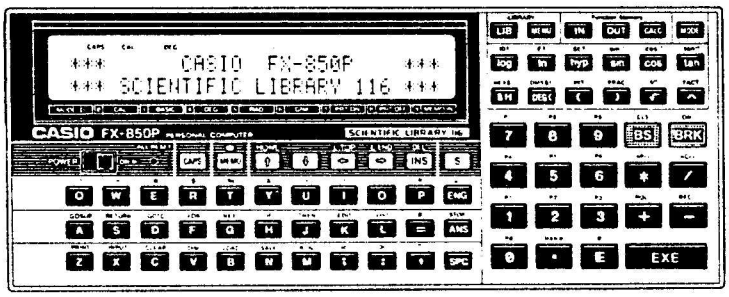
SERVICE MANUAL
& PARTS LIST (with price)

FX-850P

RP-33

MAR. 1987



FX-850P

RP-33

CASIO®

CONTENTS

1. SPECIFICATION

Display: 32 digits x 2 lines
RAM capacity: Standard: 8KB, Max.: 40KB
User area capacity: 5072 Bytes with 8KB, 62416 Bytes with 64KB RAM
Number of variables: Up to full memory capacity
Power source: 2 lithium batteries (CR-2032) for mainframe
1 lithium battery (CR-1220) for memory back up
Power consumption: 0.004 W, 7 mA (Max.)
Battery life:

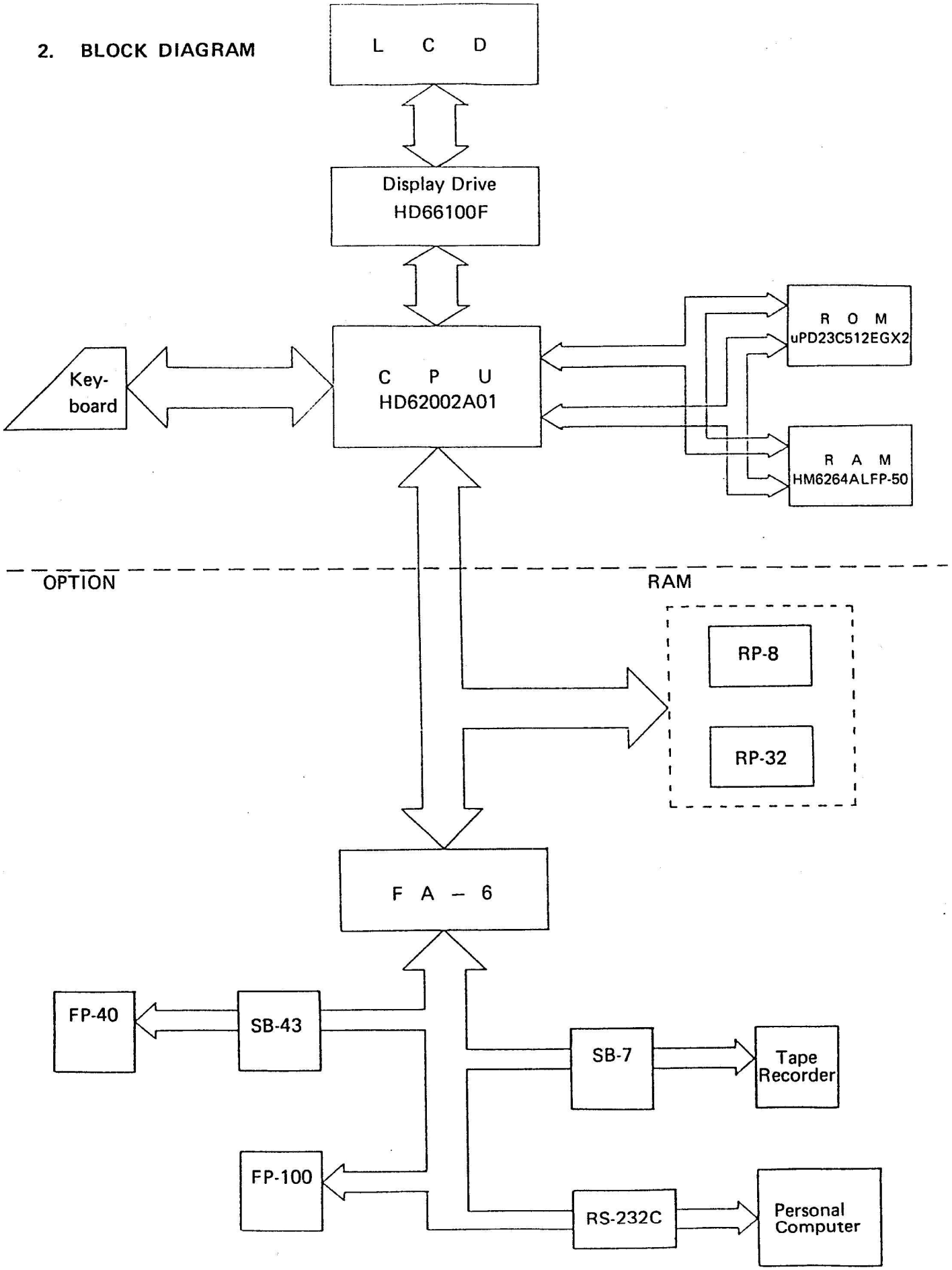
(1)	Continual program execution	Approx. 90 hours
(2)	When waiting for key entry	Approx. 150 hours
(3)	When using 1 hours per day	Approx. 4.5 months

*1 hours operation includes 10 minutes of (1) and 50 minutes of (2).

(4)	Power off	Approx. 24 months

Auto-power-off: Approx. 6 minutes
Ambient temperature range: 10°C – 35°C
Dimentions: 1/2" (11.6 mm)H x 7-5/8" (193 mm)W x 3" (78 mm)D
Weight: 6.9 oz (197 G) including batteries

