

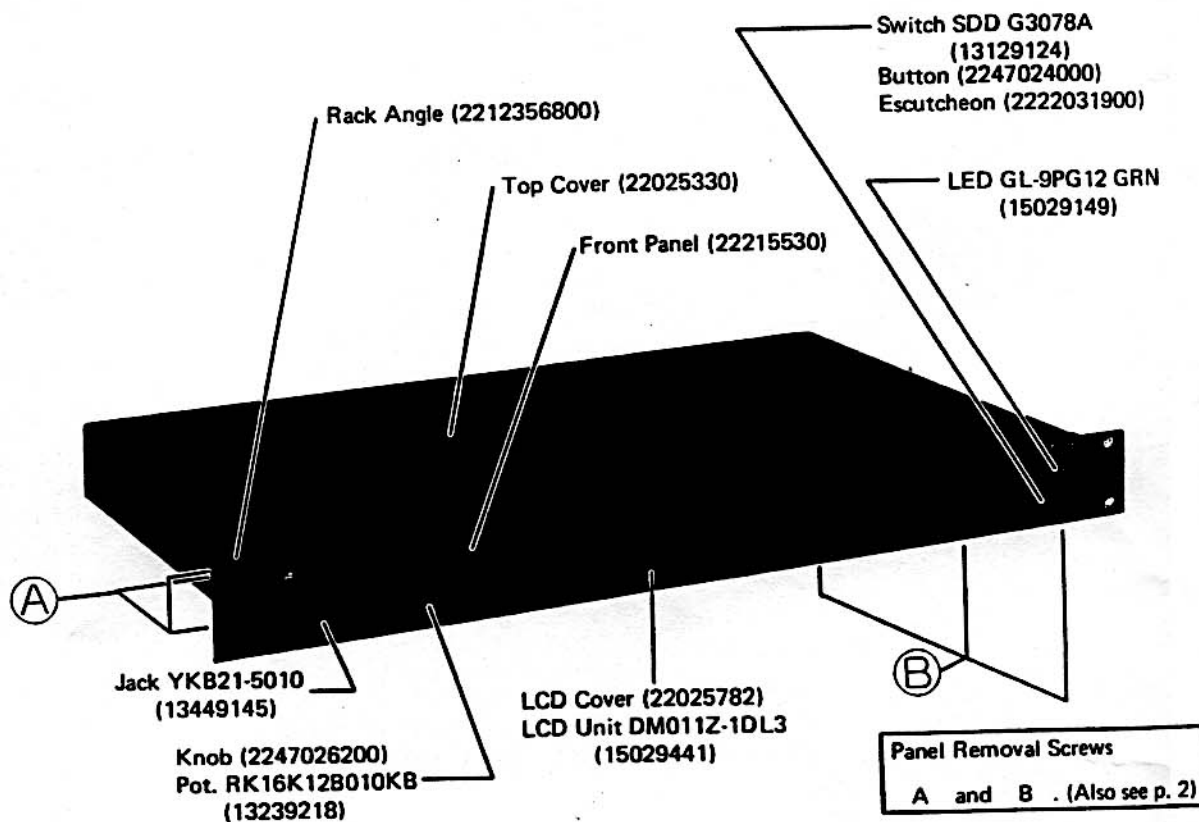
MKS-50

SERVICE NOTES

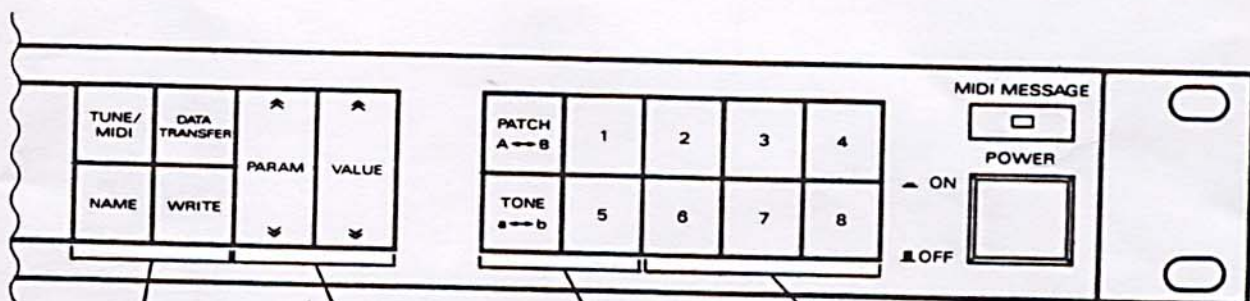
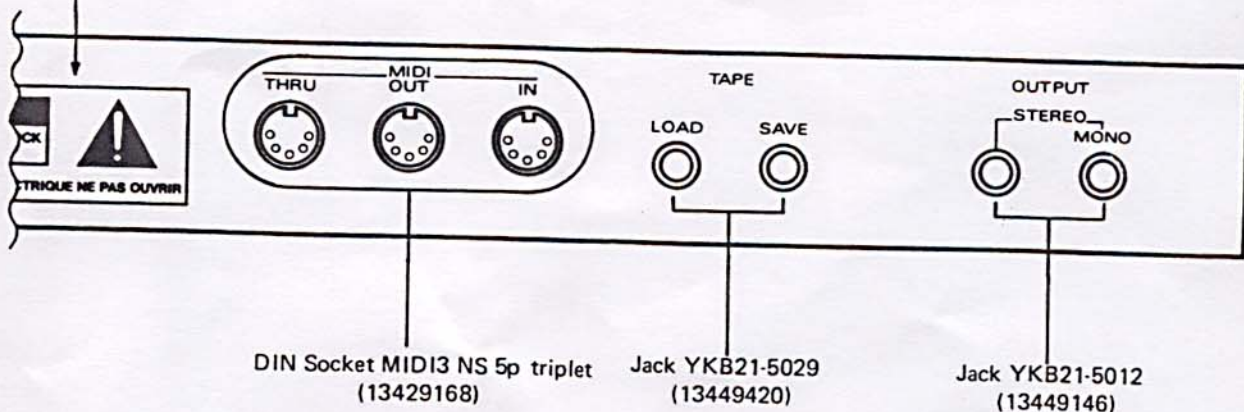
First Edition

SPECIFICATIONS

DCO	TUNE	±50 cents
	LFO MOD	±400 cents
	ENV MOD	±3200 cents
	AFTERTOUCH	±400 cents
	BENDER	±1200 cents
VCF	CUTOFF FREQ.	8Hz to 33kHz, -24dB/oct
	ENV MOD	±12 oct
	LFO MOD	±6 oct
	AFTERTOUCH	+6 oct
	KEY FOLLOW	0 - 100%
ENV	T1 4ms - 30s	
	T2 4ms - 30s	
	T3 8ms - 30s	
	T4 8ms - 30s	
LFO	RATE	0.03Hz - 60Hz
	DELAY TIME	0 - 30s
OUTPUT	AUDIO	-3dBm
	PHONES	8 - 150Ω Stereo
POWER CONSUMPTION	EXP	16W, 12W (Japan)
DIMENSIONS480(W) x 290(D) x 44(H) mm	
	18-7/8(W) x 11-7/16(D) x 1-3/4(H) in	
WEIGHT3.5kg, 7 lb, 120 oz	



Bottom Cover (22025331)



Button Assy A
(22475966)

Button Assy B
(22475967)

Button Assy C
(22475968)

Button Assy D
(22475969)

Set of the followings.

Button Frame 2P
(13129124)

Buttons
MIDI/TUNE
(22495501)

NAME
(22475699)

DATA TRANSFER
(22495502)

WRITE
(22495503)

Set of the followings.

Button Frame 2P
(13129124)

Buttons
PARAM
(22495504)

VALUE
(22495505)

Set of the followings.

Button Frame 2P
(13129124)

Buttons
PATCH A-B
(22495506)

TONE A-B
(22495507)

BUTTON 1
(22495508)

BUTTON 5
(22495515)

Set of the followings.

Button Frame 3P
(2247024000)

Buttons
BUTTON 2
(22495509)

BUTTON 3
(22495511)

BUTTON 4
(22495513)

BUTTON 6
(22495510)

