

**MICROLINE 390/391 Elite
TROUBLESHOOTING MANUAL
With
COMPONENT PARTS LIST**

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TROUBLESHOOTING MANUAL



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Troubleshooting Manual

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1. Outline

This troubleshooting flow chart is created for the purpose of repairing the ML390/391 Elite printed circuit board assemblies. Those who are engaged in the repair work are expected to have an adequate level of experience and ability.

2. Tools

The following tools are required for ordinary repair work in addition to generally used tools.

Oscilloscope	Approximately 100 MHz
Soldering iron	Any soldering iron available on the market (preferably with a pointed tip) A special soldering iron set can be used to work more efficiently.

3. Troubleshooting Items

① One of the operating voltages is missing.

- ①-1 There is no +40V output.
- ①-2 There is no +8V output.
- ①-3 There is no +5V output.
- ①-4 There is no 10V AC output.
- ①-5 There is no output.

② Only the power lamp is illuminated.

③ Printer alarm occurs.

These errors are indicated by lit LEDs on the operator panel.

- ③-1 Internal RAM error
- ③-2 Program ROM error
- ③-3 EEPROM error
- ③-4 Resident CG ROM error
- ③-5 Cartridge CG ROM error
- ③-6 External RAM error
- ③-7 Head homing or spacing error

④ Printing wrong character or some characters are not printed.

⑤ Malfunction of line feed

⑥ The printing operation is not performed after an operating switch is pressed.

6-1 The SELECT switch does not function.

6-2 The MODE switch does not function.

6-3 The LF switch does not function.

6-4 The FF switch does not function.

6-5 The PARK switch does not function.

⑦ The data cannot be received.

7-1 The parallel interface data cannot be received.

7-2 The parallel interface data is received but printing data is missing or printing operation is not performed.

① One of the operating voltages is missing.

1-1

There is no +40V output. (But there is +5V output.)

• Q1 emitter – The voltage between pins 4 and 5 of CN2 (0V) is 40V to 70 V?
(Power supply printed circuit board)

• Yes The waveform of pin 2 of IC2 is as shown in Figure 1?
(Power supply printed circuit board)



Figure 1

• Yes Replace Q1 or Q2.

• No Replace IC2 or IC3.

• No AC voltage is supplied to pins 1 or 2, and 7 or 8 of CN1?
(Power supply printed circuit board)

• Yes Replace D1.

• No The fuse on the filter board is open?

• Yes Go to step 1-5.

• No Replace the transformer.

1-2 There is no +8V output.

- The fuse F1 is open? (Power supply printed circuit board)
 - No AC voltage is supplied to pins 3 and 6 of CN1? (Power supply printed circuit board)
 - Yes Replace D12.
 - No Replace the transformer.
 - Yes Replace D12.

1-3 There is no +5V output.

- There is +8V output?
 - Yes Replace IC1. (Power supply printed circuit board)
 - No Go to step 1-2.

1-4 There is no 10 VAC output.

- Replace the transformer.

1-5

There is no output.

- The fuse on the filter board is open?
 - No Replace the transformer.
- ▼ Yes The signal is input to pin 12 of CN5? (Control printed circuit board)
 - Yes The D107 cathode voltage is approximately 13V?
 - No Replace TR108 or TR 111.
 - ▼
 - Yes Go to step ③ or ④.
- ▼ No A short circuit exists between the emitter and collector of Q1? (Power supply printed circuit board)
 - Yes Replace Q1.
- ▼ No A short circuit exists between the anode and cathode of D2? (Power supply printed circuit board)
 - Yes Replace D2.
- ▼ No A short circuit exists in D1? (Power supply printed circuit board)
 - Yes Replace D1.
- ▼ No Replace the transformer.

② Only the power lamp is illuminated. (The printing operation is not performed at all.)

• The oscillation waveform of OSC is the same as shown in Figure 2?

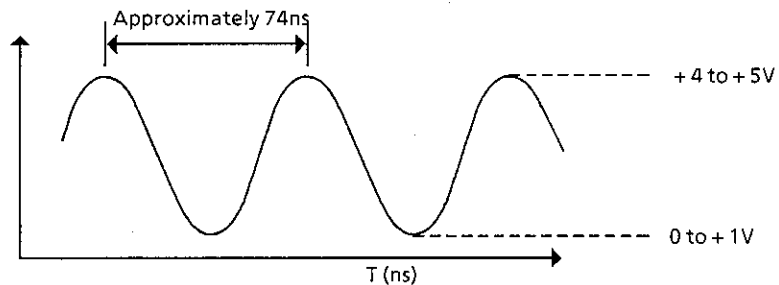


Figure 2

• No Replace the OSC or R37.

• Yes The input waveform on pin 15 of Q8 is the same as shown in Figure 3?

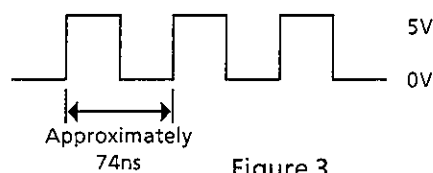


Figure 3

• No Replace Q6 (MSM79H097).

• Yes The RST signal on pin 4 of Q8 is the same as shown in Figure 4?

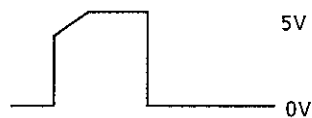


Figure 4

• No The output waveform of pin 1 on Q7 is the same as shown in Figure 4?

• Yes Replace Q11 (MSM6990).

• No The input waveforms of pin 6 and 7 of Q7 are shown in Figure 5?

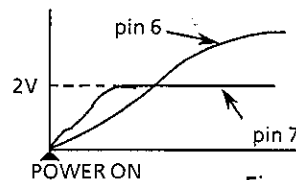


Figure 5

• Yes Replace Q7.

• No Replace the elements of the input signals of pins 6 and 7 of Q7.

• Yes The ALE, PSEN, RD, WR and BUS signals of Q8 are the same as shown in Figure 6?

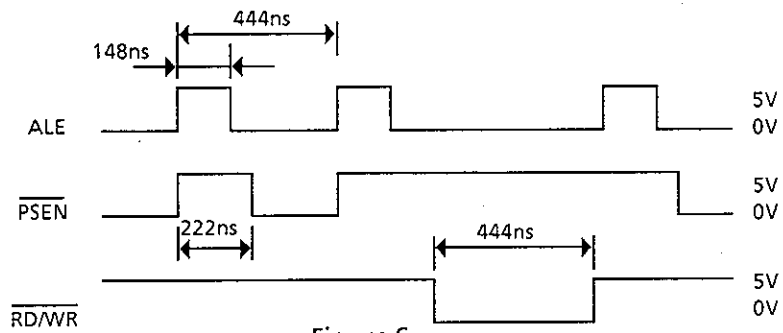


Figure 6

The signal level of the bus line should be stabilized to high or low level at the full of PSEN or at the rise of RD/WR.

- No Replace Q8.
- Yes The LAMP SD, LAMP SD CLK signal of Q8 is the same as shown in Figure 7?

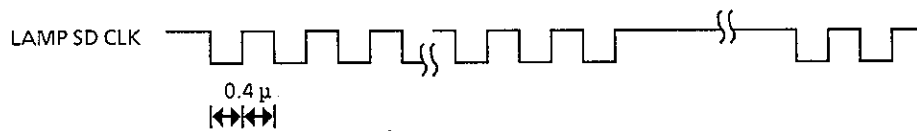


Figure 7

The signal level of LAMP SD should be stabilized to high or low level at the rise of SD CLK.

- No Replace Q8.
- Yes Replace CN1.

③ Printer alarm occurs.

3-1 Internal RAM error

- Replace Q8.

3-2 Program ROM error

- Replace Q12.

3-3 EEPROM error

• The DATA IN and CS signal levels of Q8 is the same as shown in Figure 8?

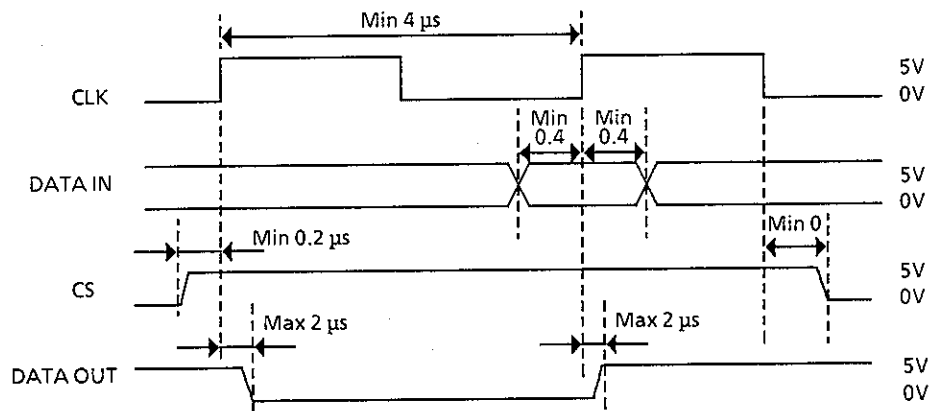


Figure 8

- No Replace Q8.

