compartment cover in place.
  2. Remove the battery compartment cover by sliding it in the direction indicated by the arrow in the illustration.
  3. Slide the main battery holder in the direction indicated by the arrow.
  4. Remove both old batteries and replace with two new ones.
    - Use two new batteries. Wipe the surfaces of the batteries with a soft, dry cloth. Make sure that the positive (+) sides of the batteries are facing up (so you can view the positive sides as the batteries lie in the battery compartment).
  5. Replace the battery holder.
  6. Replace the battery compartment cover and fasten it in place using the screw.

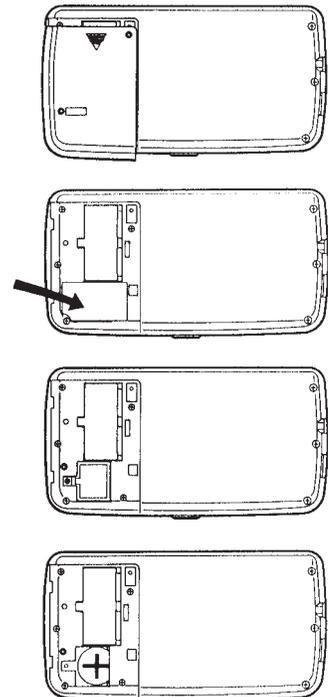


#### B) To replace the back-up battery

Before replacing the back-up battery, note the following precautions:

- Do not remove the main batteries from the SF Unit while back-up battery is removed.
- Be sure to replace the back-up battery at least once a year.

1. Remove the screw that hold the battery compartment cover in place.
2. Remove the battery compartment cover by sliding it in the direction indicated by the arrow in the illustration.
3. First, remove this sticker from the back-up battery holder.
4. After removing this sticker, take the screw off that secures the back-up battery holder in place, and then remove the battery holder.
5. Remove the old battery and replace it with a new one.
  - Wipe the surfaces of the battery with a soft, dry cloth. Make sure that the positive (+) side of the battery is facing up (so you can view the positive side as the battery lies in the battery compartment.)
6. Replace the back-up battery holder and fasten it in place using the screw, and replace the sticker over the battery holder.
7. Replace the battery compartment cover and fasten it in place using the screw.



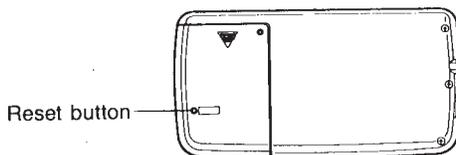
## 4. ERROR MESSAGE

Message	Meaning	Action
DATA ITEM NOT FOUND!	Text specified for search does not exist.	Correct or change specified text.
PASSWORD MISMATCH!	Wrong password entered.	Enter correct password.
MEMORY FULL!	No more room in memory for storage of data.	Delete unnecessary data items from memory.
DATA ERROR! CONSULT YOUR OWNER'S MANUAL UNDER "DATA ERROR"	Abnormal data caused by strong impact, static electricity, etc.	Consult the "DATA ERROR" section on page 3 of owner's manual.

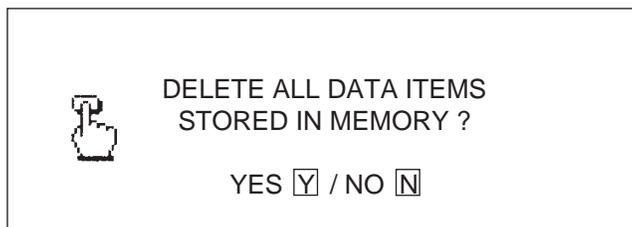
## 5. TO RESET THE DIGITAL DIARY

Before describing the RESET operation, a note of **WARNING** — *The following procedure will erase all data stored in memory, including marked data items. Be sure to perform the RESET operation only if you wish to clear all data.*

To reset the SF Unit's memory



1. Switch on power and press the RESET button with a thin, pointed object. The following message appears on the display.



### \* Important!

**Note that the following operation will clear everything stored in the unit's memory. To avoid accidental erasure of important data, be sure to perform this operation only while the system language is set to your native language. See page 2 of owner's manual for information on how to change the system language.**

2. Press  Y to reset the SF Unit and clear everything from its memory. To abort the procedure without clearing anything, press  N .

Following the **RESET** operation, the Home Time Display appears. The initial settings of the SF Unit after reset are shown below.

HOME TIME:	G.M.T.	
	JAN/1/1993 (FRI)	
	12:00 AM	
	12-hour format	
WORLD TIME:	New York	
Daily Alarm:	12:00 PM	
Sound:	Schedule alarm	————> ON
	Daily alarm	————> OFF
	Key	————> ON
Character input:	CAPS	
System Language:	English	

## 6. TO SAVE THE DATA TO OTHER MACHINE

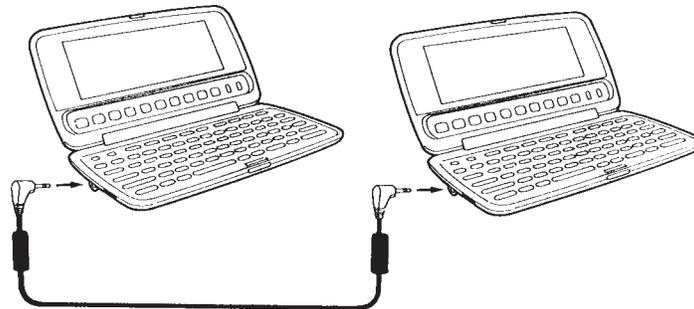
SF-8350 can transfer customers data to other SF-8350 with memory protection only when replacing the LCD or the outer case. How to transfer the data.

\* Before connecting the cable (SB-60 or SB-62), be sure to reset the slave machine to clear all data.

### Important!

\* You can not perform data communications with the CASIO SF-A series of SF Units (SF-A10, etc.).  
 \* Be sure to replace the connector covers on the SF units when you are not performing data communications.

1) Turn off the power switch and connect the two units using the cable (SB-60 or SB-62) as shown in the drawing.



SB-60/SB-62 cable

2) Turn on the power switch of each machine.

3) The slave machine must be set the date of Feb. 3rd, 1901 into the memory under the calculator mode.

Operation:

If you don't set the date, the "PASSWORD" isn't transferred to the slave machine.

4) Check the hardware parameters, and if the units have another condition, reset as follows.

To change the hardware parameters, press the , ,  and  cursor keys.

To set the hardware parameters, press the  key.

```

*** HARDWARE PARAMETERS ***
PARITY                EVEN    ODD    NONE
BIT LENGTH            7 bits 8 bits
BPS                   1200   2400  4800  9600
TEL
  
```

5) Set up the slave machine.

- 1 While in the Calendar Display, Telephone Directory, Business Card Library, Memo Mode, or Schedule Keeper, press the  key followed by  to select "DATA COMMUNICATION", and the following menu appears.

```

1 SEND
2 RECEIVE
3 PRINT
4 HARDWARE PARAMETERS
5 DATA TO RAM CARD
6 PEN PRINTING
TEL
  
```

- 2 Press  to select "RECEIVE" and the following display appears to indicate that the slave machine is ready to receive data.



```

RECEIVE OK !
TO STOP, PRESS 
TEL
  
```

6) Set up the customer's machine.

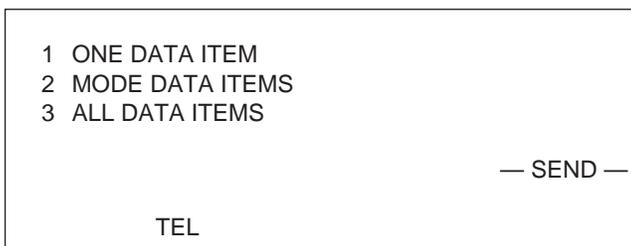
- 1 While the transmitting unit is in the Calendar Display, Telephone Directory, Business Card Library, Memo Mode, or Schedule Keeper, press the  key followed by  to select "DATA COMMUNICATION", and the following menu appears.

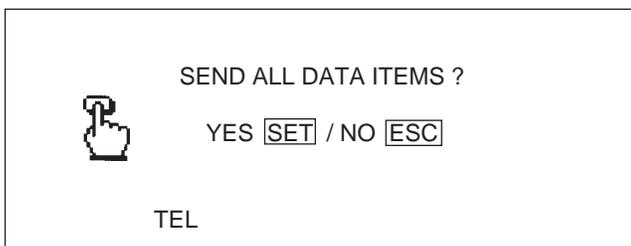
```

1 SEND
2 RECEIVE
3 PRINT
4 HARDWARE PARAMETERS
5 DATA TO RAM CARD
6 PEN PRINTING
TEL
  
```

2 Press  to select "TRANSMIT" and the following menu appears.



3 Press  to select "ALL DATA ITEMS", and the following display appears to confirm whether you wish to proceed.



4 Press the



Data are transmitted in the sequence of Telephone Directory data, Business Card Library data, Memo data, Schedule Keeper data and Calendar data.

\* If the customer's machine uses full memory, it takes about one minute and ten seconds for this transferring.

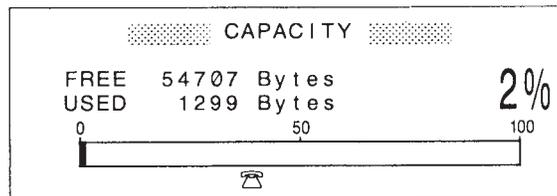
\* The following messages appear on the display of the receiving unit when a problem occurs during data communications. All data transferred up to display of the message is retained in memory, but data communication is terminated.

If one of the following error messages appear, press the , , , , , , ,  key, to clear the error message. Then, take corrective action and try data communication again.

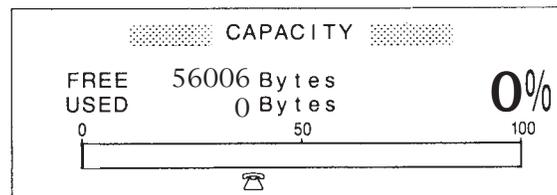
Message	Cause
STOPPED !	<ul style="list-style-type: none"> <li>• [ESC] key pressed on transmitting or receiving unit.</li> <li>• Memory area of receiving unit full.</li> <li>• Battery power drops below a certain level.</li> </ul>
TRANSMIT ERROR !	Cable connection broken or abnormal noise in cable.
MEMORY FULL !	Memory area of receiving unit full.

## 7. TO CHECK THE MEMORY CAPACITY

The memory Capacity display tells you how much total memory is used for storage of Telephone Directory, Business Card Library, Memo, Calendar, and Schedule Keeper data. It also shows the percentage of total memory used, and how much total memory area remains. Press the [CAPA] key to check the current memory capacity.