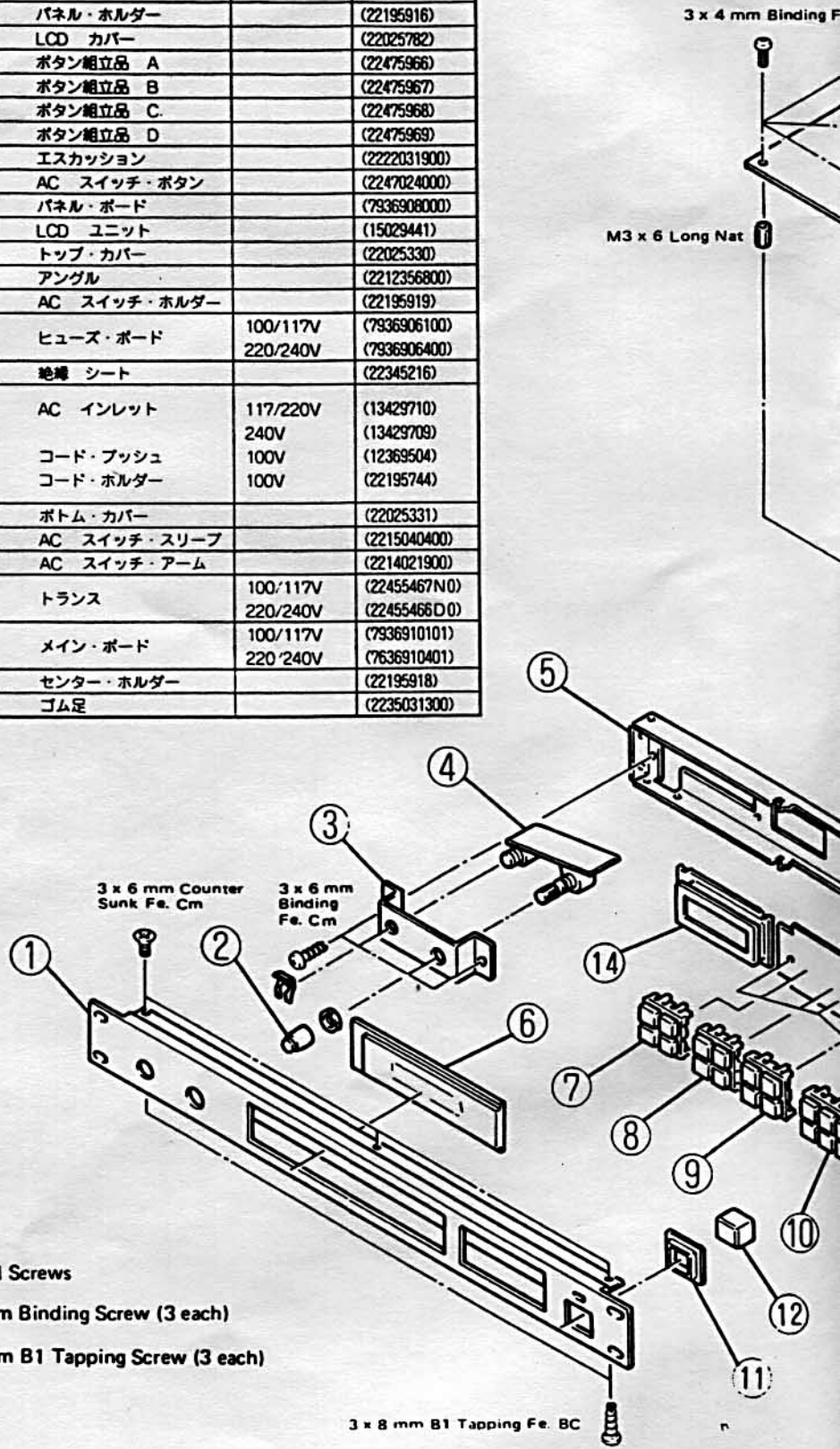
BUTTON 7
(22495512)

BUTTON 8
(22495514)

All switches : SKHHBS (13129733)

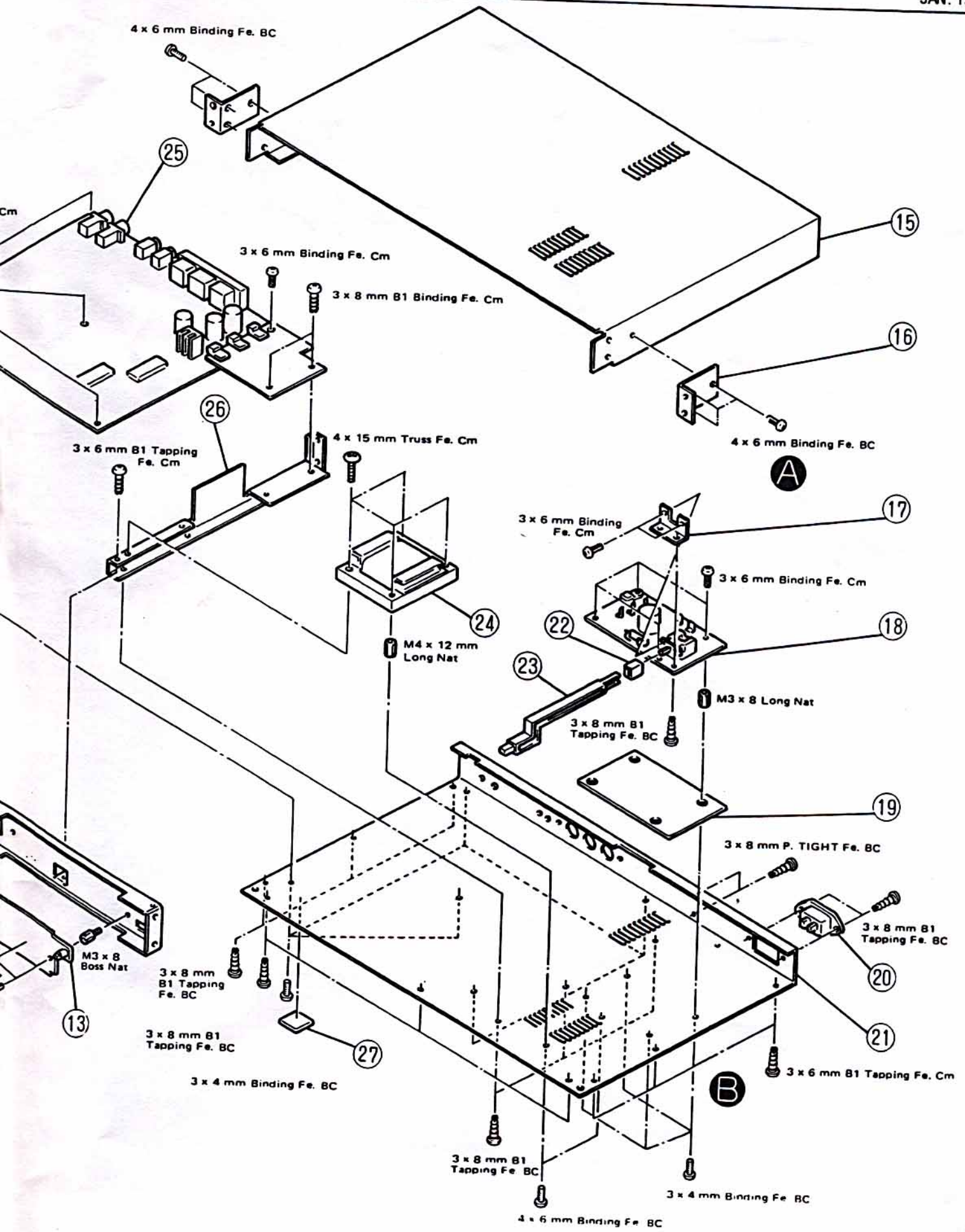
EXPLODED VIEW / 分解図

No	PART NAME (部品名)		PART. NO.
1	Front Panel	フロント・パネル	(222155300)
2	Knob	ボリューム・ツマミ	(2247026200)
3	Jack Holder	ジャック・ホルダ	(22195917)
4	Phone Board	フォン・ボード	(7936914000)
5	Panel Bracket	パネル・ホルダー	(22195916)
6	LCD Cover	LCD カバー	(22025782)
7	Button Assy A	ボタン組立品 A	(22475966)
8	Button Assy B	ボタン組立品 B	(22475967)
9	Button Assy C	ボタン組立品 C	(22475968)
10	Button Assy D	ボタン組立品 D	(22475969)
11	Escutcheon	エスカッション	(2222031900)
12	Button	AC スイッチ・ボタン	(2247024000)
13	Panel Board	パネル・ボード	(7936908000)
14	LCD Unit	LCD ユニット	(15029441)
15	Top Cover	トップ・カバー	(22025330)
16	Rack Angle	アングル	(2212356800)
17	Bracket	AC スイッチ・ホルダー	(22195919)
18	Fuse Board	ヒューズ・ボード	100/117V (7936906100) 220/240V (7936906400)
19	Insulating Shield	絶縁 シート	(22345216)
20	AC Inlet	AC インレット	117/220V (13429710) 240V (13429709)
	Cord Bushing	コード・ブッシュ	100V (12369504)
	Cord Holder	コード・ホルダー	100V (22195744)
21	Bottom Cover	ボトム・カバー	(22025331)
22	Sleeve	AC スイッチ・スリーブ	(2215040400)
23	Extension Shaft	AC スイッチ・アーム	(2214021900)
24	Power Transformer	トランス	100/117V (22455467N0) 220/240V (22455466D0)
			100/117V (7936910101) 220/240V (7636910401)
25	Main Board	メイン・ボード	(22195918)
26	Center Bracket	センター・ホルダー	(2235031300)
27	Rubber Foot	ゴム足	



Panel Removal Screws

- A 4 x 6 mm Binding Screw (3 each)
- B 3 x 6 mm B1 Tapping Screw (3 each)



PARTS LIST

PANEL/COVER

22215530		Front Panel
22025330		Top Cover
22025331		Bottom Cover
22025782		LCD Cover

KNOB, BUTTON

2247024000	Button	Power SW
2247026200	Knob	VOLUME
22475966	Button Assy A	NAME
2219076000	Button Frame 2p Buttons NAME, MIDI/TUNE, DATA TRANSFER, WRITE	
22475967	Button Assy B	
2219076000	Button Frame 2p Buttons PARAM, VALUE	
22475968	Button Assy C	
2219076000	Button Frame 2p Buttons PATCH A-B, TONE a-b, 1, 5	
22475969	Button Assy D	
2219076100	Button Frame 3p Buttons 2, 3, 4, 6, 7, 8	

SWITCH

13129124	SDD G3078A	Power SW
13129733	SKHHBS	light touch Panel Board

PCB ASSY

7936908000	(PCB 2292540701) 2/4	Panel Board
7936914000	(PCB 2292540701) 4/4	Phone Board
7936910101	(PCB 2292540701) 1/4	Main Board 100/117V
7936910401	(PCB 2292540701) 1/4	Main Board 220/240V
7936906100	(PCB 2292540701) 3/4	Fuse Board 100/117V
7936906400	(PCB 2292540701) 3/4	Fuse Board 220/240V

NOTE: Main and Fuse Boards.

Difference between voltage versions: Only in fuse system.

Any version can be supplied as a replacement for particular voltage order, with correct fuses. Specify the line voltage when ordering.