- Yes Replace Q9.

3-4 Resident CG ROM error

• The CSIZ (pin 80), ROM READ (pin 49) and BUS signals of Q6 are the same as shown in Figure 9?

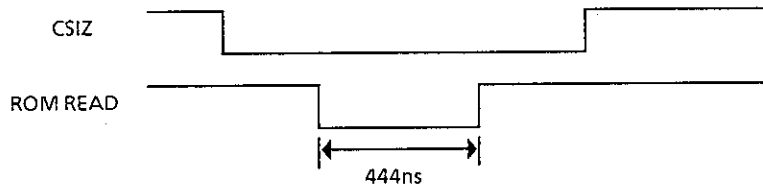


Figure 9

The DATA bus signal should be stabled to high or low level at the rise of ROM READ.

- No Replace Q6.
- Yes Replace Q5.

3-5 Cartridge CG ROM error

- Replace the cartridge.

3-6 External RAM error

• The RAS (pin 57), CAS1 (pin 54), RAM WR (pin 52), RAM OE (pin 51) and RAD 0-7 and DRAM A7-0 of Q6 are the same as shown in Figure 10?

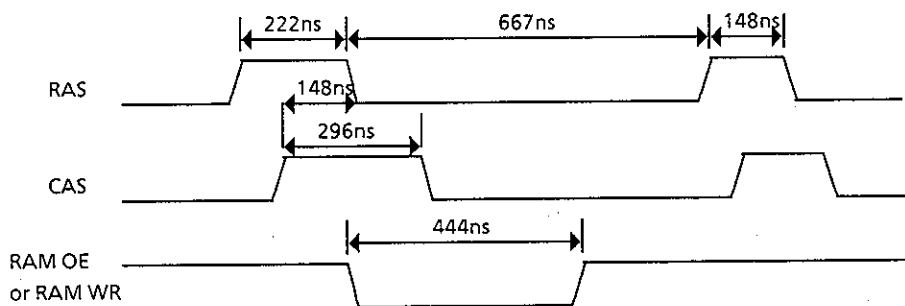


Figure 10

The signal levels of RAD 0-7 and DRAM A0-7 should be stabled to high or low level at the rise of RAM OE or RAM WR.

- No Replace Q6.
- Yes Replace Q1 or Q2 (D-RAM).

3-7 Head homing or spacing error

The waveforms of SPU (pin 61), SPV (pin 62) and SPW (pin 63) of Q11 are the same as shown in Figure 11?

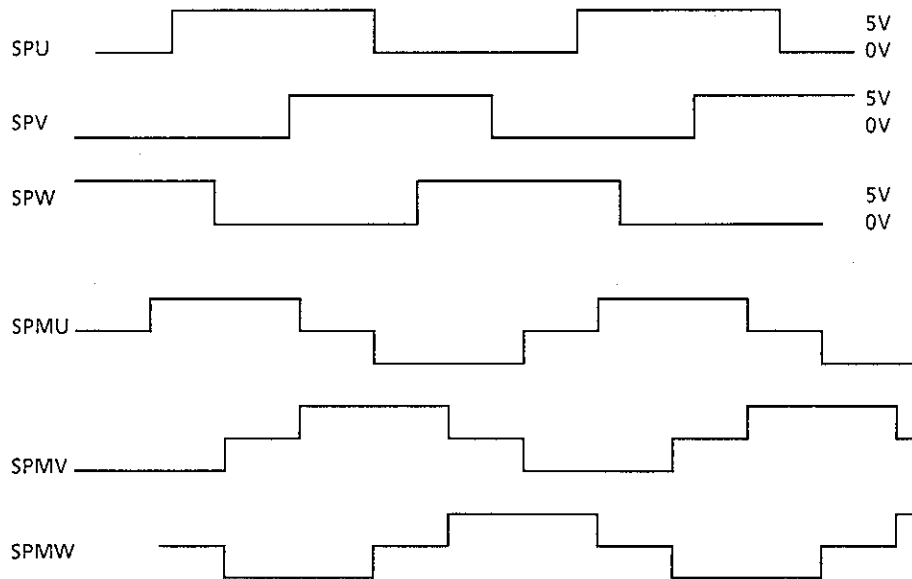


Figure 11

The cycle of SPDA should be $64\mu\text{s}$ and the rectangular wave should be output.

No The input waveforms of PHASE A (pin 80) and PHASE B (pin 81) of Q11 are the same as shown in Figure 12? (Move the carriage manually if the operation is stopped.)

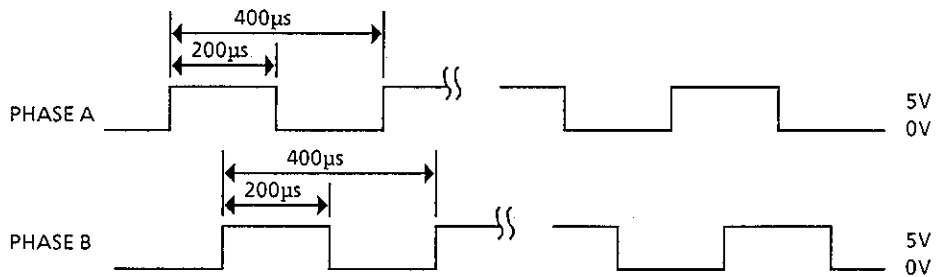
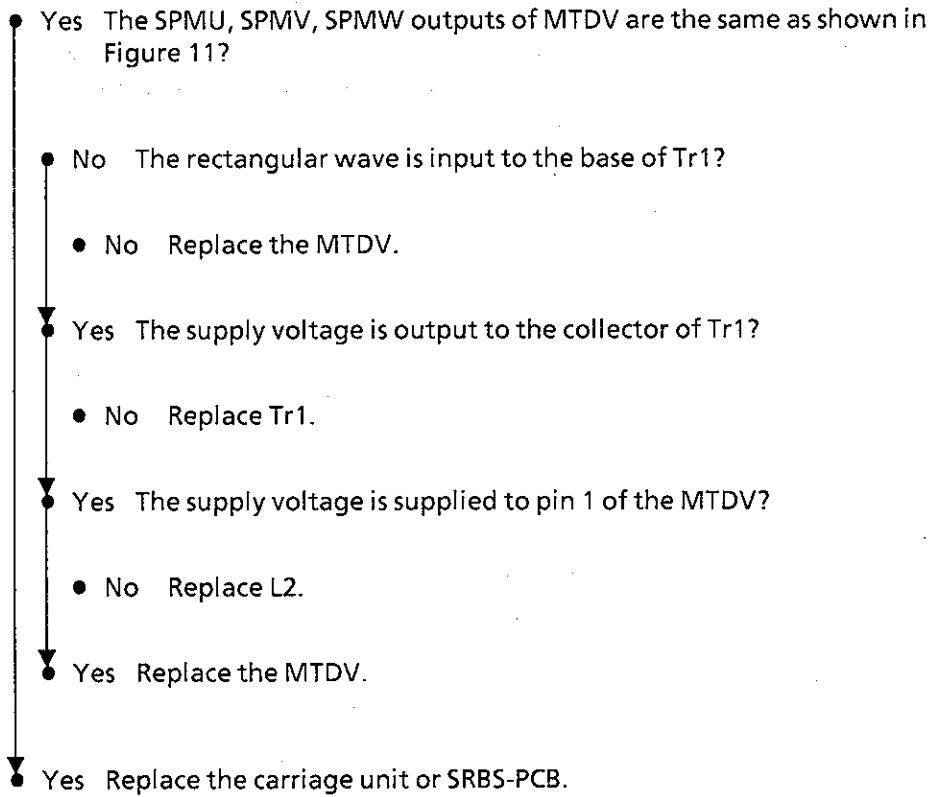


Figure 12

(The above diagram shows the timing during constant-speed operation.)

- No Replace the carriage unit or SRBS-PCB.
- Yes Replace Q11.



④ Printing wrong character or some characters are not printed.

- The RAS (pin 57), CAS 1 (pin 54), ROM READ (pin 49), RAM OE (pin 51), RAM WR (pin 52), CS, ROM A0-15, DRAM A0-7, RAD 0-7 signals of Q6 are the same as shown in the Figure 13? In other words, DMA operation of ROM to RAM and RAM to RAM is normal?