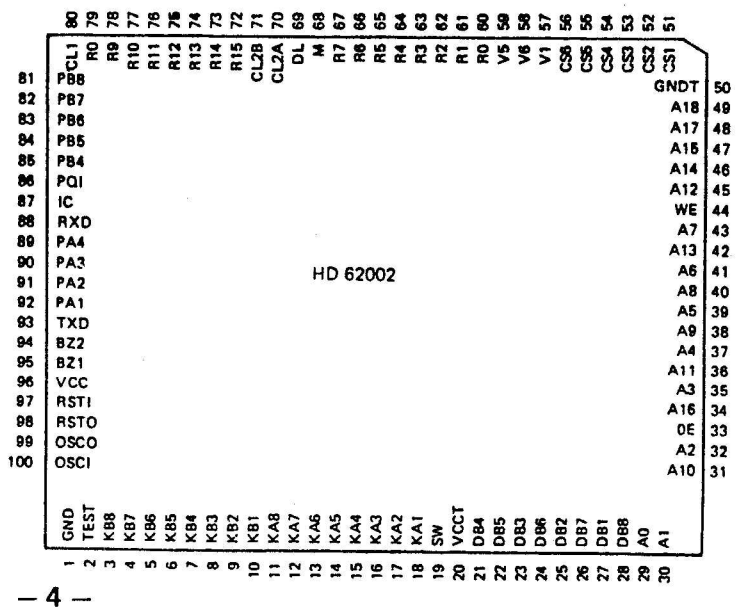
2. BLOCK DIAGRAM



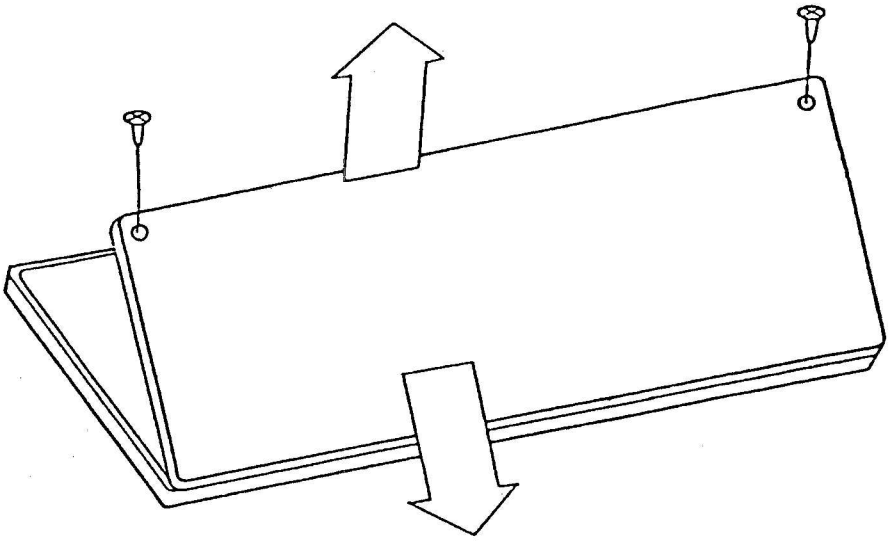
3. CPU (HD62002) PIN FUNCTION

Pin No.	Signal	Function	I/O
1	GND	+5 V	
2	TEST	SELF CHECK SIGNAL (ACTIVE: LOW LEVEL).	IN
3 10	KB8 KB1	INPUT SIGNAL from Keyboard.	IN
11 18	KA8 KA1	COMMON SIGNAL from/to Keyboard.	I/O
19	SW	POWER ON SIGNAL (ON: LOW LEVEL, OFF: HIGH LEVEL).	
20	VCCT	GROUND (OV)	
21 28	DB4 DB8	DATA BUS	I/O
29 32	A0 A2	ADDRESS BUS	OUT
33	OE	OUTPUT ENABLE SIGNAL (ACTIVE: LOW LEVEL).	OUT
34 43	A16 A7	ADDRESS BUS	OUT
44	WE	WRITE ENABLE SIGNAL (ACTIVE: LOW LEVEL).	OUT
45 49	A12 A18	ADDRESS BUS	OUT
50	GNDT	VDD (+5 V)	
51	CS1	CHIP SELECT SIGNAL to RAM (ACTIVE: LOW LEVEL).	OUT
52	CS2	CHIP SELECT SIGNAL to Option RAM (ACTIVE: LOW LEVEL).	OUT
53	CS3	CHIP SELECT SIGNAL to FA-6 (ACTIVE: LOW LEVEL).	OUT
54	CS4	CHIP SELECT SIGNAL to Option RAM (ACTIVE: LOW LEVEL).	OUT
55	CS5	CHIP SELECT SIGNAL to ROM (ACTIVE: LOW LEVEL).	OUT
56	CS6	CHIP SELECT SIGNAL to ROM (ACTIVE: LOW LEVEL).	OUT
57 59	V1 V5	LCD DISPLAY VOLTAGE.	IN
60 67	R8 R7	LCD COMMON SIGNAL.	OUT
68 71	M CL2B	LCD SEGMENT DRIVE SIGNAL.	OUT

Pin No	Signal	Function	I/O
72 79	R15 R0	LCD COMMON SIGNAL.	OUT
80	CL1	LCD SEGMENT DRIVE SIGNAL.	OUT
81	PB8	DSR SIGNAL from RS-232C.	IN
82	PB7	CD SIGNAL from RS-232C.	IN
83	PB6	CTS SIGNAL from RS-232C.	IN
84	PB5	NOT USED	
85	PB4	BUSY SIGNAL from Printer.	IN
86	PQ1	NOT USED	
87	IC	NOT USED	
88	RXD	DATA IN SIGNAL from RS-232C.	IN
89	PA4	INIT SIGNAL to Printer.	OUT
90	PA3	STROBE SIGNAL to Printer.	OUT
91	PA2	DTR SIGNAL to Printer.	OUT
92	PA1	RTS SIGNAL to RS-232C.	OUT
93	TXD	DATA OUT SIGNAL to RS-232C.	OUT
94	BZ2	BUZZER SIGNAL.	OUT
95	BZ1	BUZZER SIGNAL.	OUT
96	VCC	0 V	
97	RSTI	RESET SIGNAL from/to P key (ACTIVE: LOW LEVEL).	I/O
98	RST0	RESET OUTPUT SIGNAL.	OUT
99	OSCO	BASIC CLOCK PULSE.	OUT
100	OSCI	BASIC CLOCK PULSE.	IN

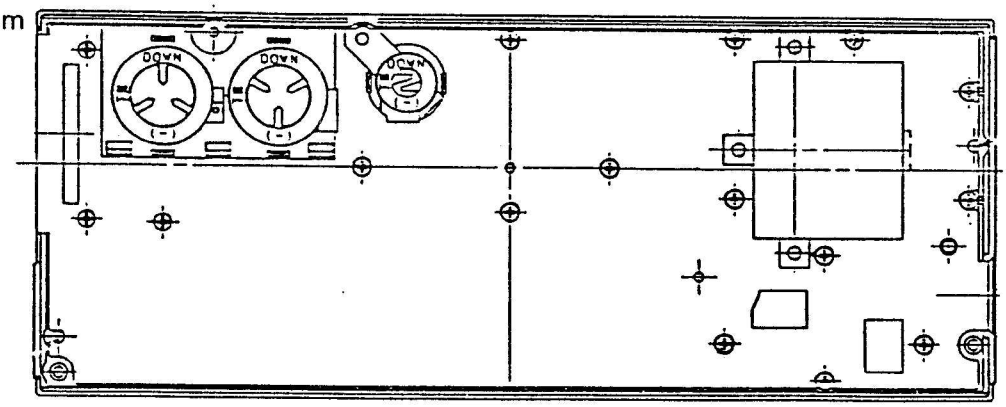


4. DISASSEMBLY

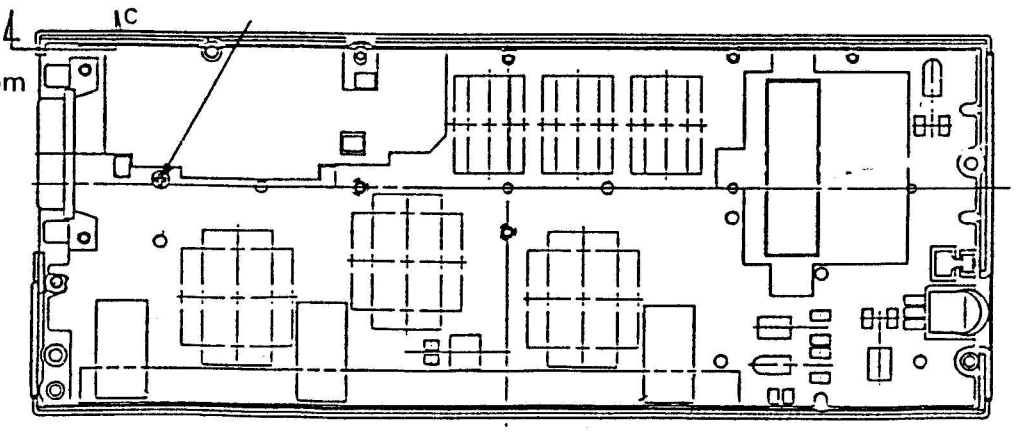


1. Remove two screws from the back.
2. Lift and slide down the lower case.
3. Remove two screws from the batteries' covers.

4. Remove 16 screws from the guide plate.
5. Lift the guide plate.



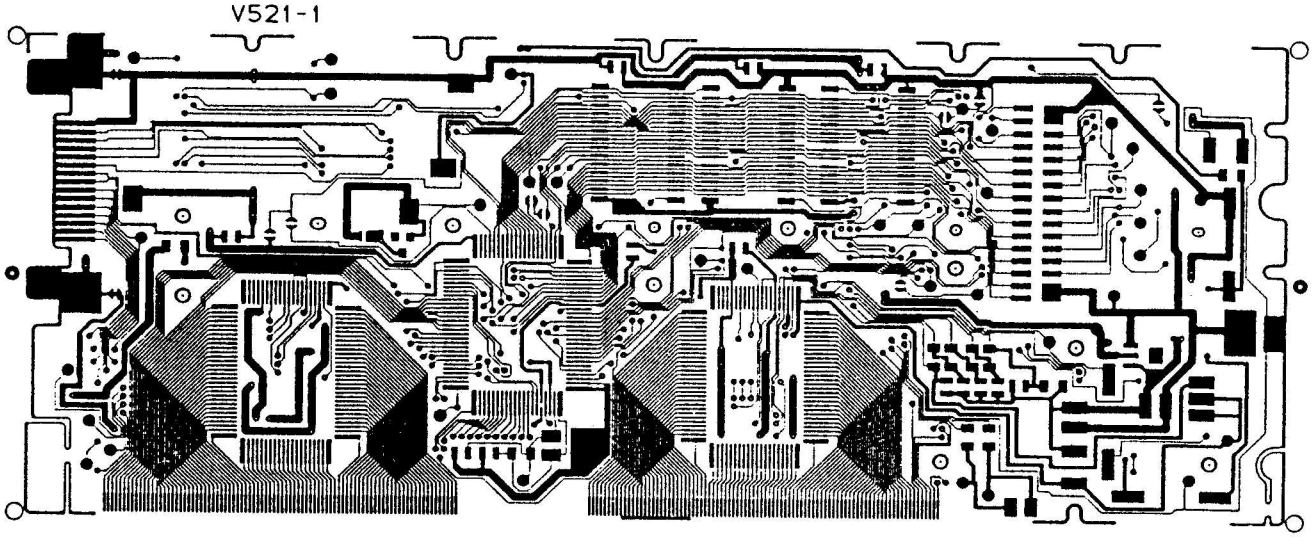
6. Remove one screw from the PCB.