(メイン・ボードおよびヒューズボード)

電圧区分による違いはヒューズ値のみですので、補修用には異なった電圧のものが供給されることがあります。その際、ヒューズの値が適当か確認して下さい。

JACK

13449145	YKB21-5010	PHONES (stereo type)
13449146	YKB21-5012	OUTPUT (each)
13449420	YKB21-5029	TAPE (SAVE, LOAD, each)

SOCKET

13429168	MID13-NS	5P Triplet DIN
13429532	TDH4100-28B	28P ROM

CONNECTOR

13439333	IL-S-2P-S2T2-EF	2P	
13439330	IL-S-3P-S2T2-EF	3P	
13439331	IL-S-11P-S2T2-EF	11P	
13439343	PS-14PE-D-41T1-PN1	14P	
13439341	5277-05A	5P	Main to Power Transformer

FUSE

12559412	SD-6	200mA	100/117V prim.
12559335	T-GGS 1A	1A	100/117V F1, Main Brd
12559538	CEE-100mAT	100mA	220/240V prim.
12559546	CEE-630mAT	630mA	220/240V F1, Main Brd

CAPACITOR

13519695	DD107-959CH680J	68pF	Temperature Compensating
13639156S0		3300 μ F/16V	
13639194S0		1000 μ F/35V	
13529104	DE7150F472MAI	0.0047 μ F	Line Bypass

CAPACITOR ARRAY

13529127	B8ZC0111-32N	8200pF x 7	
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RESISTOR ARRAY

13919146	RKM14L503F	R-2R	Ladder Network
13919312	RMLS8-153J	15k x 10	
13919334	RMLS10-153J	15k x 8	
13919166	EXB-G810860S	VCF/VCA	

POSISTOR

15229919	ERS-A33J 561T	560 Ohm	
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POTENTIOMETER

13239118	RK16K12B010KB	10kB	slide VOLUME
13299197	EVN-D4A00B15	100kB	trimpot VCF FREQUENCY

POWER TRANSFORMER

22455467N0		100/117V
22455466D0		220/240V

AC CORD, AC CORD SET

13439801W0	VFF2.5m	100V
13439812F0	UC-704-J01	117V
13439813F0	DNS EC210-J06	220V
13439846	BH-301-J01	240V England
13439814F0	SC-415-J06	240V Australian

MISCELLANEOUS

12389765	Xtal	12MHz
15029441	DM011Z-1DL3	LCD Unit
12569329	CR2032-FT6	Lithium Battery
(12569149S0	CR2032-T12)	
12449229	FK0B-160MH15	Line Filter Coil
13529105	DSS310-55D223S	EMI Filter
2222031900	Escutcheon	Power SW
2214021900	Extension Shaft	Power SW
2215040400	Sleeve	Power SW
2235031300	Rubber Foot	
22345216	Insulating Shield	
12469137	16PC16	Heat Sink (Tr)
22465154	Heat Sink	Regulator
12169333	PS-307	LED Guide
2212356800	Rack Angle	Front Panel
12199556	MET41-0105	Snap Pin (Phone Jack)

IC

15179253	MSM80C31F	CPU
15179823	M5L27128K-2	EP-ROM
15179334	TC5564PL-20	RAM
15229835	MB87123P-G	DCO
15229834	MB62H195PF-G-BND	Gate Array
15229826	IR3R05	VCF, VCA
15229836	NJU7302	S/H
15219150	μ PD7001C	A/D Converter
15219157	M5241L	VCA
15159128T0	TC4050BP	Hex Buffer/ Converter Non-inverting
15159113H0	HD14051BP	8-channel Multiplexer/ Demultiplexer
15159114T0	TC4052BP	4-channel Multiplexer/ Demultiplexer
15159505	TC40H004P	Hex Inverter
15219213	MN3009	BBD
15169504	MN3101	BBD Driver
15189136	M5218L	Low-noise OP Amp
15189147N0	μ PC4072C	BI-FET OP Amp
15159159	μ PC4570HA	Low-noise OP Amp single in line
15199133	AN7815F	+ 15V Voltage Regulator
15199134	AN7915F	- 15V Voltage Regulator
15199135	LM78MR05	+ 5V Voltage Regulator and Reset

TRANSISTOR

15129152	2SC2878A	
15129153	2SC1740	
15119134	2SA933	
15019272	2SD1406-0	
15139118B0	2SK381CP	FET

DIODE

15019125	1SS133	
15019208	1SR35-200	100V/1A
(LED)		
15029149	GL-9PG12 green	MIDI MESSAGE
(RECTIFIER)		
15019245SN	S1VB10	100/1A
(15019243	1B4B41)	
150129272	2B4B41	100/1A

OPTOISOLATOR

15229706S0	PC910
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HOLDER

22195916	Bracket	Panel
22195917		Jack, MIDI
22195918	Center Bracket	Center
22195919	Bracket	Power SW
2219076000	Frame 2p	Button
2219076100	Frame 3p	Button

CIRCUIT DESCRIPTION / 回路解説

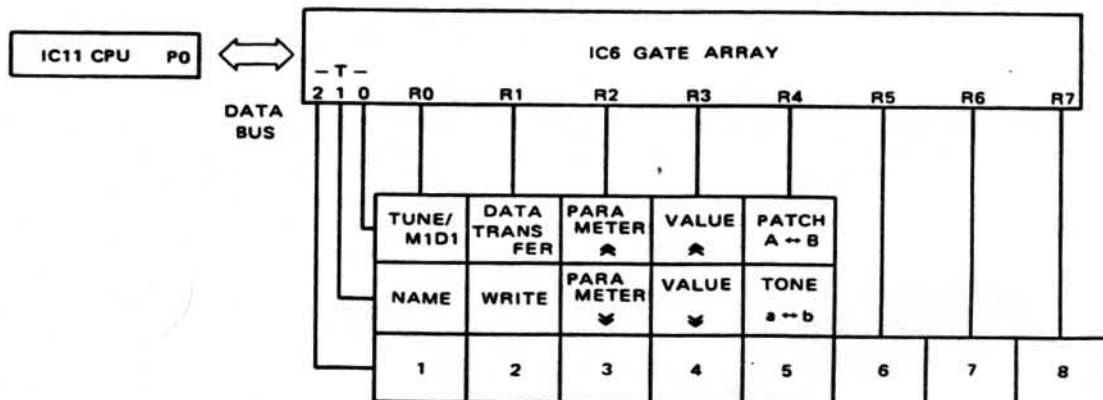
DESIGNATION	PIN NO.	FUNCTION	I/O		
P0 (Data Bus)	7 32	ROM RAM GATE ARRAY DCO Address Data	I/O		
	6 33		I/O		
	5 34		I/O		
	4 35		I/O		
	3 36		I/O		
	2 37		I/O		
	1 38		I/O		
	0 39		I/O		
	P1		7 8	SAVE (Serial Data OUTPUT for CMT)	O
			6 7	CHORUS SW	I
5 6		HPF A	I		
4 5		HPF B	I		
3 4		MIDI INDICATOR	I		
2 3		NC	I		
1 2		NC	I		
0 1		NC	I		
P2	7 28	GATE ARRAY Address ROM Address RAM Address	O		
	6 27		O		
	5 26		O		
	4 25		O		
	3 24		O		
	2 23		O		
	1 22		O		
	0 21		O		
P3	7 17	RD: RAM, GATE ARRAY READ PULSE	O		
	6 16	WR: RAM, GATE ARRAY WRITE PULSE	O		
	5 15	T1: NOT USED	I		
	4 14	T0: LOAD (Serial Data INPUT from CMT)	I		
	3 13	INT1: NOT USED	I		
	2 12	INT0: NOT USED	I		
	1 11	TXD: MIDI SERIAL OUTPUT	O		
	0 10	RXD: MIDI SERIAL INPUT	I		
RST	9	RESET PULSE INPUT	I		
X2	18	CLOCK INPUT	I		
X1	19		I		
Vss	20	GND	I		
PSEN	29	READ PULSE FOR ROM ONLY	O		
ALE	30	ADDRESS LATCH PULSE	O		
EA	31	EXT ROM MODE (LOW)	I		
Vcc	40	+5V	I		

CONTROLS READING

Various function controls (switches, external control jacks, etc.) on the MKS-50 are read into the CPU IC11 directly or through gate array IC6 or some appropriate devices (filter). Most of them are read group by group.

・Panel Board

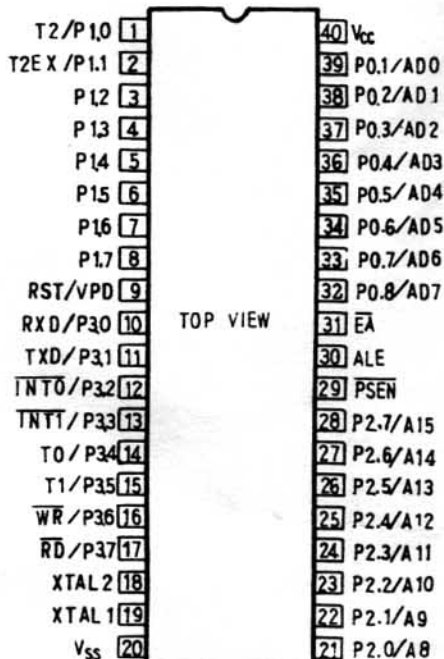
The 18 switches on the panel board are connected to gate array IC6 through 3 by 8 matrix.



Upon receiving switch scanning address on the CPU data bus P0, IC6 places latched data on T0-T2.

The 8 rows are pulled to low one by one while the switches on the low row are read through R0-R7. IC6 sends the switch status to the CPU IC11 through P0.