Following the memory reset operation, the display will appear as follows.

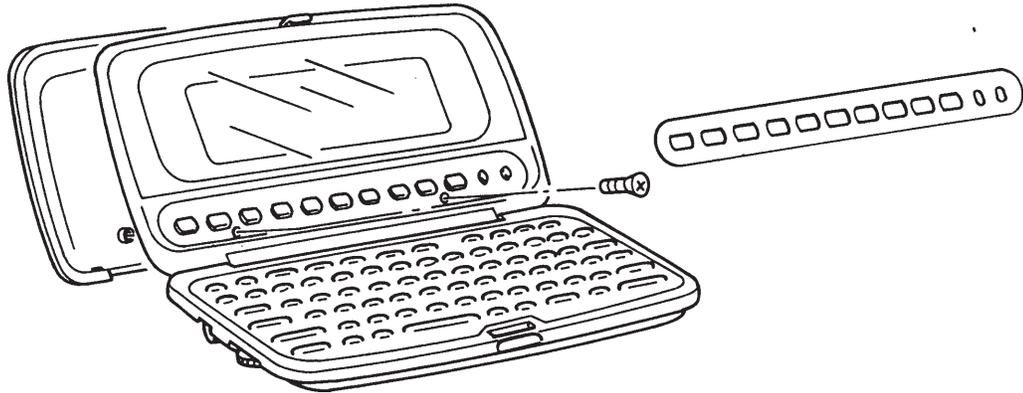


When the percentage of memory used reaches 100%, you will not be able to enter any more data into memory.

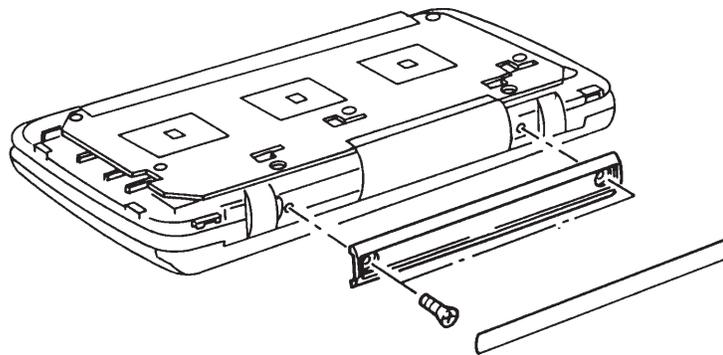
## 8. DISASSEMBLY (SF-8350)

1) To open display unit

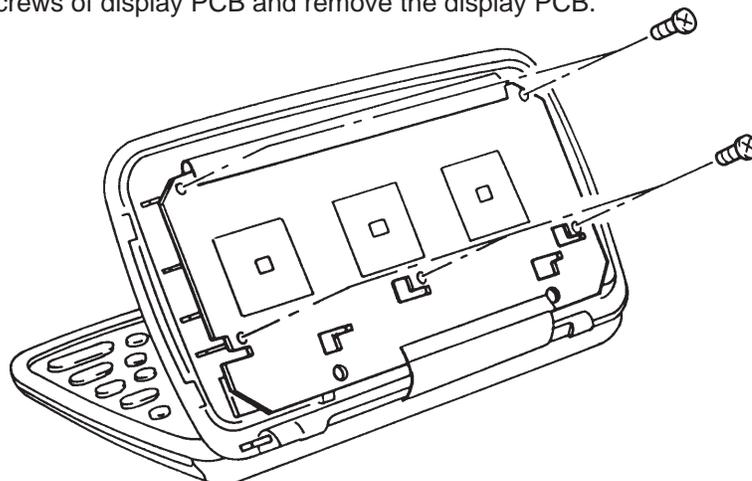
1. Remove the key switch sheet from the display frame with care using a sharp tweezers and remove 2 screws, then remove the display back cover.



2. Remove the blind plate of hinge and then release the 2 screws of hinge cover.

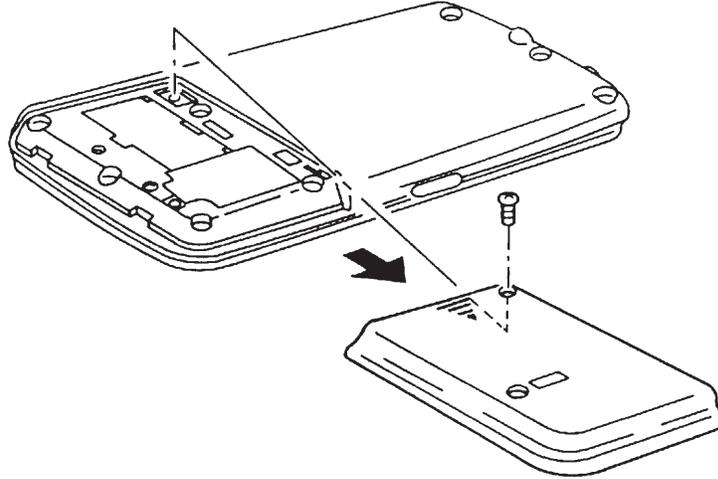


3. Release the 5 screws of display PCB and remove the display PCB.



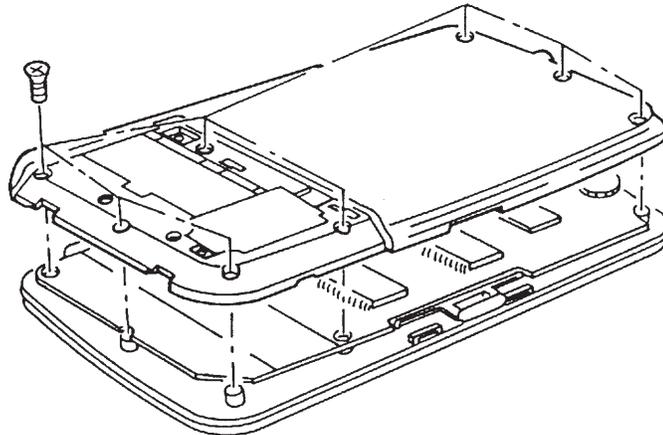
2) To open battery cover and back cover

1. Release the one screw of battery cover and remove the battery cover.

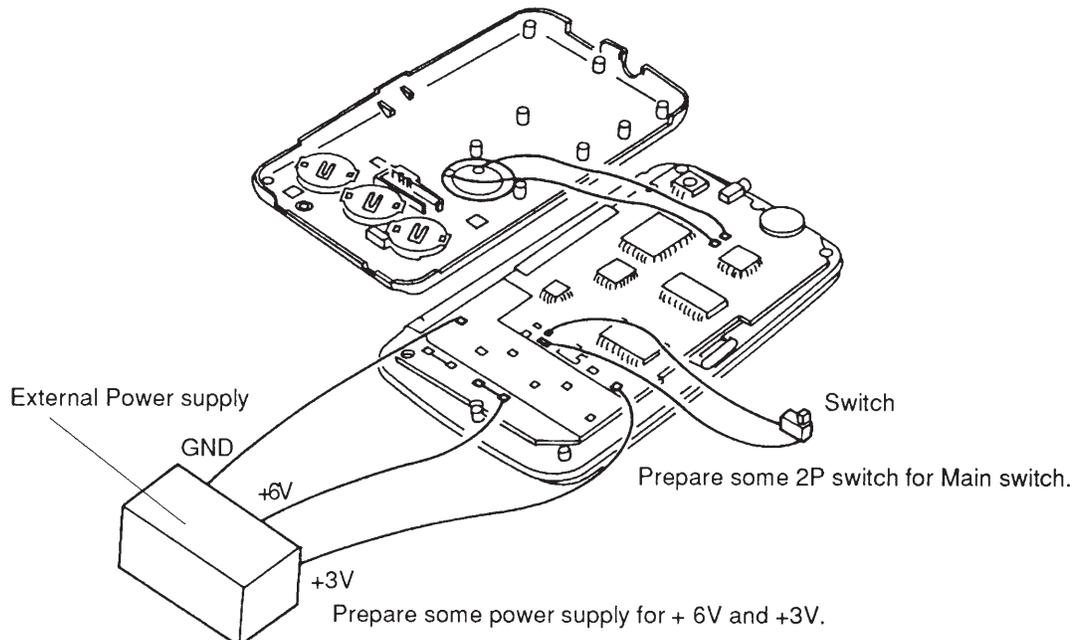


2. Remove the batteries. (Refer section 3 in this manual.)

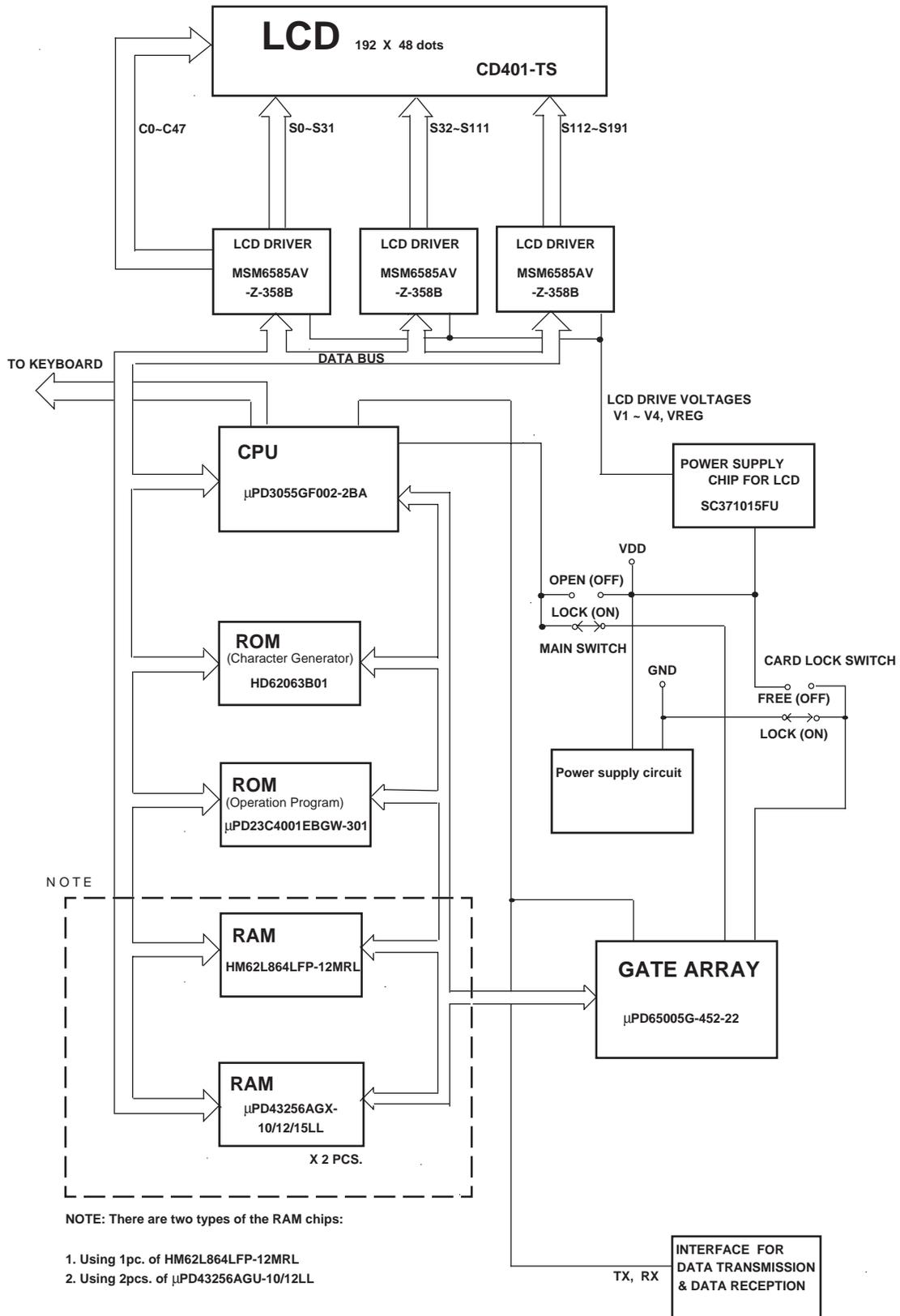
3. Release the 8 screws of the back cover. Then, remove the back cover.