5. PCB LAYOUT

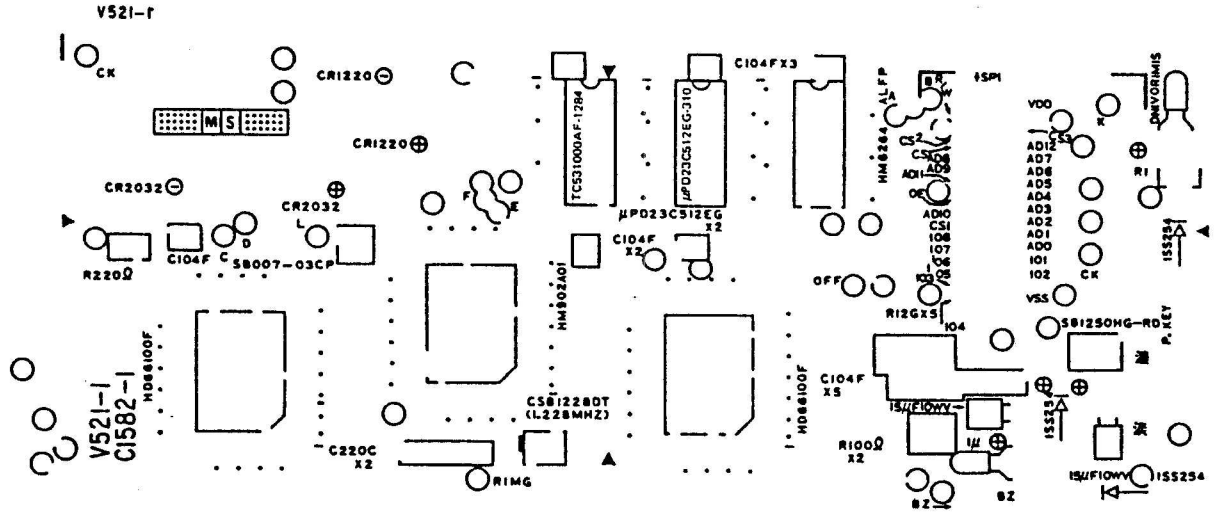
(1) Component side

V521-1



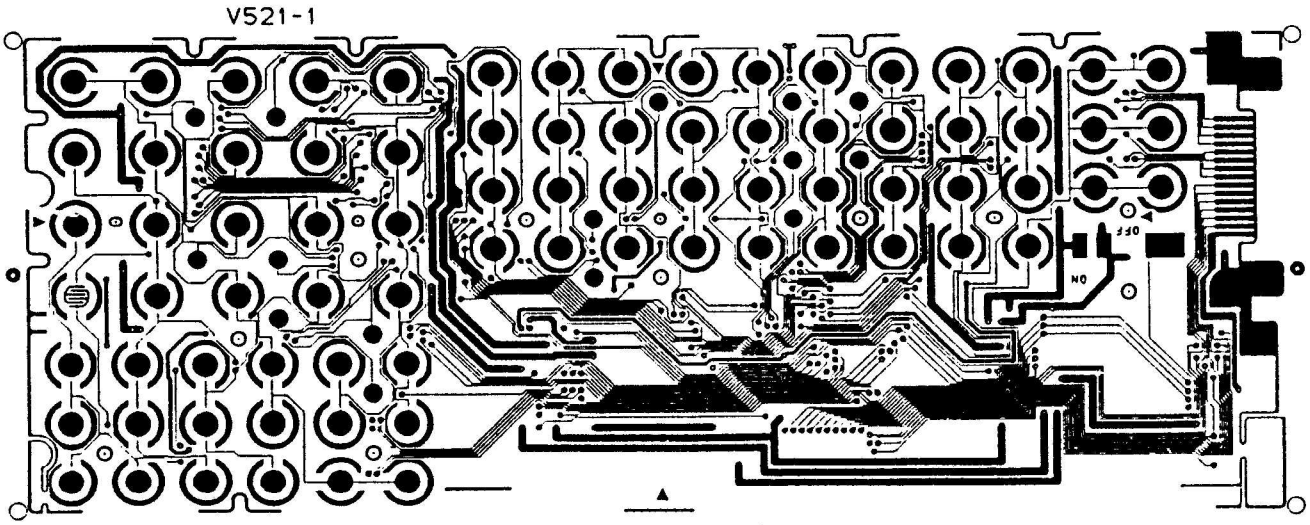
(2) Component side print

V521-r



(3) Solder side

V521-1

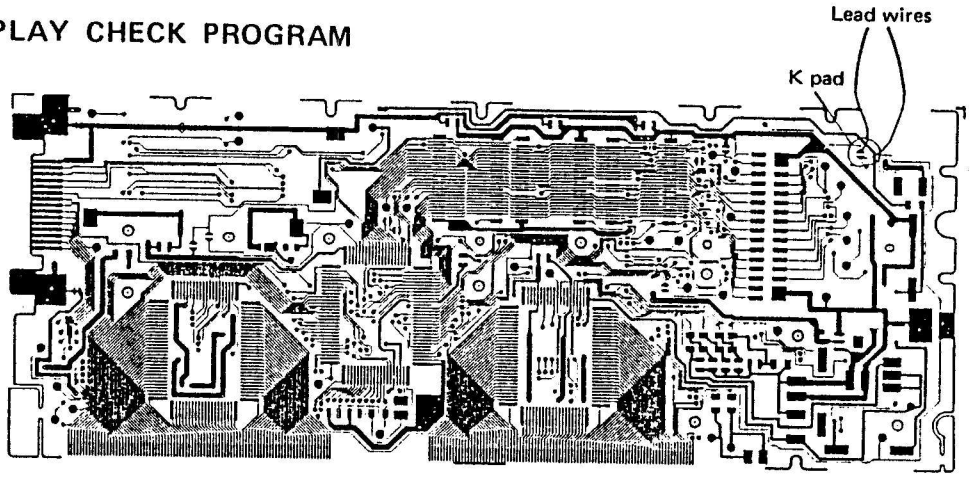


6. CHECK PROGRAM

6-1 ROM, RAM and DISPLAY CHECK PROGRAM

(1) After removing the guide plate, solder the two lead wires to each pieces of K pad. (Refer to right picture)

(2) Put the guide plate and batteries.



(COMPONENT SIDE)

OPERATION	DISPLAY TO BE CHECKED
SWITCH ON P KEY (in the back of the machine) [ALL RESET]	CAPS CAL DEG _ (The cursor flashes)
SWITCH OFF SWITCH ON	CAPS CAL DEG _ (The cursor flashes)
Short K pad	(A few seconds later, beep sounds) CAPS CAL DEG Main 8 Kbite Option 0 Kbite OK RAM
Short K pad	(Beep sounds) CAPS CAL DEG OK 512K*2 ROM? 04 32 72 22 09 38
Short K pad	(Beep sounds) CAPS CAL DEG ■■■(All segments light)■■■■■■■■
Short K pad	(Beep sounds) CAPS CAL DEG (All segments light off)
Short K pad	(Beep sounds) CAPS CAL DEG (Half of segments light)
Short K pad	(Beep sounds) CAPS CAL DEG (Another half of segments light)
[BRK]	CAPS CAL DEG _ (The cursor flashes)