CPU IC11(Main Board) MSM80C31F



各種コントロールの読み込み

各ファンクション・コントロール (スイッチ, 外部ジャック) CPU11 に読み込まれます。それらは、直接読み込まれるものもあれば、ゲート・アレイ IC6 や専用デバイス (フィルター) を読み込まれるものもあります。

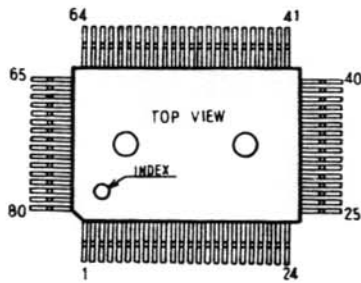
・パネルボード

パネルボードには、合計18個のスイッチが下図のように3×8マトリクス上に並べられていて、ゲート・アレイ IC6 に接続されます。

CPU IC11 がデータバス P0 よりスキャン・アドレスをゲート・アレイ IC6 の AD に出力すると、ゲート・アレイ IC6 は 3本の順次ロー・レベルにしていきます。

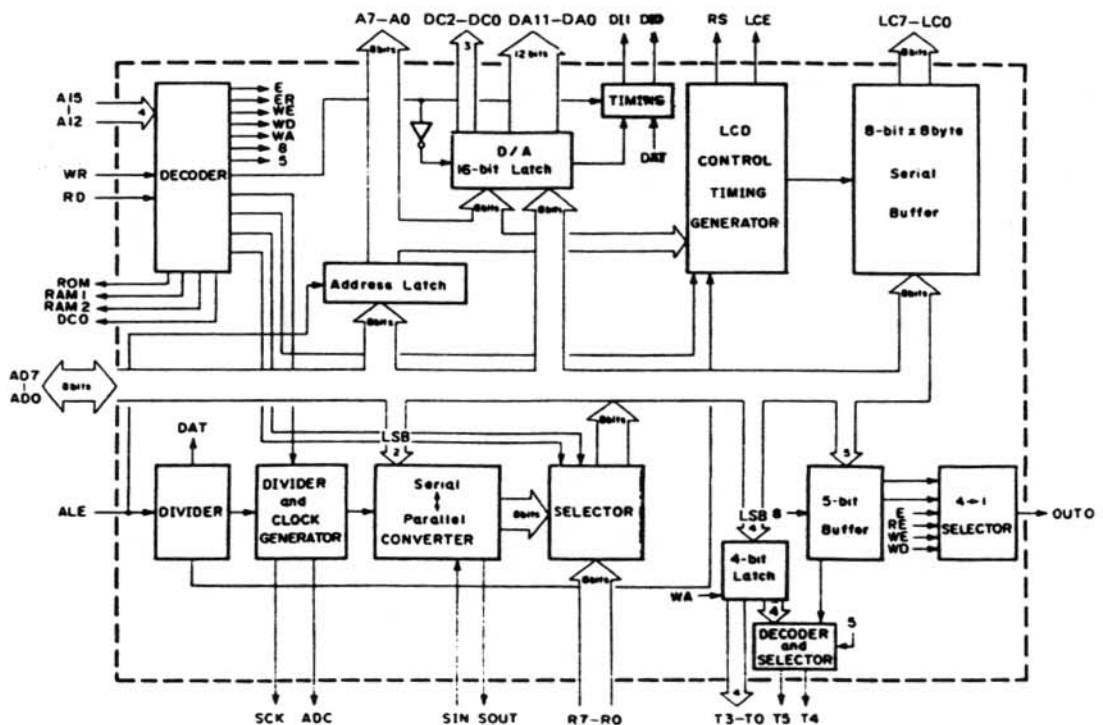
各スイッチの状態はゲート・アレイ IC6 の R0-T より取り込データ・バスを通じて CPU11 に転送されます。

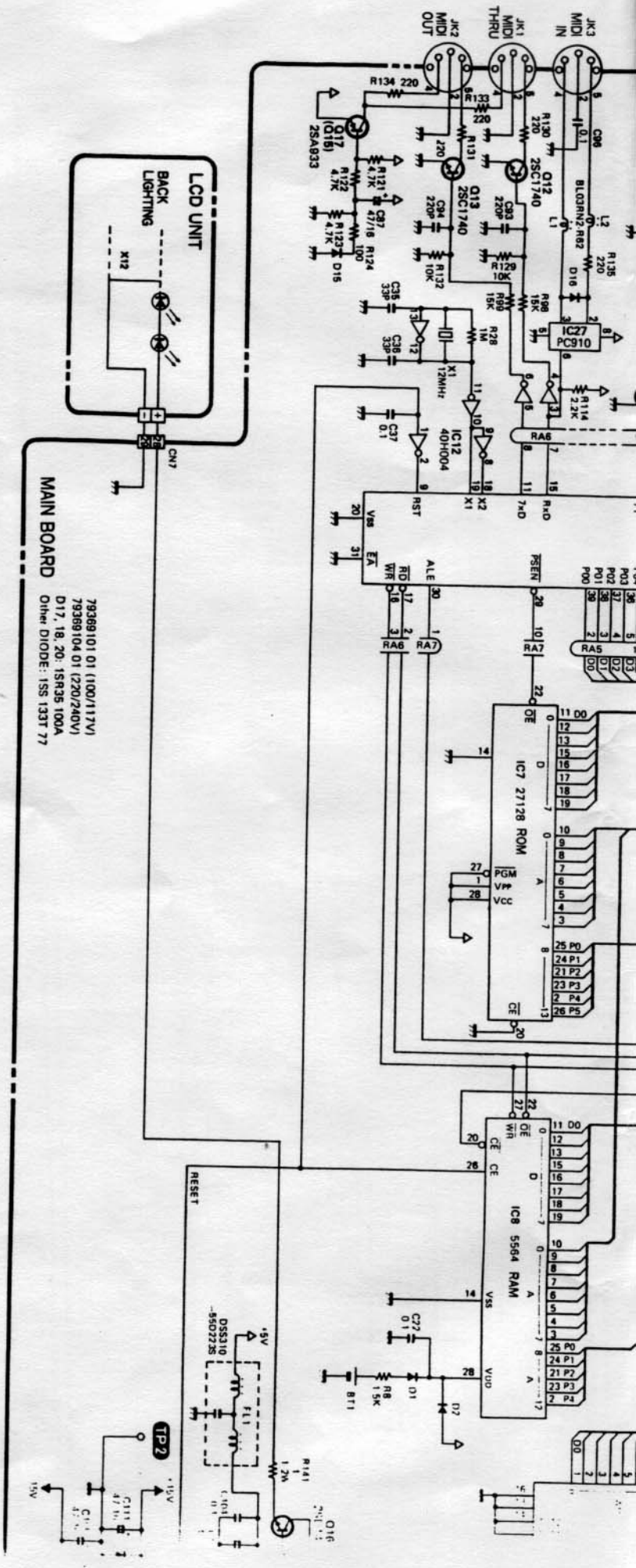
GATE ARRAY IC6(Main Board) MB62H195



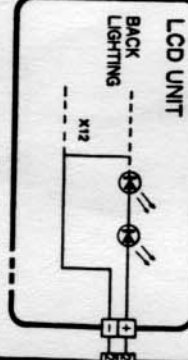
DESIGNATION	PIN NO.	FUNCTION	I/O
DA	0	D/A CONVERTER (12 bits)	O
	1		O
	2		O
	3		O
	4		O
	5		O
	6		O
	7		O
	8		O
	9		O
	10		O
R	0	Switch Read	I
	1		I
	2		I
	3		I
	4		I
	5		I
	6		I
T	0	Switch Scan	O
	1		O
	2		O
	3		O
	4		O

DESIGNATION	PIN NO.	FUNCTION	I/O
AD	0	Data Bus	I/O
	1		I/O
	2		I/O
	3		I/O
	4		I/O
	5		I/O
	6		I/O
A	0	ROM and RAM Address (lower 8 bits)	O
	1		O
	2		O
	3		O
	4		O
	5		O
	6		O
	7		O
LC	12	Address (for chip select)	I
	13		I
	14		I
	15		I
	15		I
DC	0	LCD Data	O
	1		O
	2		O
	3		O
	4		O
	5		O
	6		O
DI	0	S/H Channel Select	O
	1		O
	2		O
DI	0	IC18 Inhibit pulse	O
	1		O
SOUT	59	NC	O
SCK	58	NC	O
SIN	57	+5V	I
ADC	56	NC	O
LCE	67	LCD Write Pulse	O
RS	66	LCD Resistor Select L: Instruction H: Data	O
ROM	50	NC	O
ALE	32	ALE Pulse	I
RD	27	Read Pulse	I
WR	26	Write Pulse	I
RAM 2	53	NC	O
LED	25	NC	O
DCO	54	DCO Chip Select	O
RAM 1	51	NC	O
OUT0	55	NC	O
NC	23	NC	-
NC	63	NC	-
VDD	33	+5V	I
VDD	73	+5V	I
VSS	12	GND	I
VSS	52	GND	I