4. To check the circuit by oscilloscope, apply the power to main PCB as follow:



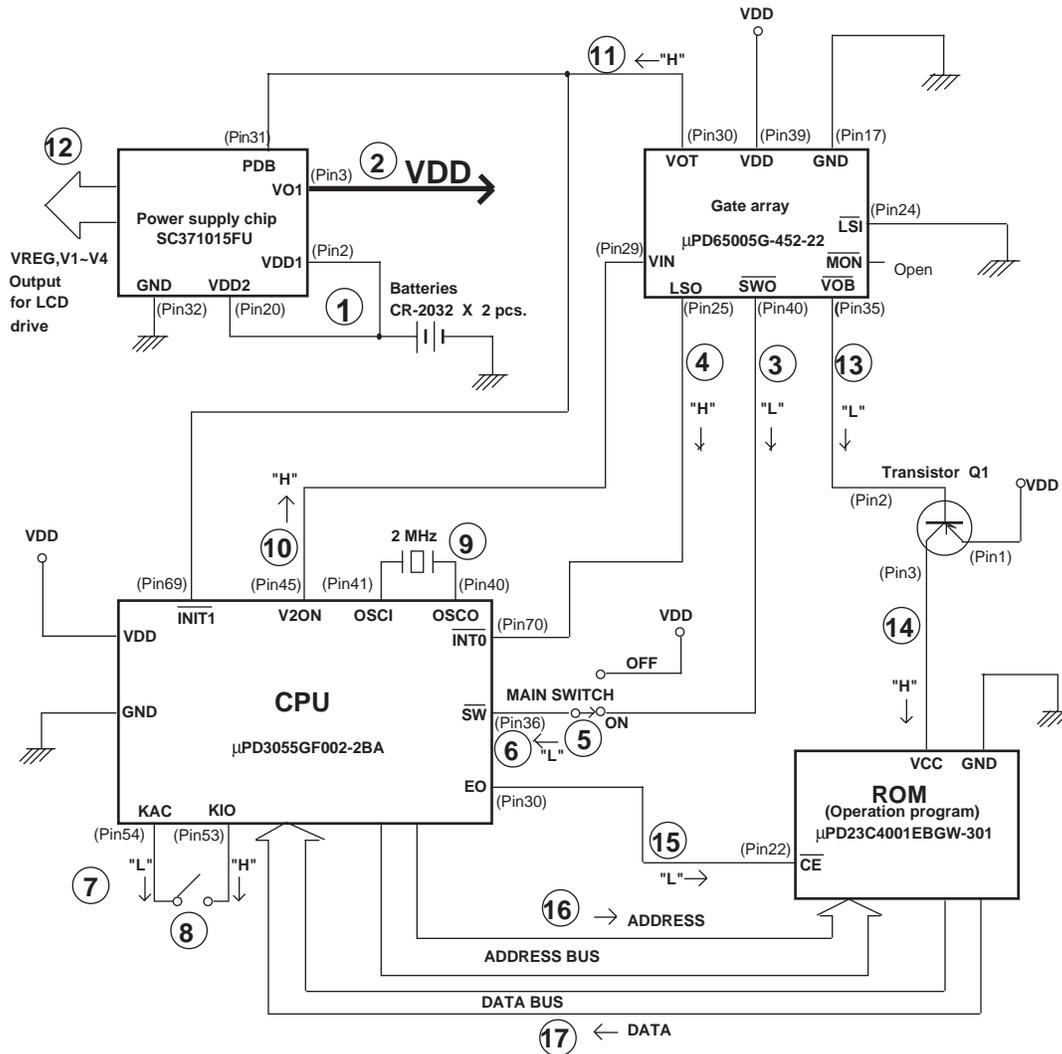
## 9. BLOCK DIAGRAM



## 10. CIRCUIT EXPLANATIONS

### 10-1. System chart

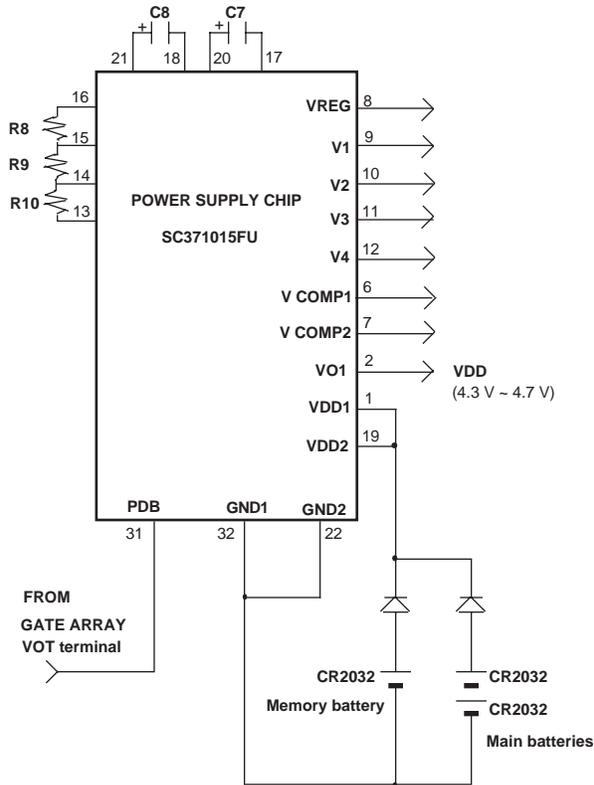
Generally, SF-8350 is working with the following steps.



1. Supply 6V to VDD1 and VDD2.
2. Output VDD (4.5V).
3. Output "L" from  $\overline{SWO}$  terminal.
4. Output "H" from LSO terminal.
5. Main switch ON.
6. Input "L" to  $\overline{SW}$  terminal.
7. Output "L" from KAC terminal.
8. Push power on button switch.
9. CPU oscillation is generated.
10. Output "H" from V2ON terminal.
11. Output "H" from VOT terminal.
12. Output all LCD drive voltages.
13. Output "L" from  $\overline{VOB}$  terminal.
14. Apply VDD to ROM.
15. CPU sends ROM chip enable signal from EO terminal.
16. CPU sends address to ROM.
17. CPU receives data from ROM.

## 10-2. Power supply circuit

### 1) Power supply chip SC371015FU



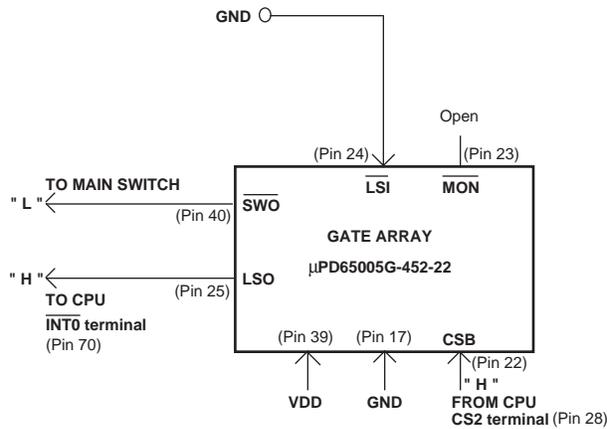
The IC SC371015FU is power supply chip for SF-8350. When IC SC371015FU receives a Voltage 6V (CR-2032 × 2 pcs.) at the terminal VDD1(Pin No.2), the regulated voltage VDD (4.3~4.7V) will be applied to the VDD lines. The outputs Vss (VREG) and V1~V4 are the LCD drive voltages. When the terminal PDB becomes "H", those voltages are generated by IC SC371015FU and capacitors C7 and C8 (ESCT1AY335R) and applied to LCD driver IC MSM6385AV-Z-358B. The resistors R8~R10 are used for dividing voltage V1~V4.

LCD DRIVE VOLTAGE	Value (Approx.) [V]	
	Contrust : Min.	Contrust : Max.
VSS(VREG)	-3.5	-6.4
V1	+3.4	+3.1
V2	+2.5	+1.7
V3	-1.5	-3.6
V4	-2.5	-4.9

The V comp1 and V comp2 outputs are the battery voltage detection outputs. According to VDD1 and VDD2 voltages, V comp1 and V comp2 will change the status as follows:

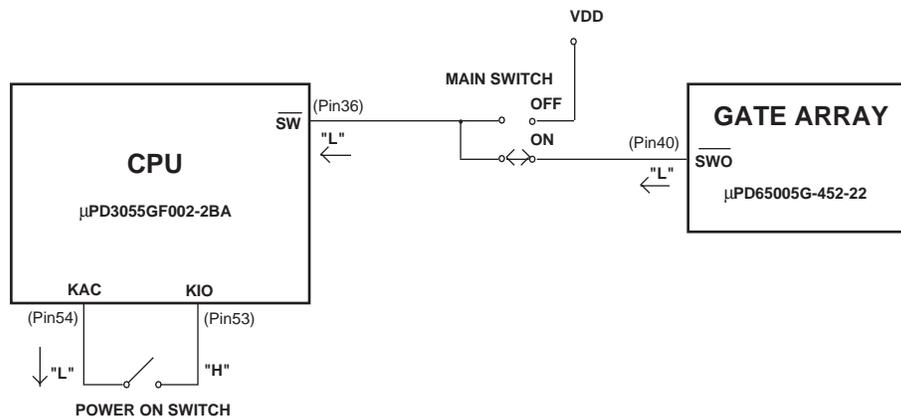
OUTPUTS	STATUS " H "	STATUS " L "
V COMP 1	When the batteries voltage is more than 4.7 V.	When the batteries voltage is less than 4.6 V.
V COMP 2	When the batteries voltage is more than 4.5 V.	When the batteries voltage is less than 4.4 V.