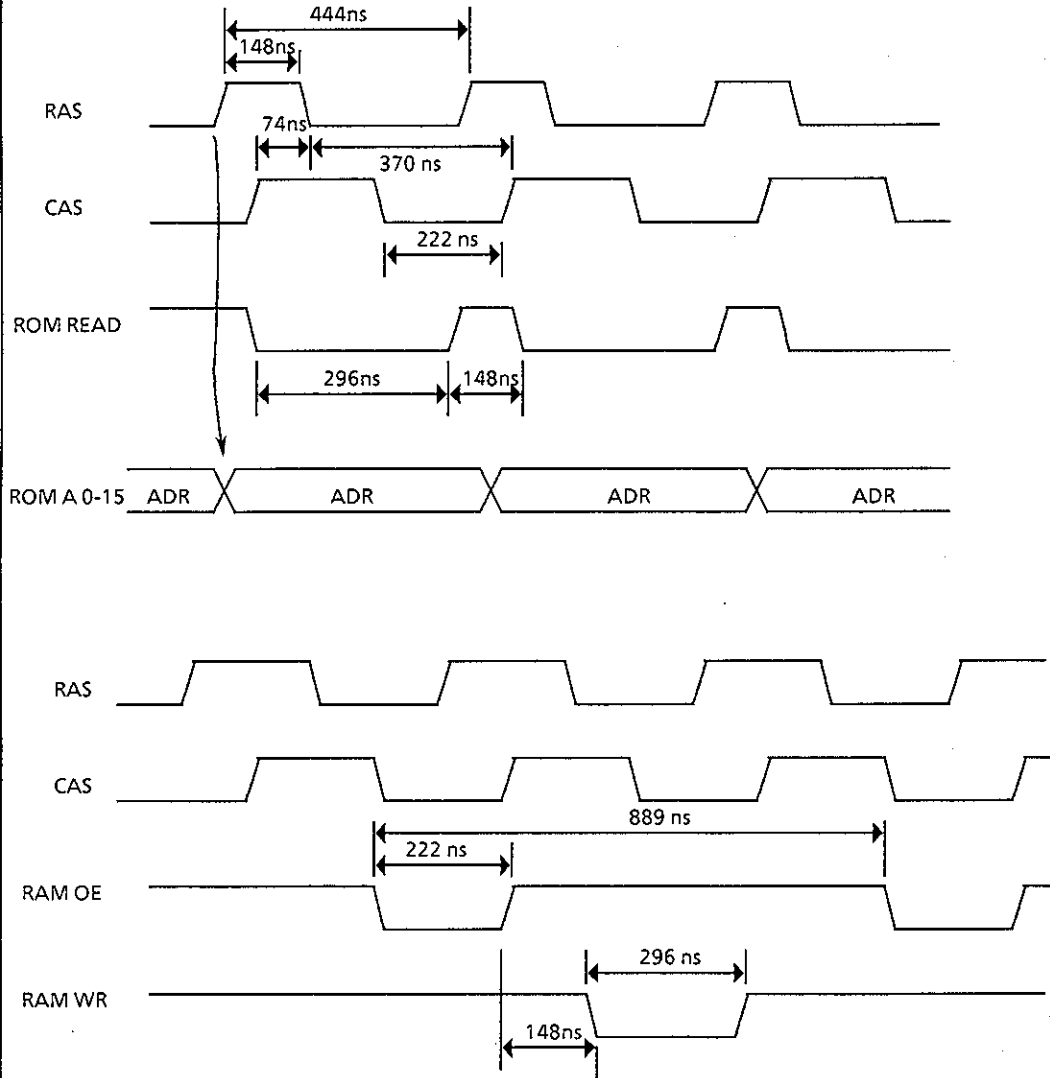


Figure 13

The DRAM A0-7 should be stabilized to high or low level at the fall of CAS.
 The RAD 0-7 should be stabilized to high or low level at the fall of CAS and at the rise of RAM OE.

- No Replace Q6.
- Yes When the on-line graphic printing ("FF") is performed, the S DATA, S-CLOCK, HD OFF and HDDV signals are the same as shown in Figure 14?

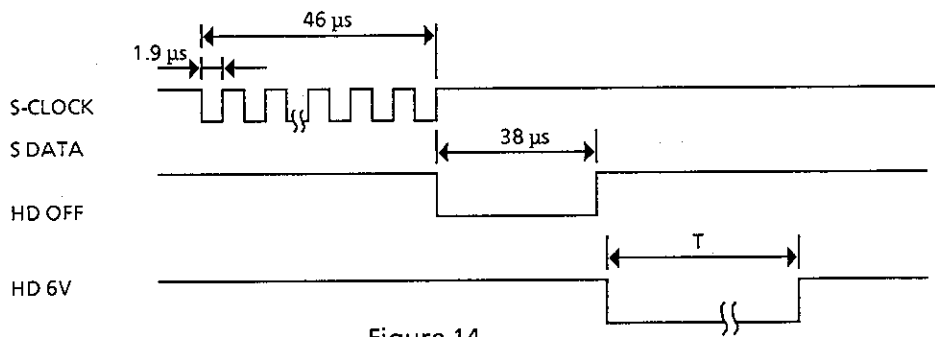


Figure 14

T: Variable by the firmware setting

- No Replace Q6.

▼ Yes The output waveforms of pins 13 and 14 of the comparator Q7 are the same as shown in Figure 15?

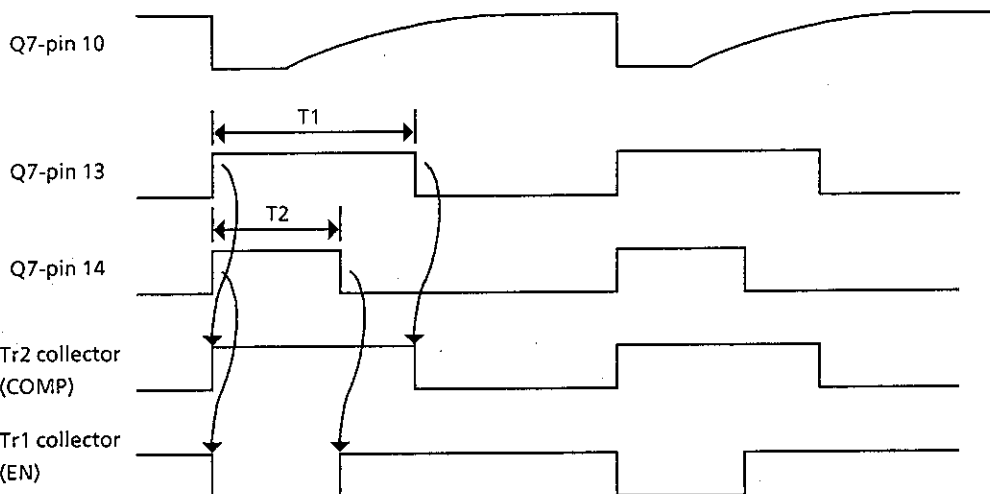


Figure 15

The T1 and T2 are variable by the firmware setting.

- No Replace Q7.

▼ Yes The COMP and EN signals are the same as shown in Figure 15?

- No Replace Tr119 and Tr4, or Tr118.

▼ Yes Replace the carriage unit or SRBS-PCB.

⑤ Malfunction of line feed

• The LF PHA and LF PHB signals of Q11 are the same as shown in Figure 16?

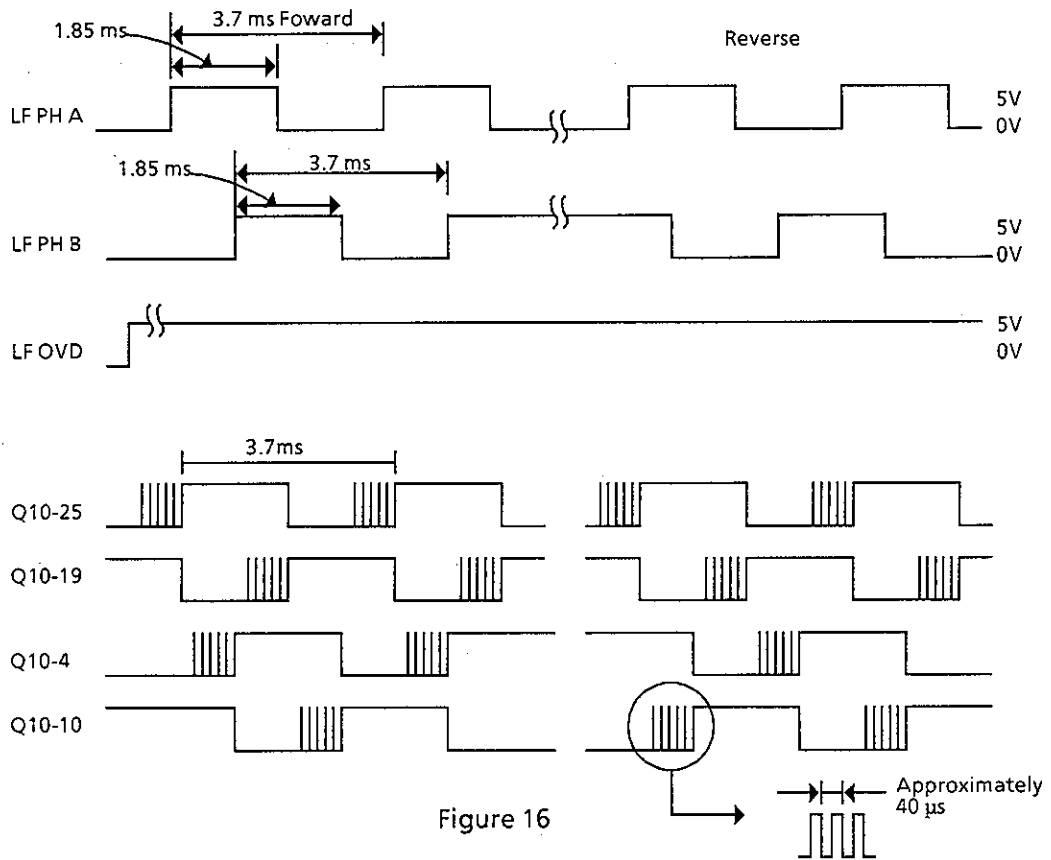


Figure 16

- No Replace Q6.
- ▼ Yes The waveform of LF OVD is the same as shown Figure 16 during constant-speed operation?
 - No Replace Q11.
 - ▼ Yes The VR1/VR2 voltage of pins 2 and 27 of Q10 are approximately 3.2V?
 - No Replace one of the input elements (Tr140~143 or TR114~116) of VR1 or VR2.
 - ▼ Yes The waveform of pins 4, 10, 19 and 25 of the Q10 are the same as shown in Figure 16?
 - No Replace Q10.
 - ▼ Yes Replace either LF motor or LF motor interconnect module.