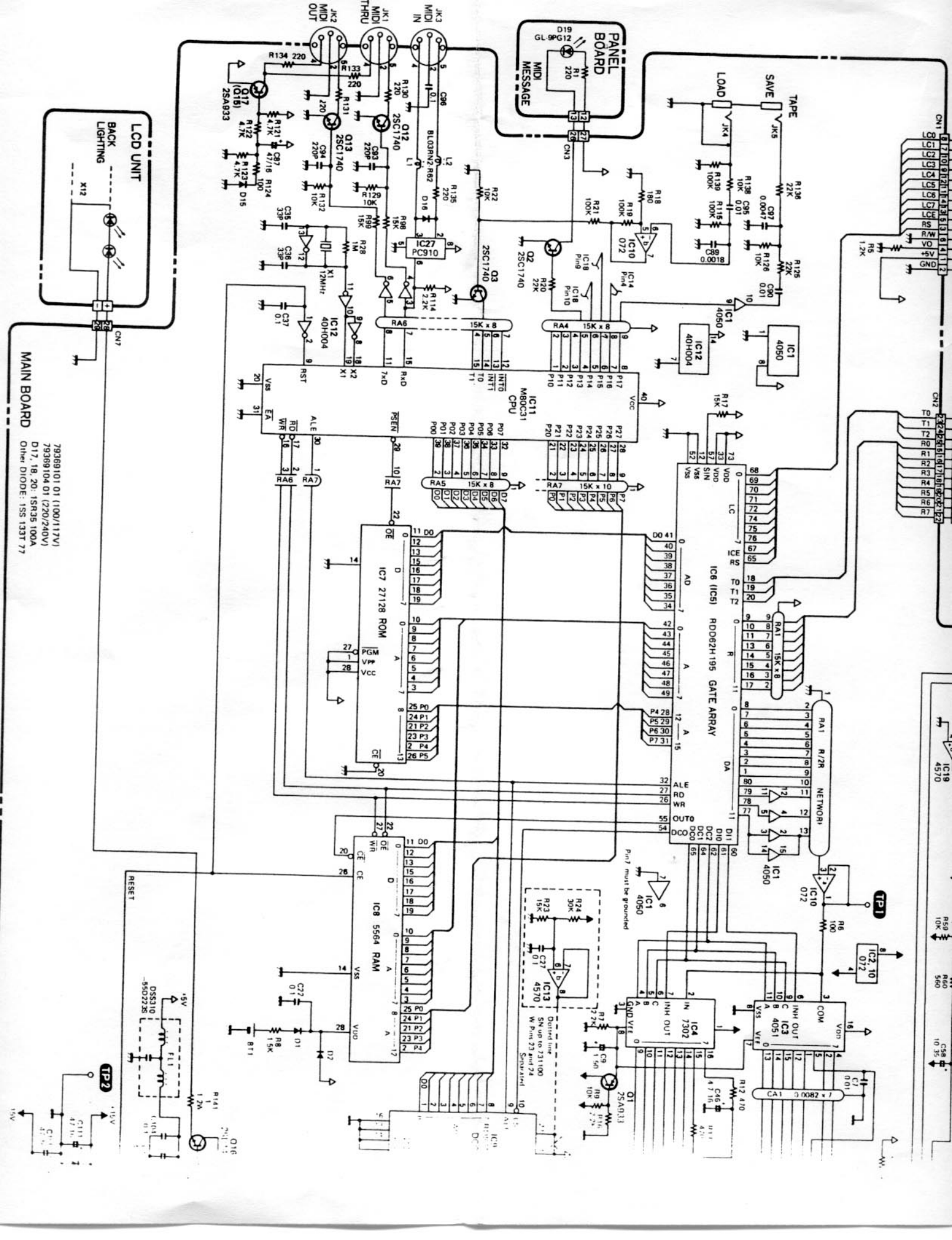


79369101 01 (100/117V)
 79369104 01 (220/240V)
 D17, 18, 20: 1SR35 100A
 Other DIODE: 1SS 133T 77



MAIN BOARD





79369101 01 (100/117V)
 79369104 01 (220/240V)
 D17, 18, 20: 1SR35 100A
 Other DIODE: 1SS 13T 77