6-2 KEY OPERATION CHECK

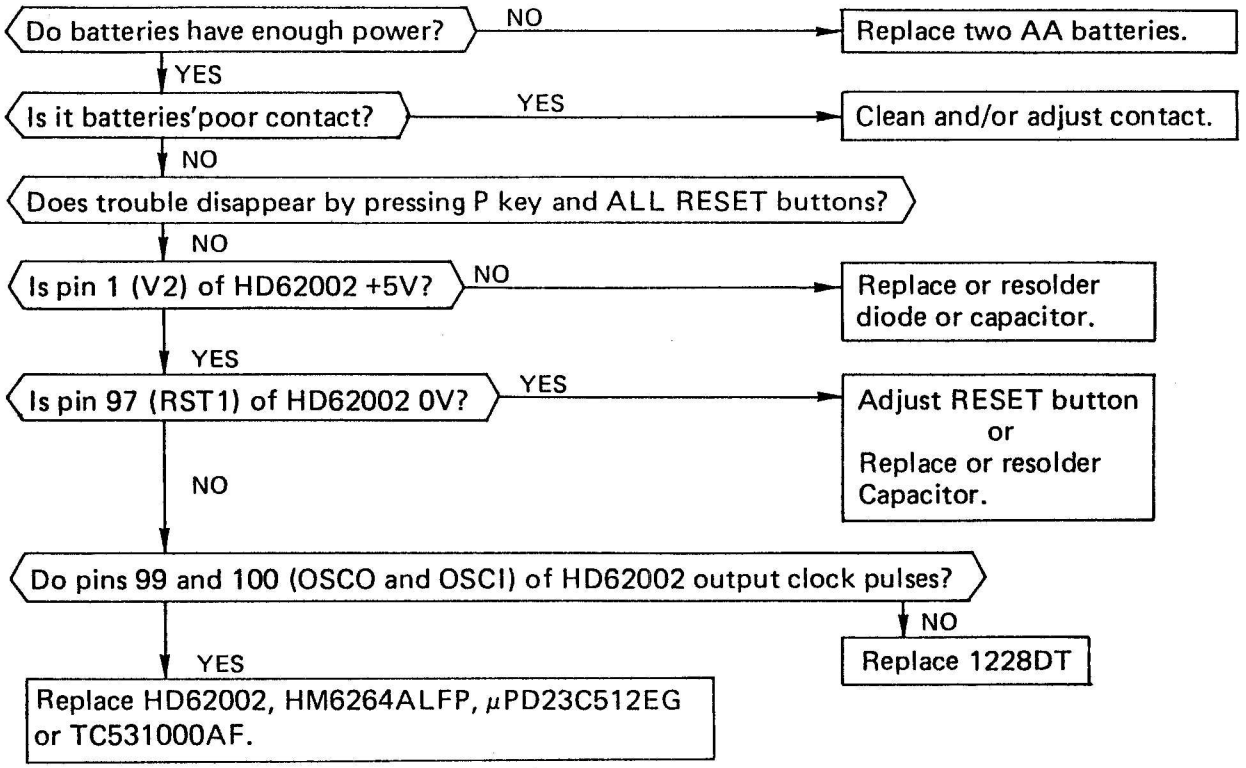
OPERATION	DISPLAY TO BE CHECKED
SWITCH ON P KEY (in the back of the machine) [ALL RESET]	CAPS CAL DEG _ (The cursor flashes)
SWITCH OFF SWITCH ON	CAPS CAL DEG _ (The cursor flashes)
[MODE] 1	CAPS BASIC DEG P 0 1 2 3 4 5 6 7 8 9 3 5 3 6 B READY P0
Q W E R T Y U I O P	CAPS BASIC DEG READY P0 Q W E R T Y U I O P _ (The cursor flashes)
S(red) ⇦ A S D F G H J K L =	CAPS BASIC DEG Q W E R T Y U I O P A S D F G H J K L = _ (The cursor flashes)
[CAPS] $ [BS] Z X C V B N M ; : , [SPC]	BASIC DEG z x c v b n m ; : , ␣ _ (The cursor flashes) (Blank)
S (red) ⇧ ⇨	BASIC DEG z x c v b n m ; : , (flashes)
[MODE] 0 0. + 1 2 3 − 4 5 6 ∗ 7 8 9 [EXE]	CAL DEG 0. + 1 2 3 − 4 5 6 ∗ 7 8 9 −3 5 9 6 6 1
/E ( ) ^	CAL DEG −3 5 9 6 6 1 −3 5 9 6 6 1/E ( )^_ (The cursor flashes)
S (red) [BS]	CAL DEG _ (The cursor flashes)
[log] [ln] [hyp] [sin] [cos] [tan] [&H] [DEG()] √‾	CAL DEG LOGLNHYPSINCOSTAN&HDEG (SQR_ (The cursor flashes)
[BRK] A = 1 2 3 ∗ X [IN]	CAL DEG a = 1 2 3 ∗ X _ (The cursor flashes)
[CALC]	CAL DEG X?
4 5 6 [EXE]	CAL DEG X ? 4 5 6 a = 5 6 0 8 8
[ENG]	CAL DEG STOP X ? 4 5 6 5 6 . 0 8 8 E + 0 3

OPERATION	DISPLAY TO BE CHECKED
[ANS] [OUT]	CAL DEG STOP 56.088E+03 56088a=123∗X_(The cursor flashes)
[BRK]⇧ S(red) [INS] S (red) [INS]	CAL DEG 6088a=123∗X (flashes)
S (red) [BS] [MODE] 5	CAL RAD _ (The cursor flashes)
[MODE] 6 [MODE] 7	CAL GRA PRT _ (The cursor flashes)
[MODE] 8 [MODE] 9	GRA MEMO IN 1 _ (The cursor flashes)
12 [EXE]⇦	GRA MEMO IN EDIT 1 12 (flashes)
[MODE] 0	CAL GRA _ (The cursor flashes)
[MEMO]	CAL GRA MEMO 1 12 (1 and ■ flashes by turns)
[BRK]	CAL GRA _ (The cursor flashes)
[CAPS] AKASA	CAL GRA AKASA_ (The cursor flashes)
[CAPS] S(red) BS	CAL GRA _ (The cursor flashes)
[MODE] 110BEEP:S(red) D10 [EXE]	BASIC GRA 10BEEP GOTO 10 _ (The cursor flashes)
S(red) M [EXE]	BASIC GRA RUN (Conferm buzzer sound)
[BRK]	BASIC GRA Break Ready P0
[MODE] 0	CAL GRA _ (The cursor flashes)
[LIB]	CAL GRA LIB Prime factors (2≦Base <10^{10}) Base?

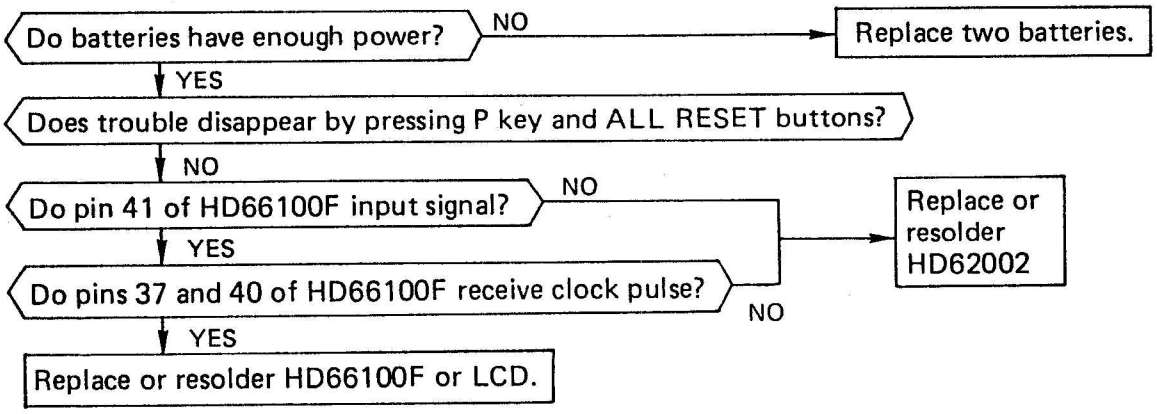
OPERATION	DISPLAY TO BE CHECKED
[BRK] [MENU]	CAL GRA LIB 5010 : Prime factors Base = a * b * C * . . .
[BRK]	CAL GRA Break _ (The cursor flashes)

7. TROUBLESHOOTING

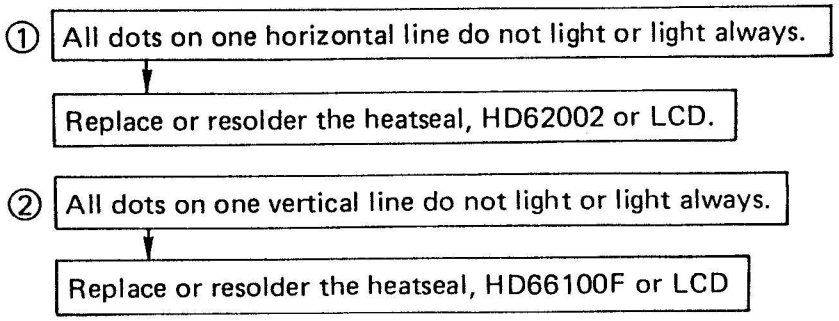
7-1 No display and no buzzer by pressing any key.