⑥ The printing operation is not performed after the operating switch is pressed.

6-1 The SELECT switch does not function.

- The SEL SW signal on pin 49 of Q11 is set low when the SEL SW is pressed?
 - No Replace either one of the elements of the SEL SW or CN1.
 - Yes Replace Q11.

6-2 The MODE switch does not function.

- The MODE SW signal of Q11 is set low when the MODE SW is pressed?
 - No Replace either one of the elements of the MODE SW or CN1.
 - Yes Replace Q11.

6-3 The LF switch does not function.

- LF operation is performed in online condition?
 - No Go to step ⑤.
 - Yes The LF SW signal of Q11 is set low when LF SW is pressed?
 - No Replace either one of the elements of the LF SW or CN1.
 - Yes Replace Q11.

6-4 The FF switch does not function.

● FF operation is performed during online?

● No Go to step ⑤.

▼
● Yes The FF SW signal is set low when FF SW is pressed?

● No Replace either one of the elements of the FF SW signal or CN1.

▼
● Yes Replace Q11.

6-5 The PARK switch (SET TOF, PRINT, PRINT QUALITY, CHARACTER and PITCH switches) does not function.

● The PARK SW signal is set low when PARK SW is pressed?

● No Replace the PARK SW or CN1.

▼
● Yes Replace Q11.

⑦ The data cannot be received.

7-1 The parallel interface data cannot be received.

- The IF DATA 8-1 of Q11 (MSM6990) is the same as shown in Figure 17?

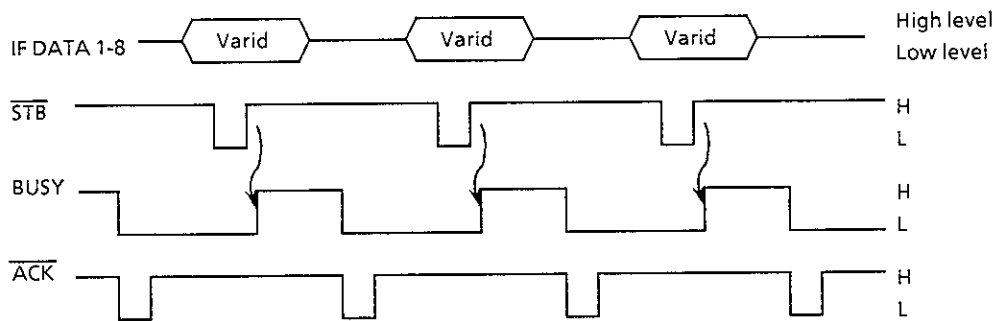


Figure 17

- No Replace either resistor of IF DATA 1-8 signals or the CN7.
- Yes The \overline{STB} signal (pin 2) of Q11 is the same as shown in Figure 17.
 - No Replace either resistor or capacitor of the \overline{STB} signal.
- Yes The BUSY signal (pin 68) or ACK signal (pin 69) of Q11 is the same as shown in Figure 17?
 - No Replace Q11.
 - Yes Replace Q13.

7-2 The parallel interface data is received but printing data is missing or printing operation is not performed.

- Gap occurs during self-test.
 - Yes Go to step ④.
- No The BUSY (pin 68) or ACK (pin 69) signal of Q11 is the same as shown in Figure 17?
 - Yes Replace Q11.
 - No Replace either Q13 or resistor of ACK or BUSY signal.

COMPONENT PARTS LIST



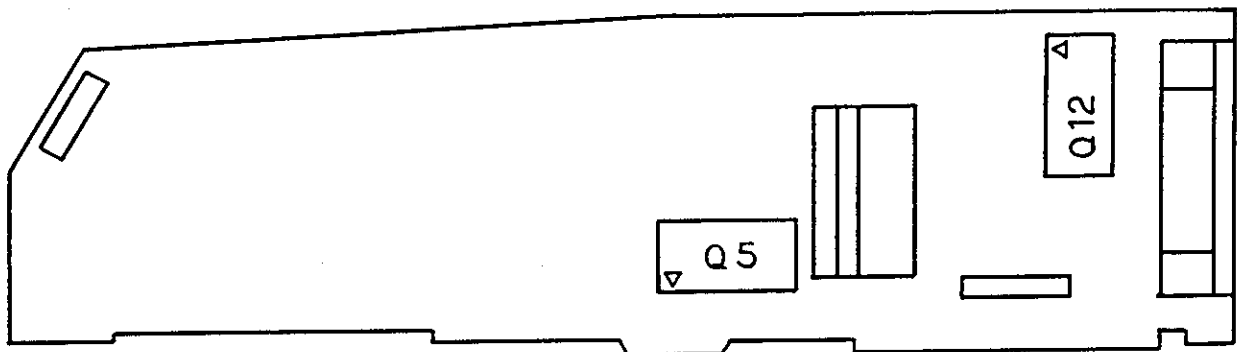
CONTENTS

Component Parts List

SKRA-Printed Circuit Board	4YA4021-1052GXXX	2-1
LXSP-5 Printed Circuit Board	4YA4021-1048G5	2-13
SUII-Printed Circuit Board	3YU5057-3311G1	2-16
RS-232C (LXHI)-Printed Circuit Board	4YA4021-1050GXXX	2-20

Table of ROM identification for each G. NO.

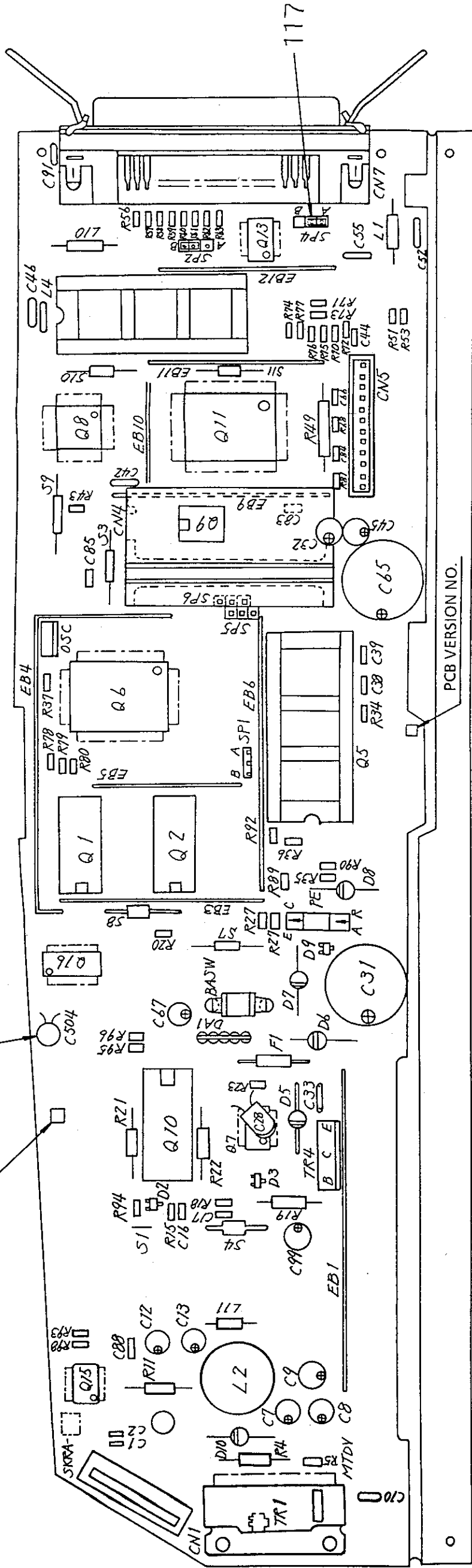
G. NO.	ROM NO.	ROM code NO.	ROM code NO.	Use	Remarks
107	Q5	817A2633M0189		ML390 Elite ODG	EI compatible
	Q12	4YR4084-1113G1	84-1113		
202	Q5	-		ML390/391 ODG, ICL, NON EUR	Without ROM for maintenance
	Q12	-			
206	Q5	817A2633M0189		ML391 Elite ODG	EI compatible
	Q12	4YR4084-1114G1	84-1114		
108	Q5	817A2633M0189		ML390 Elite ICL	EI compatible
	Q12	4YR4084-1115G1	84-1115		
207	Q5	817A2633M0189		ML391 Elite ICL	EI compatible
	Q12	4YR4084-1116G1	84-1116		
109	Q5	817A2633M0189		ML390 Elite N-E	EI compatible
	Q12	4YR4084-7045G1	84-7045		
208	Q5	817A2633M0189		ML391 Elite N-E	EI compatible
	Q12	4YR4084-7046G1	84-7046		