## 2) Gate array



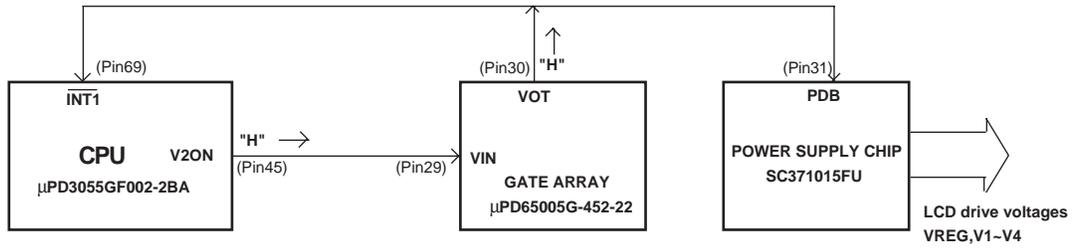
When VDD is applied from power supply IC SC371015FU to gate array uPD65005G-452-22, gate array will send "L" signal to activate the main switch signal from terminal  $\overline{\text{SWO}}$ . Also, gate array will send "H" signal to release the  $\overline{\text{INT0}}$  terminal of CPU from LSO terminal. The terminal CSB is for the chip select of gate array. This signal is sent from CPU terminal CS2. And when the VDD is applied to CPU, CPU will send "H" signal to CSB terminal.

## 3) Main switch and power on switch



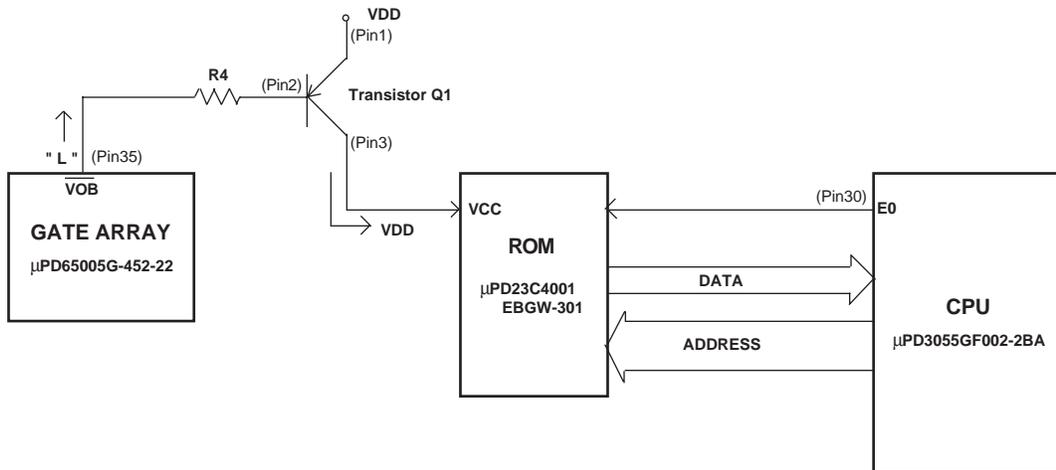
When the main switch is set to on position,  $\overline{\text{SW}}$  terminal of CPU becomes "L", then CPU will send "L" signal to KAC terminal to enable the system power on. The KIO terminal is "H" when VDD is applied to CPU. Therefore, when pressing the power on switch, CPU will generate a clock pulse (2 MHz) for start up the system.

#### 4) Power supply for LCD



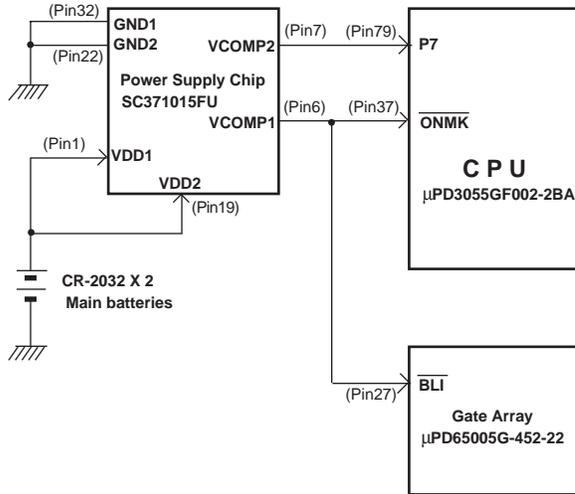
When the system starts up, the CPU will send an "H" signal to the VIN terminal of the gate array from the V2ON terminal. Then, the gate array will send an "H" signal from the VOT terminal to release the interruption signal  $\overline{\text{INT1}}$  of the CPU and also, it will be sent to the PDB terminal of the power supply chip to generate LCD drive voltages.

#### 5) ROM driving transistor



After the gate array sends a VOT signal, the gate array sends an "L" signal from the  $\overline{\text{VOB}}$  terminal to the base terminal of transistor Q1. Then, the VDD is applied to the ROM (operation program), and the CPU can read a ROM program data by the E0 signal.

### 10-3. Battery voltage detection



The power supply IC chip SC371015FU has two kind voltage detection circuit in it. According to the batteries input voltage, the detection outputs V comp1 and V comp2 will change the status as follow:

#### VCOMP2

Batteries Voltage	VCOMP2
More than about 4.6V	"H"
Less than about 4.6V	"L"

#### VCOMP1

Batteries Voltage	VCOMP1
More than about 4.4V	"H"
Less than about 4.4V	"L"

When CPU receive VCOMP2 detection signal, the machine shows "MAIN POWER SUPPLY BATTERIES GETTING WEAK! REPLACE!" on the display. And when the batteries voltage is weak more (approx. 4.53V), as the VCOMP1 detection signal becomes "L". The machine will operate an auto power off operation.

## 10-4. CPU pin description ( $\mu$ PD3055GF002-2BA)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
1~14,16,17	A0~A15	Out	L	Pulse	Address Bus line
15,39,100	VSS	In	GND	GND	GND terminal
24	WE	Out	H	Pulse	Write signal
25	OE	Out	H	Pulse	Read signal
26	FE	Out	H	Pulse	Not used
27	CS1	Out	H	H	Not used
28	CS2	Out	H	H	Chip select signal for gate array
29	CS3	Out	H	Pulse	Chip select signal for ROM ( $\bar{C}$ Character generator)
30	E0	Out	L	Pulse	Chip enable signal for ROM (Operation program)
31	E1	Out	L	H	Chip enable signal
32	E2	Out	L	H	Chip enable signal
33	E3	Out	L	H	Chip enable signal
34	BCON	Out	H	H	BCN signal to gate array
35	MDP2	Out	H	L	MDP signal to gate array
36	SW	In	L	L	Switch signal (When switches are at ON position.)
37	ONMK	In	H	H	Battery detection V comp1 input
38	TEST	In	L	L	TEST terminal (connect to GND)
40,41	OSC O/I	In	L	Pulse	Clock input
42	VOSC	In	L	H	Power input for Clock
43,91	VDD1	In	H	H	VDD input terminal
44	VDD2	In	H	H	VDD input terminal
45	V2ON	Out	L	H	Power on output signal
46~53	KI7~KI0	In	H	H	Key input signal (KI7---Not used)
54	KAC	Out	L	Pulse	Power on switch signal output
55~65,67	KC0~KC11	Out	H	Pulse	Key common signal output
66	GND	In	L	L	GND terminal
68	INT2	In	H	H	Interrupt signal from ROM (Character generator)
69	INT1	In	L	H	Interrupt signal from gate array
70	INT0	In	H	H	Interrupt signal from gate array
71	BRK	In	H	H	VDD input terminal
72	P0	Out	H	H	Transmission data output
73	P1	In	L	H	Reception data input
74	P2	In	H	H	Card lock switch input
75	P3	In	L	H	IC card detection signal input
76	P4	Out	H	Pulse	KC12 key common signal output
77	P5	Out	H	Pulse	KC13 Key common signal output
78	P6	In	H	H	Memory back-up battery detection input
79	P7	In	H	H	Battery detection V comp2 input
80	H1	Out	H	H	Display contrast control signal output (Up/Down)
81	WENL	In	L	L	GND terminal
82	H2	Out	H	H	Not used
83	L1	Out	L	H	Chip enable signal for gate array
84	L2	Out	L	L	Display contrast control clock signal
85	DT	Out	H	Pulse	Not used
86	PRO	Out	L	H	LCD driver mode selection signal
87	FR	Out	L	Pulse	LCD driver synchronous signal
88	LP	Out	H	Pulse	LCD driver latch pulse signal
89	GC	Out	H	Pulse	Not used
90	DE	Out	H	Pulse	LCD driver data latch clock signal
92~99	IO7~IO0	In/Out	L	Pulse	Data bus line
18~23	RA14~19	Out	L	Pulse	Address line (Used only RA15,16)