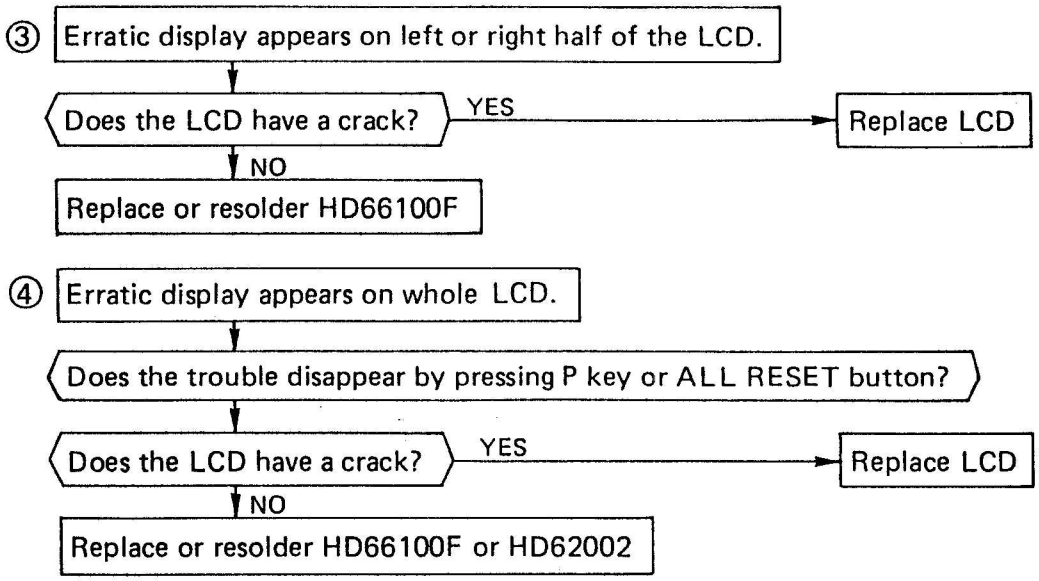


7-2 Buzzer sounds, but no display on screen when pressing keys.

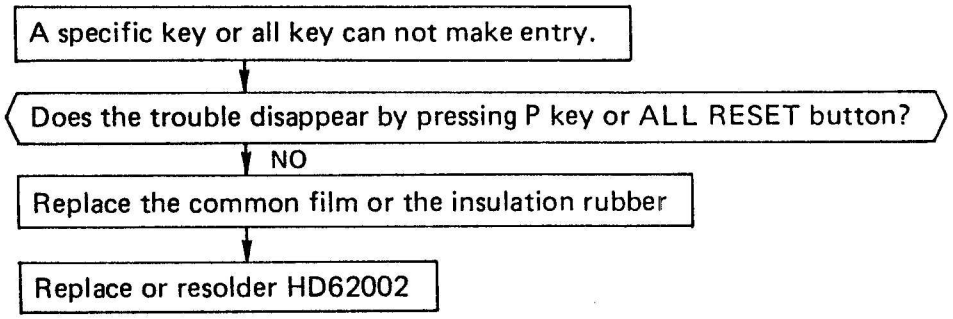


7-3 Erratic display

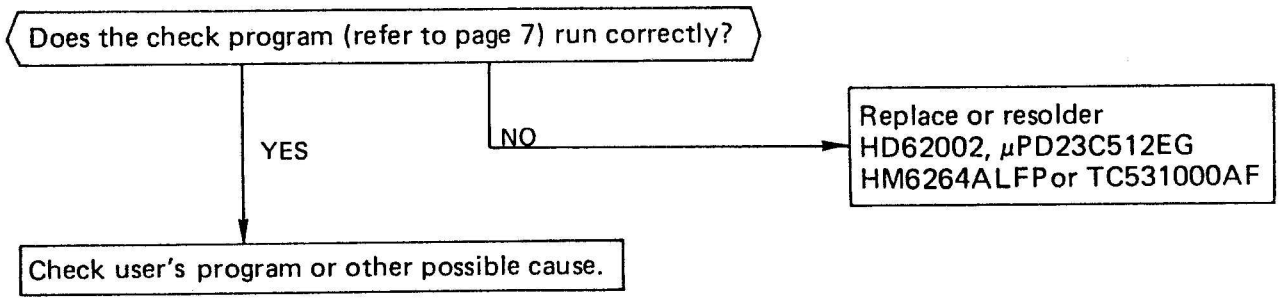




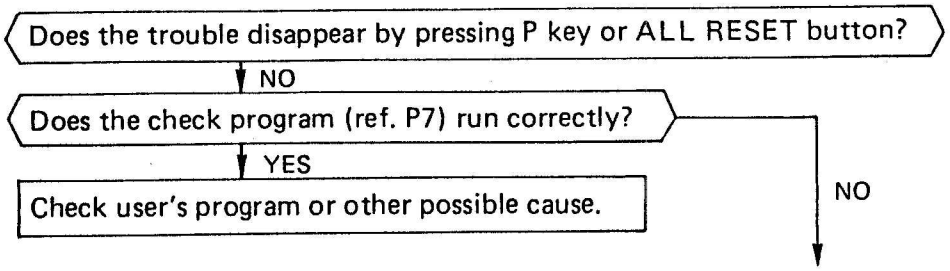
7-4 No key input possible.

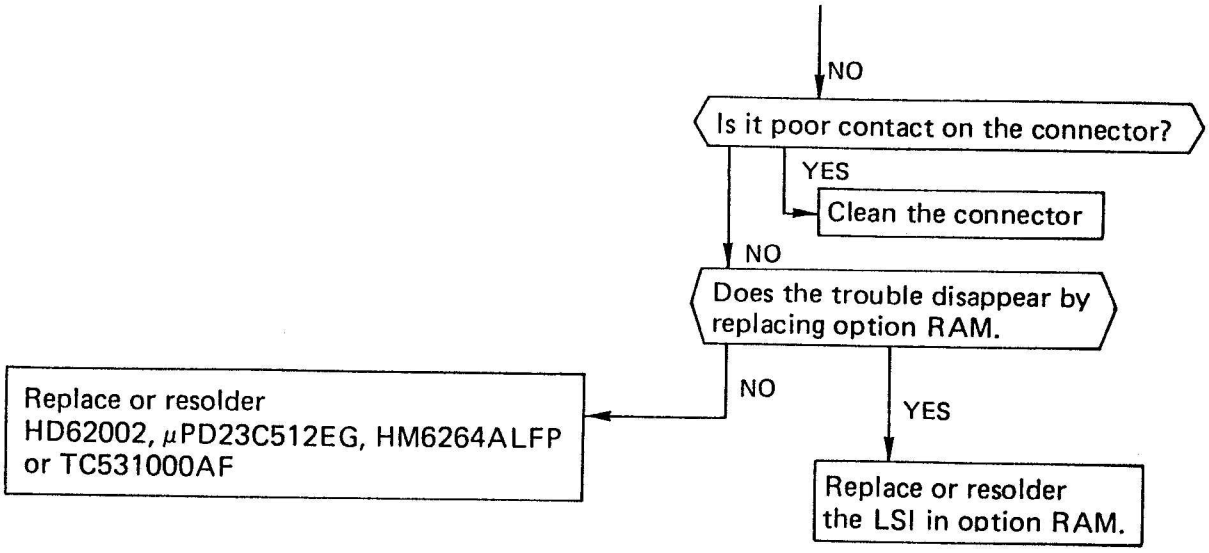


7-5 Miscalculation, No Program Execution or Error Occurs.



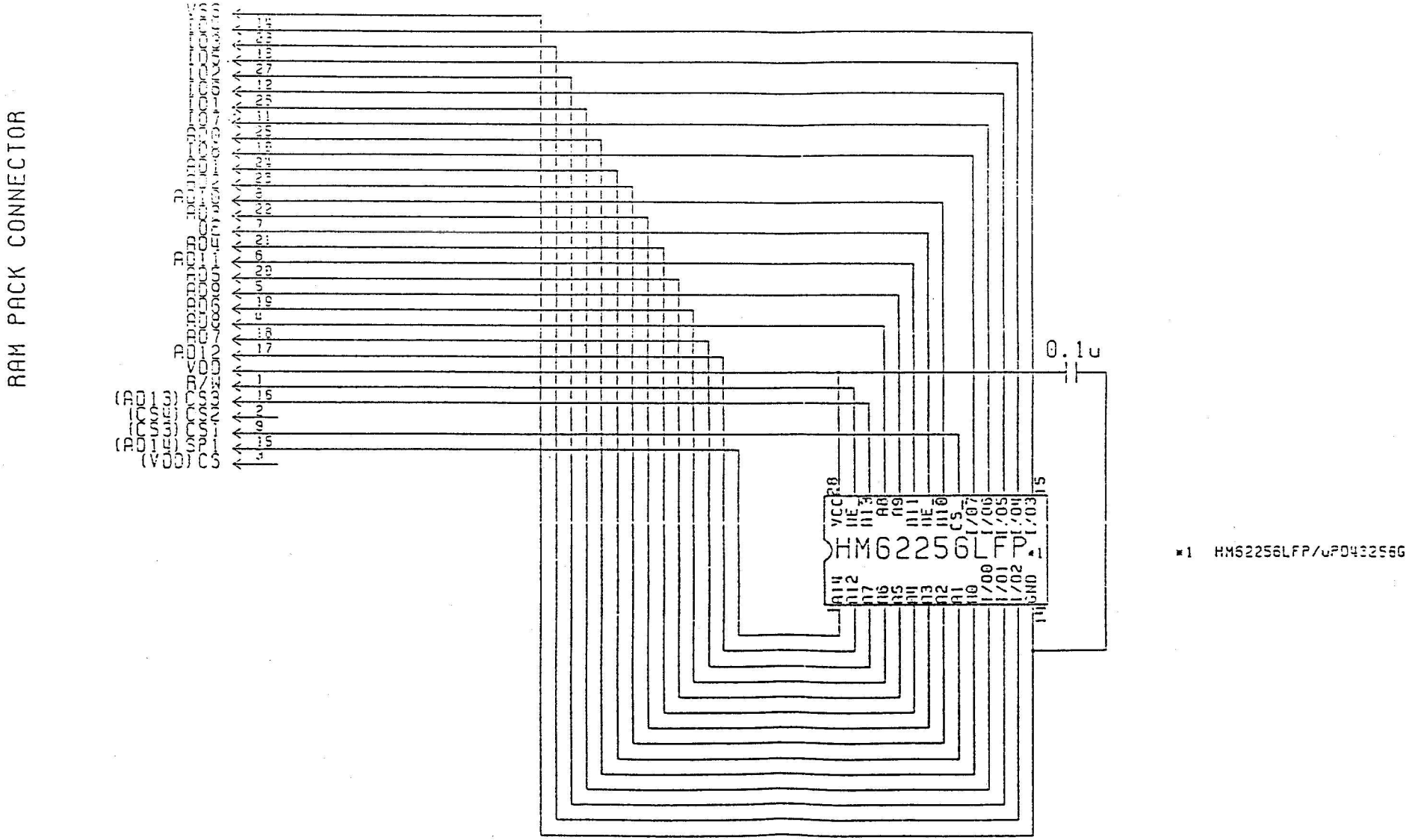
7-6 Memory capacity does not increase when option RAM is used, and error occurs.