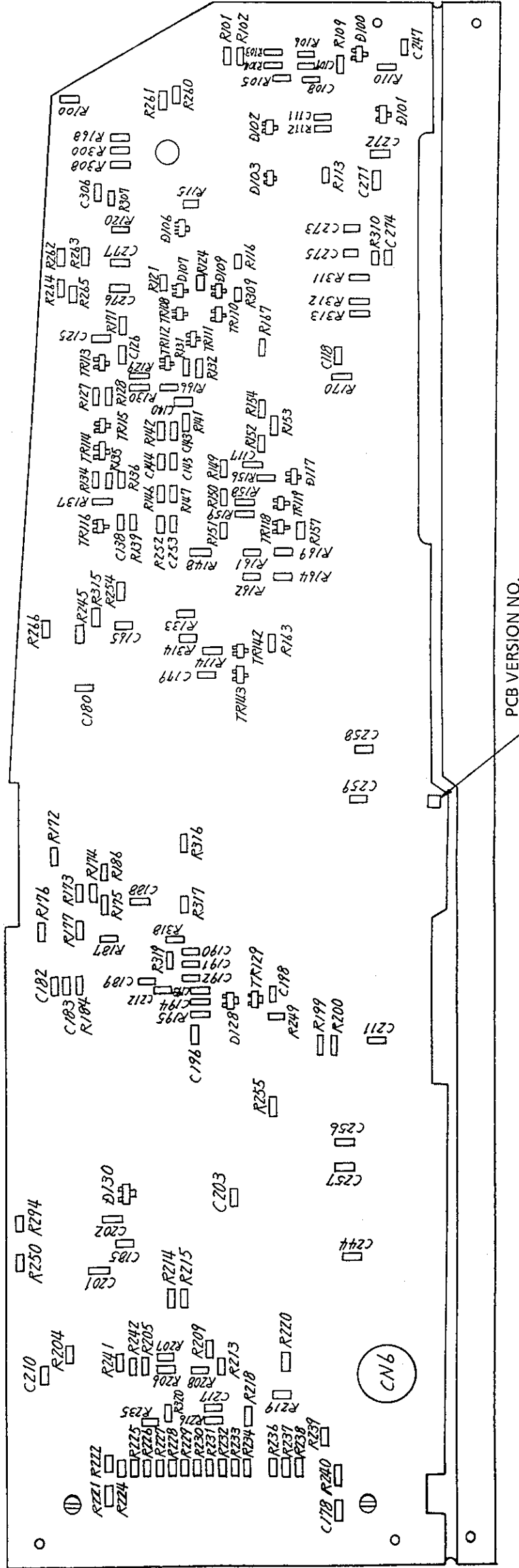
SKRA-Printed Circuit Board (4YA4021-1052GXXX) 1/2 (1/2)

REV. NO.

136



PCB VERSION NO.



PCB VERSION NO.

PCB VERSION NO.	11
REV. NO.	11

SKRA-Printed Circuit Board
 (4YA4021-1052GXXX) 1/2(2/2)
 for ODG, IPL, NON EUR

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (1/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
1					
2					
3	DA1	IB25-03-479 Diode array	761A2234M0001	1	
4	D117	MA3056-M Zener DI (CP)	613A0291M0122M	1	
5	D10	DFA1A1 Rectifier DI	610A0221L0021	1	
6	D5-8	EM01Z/SM1XN02/DSM1D2 Rectifier DI	610A0003M0001	4	
7	D2,9,100,103, 130	MA151WK/DAN202K Signal DI (CP)	611A0003N0003	5	
8	D106	MA152WA Signal DI (CP)	611A0029M0002	1	
9	D128	RD2.7M-B1 Zener DI (CP)	613A0233M0042A	1	
10	D3,109	MA3047-H Zener DI (CP)	613A0291M0102H	2	
11	D107	MA3120 Zener DI (CP)	613A0291M0202	1	
12	D102	MA3240-M/RD24M-B2 Zener DI (CP)	613A0103M0272B	1	
13	D101	MA3330-M Zener DI (CP)	613A0291M0302M	1	
14					
15	R131,135,148, 163,222,309	RM73B2B101J RN resistor (CP)	323A5015J0101	6	
16	R308	RM73B2B271J RN resistor (CP)	323A5015J0271	1	
17	R205-209, 213-215	RM73B2B331J RN resistor (CP)	323A5015J0331	8	
18	R35,70-77, 132,241,242	RM73B2B431J RN resistor (CP)	323A5015J0431	12	
19	R245	RM73B2B471J RN resistor (CP)	323A5015J0471	1	
20	R166,172,186, 250,294	RM73B2B511J RN resistor (CP)	323A5015J0511	5	

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (2/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
21	R78-80,93-96, 98,173-177, 184,254, 310-319	RM73B2B681J RN resistor (CP)	323A5015J0681	25	
22					
23	R43,68,113, 137,146,147, 150,169,216, 219,221, 260-266	RM73B2B102J RN resistor (CP)	323A5015J0102	18	
24					
25	R170,187	RM73B2B122J RN resistor (CP)	323A5015J0122	2	
26	R204	RM73B2B182J RN resistor (CP)	323A5015J0182	1	
27	R110,127,128, 130	RM73B2B202J RN resistor (CP)	323A5015J0202	4	
28	R103,129,133, 161,162	RM73B2B222J RN resistor (CP)	323A5015J0222	5	
29	R56-63, 104-106,154, 232-238,240	RM73B2B332J RN resistor (CP)	323A5015J0332	20	
30					
31	R36,89,90, 109,114,168	RM73B2B512J RN resistor (CP)	323A5015J0512	6	
32					
33	R26,27,53,81, 139,167,171, 199,200,252, 255,300	RM73B2B562J RN resistor (CP)	323A5015J0562	12	
34					
35					
36	R153,157	RM73B2B682J RN resistor (CP)	323A5015J0682	2	

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
37	R20,51,92, 100,124,195, 218,220, 224-231,239, 249,320	RM73B2B103J RN resistor (CP)	323A5015J0103	19	
38					
39					
40	R112	RM73B2B203J RN resistor (CP)	323A5015J0203	1	
41	R307	RM73B2B303J RN resistor (CP)	323A5015J0303	1	
42	R136,151	RM73B2B363J RN resistor (CP)	323A5015J0363	2	
43	R141,142	RM73B2B473J RN resistor (CP)	323A5015J0473	2	
44	R121	RM73B2B513J RN resistor (CP)	323A5015J0513	1	
45	R152	RM73B2B683J RN resistor (CP)	323A5015J0683	1	
46	R115,116	RM73B2B104J RN resistor (CP)	323A5015J0104	2	
47	R15	RM73B2B124J RN resistor (CP)	323A5015J0124	1	
48	R5	RM73B2B224J RN resistor (CP)	323A5015J0224	1	
49	R37,120	RM73B2B105J RN resistor (CP)	323A5015J0105	2	
50	R101,102,156, 159	RM73B2B242F RN resistor (CP)	323A5015F0242	4	
51	R158	RM73B2B302F RN resistor (CP)	323A5015F0302	1	
52	R23	RM73B2B332F RN resistor (CP)	323A5015F0332	1	
53	R134,149	RM73B2B154F RN resistor (CP)	323A5015F0154	2	
54	R18	RM73B2B271F RN resistor (CP)	323A5015F0271	1	

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (4/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
55	R34	RM73B2B471F RN resistor (CP)	323A5015F0471	1	
56	R4,21,22	MSF1/2B0.51ΩJ RS resistor	324A1001J0518	3	
57	R11	RD1/2Y2KΩJ RD resistor	321A1431J0202	1	
58	R19	RD1/2Y1.2KΩJ RD resistor	321A1431J0122	1	
59	R49	FMR1-1.8ΩJ Fuse resistor	327A1002J0189	1	
60	R164	RM73B2B124F RN resistor (CP)	323A5015F0124	1	
61					
62	C1,38,39,88, 190-194,198, 256,257, 271-277	CC3216SL1H101J CC capacitor 50V (CP)	303A3008K0101	19	
63					
64	C140,143-145	CC3216SL1H821J CC capacitor 50V (CP)	303A3008K0821	4	
65	C84,108	CK3216B1H102K CK capacitor 50V (CP)	303A6009K3102	2	
66	C17,111,125	CK3216B1H103K CK capacitor 50V (CP)	303A6009K3103	3	
67	C16,44,83,85, 117,118,126, 138,165,178, 179,180,185, 188,189,202, 203,210-212, 244,247,253, 258,259,306	CK3216F1H104Z CK capacitor 50V (CP)	303A6009Z3104	26	
68					
69					
70					
71	C196,201	CK3216B1H223K CK capacitor 50V (CP)	303A6009K3223	2	