### 10-5. Gate array pin descriptions ( $\mu$ PD65005G-452-22)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
1~8	OI7~OI0	In/Out	L	L	Not used
9	A15	In	L	Pulse	Address input
10,11	A01,A00	In	L	Pulse	A1,A0 address input
12	CEB	In	L	Pulse	Decode signal for data access
13~16,18~21	IO0~IO7	In/Out	L	Pulse	Data bus line
17	GND	In	L	L	GND terminal
22	CSB	In	H	Pulse	Chip select signal from CPU
23	MON	Out	L	L	Not used
24	LSI	In	L	L	Connected to GND
25	LSO	Out	H	H	Card lock switch detection output
26	PDN	In	H	H	Power down detection input
27	BLI	In	H	H	Battery detection V comp1 input
28	DEB	Out	H	Pulse	Chip selection signal for ROM(Character generator)
29	VIN	In	L	H	Power on signal input
30	VOT	Out	L	H	Power on signal output
31	OEI	In	H	Pulse	Read signal input
32	WEI	In	H	Pulse	Write signal input
33	BBC	Out	L	Pulse	Memory back-up battery scanning signal
34	CDE	In	L	H	IC card detection signal input
35	VOB	Out	H	L	ROM power switching signal (Operation program)
36	TXO	Out	H	H	Transmission data output
37	TXI	In	H	H	Reception data input
38	FOM	In	H	H	VDD terminal
39	VDD	In	H	H	VDD terminal
40	SWO	Out	L	L	Main switch control signal
41	BCN	In	H	H	BCON signal from CPU
42	MDP	In	H	L	MDP2 signal from CPU
43	OEO	Out	L	Pulse	Read signal for IC card (Not used)
44	WEO	Out	L	Pulse	Write signal for IC card (Not used)

### 10-6. Power supply chip IC pin descriptions (SC371015FU)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
32,22	GND1,2	In	L	L	GND terminal
1,19	VDD1,2	In	H	H	Main battery positive terminal (+6V)
2	VO1	Out	H	H	VDD output terminal (4.5V)
31	PDB	In	L	H	Power on switch signal from gate array
6	V COMP1	Out	H	H	Battery detection signal (less than 4.6V---"L")
7	V COMP2	Out	H	H	Battery detection signal (less than 4.4V---"L")
8	VSS	Out	L	*-5V	LCD drive power V REG
9	V1	Out	L	*3.25V	LCD drive power V1
10	V2	Out	L	*1.95V	LCD drive power V2
11	V3	Out	L	*-2.5V	LCD drive power V3
12	V4	Out	L	*-3.75V	LCD drive power V4
13~16	VD/V1~4	**	H	**	Voltage dividing terminal for LCD drive power
17	C1N	**	GND	-5V	Negative terminal for doubler capacitor C7
18	C2P	**	3V	GND	Positive terminal for doubler capacitor C8
20	C1P	**	3V	-2.2V	Positive terminal for doubler capacitor C7
21	C2N	**	GND	-2.2V	Negative terminal for doubler capacitor C8
23	SUB CONT	In	L	**	

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
24	EROUT	Out	6V	5V	VFB capacitor terminal
25	VFB	**	H	3.2V	EROUT signal input
26	MIN	**	5V	3.2V	
27	MAX	**	5V	3.2V	
28	U/D	In	H	5V	Display contrast control signal (Up/Down)
29	CLOCK	In	L	L	Display contrast clock signal
30	SET	In	H	H	Display contrast data reset signal
31	PDB	In	L	H	

### 10-7.Character generator ROM pin descriptions (HD62063B01)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
1,7~12,23	NC	**	L	L	Not used
2	BLD	In	L	L	Not used (Battery voltage detection terminal)
3	VOOSC	In	3V	3V	Connected capacitor
4,20	GND	Power	H	H	VDD terminal
5,6	OSI/OSO	In	Pulse	Pulse	External clock terminal (32.768 KHz)
13	TNL	Out	H	H	Not used
14,19	IN1+,IN2+	In	H	H	Connected to VDD
15,32	VSS1,VSS2	Power	L	L	GND terminal
16,21	IN1-,IN2-	In	H	H	Connected to VDD
17,22	OUT1,OUT2	Out	H	H	Not used
18	TNH	Out	H	H	Not used
24	IN	In	L	Pulse	Power on key input terminal
25	OUT	Out	H	Pulse	KI0 terminal for power on
26,27	BZ1,2	Out	L	L	Buzzer signal
28	INT	Out	H	H	Interrupt signal for alarm clock (alarm time----"L")
29,30	CEH,CEL	Out	H	Pulse	RAM chip select signal
31	CED	In	H	Pulse	Chip enable signal of CPU
33	EN	In	L	H	Enable signal (Buzzer off-----"L")
34~37	IO3~IO0	In/Out	L	Pulse	Data bus line (IO0~IO3)
38~42	A0~A3,A15	In	L	Pulse	Address bus line (A0~A3,A15)
43	WEB	In	H	Pulse	Write signal
44	CSB	In	H	Pulse	Chip select signal

### 10-8. Operation program ROM pin descriptions ( $\mu$ PD23C4001EBGW-301)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
1,30,31	NC	-	L	+5V	Connected to VCC
2~12, 23, 25~29	A0~A16	In	L	Pulse	Address bus line (A0~A14,RA15,RA16)
13~15, 17~21	IO0~IO7	Out	L	Pulse	Data bus line (IO0~IO7)
16	GND	Power	GND	GND	GND terminal
22	$\overline{CE}$	In	L	Pulse	Chip selection terminal
24	OE	In	L	Pulse	Output enable terminal
32	VCC	Power	L	+5V	VCC terminal

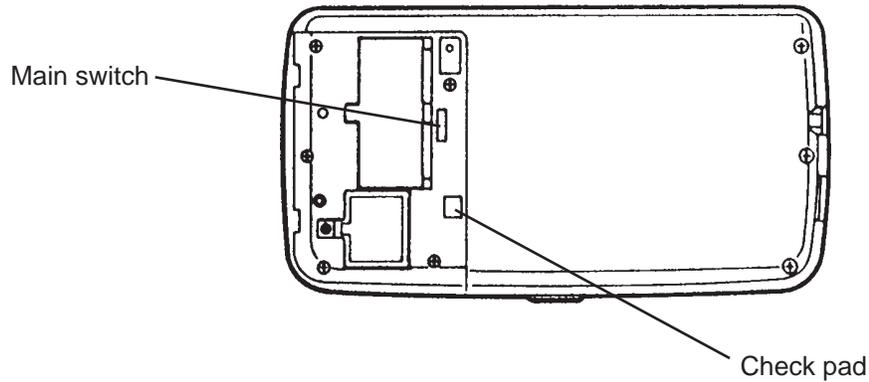
### 10-9. RAM pin descriptions ( $\mu$ PD43256AGU-10/12/15LL)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
2, 4~6, 9~13, 15~18	A0~A14	In	L	Pulse	Address bus line (A0~A14)
21~23, 25~29	D1~D8	In/Out	L	Pulse	Data bus line (IO0~IO7)
24	GND	In	L	L	GND terminal
31	CSB	In	H	Pulse	Chip select signal
1	OEB	In	H	Pulse	Read signal from CPU
7	WEB	In	H	Pulse	Write signal from CPU
8	VCC	In	H	H	VDD terminal

### 10-10. RAM pin descriptions (HM62L864LFP-12MRL)

Pin No.	Name	In/Out	Status of OFF	Status of ON	Description
1	NC	-	-	-	No connection
2~12, 23, 25~28,31	A0~A16	In	L	Pulse	Address bus line (A0~A15)
13~15, 17~21	IO0~IO7	Out	L	Pulse	Data bus line (IO0~IO7)
16	VSS	Power	GND	GND	GND terminal
22	CS1	In	H	Pulse	Chip selection terminal 1
24	OEB	In	H	Pulse	Output enable terminal
29	WEB	In	H	Pulse	Write enable terminal
30	CS2	In	H	H	Chip selection terminal 2
32	VDD	Power	+5V	+5V	VDD terminal

## 11. DIAGNOSTIC OPERATION



SELECT MENU	1 DISPLAY
	2 MEMORY
	3 KEY
	4 BUZZER
	5 I/F

### 1. Diagnostic mode

The diagnostic mode appears when main switch is turned on while there is a short in the checkpad. After this operation, the machine will beep and display "SELF-TEST".

The menu appears after press SET key. Tests are conducted by selecting the mode from the list on screen. The each test can be selected by the following function keys.

TEL key	: Test the LCD display
Business card key	: Test the IC memory chip and the RTC
MEMO key	: Test all keys
SCHEDULE key	: Buzzer test
CALENDAR key	: SB-60/SB-62cable interface

DISPLAY	1 WHITE
	2 BLACK
	3 CHECKER
	4 REVERSE
	5 FRAME

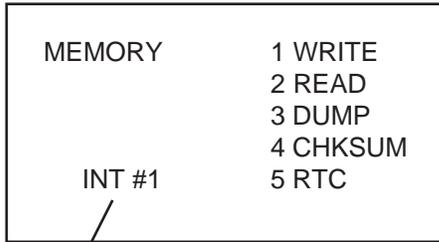
### 2. Display check

DISP CHNG key : Return to menu display

TEL key	: Lights on dot at corners
Business card key	: Lights on in all dots(black screen)
MEMO key	: Checker display
SCHEDULE key	: Reverse checker display
CALENDAR key	: Lights on dot along the screen edge (frame)

### 3. ROM/RAM check

DISP CHNG key :Return to menu



INT---Internal RAM  
 EXT--External RAM(RAM card)  
 #1---Test data pattern(00,01,02...)  
 #2---Test data pattern(FF,FE,FD....)

- TEL key :Write the set pattern to the selected RAM area
- Business card key :Compare the pattern displayed after # with the write data of RAM and displays the results.
- MEMO key :Dump contents of memory. (direction depends on setting of internal/external switch)
- SCHEDULE key :Call up checksum and XOR values for connected ROM/RAM data.
- CALENDAR key :Bring up clock display. The present time, data and daily alarm can be set.

NOTE 1. To change the RAM internal or external, press WORLD TIME key. As SF-8350 has no RAM card interface, Test only Internal RAM area.

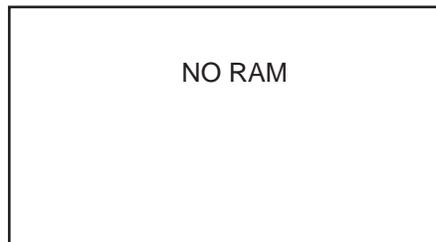
NOTE 2. To change the test data pattern,  
 press HOME TIME key for data pattern 1 (00,01,02,03,.....FF,00,01,02,03,.....).  
 press WORLD TIME key for data pattern 2 (FF,FE,FD,.....00,FF,FE,FD,.....).

#### 1) RAM write

The following message will be displayed while writing the data to RAM.



When there is no RAM to write a data, the following message will be displayed.



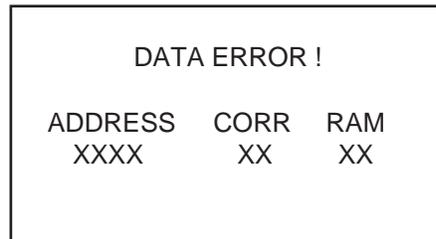
To release this message, press DISP CHNG key.