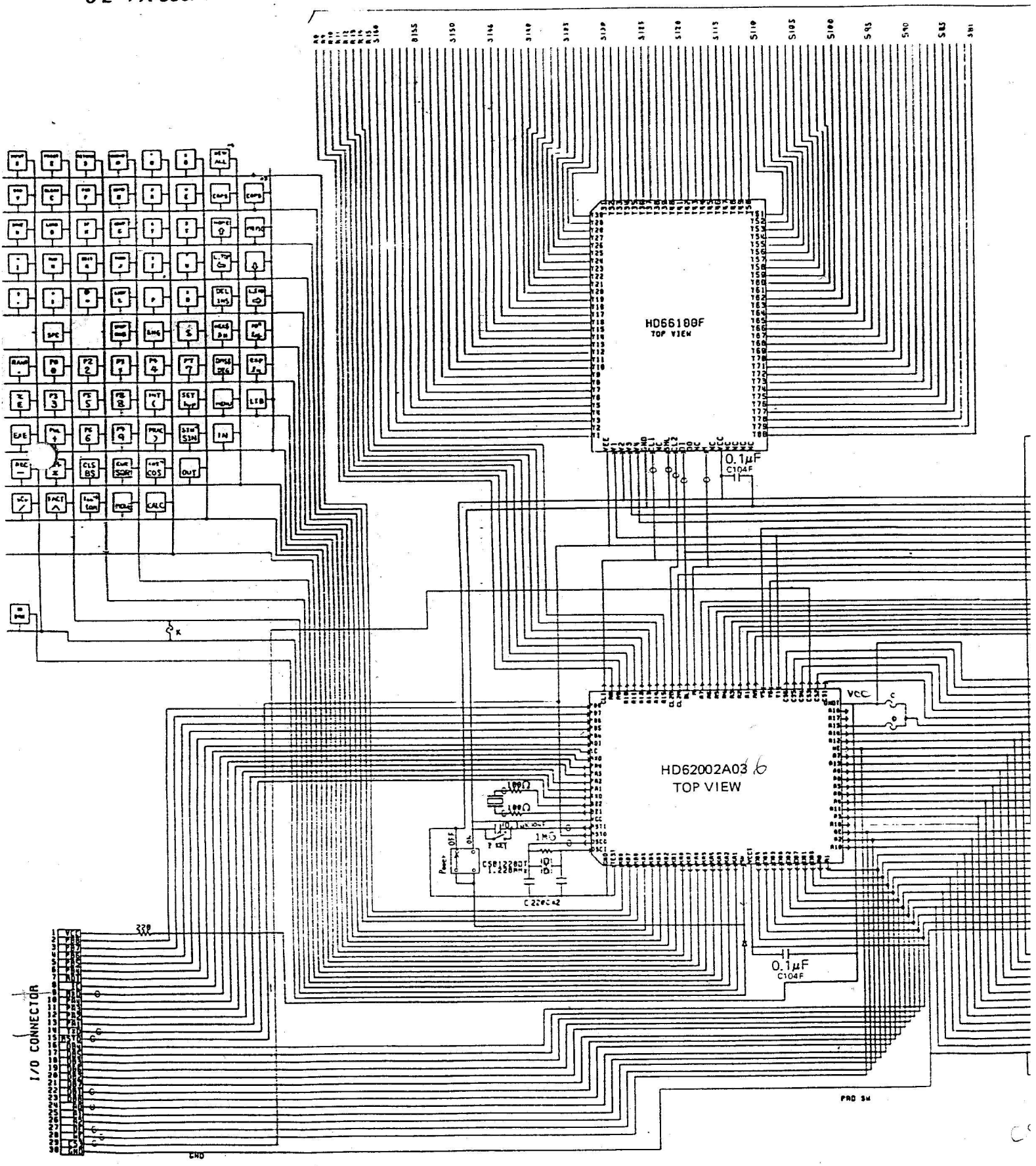



NO
Is it poor contact on the connector?
YES
Clean the connector
NO
Does the trouble disappear by replacing option RAM.
NO
YES
Replace or resolder HD62002, μPD23C512EG, HM6264ALFP or TC531000AF
Replace or resolder the LSI in option RAM.