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (5/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
72	C182,183	CC3216CH1H100D CC capacitor	50V (CP) 303A3008C0100	2	
73	C66	CC3216SL1H561J CC capacitor	50V (CP) 303A3008K0561	1	
74	C107	CC3216SL1H100D CC capacitor	50V (CP) 303A3008K0100	1	
75	C2	CC3216SL1H221J CC capacitor	50V (CP) 303A3008K0221	1	
76	C217	CC3216SL1H471J CC capacitor	50V (CP) 303A3008K0471	1	
77	C31,65	SRC50VB-680(M) CE capacitor	50V 680µF 304A1035H1681	2	
78	C28	CQMF92PP2A223G-F0 CQ capacitor	0.022µF 306A4103G2223	1	
79	C8,9	CEUSM1H100 CE capacitor	50V 10µF 304A1041H1100	2	
80	C10,33,52,91, 504	TCK45F2E103ZYA CK capacitor	250V 10000PF 302A4027Z5103	5	
81	C7,12,99	CEUSM2A3R3 CE capacitor	100V 3.3µF 304A1041A2339	3	
82	C45	CEUSM1A101 CE capacitor	10V 100µF 304A1041A1101	1	
83	C67	50MS5-10M CE capacitor	50V 10µF 304A1046H1100	1	
84	C42,46,55	CK92F1E105ZS CK capacitor	25V 1µF 303A4117Z2105	3	
85	C13,32	CEUSM1E470 CE capacitor	25V 47µF 304A1041E1470	2	
86					
87	Q1,2	464P-12 MOS-D-RAM	802A2003M8302	2	
88	Q8	MSM80C154VGS-V1K-1 MOS-CPU	(FP) 851A0124N0013	2	
89	Q6	MSM79H097GS-V1K MOS digital IC	(FP) 702A4824N9029	1	
90	Q13	74LS06FP BIP digital IC	(SO) 700A0503N0006	1	

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (6/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
91					
92	Q10	M54646AP BIP linear IC	720A1822M0002	1	
93	Q11	MSM6990GS-V1K MOS digital IC (FP)	702A2024N0003	1	
94	Q9	ER59256-NW MOS-EEPROM	816A8020M0000	1	
95	Q7,15	NJM2901M/UPC339G2 BIP linear IC (SO)	720A0503N0007	2	
96	Q16	74LS245FP BIP digital IC (SO)	700A0503N0245	1	
97					
98	L2	RSL1513N102K/OL1614 H coil	353A3040K0102	1	
99	L4	DSS306-OAFZ103N EMI filter	342A1009P3103	1	
100	L1,10,11	FBA04HA900KF-00 Beads core	105A1222C1001	3	
101					
102	TR111,113, 114,116,129	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	5	
103	TR1	2SB1123 PNP-LF-TR (CP)	601A1032N0002	1	
104	TR108,110, 112,115,118, 119,142,143	2SC3361/2SC2412K NPN-HF-TR (CP)	602A1003N0002	8	
105					
106	TR4	2SB883 PNP-LF-TR	601A1232M0001	1	
107	MTDV	HA13412 BIP linear IC	720A4021E0004	1	
108					
109	SP1,2,4-6	FFC-3AMEP1 FC connector	225A3123P0030	5	
110					

SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (7/8) REV. 11 PCB version 11

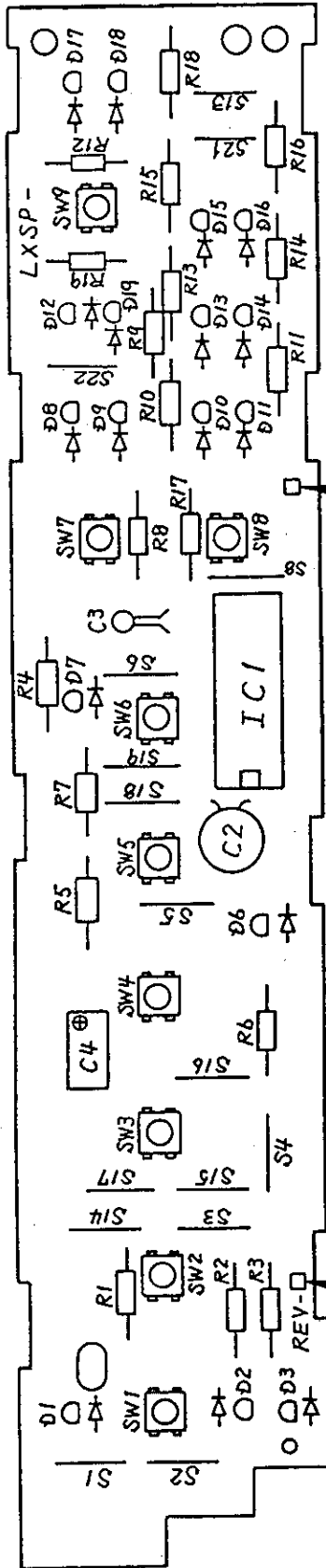
For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
111	CN1	AK-127S15D PC connector	224A1156P0150	1	
112	CN4	MCR69-30D-2.54DS PC connector	224A1052P0300	1	
113	CN5	DF1B-12P-2.5DSA PC connector	224A3716P0120	1	
114	CN6	TCS7688-01-201 Round type connector	221A1622P0081	1	
115	CN7	57RE-40360-730B-D29A Square type connector	220A1783P0360	1	
116	Q5,12	IC26-3206-GS4 IC socket	245A1016P0320	2	
117		DIC-252 PC connector	224A3182P0020	5	
118	OSC	FAR-C4SB13500000M02A Piezoelectric vibrator	381A2001B0006	1	
119	BASW	MSW-1731CVC Leaf switch	218A7050P0001	1	
120	PE	EE-SX1054 Photo sensor	651A0127M0001	1	
121	F1	251-001 Fuse	540A2208S1102	1	
122					
123	S3,4,7-11	JPW02 Jumper wire	321A1520P0001	7	
124					
125					
126	EB3	Power bar	4PP4021-1070P001	1	
127	EB11	Power bar, L=38.1	3LH-31313-133	1	
128	EB5	Power bar, L=30.48	3LH-31313-158	1	
129	EB10	Power bar, L=22.86 P=22.86, N=2	3LH-31313-15	1	
130	EB6	Power bar	4PP4021-1072P001	1	
131	EB9	Power bar, L=45.72	3LH-31313-160	1	
132	EB12	Power bar, L=38.1	3LH-31313-163	1	

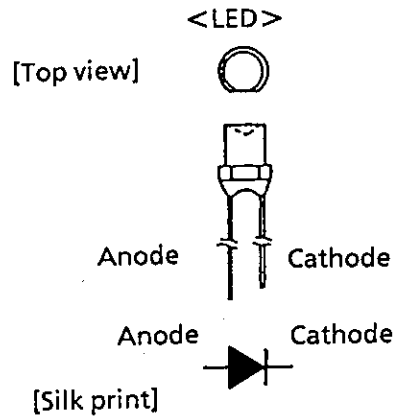
SKRA-Printed Circuit Board (4YA4021-1052GXXX) 2/2 (7/8) REV. 11 PCB version 11

For: G107, 206 (ODG) . G108, 207 (ICL) . G109, 208 (NON EUR) . G202 (Maintenance W/O ROM)

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
133	EB1	Power bar	4PP4021-1072P004	1	
134	EB4	Power bar	4PP4021-1073P001	1	
135					
136		Nitoflon tape (13 mm x 10 mm)	4YC4061-1042P001	1	
137					
138					
139					
140					



(Note 1) The LED (D1, D3, D6-D11, D13-D18) should be mounted, matching the polarity to the silk-printed patterns as shown below.