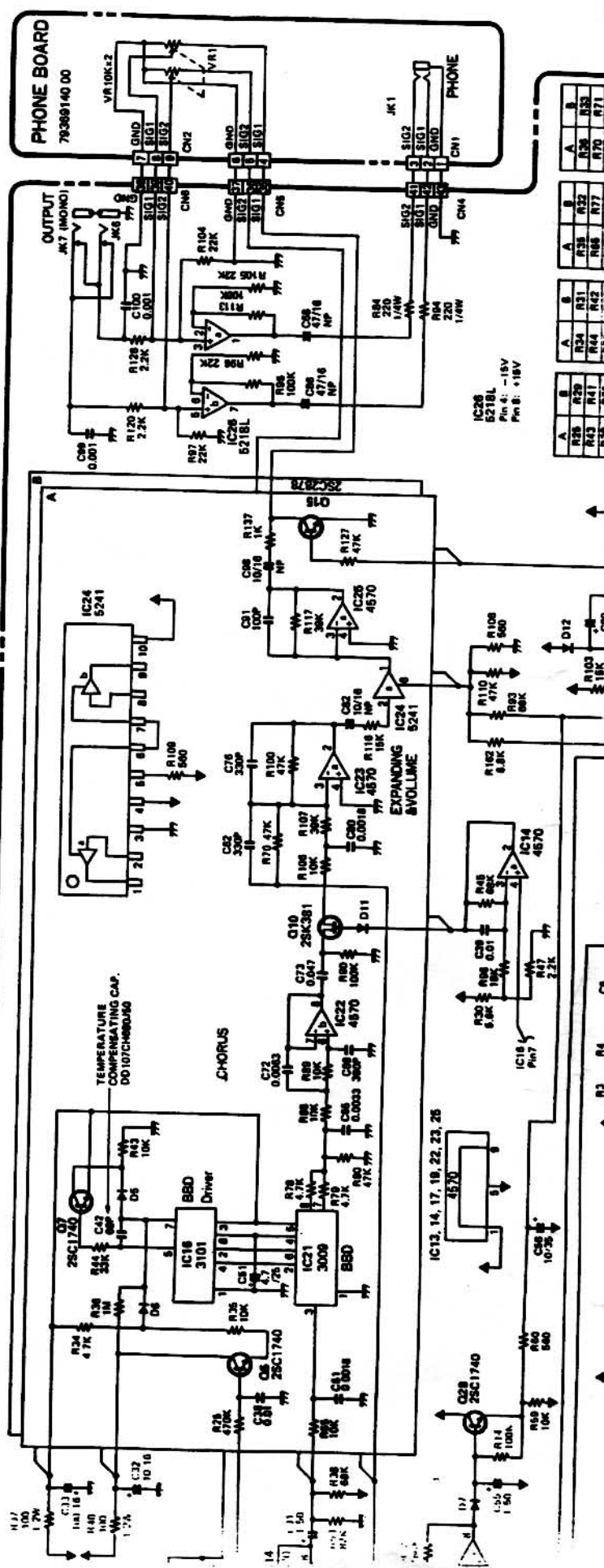
LCD UNIT
 BACK LIGHTING

MAIN BOARD

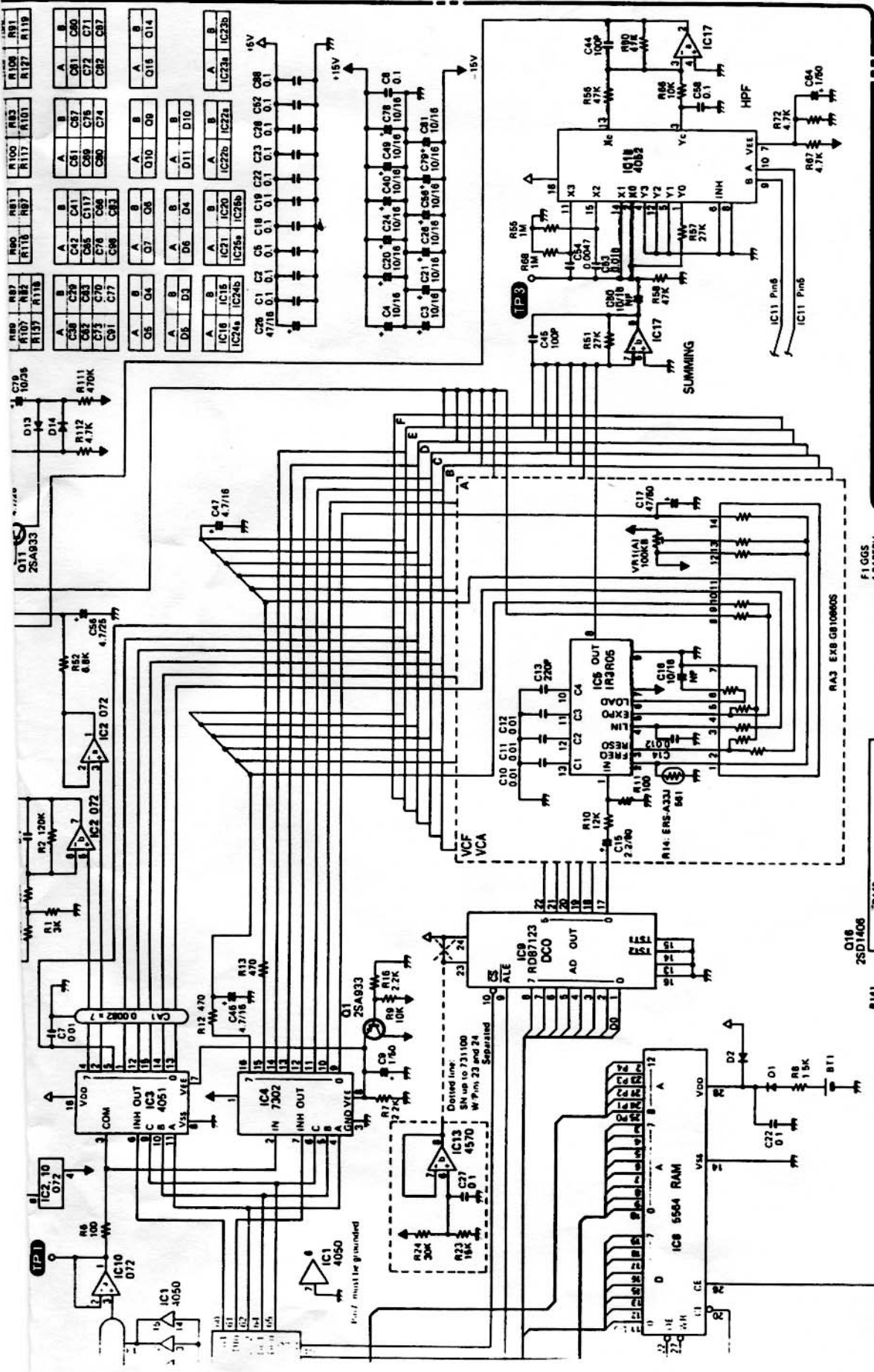
RESET

15V

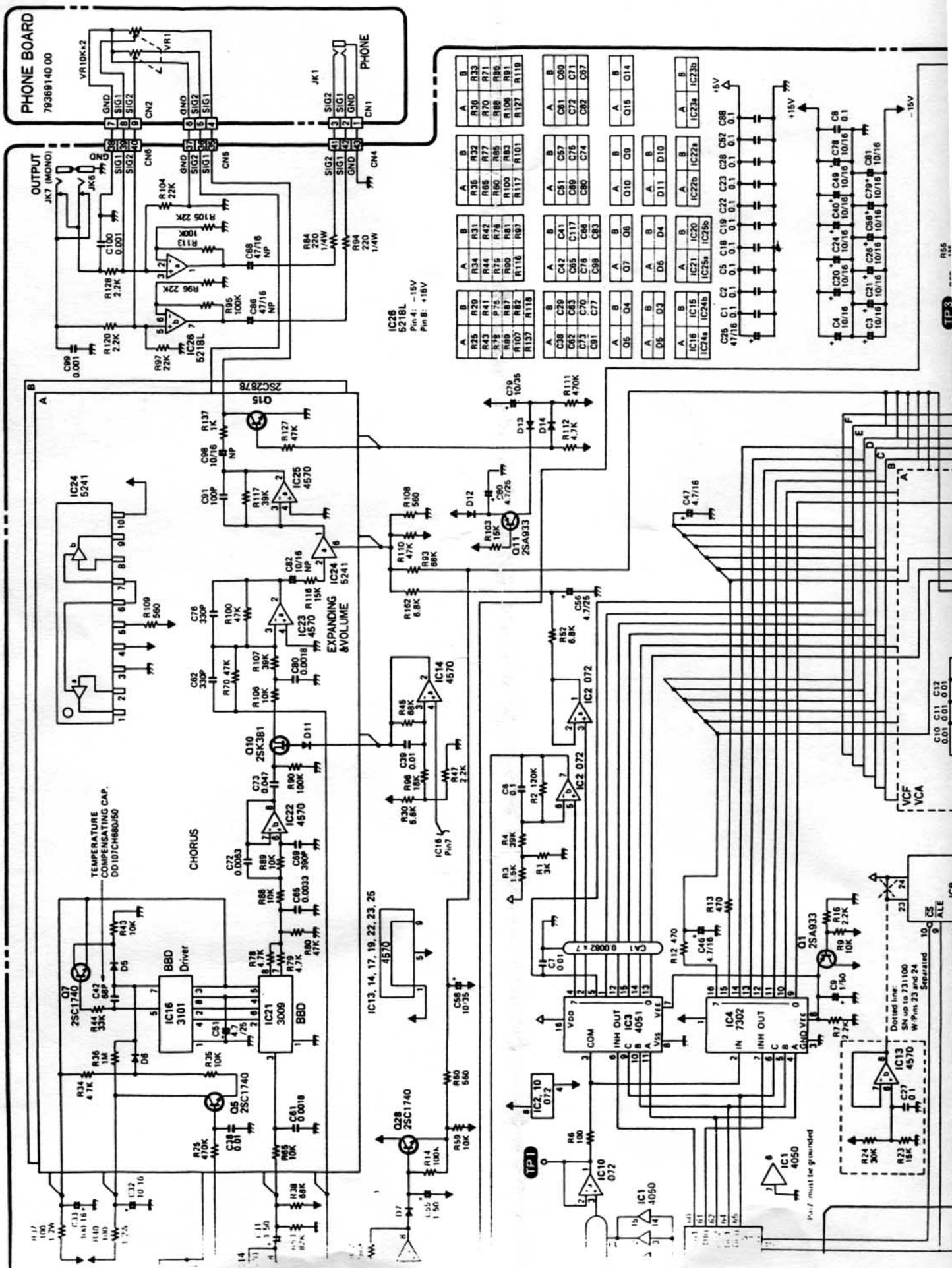
IC19 4570
 IC18 5560
 IC17 7410
 IC16 7410
 IC15 7410
 IC14 7410
 IC13 7410
 IC12 40H04
 IC11 M80C31
 IC10 7410
 IC9 7410
 IC8 5564
 IC7 27128
 IC6 (ICS) RDD62H195 GATE ARRAY
 IC5 4050
 IC4 7410
 IC3 7410
 IC2 25A033
 IC1 4050



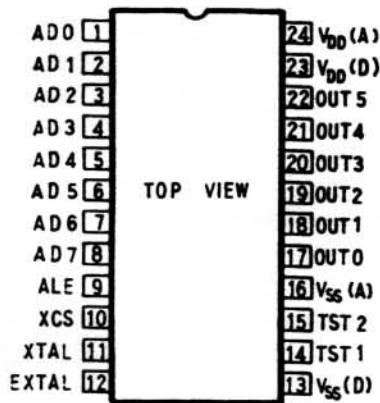
A	B
R28	R29
R30	R31
R32	R33
R34	R35
R36	R37
R38	R39
R40	R41
R42	R43
R44	R45
R46	R47
R48	R49
R50	R51
R52	R53
R54	R55
R56	R57
R58	R59
R60	R61
R62	R63
R64	R65
R66	R67
R68	R69
R70	R71