8. CIRCUIT DIAGRAM

8-1 RP-33

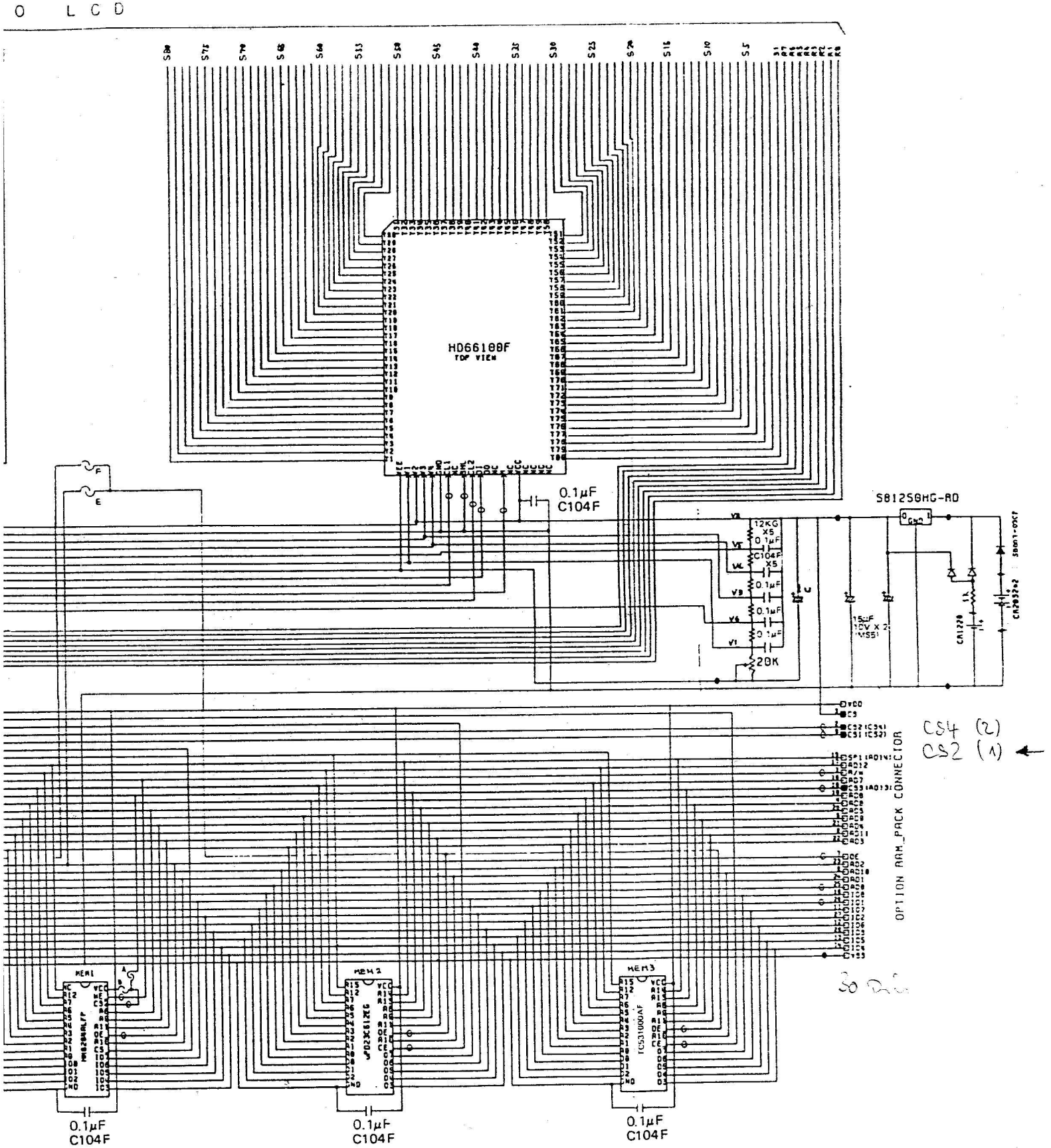




CS3

128K ROM 2 X 2

64K ROM 2 X 6



Short pad

A: OPEN D: SHORT K: OPEN
B: SHORT E: OPEN (Forcheck program)
C: OPEN F: SHORT

< 23C512
< 62256

9. PARTS LIST

FX-850P (VX521BA)

Notes: 1. Prices and specifications are subject to change without prior notice.
2. As for spare parts order and supply, refer to the "GUIDE-BOOK for Spare Parts Supply" published separately.

Item	Code No.	Part Name	Specification	Q'ty	*	Unit Price J.F. Yen (¥) (FOB: JAPAN)	RANK
		A. PCB-V521-1					
☆	4301 9230	PCB-V521-1 (Without components)	C1582-1	1		1,260	X
	2001 1149	LSI	HM6264ALFP-50	1		690	A
☆	2010 2303	LSI	HD62002A01	(1)		1,810	A
☆	2010 2709	LSI, Interchangeable	HD62002A03	(1)		670	A
☆	2010 3199	LSI	TC531000AF-1284	1		670	A
☆	2010 3192	LSI	UPD23C512EG-310	1		670	A
☆	2010 2317	LSI	HD66100F	2		580	A
☆	2105 0546	C-MOS IC	S-81250HG-RD	1		120	A
	2301 0241	Diode	1SS254T-77-T	3	20	5	B
☆	2390 0035	Shottky diode	SB007-03CP-TB	1	20	18	B
☆	2590 0175	Ceramic oscillator	CSB1228DT2	1	5	78	B
	2765 0028	Volume	V08L-PH-Y12-B-203	1		200	C
☆	2792 0217	Chip resistor	MCR10EZHJ101	2	20	3	C
☆	2792 0470	Chip resistor	MCR10EZHJ102	1	20	3	C
☆	2792 0815	Chip resistor	MCR10EZHJ221	1	20	3	C
☆	2795 0525	Chip resistor	MCR10EZHG105	1	20	5	C

Note: ☆ – New part
Q'ty – Quantity used per unit
* – Minimum order and supply quantity

Rank A: Essential
B: Stock recommended
C: Less recommended
D: No stock recommended

Item	Code No.	Part Name	Specification	Q'ty	•	Unit Price J.F. Yen (¥) (FOB: JAPAN)	RANK
☆	2795 0693	Chip resistor	MCR10EZHG123	5	20	5	C
☆	2801 7168	Electrolytic capacitor	CE04C-1A150MS5	2	20	19	C
	2805 0216	Electrolytic capacitor	CE04C-1H010MS5	1	20	22	C
☆	2890 8920	Chip capacitor	C2012CH1H220J-TP	2	20	7	C
☆	2895 0161	Tantalum capacitor	DN1VOR1M1S	1	20	26	C
☆	2896 0168	Tantalum capacitor	C2012Y5V1R104Z-TP	11	20	9	C
	3501 0182	Connector	69836-001	1		560	C
	6325 8131	P spring, G195	A33138A-1	1	10	4	D
	6380 1140	Insulation seal, B-G898 (For P spring)	A48906-1	1	20	2	D
	6350 3900	Insulation seal, V505 (For Volume)	C41341-1	1	20	5	C
	6381 1590	Insulation seal, G760 (For Connector)	C31005-1	1		100	C
☆	6384 5620	Insulation seal, A-V521 (For RAM pack)	C41894-1	1	20	27	C
☆	6384 5630	Insulation seal, B-V521 (For Batteries)	C41822-1	1	20	11	C
	6329 2510	Sorew with washer, G300B (For PCB-V521-1)	A44347-2	2	50	2	D
	6333 0000	Flat screw, A-G317B (For PCB-V521-1)	A45491-13	1	50	2	D
☆	6384 5610	Connector cap, V521	C41825-1	1	20	27	C
		B. DISPLAY					
☆	3335 0749	LCD	LR590-C	1		760	A
☆	5600 8440	Heat seal, V521	KZ-06-S	1		190	A
☆	6384 5640	Insulation seal, A-V521 (For Heat seal)	C41819-1	1	20	7	B
☆	6384 5650	Insulation seal, B-V521 (For Heat seal)	C41920-1	1	20	7	B
☆	6384 5660	Display frame V521	C31279-1	1		110	C
	6329 7460	Adhesive tape, G302 (For fixing LCD to Display	A44931-1 frame)	1	10	2	C
	6349 7930	Adhesive tape, G707 (For fixing LCD to Display	A45344-16 frame)	1	20	5	C
	6345 9240	Cushion G764 (On back of LCD)	C41027-1	2	20	5	C
		C. KEY					
☆	0007 1734	Key to set, VX521BA	For FX-850P	1		250	C

Note: ☆ – New part
Q'ty – Quantity used per unit
• – Minimum order/supply quantity

Rank A: Essential
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D: No stock recommended

Item	Code No.	Part Name	Specification	Q'ty	•	Unit Price J.F. Yen (¥) (FOB: JAPAN)	RANK
☆	6384 5750	Key contact rubber, A-V521	C31272-1	1		58	B
☆	6384 5760	Key contact rubber, B-V521	C31273-1	1	5	56	B
☆	6384 5790	Common film, V521B	C2727-1	1	5	72	B
☆	6384 5800	Spacer, V521	C31275-1	1	20	17	B
☆	6384 5810	Shield plate, V521	C31276-1	1	10	34	C
	6350 3710	Slide knob, V505	C3922-1	1	20	18	C
	6025 1583	Contact spring, G71 (For Slide knob)	A43684C-1	1	10	6	C
☆	6335 2030	Reset button, G910	A46628-1	1	20	3	D
		D. PCB HOLDER					
☆	6384 6090	PCB holder assy	C2700*1	1		210	D
	Consists of:						
☆	6384 5820	PCB holder V521	C1578-1	1		110	D
	6324 9394	Nut, A-G144	A43705-8	3	20	5	D
	≪For Lithium battery: CR-2032 x 2 pcs.≫						
	6329 7621	Battery spring, A-G272	A33938A-1	1	10	7	C
	6329 7630	Battery spring B-G272	A33939-1	1	10	8	C
	6329 7640	Battery spring, C-G272	A33940-1	1	10	6	C
	6329 7660	Battery insulation seal, G272	A45154-1	2	10	2	D
	≪For Lithium battery: CR-1220 x 1 pce.≫						
	6334 9890	Battery spring, A-G910	A35801-1	1	10	6	C
	6334 9900	Battery spring, B-G910	A35800-1	1	10	5	C
	6334 9910	Battery insulation seal, G910	A46472-1	1	10	3	D
	3240 1571	Buzzer	FFB-S55C41A3	1		36	C
	6330 4750	Adhesive tape, G333 (For Buzzer)	A45381-1	1	10	5	C
	6337 9150	Flat sorew, C-G475 (For PCB holder)	A33953-31	16	50	2	D
	6381 0260	Earth spring, A-G760	C41401-1	2	20	9	D
	6381 0290	Earth spring, B-G760	A47157-9	1	20	6	D
		E. UPPER CASE					
☆	6384 6000	Upper case subassy (Consists of: Upper case, Upper panel, Nut and Adhesive tape)	C31267*2	1		430	C
☆	6384 5690	Window, V521	C31268-1	1	5	50	C

Note: ☆ – New part
Q'ty – Quantity used per unit
• – Minimum order/supply quantity

Rank A: Essential
B: Stock recommended
C: Less recommended
D: No stock recommended