PCB VERSION NO.	7
REV. NO.	7

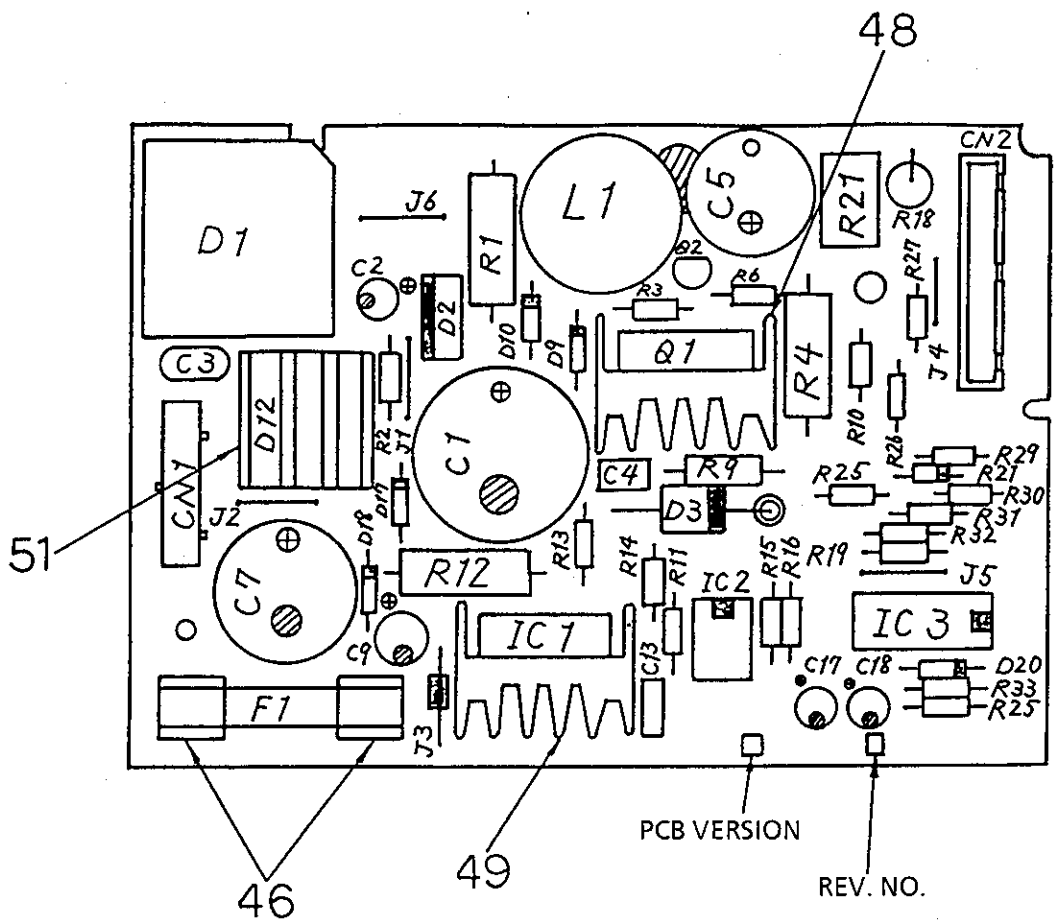
LXSP-5 Printed Circuit Board (4YA4021-1048G5) 1/2

LXSP-5 Printed Circuit Board (4YA4021-1048G5) 2/2 (1/2) REV. 7 PCB version No.7

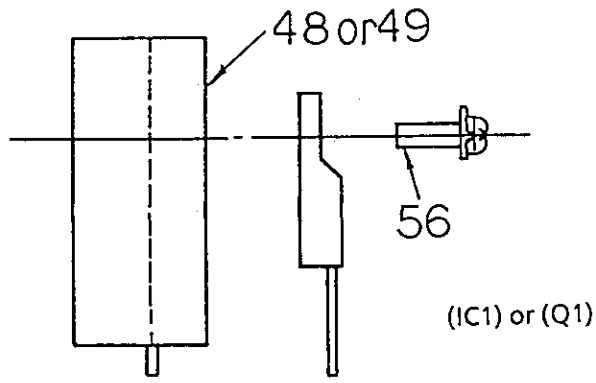
No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
1					
2					
3					
4	R1,2,6-19	RD1/4Y110ΩJ RD resistor	321A1421J0111	16	
5	R3	RD1/4Y150ΩJ RD resistor	321A1421J0151	1	
6	R4,5	RD1/4Y5.6KΩJ RD resistor	321A1421J0562	2	
7					
8					
9	SW1-9	SOA-113HS Push-button switch	205A1162P1001	9	
10	C4	CEUSM1H100 50V CE capacitor 10μF	304A1041H1100	1	
11					
12					
13	C3	TCK45B1H101KYA 50V CK capacitor 100PF	302A4027K3101	1	
14	C2	TCK45F2E103ZYA 250V CK capacitor 10000PF	302A4027Z5103	1	
15					
16	S1-6,8,13-19, 21,22	Short wire (Small type)	4KH-31017-10	16	
17	D1,3,6-19	GL3HY47-B,C (LT3H477) LED	650A0228M0007	16	
18	D2	GL3HD47 LED	650A0128M0022	1	
19					
20	IC1	MSM59371RS CPU-INF-IC	855A0824F0014	1	
21					
22					
23					

LXSP-5 Printed Circuit Board (4YA4021-1048G5) 2/2 (2/2) REV. 7 PCB version No.7

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
24					
25					
26					
27					
28					



(Note 1) Details for mounting the IC1



SUI-Printed Circuit Board (3YU5057-3311G1)
REV.1 PCB version 1

SULL-Printed Circuit Board (3YU5057-3311G1) 2/2 (1/3) REV. 1 PCB version 1

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
1	D1	Diode-bridge RB602/S5VB20	4FP-24462	1	
2	D12	Diode-bridge RB402/S4VB20	4FP-24461	1	
3	D3	Diode ERC35-02/RG4Z	4FP-24460	1	
4	D17,18,20,21	Diode 1S2075Ⓢ/1S1588/1S953	4FP-24207	4	
5	D9	Zener DI RD5.6EB	4FP-24005-3	1	
6	D10	Zener DI RD39EB6 or 7	4FP-24005-55	1	
7	D2	Thyristor TF821M/CR8AMW8/8P2M	4FP-24459	1	
8	R13,16	Resistor,1/4W 100Ω, Carbon, ± 5%	4LP-8446-101	2	
9	R6	Resistor,1/4W 220Ω, Carbon, ± 5%	4LP-8446-221	1	
10	R19	Resistor,1/4W 430Ω, Carbon, ± 5%	4LP-8446-431	1	
11	R3,14,15	Resistor,1/4W 560Ω, Carbon, ± 5%	4LP-8446-561	3	
12	R2	Resistor,1/4W 1.2KΩ, Carbon, ± 5%	4LP-8446-122	1	
13	R29	Resistor,1/4W 3KΩ, Carbon, ± 5%	4LP-8446-302	1	
14	R28	Resistor,1/4W 10KΩ, Carbon, ± 5%	4LP-8446-103	1	
15	R27	Resistor,1/4W 27KΩ, Carbon, ± 5%	4LP-8446-273	1	
16	R33	Resistor,1/4W 680KΩ, Carbon, ± 5%	4LP-8446-684	1	
17	R31	Resistor,1/4W 130Ω, Carbon, ± 1%	323A1222F0131	1	
18	R11	Resistor,1/4W 820Ω, Carbon, ± 1%	323A1222F0821	1	

SUII-Printed Circuit Board (3YU5057-3311G1) 2/2 (2/3) REV. 1 PCB version 1

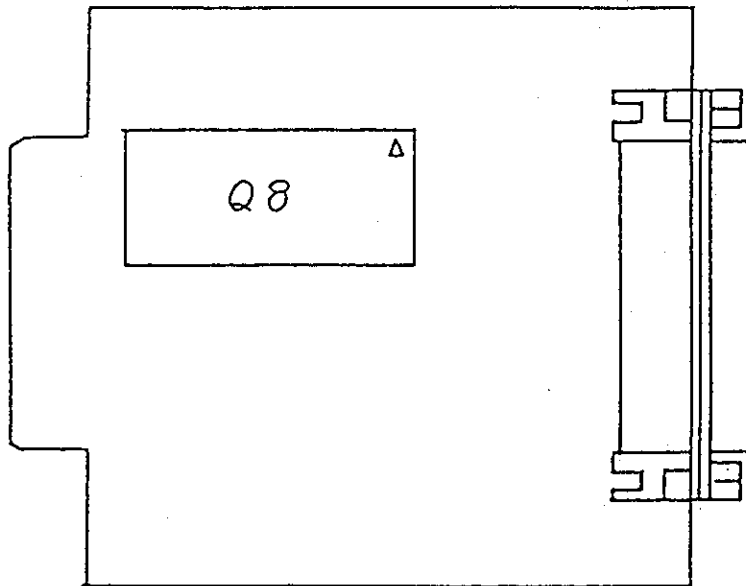
No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
19	R26	Resistor, 1/4W 910Ω, Carbon, ±1%	323A1222F0911	1	
20	R25	Resistor, 1/4W 1.3KΩ, Carbon, ±1%	323A1222F0132	1	
21	R30,32	Resistor, 1/4W 3KΩ, Carbon, ±1%	323A1222F0302	2	
22	R10	Resistor, 1/4W 27KΩ, Carbon, ±1%	323A1222F0273	1	
23	R9	Resistor, 1/2W 100Ω, Metal, ±5%	4FP-22113-101	1	
24	R12	Resistor, 2W 39KΩ, Metal, ±5%	4FP-22115-390	1	
25	R4	Resistor, 2W 5.6KΩ, Metal, ±5%	4FP-22115-562	1	
26	R1	Resistor, 2W 7.5KΩ, Metal, ±5%	4FP-22115-752	1	
27	R18	Resistor, 2W 3KΩ, Metal, ±5%	4FP-22068-302	1	
28	R21	Resistor, 5W 0.2Ω, Cement, ±5%	4FP-22108-8	1	
29	C4	Capacitor 100V 0.001μF, Plastic, ±10%	4FP-23044-35	1	
30	C13	Capacitor 100V 0.0015μF, Plastic, ±10%	4FP-23044-36	1	
31	C3	Capacitor 250V 0.01μF, Prorcelamic, +80%/-20%	302A4027Z5103	1	
32	C2	Capacitor 50V 1μF, Elec, +50%/-10%	4FP-23012-57	1	
33	C17,18	Capacitor 50V 10μF, Elec, +50%/-10%	4FP-23012-61	2	
34	C9	Capacitor 10V 100μF, Elec, +50%/-10%	4FP-23012-12	1	
35	C5	Capacitor 50V 1000μF, Elec, ±20%	4FP-23140	1	
36	C1	Capacitor 80V 3300μF, Elec, ±20%	4FP-23139	1	
37	C7	Capacity 16V 8200μF, Elec, ±20%	4FP-23141	1	