#### 2) RAM read

Normal end display is;



Error end display is;



To release this message, press DISP CHNG key.

3) Memory dump

```

MEMORY DUMP
XX XX XX XX XX XX XX XX XX XX
XX XX XX XX XX XX XX XX XX XX
XX XX XX XX XX XX XX XX XX XX
XX XX XX XX XX XX XX XX XX XX
    
```

When memory dump is operated by pressing MEMO button, a display will appear as shown at left. The first two lines, beginning from the top left, signify the following address values in reference to the one megabyte "E0" area:

00001,00002,00004,.....,00080,00100,00200  
00400,00800,01000,.....,20000,40000,80000

The lower two lines refer to the data in the "E1" area.

Note : The Internal/External switch is activated pressing CAL button. SF8350 has no external RAM area.

4) CHECK SUM

TYPE	SIZE	CHECK-SUM	XOR
E0 ROM	128KB	1169	4F
CE RAM	64KB	8300	00

Type : ROM and RAM are shown.  
However, if the ROM is not in standard Casio format, a format error will be displayed.

Size : Memory capacity (total)

Checksum:

XOR : Logic operation for all data.

The ON key is the only key that remains functional when an error has occurred or check-sum is being displayed.

5) RTC

```

TIME DISPLAY
yyymmddhhmmss.....
.....
1990 04 04 12 34 56
    
```

Input can be made in the second and third lines using the numeric keys. Entry of 12 or more digits sets the time and date. Entry of 4 or 6 digits sets the daily alarm. The ON key clears current entries.

4. Key check

```

KEY
1 RANDOM
2 AUTO
    
```

TEL Key :

The 'key code' will be displayed.

The 'key code' is numbered incrementally from left to right with the DISPLAY CHANGE key as "00", and TEL key as "01" etc. Accordingly, the SET keys is "81". To release this test, press SEARCH key.

Business card key :

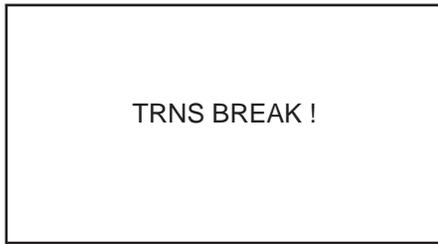
Limits the mode mentioned above so that the keys must be pressed in order according to the key code. If an error is made a buzzer sounds for about 1 second. (A correct entry results in a beep tone)

In either mode a press of the SEARCH key will return the screen to the menu mode.



NOTE : As diagnostic program area does not have all ASCII code, to display a reception data, some character will be changed to other character. For example, a capital letter will be changed to small letter.

Break display (Broken transmission)

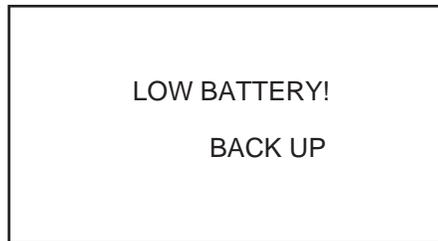


Error display



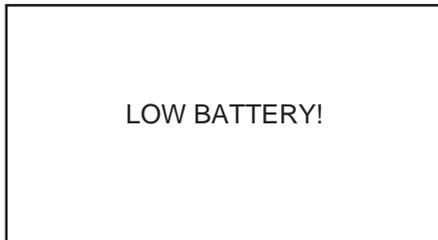
## 7. Battery level check

Memory back up battery



The memory back up voltage detector detects any irregularity in voltage, the machine goes into an error state and the display is as shown at left figure. To release this display, press any key.

Main battery



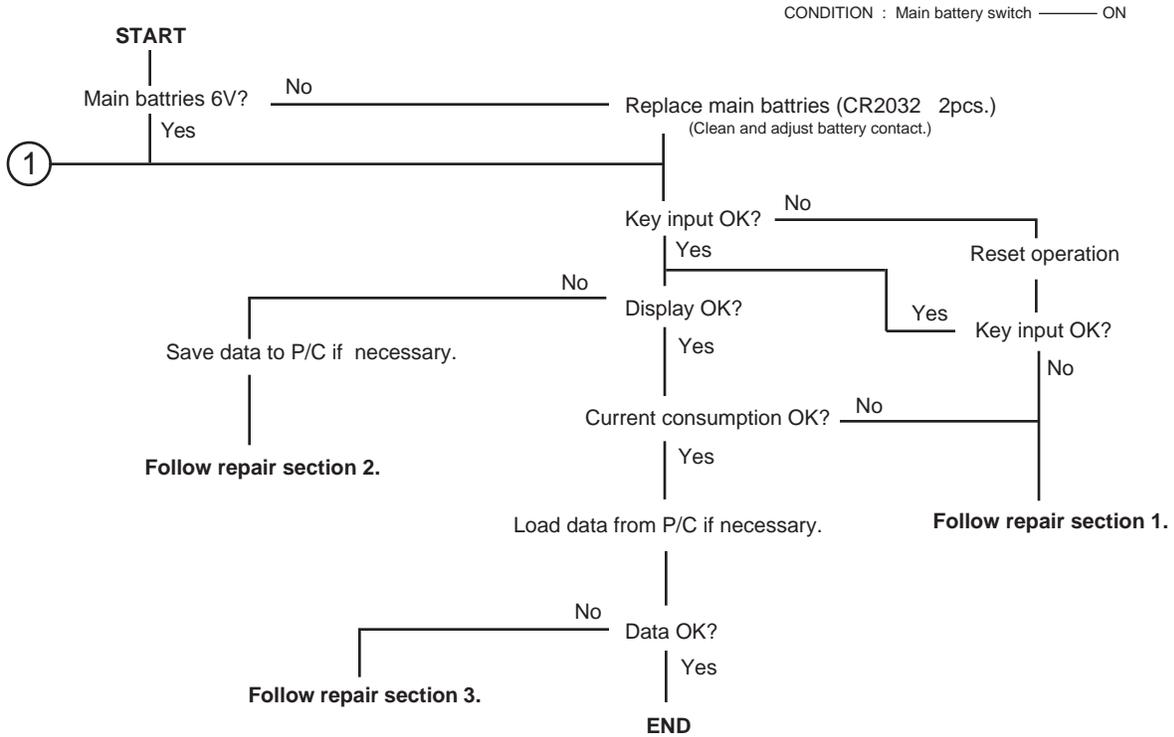
When the main battery voltage detector detects low battery condition while display is on, the machine shows the message as shown at left figure. When this message is displayed, only ON/OFF key are possible to operate. And if the voltage becomes lower than 4.4V, the display will be off mode (auto power off mode).

## 8. Others

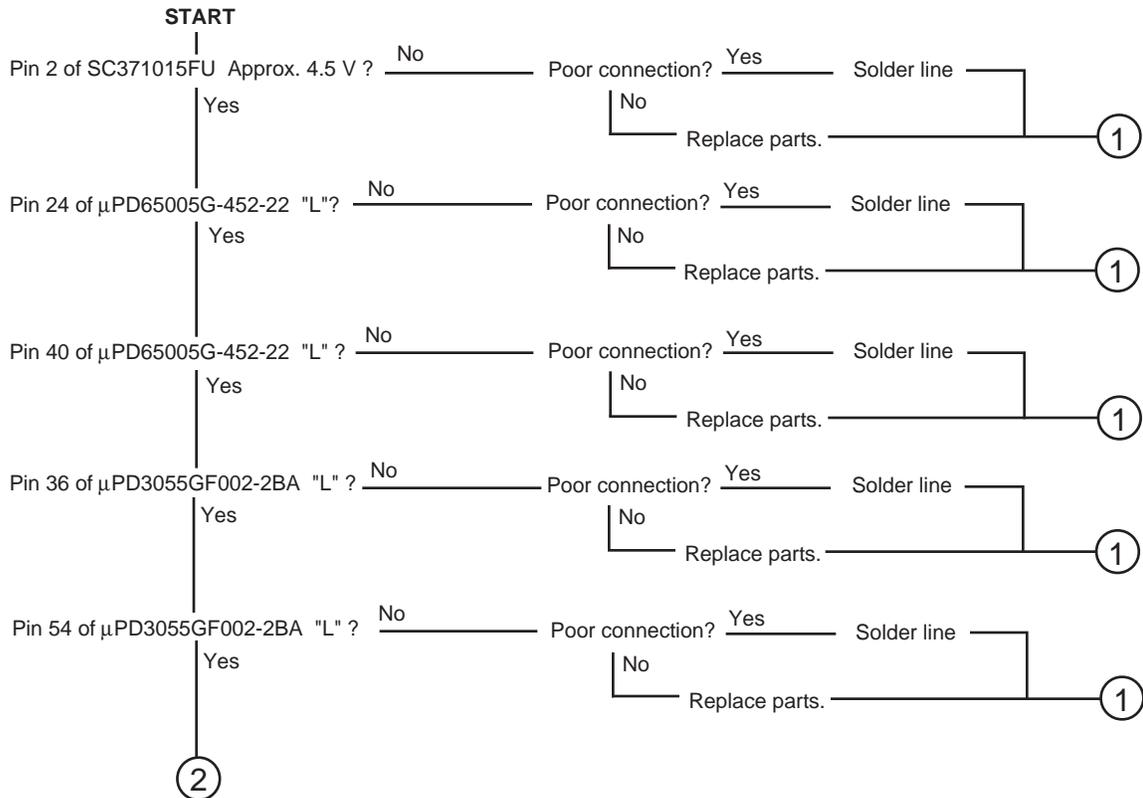
- 1) When power is off after presetting a alarm time, automatically power is on at a alarm time. However, the display is not reserved in this case.
- 2) When executing memory sum check, before execute the RAM write check (with TEL button).
- 3) To release diagnostic mode, press reset button.
- 4) The display contrast can be changed by the contrast volume.