Item	Code No.	Part Name	Specification	Q'ty	•	Unit Price J.F. Yen (¥) (FOB: JAPAN)	RANK
		F. LOWER CASE					
☆	6384 5580	Lower panel, V521	C31280-1	1		240	C
☆	6384 5600	Insulation seal, V521 (With Lower panel)	C31282-1	1	5	56	D
	6332 6880	Screw, B-G420 (For Lower panel)	A45919-1	2	50	2	D
☆	6384 5590	Battery holder, V521 (For Lighium battery: CR-2032x2)	C31281-1	1	10	30	C
	6350 3520	Insulation seal, V505 (With Battery holder V521)	C41280-1	1	20	8	D
☆	6350 7880	Screw, V505 (For Battery holder V521)	C41119-2	1	50	2	D
	6334 9650	Battery holder, B-G910 (For Lithium battery: CR-1220x1)	A35803-1	1	10	12	D
	6337 9150	Flat screw, C-G475 (For Battery holder B-G910)	A33953-31	1	50	2	D
		G. OTHERS					
☆	6385 2770	Hard case, V521	C2702-1	1		110	C
☆	6385 2750	Label, V521B	A38199-2	1	20	9	D

Note: ☆ – New part
Q'ty – Quantity used per unit
• – Minimum order/supply quantity

Rank A: Essential
B: Stock recommended
C: Less recommended
D: No stock recommended

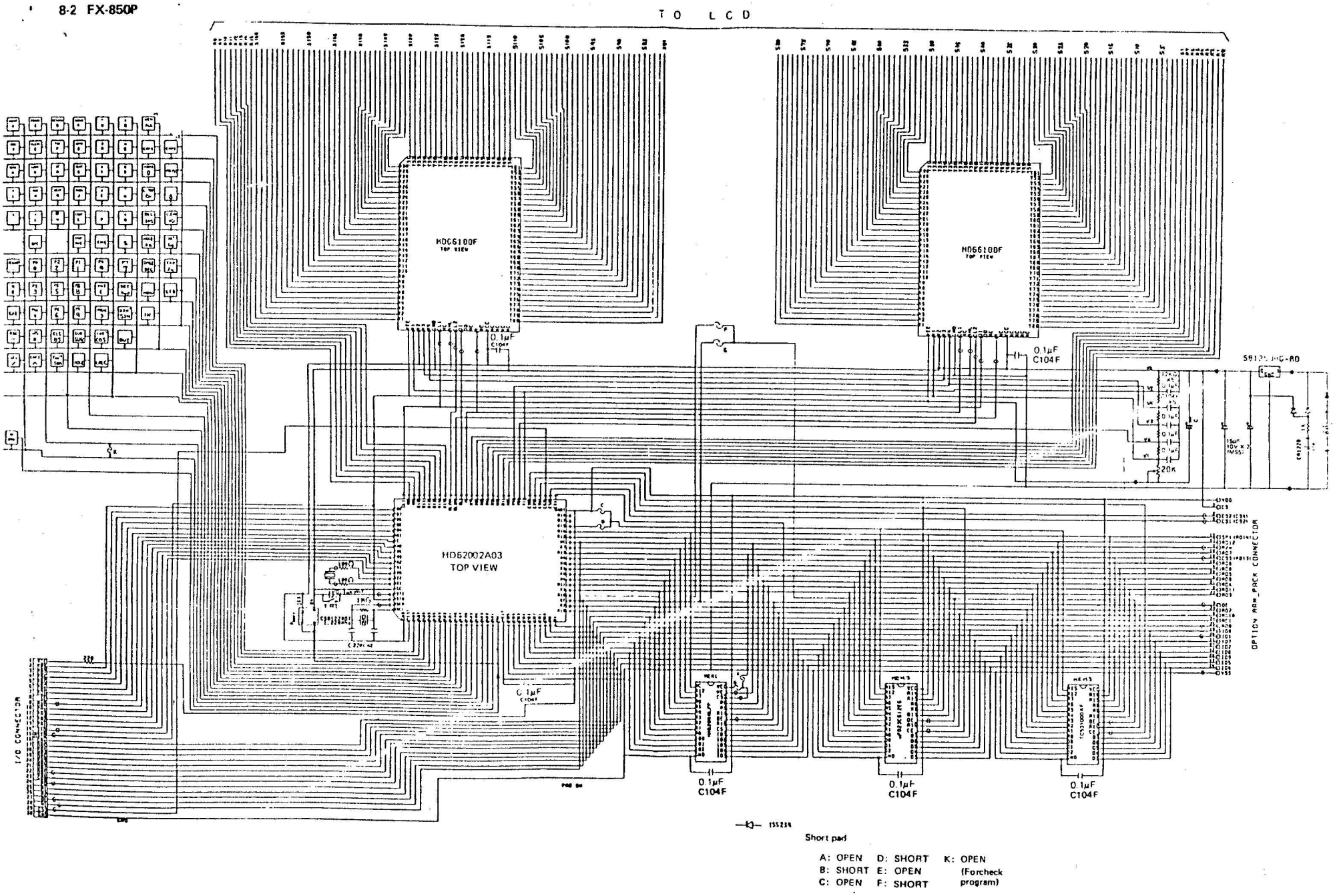
~~PR-33~~ (VX526AA)
RP-33

Notes:
1. Prices and specifications are subject to change without prior notice.
2. As for spare parts order and supply, refer to the "GUIDE-BOOK for Spare Parts Supply" published separately.
3. Numbers in item column correspond to the same numbers in drawing.

Item	Code No.	Part Name	Specification	Q'ty	•	Unit Price J.F. Yen (¥) (FOB: JAPAN)	RANK
☆	4301 9360	PCB-V526-1 (Without components)	C31300-1	1		110	X
☆	2010 2324	LSI	HM62256LFP-15S	1		2,080	A
☆	2896 0231	Chip capacitor	C2012Y5V1B104Z	1	20	9	C
	6347 1390	Insulation seal, G748 (For PCB-V526-1)	C4964-1	1	20	7	C
	6347 1400	Adhesive tape, G748	C41058-1	1	20	5	C
☆	6347 1411	Interconnector, G748	C4963A-1	1		340	B
☆	6384 7760	Decorative upper case, V526	C3743-5	1	5	88	C
	6347 1370	Lower case subassy	C4976*1	1		120	C
	5150 1462	Tapping screw (For Decorative panel)	M1.4x2.0 B	2	50	2	X
☆	6347 2690	Hard case, G748 (Upper)	C41090-1	1	10	30	C
☆	6347 2700	Hard case G748 (Lower)	C3832-1	1	10	30	C

Note: ☆ — New part
Q'ty — Quantity used per unit
• — Minimum order/supply quantity

Rank A: Essential
B: Stock recommended
C: Others
X: No stock recommended


TO LCD
HD66100F
TOP VIEW
HD66100F
TOP VIEW
HD62002A03
TOP VIEW
0.1μF
C104F
20K
I/O CONNECTOR
OPTION ROM_PACK CONNECTOR
Short pad
A: OPEN D: SHORT K: OPEN
B: SHORT E: OPEN (Forcheck program)
C: OPEN F: SHORT

DEFCHR$ (F)

ZWECK: Definiert Punktmuster für die freidefinierbaren Zeichen mit den Codes 252 bis 255.

FORMAT: DEFCHR$(Code) = Argument
Hexadezimalwert

BEISPIEL: DEFCHR$(252)="842A2A2A9E"

PARAMETER: $0000000000_H \leq$ Argument $\leq FFFFFFFFFF_H$

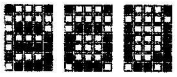
ERKLÄRUNG:

1. Der Hexadezimalwert wird mit den Werten 0 bis 9 und den Buchstaben A bis F ausgedrückt.
2. Im manuellen Modus sowie im Programmmodus ist Verwendung gleich.

BEISPIEL MANUELL:
DEFCHR$(252)="842A2A2A9E" EXE
CHR$(252) EXE
→ 

BEISPIELPROGRAMM:

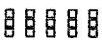
```
10 DATA 842A2A2A9E,9C2222229C,BC020204BE
20 PRINT CHR$(252);CHR$(253);CHR$(254);
30 READ A$,B$,C$
40 DEFCHR$(252)=A$
50 DEFCHR$(253)=B$
60 DEFCHR$(254)=C$
```

→ 

Es ist egal, ob das Zeichen vor oder nach dem Ausdruck definiert wird, da sich mit der Ausführung von DEFCHR$(xxx) jedes auf dem Display ausgedruckte CHR(xxx) seine neue Definition annimmt !

3. **Erklärung der Zeichenmatrix:**

Zeichenmatrix 7 Punkte vertikal x 5 Punkte horizontal: 

aufgeteilt in 4 Gruppen zu je 4 Punkten: 
und 4 Gruppen zu je 3 Punkten: 

Die 10 HEX-Werte des Arguments lassen sich mit nebenstehender Grafik entsprechend dem gewünschten Muster zusammenstellen.