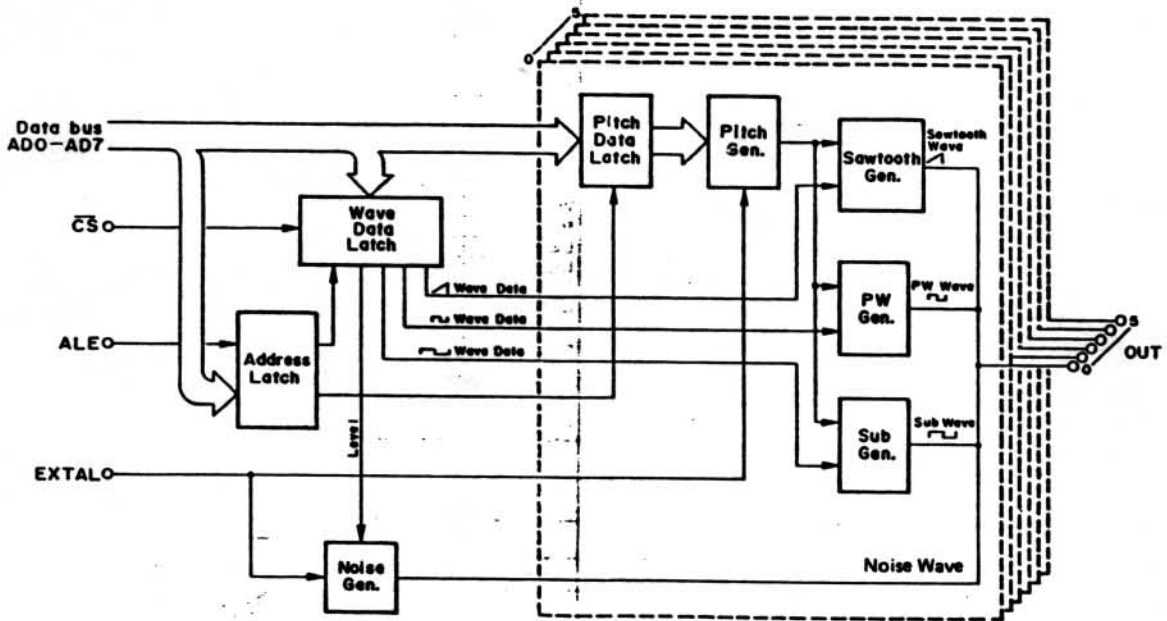
R100	R81	R106	R91
R107	R82	R107	R101
R108	R83	R108	R102
R109	R84	R109	R103
R110	R85	R110	R104
R111	R86	R111	R105
R112	R87	R112	R106
R113	R88	R113	R107
R114	R89	R114	R108
R115	R90	R115	R109
R116	R91	R116	R110
R117	R92	R117	R111
R118	R93	R118	R112
R119	R94	R119	R113
R120	R95	R120	R114
R121	R96	R121	R115
R122	R97	R122	R116
R123	R98	R123	R117
R124	R99	R124	R118
R125	R100	R125	R119
R126	R101	R126	R120
R127	R102	R127	R121
R128	R103	R128	R122
R129	R104	R129	R123
R130	R105	R130	R124
R131	R106	R131	R125
R132	R107	R132	R126
R133	R108	R133	R127
R134	R109	R134	R128
R135	R110	R135	R129
R136	R111	R136	R130
R137	R112	R137	R131
R138	R113	R138	R132
R139	R114	R139	R133
R140	R115	R140	R134
R141	R116	R141	R135
R142	R117	R142	R136
R143	R118	R143	R137
R144	R119	R144	R138
R145	R120	R145	R139
R146	R121	R146	R140
R147	R122	R147	R141
R148	R123	R148	R142
R149	R124	R149	R143
R150	R125	R150	R144
R151	R126	R151	R145
R152	R127	R152	R146
R153	R128	R153	R147
R154	R129	R154	R148
R155	R130	R155	R149
R156	R131	R156	R150
R157	R132	R157	R151
R158	R133	R158	R152
R159	R134	R159	R153
R160	R135	R160	R154
R161	R136	R161	R155
R162	R137	R162	R156
R163	R138	R163	R157
R164	R139	R164	R158
R165	R140	R165	R159
R166	R141	R166	R160
R167	R142	R167	R161
R168	R143	R168	R162
R169	R144	R169	R163
R170	R145	R170	R164
R171	R146	R171	R165
R172	R147	R172	R166
R173	R148	R173	R167
R174	R149	R174	R168
R175	R150	R175	R169
R176	R151	R176	R170
R177	R152	R177	R171
R178	R153	R178	R172
R179	R154	R179	R173
R180	R155	R180	R174
R181	R156	R181	R175
R182	R157	R182	R176
R183	R158	R183	R177
R184	R159	R184	R178
R185	R160	R185	R179
R186	R161	R186	R180
R187	R162	R187	R181
R188	R163	R188	R182
R189	R164	R189	R183
R190	R165	R190	R184
R191	R166	R191	R185
R192	R167	R192	R186
R193	R168	R193	R187
R194	R169	R194	R188
R195	R170	R195	R189
R196	R171	R196	R190
R197	R172	R197	R191
R198	R173	R198	R192
R199	R174	R199	R193
R200	R175	R200	R194
R201	R176	R201	R195
R202	R177	R202	R196
R203	R178	R203	R197
R204	R179	R204	R198
R205	R180	R205	R199
R206	R181	R206	R200
R207	R182	R207	R201
R208	R183	R208	R202
R209	R184	R209	R203
R210	R185	R210	R204
R211	R186	R211	R205
R212	R187	R212	R206
R213	R188	R213	R207
R214	R189	R214	R208
R215	R190	R215	R209
R216	R191	R216	R210
R217	R192	R217	R211
R218	R193	R218	R212
R219	R194	R219	R213
R220	R195	R220	R214
R221	R196	R221	R215
R222	R197	R222	R216
R223	R198	R223	R217
R224	R199	R224	R218
R225	R200	R225	R219
R226	R201	R226	R220
R227	R202	R227	R221
R228	R203	R228	R222
R229	R204	R229	R223
R230	R205	R230	R224
R231	R206	R231	R225
R232	R207	R232	R226
R233	R208	R233	R227
R234	R209	R234	R228
R235	R210	R235	R229
R236	R211	R236	R230
R237	R212	R237	R231
R238	R213	R238	R232
R239	R214	R239	R233
R240	R215	R240	R234
R241	R216	R241	R235
R242	R217	R242	R236
R243	R218	R243	R237
R244	R219	R244	R238
R245	R220	R245	R239
R246	R221	R246	R240
R247	R222	R247	R241
R248	R223	R248	R242
R249	R224	R249	R243
R250	R225	R250	R244
R251	R226	R251	R245
R252	R227	R252	R246
R253	R228	R253	R247
R254	R229	R254	R248
R255	R230	R255	R249
R256	R231	R256	R250
R257	R232	R257	R251
R258	R233	R258	R252
R259	R234	R259	R253
R260	R235	R260	R254
R261	R236	R261	R255
R262	R237	R262	R256
R263	R238	R263	R257
R264	R239	R264	R258
R265	R240	R265	R259
R266	R241	R266	R260
R267	R242	R267	R261
R268	R243	R268	R262
R269	R244	R269	R263
R270	R245	R270	R264
R271	R246	R271	R265
R272	R247	R272	R266
R273	R248	R273	R267
R274	R249	R274	R268
R275	R250	R275	R269
R276	R251	R276	R270
R277	R252	R277	R271
R278	R253	R278	R272
R279	R254	R279	R273
R280	R255	R280	R274
R281	R256	R281	R275
R282	R257	R282	R276
R283	R258	R283	R277
R284	R259	R284	R278
R285	R260	R285	R279
R286	R261	R286	R280
R287	R262	R287	R281
R288	R263	R288	R282
R289	R264	R289	R283
R290	R265	R290	R284
R291	R266	R291	R285
R292	R267	R292	R286
R293	R268	R293	R287
R294	R269	R294	R288
R295	R270	R295	R289
R296	R271	R296	R290
R297	R272	R297	R291
R298	R273	R298	R292
R299	R274	R299	R293
R300	R275	R300	R294
R301	R276	R301	R295
R302	R277	R302	R296
R303	R278	R303	R297
R304	R279	R304	R298
R305	R280	R305	R299
R306	R281	R306	R300
R307	R282	R307	R301
R308	R283	R308	R302
R309	R284	R309	R303
R310	R285	R310	R304
R311	R286	R311	R305
R312	R287	R312	R306
R313	R288	R313	R307
R314	R289	R314	R308
R315	R290	R315	R309
R316	R291	R316	R310
R317	R292	R317	R311
R318	R293	R318	R312
R319	R294	R319	R313
R320	R295	R320	R314
R321	R296	R321	R315
R322	R297	R322	R316
R323	R298	R323	R317
R324	R299	R324	R318
R325	R300	R325	R319
R326	R301	R326	R320
R327	R302	R327	R321
R328	R303	R328	R322
R329	R304	R329	R323
R330	R305	R330	R324
R331	R306	R331	R325
R332	R307	R332	R326
R333	R308	R333	R327
R334	R309	R334	R328
R335	R310	R335	R329
R336	R311	R336	R330
R337	R312	R337	R331
R338	R313	R338	R332
R339	R314	R339	R333
R340	R315	R340	R334
R341	R316	R341	R335
R342	R317	R342	R336
R343	R318	R343	R337
R344	R319	R344	R338
R345	R320	R345	R339
R346	R321	R346	R340
R347	R322	R347	R341
R348	R323	R348	R342
R349	R324	R349	R343
R350	R325	R350	R344
R351	R326	R351	R345
R352	R327	R352	R346
R353	R328	R353	R347
R354	R329	R354	R348
R355	R330	R355	R349
R356	R331	R356	R350
R357	R332	R357	R351
R358	R333	R358	R352
R359	R334	R359	R353
R360	R335	R360	R354
R361	R336	R361	R355
R362	R337	R362	R356
R363	R338	R363	R357
R364	R339	R364	R358
R365	R340	R365	R359
R366	R341	R366	R360
R367	R342	R367	R361
R368	R343	R368	R362
R369	R344	R369	R363
R370	R345	R370	R364
R371	R346	R371	R365
R372	R347	R372	R366
R373	R348	R373	R367
R374	R349	R374	R368
R375	R350	R375	R369
R376	R351	R376	R370
R377	R352	R377	R371
R378	R353	R378	R372
R379	R354	R379	R373
R380	R355	R380	R374
R381	R356	R381	R375
R382	R357	R382	R376
R383	R358	R383	R377
R384	R359	R384	R378
R385	R360	R385	R379
R386	R361	R386	R380
R387	R362	R387	R381
R388	R363	R388	R382
R389	R364	R389	R383
R390	R365	R390	R384
R391	R366	R391	R385
R392	R367	R392	R386
R393	R368	R393	R387
R394	R369	R394	R388
R395	R370	R395	R389
R396	R371	R396	R390
R397	R372	R397	R391
R398	R373	R398	R392
R399	R374	R399	R393
R400	R375	R400	R394
R401	R376	R401	R395
R402	R377	R402	R396
R403	R378	R403	R397
R404	R379	R404	R398
R405	R380	R405	R399
R406	R381	R406	R400
R407	R382	R407	R401
R408	R383	R408	R402
R409	R384	R409	R403
R410	R385	R410	R404
R411	R386	R411	R405
R412	R387	R412	R406
R413	R388	R413	R407
R414	R389	R414	R408
R415	R390	R415	R409
R416	R391	R416	R410
R417	R392	R417	R411
R418	R393	R418	R412
R419	R394	R419	R413
R420	R395	R420	R414
R421	R396	R421	R415
R422	R397	R422	R416
R423	R398	R423	R417
R424	R399	R424	R418
R425	R400	R425	R419
R426	R401	R426	R420
R427	R402	R427	R421
R428	R403	R428	R422
R429	R404	R429	R423
R430	R405	R430	R424
R431	R406	R431	R425
R432	R407	R432	R426
R433	R408	R433	R427
R434	R409	R434	R428



DCO IC9(Main Board)
MB87123



DESIGNATION	PIN NO.	FUNCTION	I/O	
AD	0	1	DCO DATA INPUT (8 bits)	I
	1	2		
	2	3		
	3	4		
	4	5		
	5	6		
	6	7		
	7	8		
OUT	0	17	Ach	O
	1	18	Bch	
	2	19	Cch	
	3	20	Dch	
	4	21	Ech	
	5	22	Fch	O
ALE	9	ADDRESS LATCH PULSE INPUT	I	
CS	10	CHIP SELECT INPUT	I	
EXTAL	11	MASTER CLOCK INPUT	I	
XTAL	12	NC	I	
TST	1	14	GND	I
	2	15		
VS	13	Digital GND	I	
VS	16	Analog GND	I	
VD	23	Analog +5V	I	
VD	24	Digital +5V	I	



DMUX AND S/H

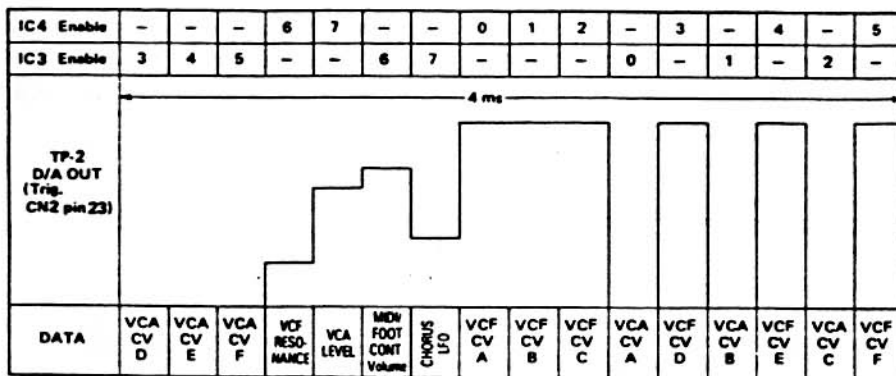
Data for controlling VCF, VCA and subsequent stages are fed from DAC RA1 and IC10 to IC3 and IC4 in multiplexed analog form as shown below. IC3 and IC4 demultiplex the data and sample each of the signals into the correct destination. Note that IC4 7302 has hold capacitors built internally.