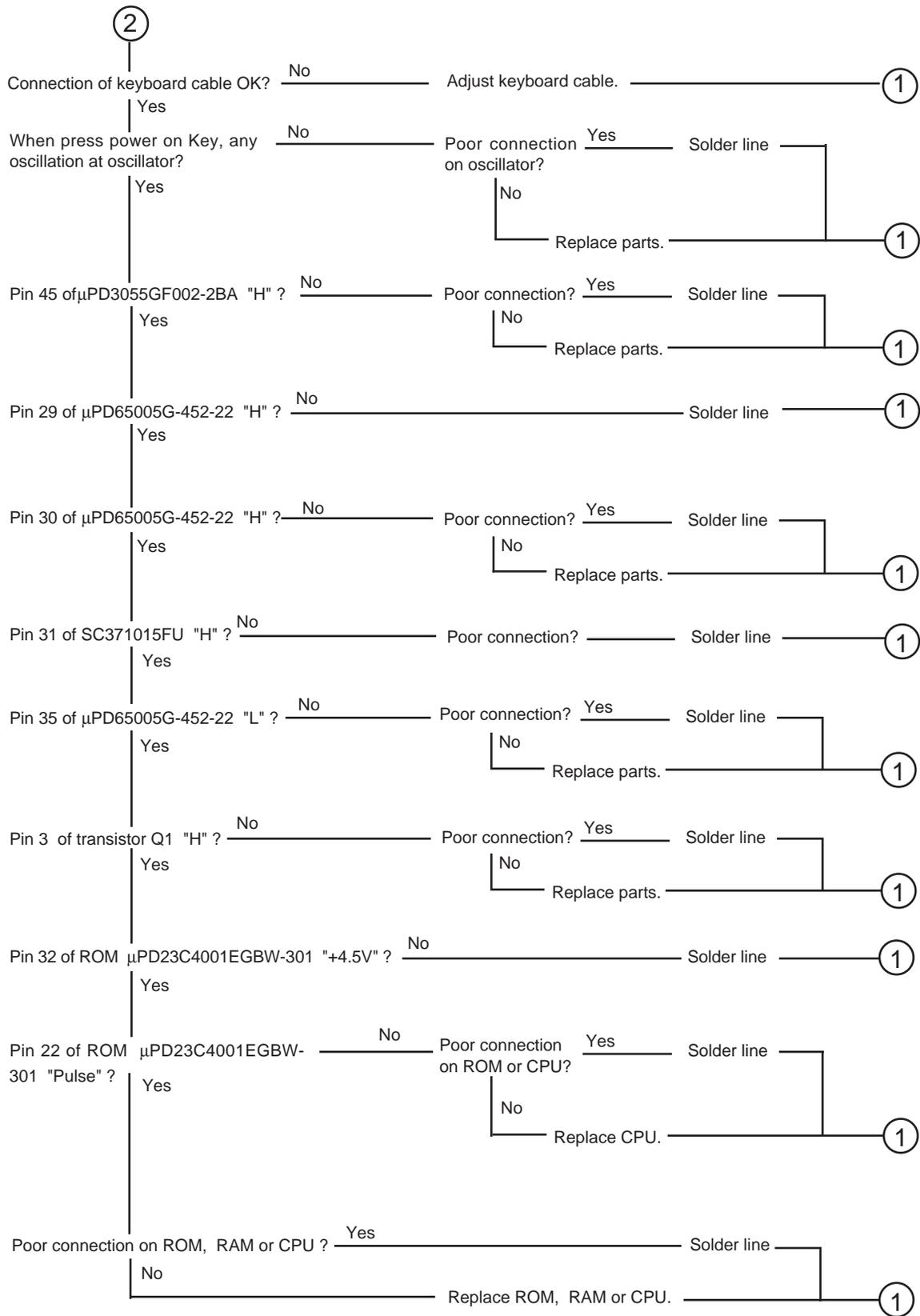
## 12. TROUBLESHOOTING

Generally, check the machine with the following steps for repair.