SUII-Printed Circuit Board (3YU5057-3311G1) 2/2 (3/3) REV. 1 PCB version 1

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
38	Q1	PNP Transistor 2SB1382/2SB1420	4FP-24494	1	
39	Q2	NPN Transistor 2SC1627/2SC2719	4FP-24486	1	
40	FB1	Beads B-20L-48B	4FP-21542-6	1	
41	L1	Coil SK-216N-060-550H	4FP-21566-2	1	
42	IC1	Regulator SI3052V	4FP-25074	1	
43	IC2	Regulator controller M5291P	4FP-25129	1	
44	IC3	Comparator μPC339C/NJM2901	4FP-25166	1	
45	F1	Fuse MGC-2/61NM020H	4FP-21107-2	1	
46	FH1	Fuse holder TS-01-P-SN	4FP-21069	2	
48	H1	Heat sink	4FP-14110-5	1	
49	H2	Heat sink	4FP-14110-4	1	
50	CN1	Connector 172681-8	4FP-12836-8	1	
51	H3	Heat sink	4FP-14133	1	
52	J1,2,4,5	Jumper wire	4FP-22079-3	4	
53	J3,6	Jumper wire	4FP-22079-4	2	
56		Screw	+P(SW+2W)3-12-HHC	3	

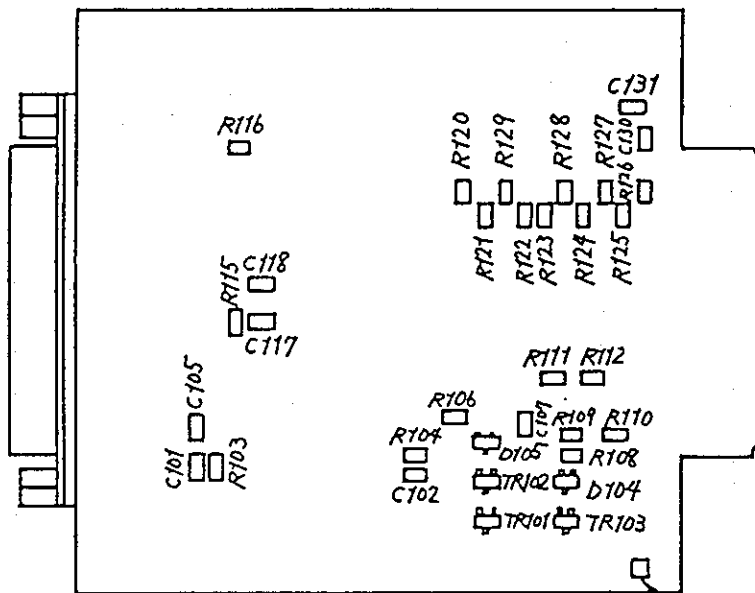
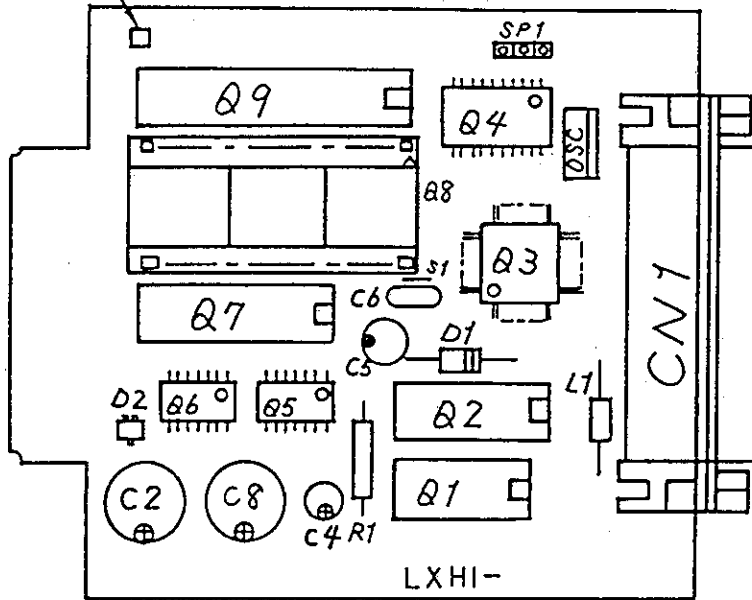
Table of ROM classification according to G. NO.

G. NO.	ROM NO.	ROM code NO.	ROM code NO.	Use	Remarks
001	Q8			ODA/ODG	Factory option
003	Q8			ODG	Single unit supply



RS-232C (LXHI) Printed Circuit Board (4YA4021-1050GXXX) 1/2 (1/2)
REV. 6 PCB version 6

REV. NO.



PCB VERSION NO.

RS-232C (LXHI)-Printed Circuit Board (4YA4021-1050GXXX) 1/2 (2/2)
REV. 6 PCB version 6

RS-232C LXHI-Printed Circuit Board (4YA4021-1050GXXX) 2/2 (1/3) REV.6 PCB version 6

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
1					
2					
3	D2	MA153 Signal DI (CP)	611A0029N0004	1	
4	D104,105	MA151WK/DAN202K Signal DI (CP)	611A0003N0003	2	
5	D1	RD10F-B Zener DI	613A2232L0182	1	
6					
7	R115	RM73B2B102J RN resistor (CP)	323A5015J0102	1	
8	R104	RM73B2B122J RN resistor (CP)	323A5015J0122	1	
9	R103,109,110	RM73B2B242J RN resistor (CP)	323A5015J0242	3	
10	R111,112,116, 120-129	RM73B2B103J RN resistor (CP)	323A5015J0103	13	
11	R106	RM73B2B203J RN resistor (CP)	323A5015J0203	1	
12	R108	RM73B2B474J RN resistor (CP)	323A5015J0474	1	
13	R1	RD1/2Y150ΩJ RD resistor	321A1431J0151	1	
14					
15	C101,102,105, 107,117,118, 130,131	CK3216F1H104Z CK capacitor (CP)	50V 303A6009Z3104	8	
16					
17	C6	CK92F1E105ZS CK capacitor	25V 1μF 303A4117Z2105	1	
18	C5	CEUSM1E470 CE capacitor	25V 47μF 304A1041E1470	1	
19	C2,3	CEUSM1E221 CE capacitor	25V 220μF 304A1041E1221	2	
20	C4	CEUSM2A010 CE capacitor	100V 1.0μF 304A1041A2109	1	

RS-232C LXHI-Printed Circuit Board (4YA4021-1050GXXX) 2/2 (2/3) REV.6 PCB version 6

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
21					
22	Q6	SN74LS05NS BIP digital IC (SO)	700A0550N0005	1	
23	Q5	SN74LS32NS BIP digital IC (SO)	700A0550N0032	1	
24	Q4	SN74LS373NS BIP digital IC (SO)	700A0550N0373	1	
25	Q7	74LS245P BIP digital IC	700A0503M0245	1	
26	Q2	75189P BIP-INF-IC	710A0003M0189	1	
27	Q1	75188P BIP-INF-IC	710A0003M0188	1	
28					
29					
30	Q3	MSM80C51FV-568GS-V1K MOS-CPU (ROM) (FP)	853A0150N0568	1	
31	Q9	HM6264ALSP-15 MOS-S-RAM	804A0021M6335	1	
32					
33	Q8	DL2-28A-05 IC socket	245A1155P0280	1	
34					
35	TR101	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	1	
36	TR103	2SA1331/2SA1037K PNP-HF-TR (CP)	600A1003N0002	1	
37	TR102	2SC3361/2SC2412K NPN-HF-TR (CP)	602A1003N0002	1	
38					
39					
40	OSC	FAR-C4SB11059000-M02 Oscillator	4LP-12186-1	1	
41	S1	Shoting wire (U type) 0.65 P=2.5	5KH-31036-25	1	

RS-232C LXHI-Printed Circuit Board (4YA4021-1050GXXX) 2/2 (3/3) REV.6 PCB version 6

No.	Symbol	Type/Name	Part No.	Q'ty	Remarks
42	SP1	FFC-3AMEP1 FC connector	225A3123P0030	1	
43					
44	CN1	D25S-LLD-hexagon (#4-40) Square connector	220A0121P0250	1	
45					
46	L1	FBA04HA900KF-00 Beads core	105A1222C1001	1	
47					
48		DIC-252 PC connector	224A3182P0020	1	
49					
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