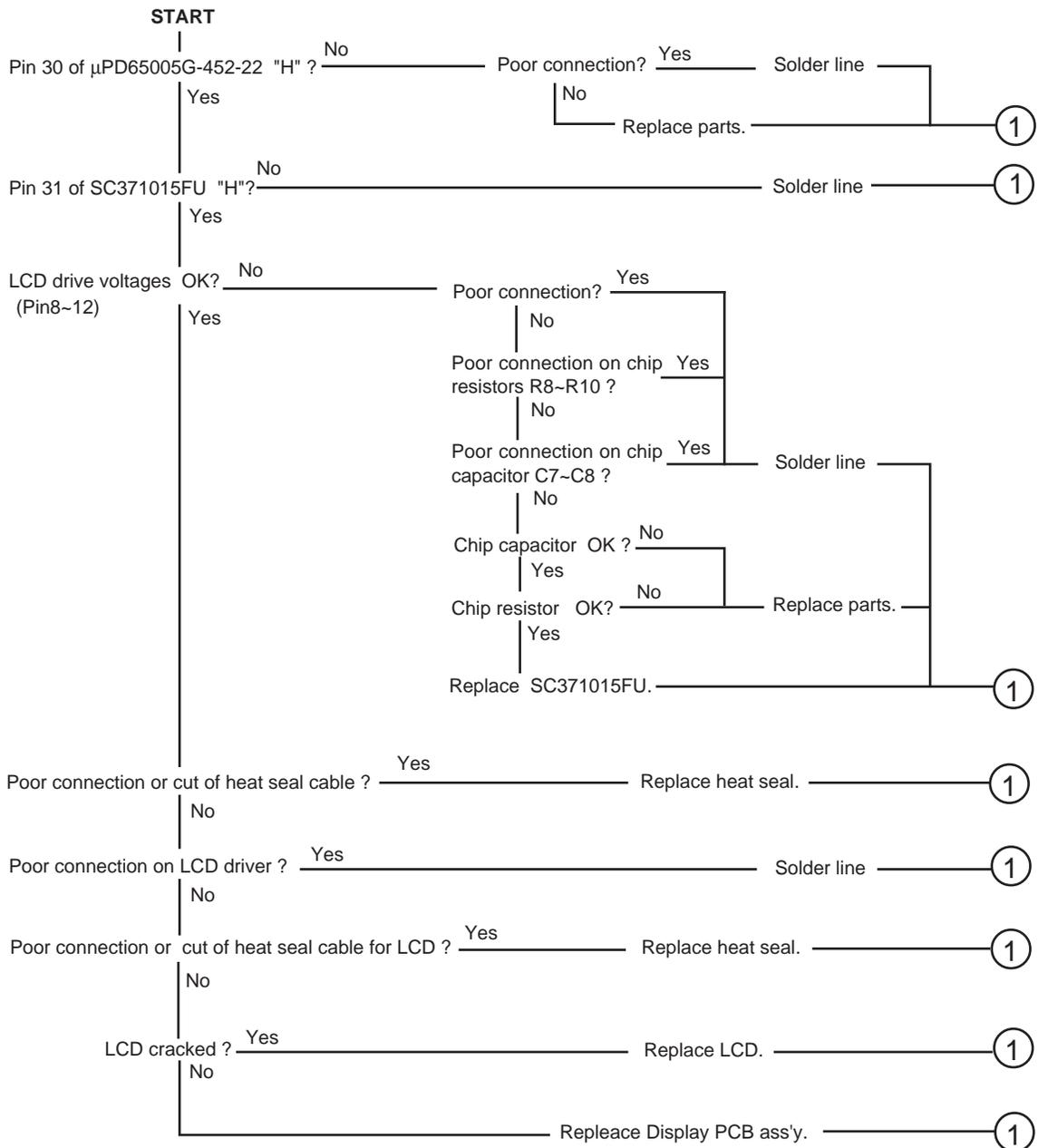


### Repair section 1 : For no key input problem

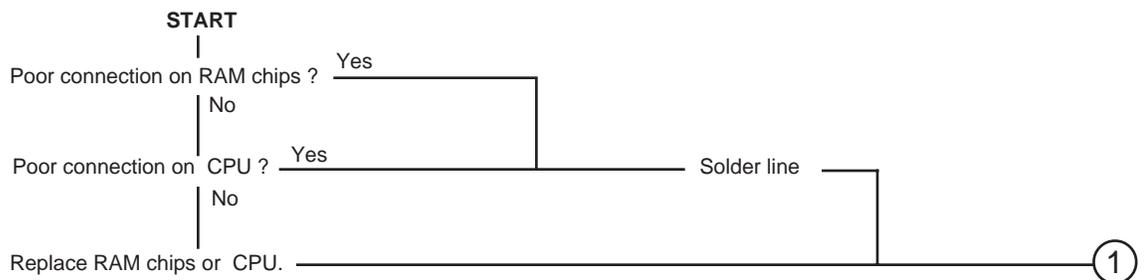




## Repair section 2 : For no display or wrong display problem



## Repair section 3 : For memory problem



### 13. PARTS LIST (SF-8350)

N	Item	Code No.	Parts Name	Specification	Q'ty		M	FOB Japan N.R.Yen Unit Price	R
					A	B			
<b>1. CPU BOARD ASS'Y</b>									
N	LSI7	2011 5635	LSI (ROM)	UPD23C4001EBGW-301	1	1	1		A
	LSI8	2011 3808	LSI (RAM)	HM62L864LFP-12MRL	1	0	1		A
N	LSI8	2011 2849	LSI (RAM)	UPD43256AGU-10,12LL	0	1	1		A
N	LSI6	2011 2849	LSI (RAM)	UPD43256AGU-10,12LL	0	1	1		A
	LSI4	2010 8113	LSI	HD62063B01	1	1	1		A
	LSI3	2011 1645	LSI	UPD65005G-452-22	1	1	1		A
	LSI2	2105 2436	LSI	SC371015FU	1	1	1		A
	LSI1	2011 0098	LSI	UPD3055GF002-2BA	1	1	1		A
	X1	2590 0777	Ceramic oscillator	CSAC2.01MGCM001-TC	1	1	1		B
	Q3	2259 0959	Chip digital transistor	DTC114YKT-14671K	1	1	20		C
	Q1	2250 0413	Chip transistor	2SA1141-T1B(M6)	1	1	20		C
	D1	2390 1197	Diode	MA743-(TX)	1	1	10		C
	D2	2390 0364	Diode	MA713-TX	1	1	10		C
	C13	2895 1204	Chip tantalum capacitor	ECST0J106R	1	1	20		C
	C9	2895 1190	Chip tantalum capacitor	ECST1AX106R	1	1	10		C
	C7,C8	2895 1197	Chip tantalum capacitor	ECST1AY335R	2	2	20		C
	C12	2845 1925	Chip capacitor	MCH312F105ZP	1	1	20		C
	C19	2895 1365	Chip capacitor	MCH325F474ZP	1	1	20		C
	C5,C6,C15, C18,C22,C23	2845 1540	Chip capacitor	MCH212F104ZK	6	6	20		C
	C21	2845 1540	Chip capacitor	MCH212F104ZK	0	1	20		C
	C10	2845 2030	Chip capacitor	MCH215C102KK	1	1	20		C
	C1	2845 2289	Chip capacitor	MCH215C471KK	1	1	20		C
	C2	2845 2968	Chip capacitor	MCH215C221KK	1	1	20		C
	C3,C4	2845 2499	Chip capacitor	MCH215A300JK	2	2	20		C
	C16,C17	2845 1652	Chip capacitor	MCH215A180JK	2	2	20		C
	R1,R28	2795 3346	Chip resistor	MCR03EZHZJ105	2	2	20		C
	R19	2795 4214	Chip resistor	MCR03EZHZG304	1	1	20		C
	R5	2795 3367	Chip resistor	MCR03EZHZJ224	1	1	20		C
	R4	2795 3374	Chip resistor	MCR03EZHZJ154	1	1	20		C
	R17	2795 3017	Chip resistor	MCR03EZHZJ104	1	1	20		C
	R15	2795 3003	Chip resistor	MCR03EZHZJ473	1	1	20		C
	R25	6511 7460	Chip resistor	CC4702310C1	1	1	20		C
	R2	2795 3101	Chip resistor	MCR03EZHZG363	1	1	20		C
	R14	2795 2947	Chip resistor	MCR03EZHZJ182	1	1	20		C
	R13	2795 2940	Chip resistor	MCR03EZHZJ102	1	1	20		C
	R6,R23,R24	2795 2926	Chip resistor	MCR03EZHZJ101	3	3	20		C
	R3,R8, R9,R26	2795 3360	Chip resistor	MCR03EZHZJ000	4	4	20		C
	R16	2795 3360	Chip resistor	MCR03EZHZJ000	0	1	20		C
	R20	2795 3360	Chip resistor	MCR03EZHZJ000	1	0	20		C
	R21	2795 3360	Chip resistor	MCR03EZHZJ000	1	0	20		C
	R22	2795 3360	Chip resistor	MCR03EZHZJ000	0	1	20		C
	J1	3501 6405	Miniature jack	HSJ1169-012010	1	1	5		X
	X2	7110 0642	Cristal oscillator	DT-26S	1	1	10		B
	R7	2765 1001	Volume	RK09G-J11TS-100KB	1	1	5		C
N	1	6406 7520	CPU board assembly (Consists of the above parts)	DB04AX3101N	1	0	1		A
	2	6511 7420	Heat seal	FX201P20172	1	1	5		A
	3	6511 7410	Insulation seal	HGFC0005104	2	2	10		X
<b>2. DISPLAY BOARD ASS'Y</b>									
		2011 1974	LSI	MSM6385AV-Z358B	3	3			A
	4	3335 3612	LCD	CD401A-TS	1	1	1		A

Notes: N – New part

M – Minimum order/supply quantity

R – Rank

Q'ty – Quantity used per unit

R – A : Essential

B : Stock recommended

C : Others

X : No stock recommended

A : SF-8350

(one RAM type, LX-572AT)

B : SF-8350

(two RAM type, LX-572AU)

N	Item	Code No.	Parts Name	Specification	Q' ty		M	FOB Japan N.R.Yen Unit Price	R
					A	B			
	5	6511 7710	Heat seal	FX200P40013	1	1	1		A
	6	6511 9030	Cushion (A)	FH100024206	2	2	20		X
N	7	6406 7530	D/D PCB ass'y (572)	APDB04XX04S(B)*1	1	1	1		A
<b>3. UPPER CASE</b>									
	8	6511 9000	Upper case A (DISPLAY)	FAADB040021	1	1	5		X
	9	6512 3160	Upper case B (KEYBOARD)	FAADB040039	1	1	5		X
	10	6511 7340	Hinge A	FC002800001	1	1	20		X
	11	6511 7130	Hinge B	FC002800109	1	1	20		X
	12	6511 7350	Shaft L	FC000510014	2	2	20		X
	13	6511 7360	Shaft	FC000510022	2	2	20		X
N	14	6406 7460	Display plate	EL5F0004108	1	1	1		C
N	15	6406 7470	Upper sheet (DISPLAY)	EL5F0005104	1	1	5		X
	16	6511 7120	Upper sheet (KEYBOARD)	EL50026F102	1	1	1		X
	17	6511 8870	LCD tape	HGFC0006101	1	1	1		X
	18	6511 7140	Key contact rubber (DISPLAY)	LADB0420007	1	1	10		B
	19	6511 7150	Key contact rubber (KEYBOARD)	LADB0410001	1	1	1		B
	20	6511 8400	Key contact rubber (RESET)	LADB0220105	1	1	20		B
N	21	6406 7480	Key top set (DISPLAY)	KGDB0410030	1	1	5		C
	22	6511 7260	Key top set (KEYBOARD)	KGDB0410013	1	1	1		C
<b>4. LOWER CASE</b>									
N	23	6406 7500	Lower case A (KEYBOARD)	FABDB040108	1	1	1		X
N	24	6406 7450	Lower case B (DISPLAY)	FABDB040094	1	1	1		X
	25	6402 4700	Nut	MD100000505	2	2	20		X
	26	6511 7380	Battery spring (+)	EF01DB04000	3	3	20		C
	27	6511 7390	Battery spring (-)	EF02DB04002	3	3	20		C
	28	6402 4590	Nut tape	HGFC0002601	2	2	20		X
	29	6510 4420	Battery insulation label	HGFC0001109	3	3			X
	30	6511 7770	Battery cover label	HGFC0004400	1	1	20		X
	31	6511 7780	Battery cover	FADDB040007	1	1	1		C
	32	6511 7180	Battery holder S (for memory back up battery)	ECDB0411111	1	1	20		X
	33	6510 4310	Screw (for battery holder (s))	MAA80006311	1	1	20		B
	34	6511 7200	Screw (for hinge)	MAB10004200	2	2	20		B
	35	6511 7210	Screw	MAB10023301	8	8	20		B
	36	6511 7220	Screw	MAB10013209	5	5	20		B
	37	6511 8410	Screw	MAB10015201	2	2	20		B
	38	6511 7240	Screw	MAA20092300	1	1	20		B
	39	6510 5250	Screw	MAB80004209	2	2	20		B
	40	6511 7310	Blind seal	HGFC0004507	1	1	20		X
	41	6511 7190	Battery holder L	ECDB0411102	1	1	10		X
<b>5. OTHERS</b>									
N	42	6512 0660	Switch knob	FB1DB020500	1	1	20		C
N	43	6406 6250	Switch spring	EF07DB02119	1	1	20		C
N	44	6512 3120	Buzzer	CK234P50105	1	1	1		X
	45	6510 4500	Buzzer tape	HGFC0000501	1	1	20		X
	46	6511 7080	Knob	FB3DB040008	1	1	20		C
	47	6390 0430	Cap V332	A310765-1	1	1	20		C
	48	6511 7290	Battery change label A	HGFC0004604	1	1	20		C
	49	6511 7300	Battery change label B	HGFC0004701	1	1	20		C
	50	6511 7270	Insulation sheet	ELBDB041106	1	1	20		X
N	51	6406 7490	Hinge blind plate	HGFC0008901	1	1	20		C

Notes: N – New part

M – Minimum order/supply quantity

R – Rank

Q'ty – Quantity used per unit

R – A : Essential

B : Stock recommended

C : Others

X : No stock recommended

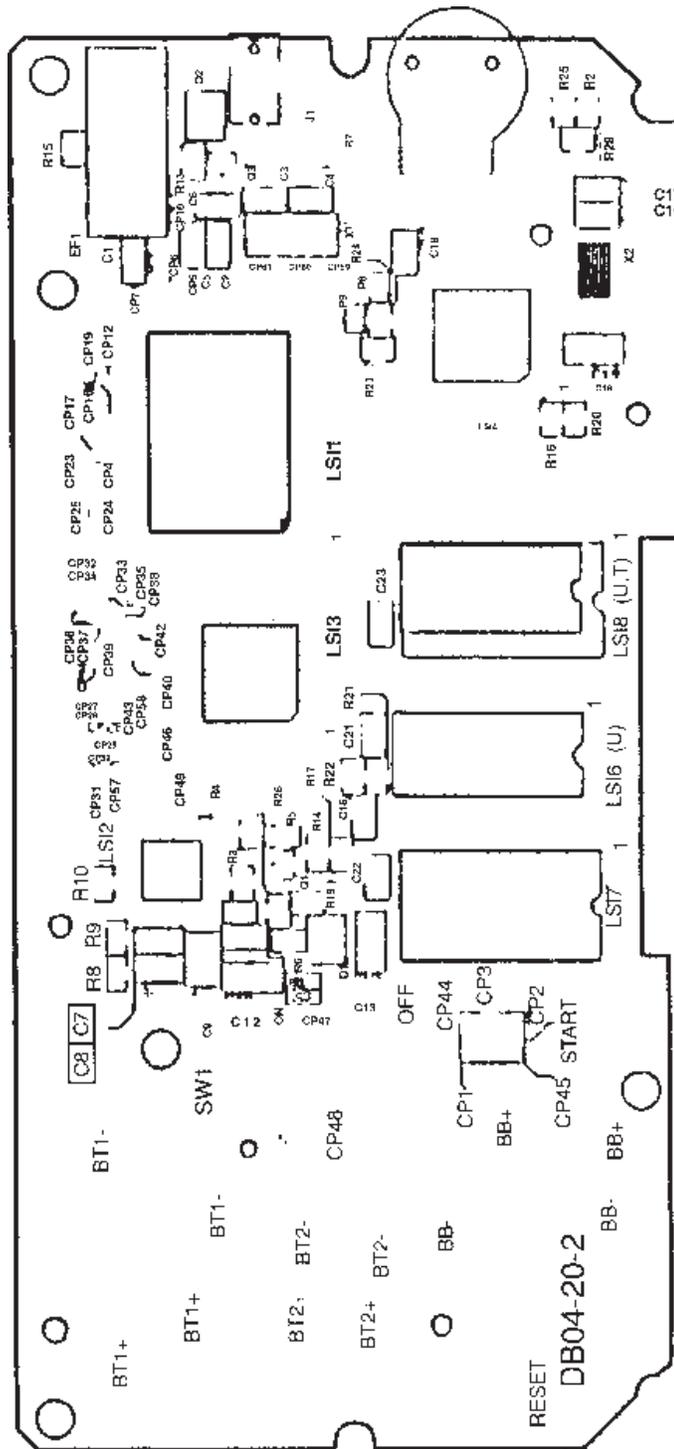
A : SF-8350

(one RAM type, LX-572AT)

B : SF-8350

(two RAM type, LX-572AU)

# 14. PCB VIEW (SF-8350)





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