デマルチプレクサー サンプル・アンド・ホールド

VCF,VCA 等を制御するデータは、DAC RA1,IC10 から出力され、IC3,IC4 に入ります。この間のデータは右図のように時分割多重のアナログ・データです。

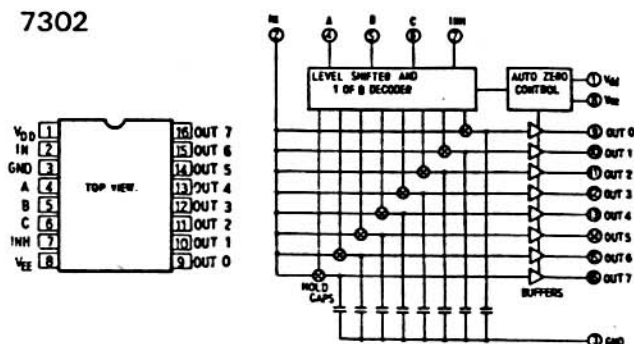
IC3,IC4 は、このデータを振り分けて次のデータが入ってくるまでホールドします。

注) IC4 7302 は内部にホールド・コンデンサとバッファを持っています。



A	B	C	IC4 OUT		IC3 OUT	
0	0	0	0	VCF A CV	0	VCA A CV
0	0	1	1	VCF B CV	1	VCA B CV
0	1	0	2	VCF C CV	2	VCA C CV
0	1	1	3	VCF D CV	3	VCA D CV
1	0	0	4	VCF E CV	4	VCA E CV
1	0	1	5	VCF F CV	5	VCA F CV
1	1	0	6	RESONANCE CV	6	VOLUME CV
1	1	1	7	VCA LEVEL CV	7	CHORUS RATE CV

7302



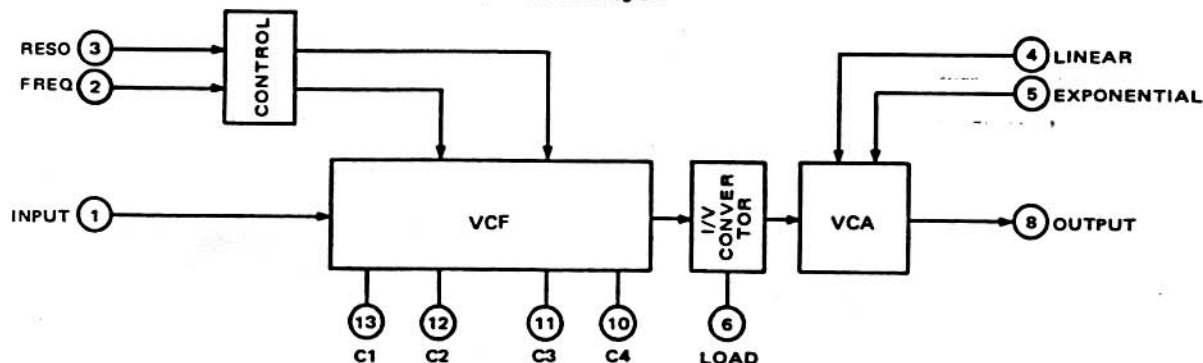
VCF, VCA

IC5 IR3R05 consists of VCF and VCA. The VCF has two 2-pole LPFs (-12dB/oct) in series to have a total -24dB/oct capability. The VCA has two control inputs, LINEAR and EXPONENTIAL. Applied to EXPONENTIAL is a CV for compression to provide companding function in combination with expanding being performed at IC24 in CHORUS stage.

VCF, VCA

IC5 IR3R05 はワンチップの VCF/VCA です。VCF はステートバリャブルな 2 ポール LPF 2 段構成で、4 ポール -24dB/oct(-12dB/oct×2) の特性を持っています。VCA の LINEAR 入力には VCA CV が、EXPONENTIAL 入力には VCA LEVEL CL と COMPRESSION が加えられます。VCA は CHORUS 回路の IC24 での Expanding との組合せで Companding 回路を形成します。

IR3R05 Block Diagram



ADJUSTMENT AND CHECKING

The test routine should be preceded by DC voltage confirmation.

1. POWER SUPPLIES

NOTE:

Paragraphs 1 and 2 correlate: some steps may have to be repeated after corrective procedure is taken at another step.

1A. Battery

Test points: IC8 (RAM) pin 24 (Vdd), pin 12 (GND)

With power off measure the voltage across the test points. It should be within 2.800 to 3.500V.

1B. DC Supplies

Test points: Main Board DC rails +5V, +15V, -15.

Turn the power on. (See NOTE for LCD reading.)

The voltages should be as follows:

+5V +5.0 ±0.2V

+15V +15.0 ±0.5V

-15V -15.0 ±0.5V

NOTE:

The display will show an error message "CHECK BATTERY!!!" if the unit has problems around RAM IC8:

Memory destroyed. . . . RAM defective or erased due to poor backup battery.

*RAM Initialization. . . . Not attempted or failed
(See RAM INITIALIZATION)*

2. RAM AND LCD

2A. RAM, IC8

No fear of memory erasure or overwrite in this step.

2-1. With power OFF. Press and hold PATCH A-B and DATA TRANSFER and switch the power ON.

The LCD will read either:

"RAM CHECK OK!!"

"RAM wr/rd ERR!!"

2B. LCD

2-2. Press PATCH A-B. All LCD segments and the back-light LED will be lit.

2-3. Press PATCH A-B. All LCD segments will go off while the LED will remain lit.

2-4. Repetition of PATCH A-B should alternately turn on and off the LCD.

RAM INITIALIZATION

CAUTION:

User program will be erased. Should be performed only when in the following cases.

RAM, IC8 replaced

Backup battery replaced

RAM contents erased

MIDI mode to be changed (POLY or MONO)

During initialization the following data are transferred from ROM IC7 to RAM IC8.

TUNE/MIDI function

16 chord memories

64 tones for the a group

128 patches for A/B groups

In addition, TONE-names in A group are copied to the A group PATCH NAMES.

The initialization also sets the MIDI receiving mode. So there are two ways through which the MKS-50 enters initialization.

INITIALIZATION WITH POLY MODE

Press and hold NUMBER Buttons 4 and 8, and switch the power on. The display will transiently show "FACTORY PRESET".

INITIALIZATION WITH MONO MODE

Press and hold NUMBER buttons 3 and 7, and switch the power on. The display will transiently show "FACTORY PRESET".

3. TEST MODE

3A. Entering Test Mode

Press and hold TUNE/MIDI and PATCH A-B, and turn the power on. The display will read "\$ADJ/INS MODE!!!", prompting a command input. In the test mode, some switches and functions change their effects.

3B. Key Assignment

Rotary mode.....One module is assigned to a key. Assignment is cyclic in the order from A to F.

Tone parameter.....Two test tone parameters are available. Only one set can be selected at a time, using one of the buttons shown in the table below.

SWITCH	LCD DISPLAY/FUNCTION
NAME	"\$adj VCF sine" Sets VCF cutoff adj parameter values
WRITE	"&adj BASIC wave" Sets basic tone parameter values

NOTE:

Default setting is NAME on, while LCD reading remains "\$ADJ/INS MODE!!!".

Pressing WRITE, TONE a-b (display shows T-all BASIC wave) and PARAMETER allows to glance over the basic parameter values one by one at a time.

The parameters not listed in the table below have values 00.

4B. Test points. TP-3 (SUM OUT), TP-2 (GND)

- 4-1. Press NAME. The display will show "\$adj VCF sine".
- 4-2. Press A4 key (Module No. 1 should be assigned to the key). Adjust VR1A for a maximum amplitude. (typ. 0.8-1.5Vp-p.)
- 4-3. Press A4 key (module No. 2). Adjust VR1B.
- 4-4. Repeat for the remainder.
If C6 key is available, check for no level reduction on this key at all modules.

5. DCO

5A. Test instrument.scope (0.5V/DIV, 1ms/DIV)

LCD reading	Press SW	Check for
DCO RNG = 8' → 8' PULSE = 01 PULSE = 01 → 00 SAWTOOTH = 00	PARAMETER VALUE PARAMETER VALUE	Become inaudible No sound heard
SAWTOOTH = 00 → 01 SAWTOOTH = 00 → 02 SAWTOOTH = 00 → 03 SAWTOOTH = 00 → 04 SAWTOOTH = 00 → 05	A4 6 times A4 6 times A4 6 times A4 6 times A4 6 times	Waveform and its level remain unchanged
SAWTOOTH = 00 → 00	PARAMETER SELECT	No sounds

5B. Test pointone of OUTPUT jacks
(no connection for the other)

- 5-1. Press WRITE.
- 5-2. Press TONE a-b. The display will show T-all BASIC wave.
- 5-3. While watching the scope, generate A4 6 times; verify similarity of output from 6 modules in level and waveshape.
- 5-4. Press PARAMETER: the display will change reading to DCO RNG = 8'.
- 5-5. Press VALUE and the display changes 8' to 32' followed by pitch change in sound. Press VALUE for 16', 8' and 4'.
- 5-6. In a similar way perform PULSE and the subsequent items to the list in the table below.

[テスト・ポイント]

メインボード TP3(SUM OUT), TP-2(GND)

[調整方法]

1. テストモードに設定し、(NAME) を押し VCF カットオフ・フリケンシー調整用音色データにセットをする。
以後モニタースピーカーも接続して、音を聞きながら調整する。
2. A4 を発音するごとにモジュールが1-6に変わるので、各モジュールごとにサイン波が最大になるように VR1 (A-F) で調整する。
0.8-1.5Vp-p の範囲に入っていれば良い。
できれば C6 を 6 回発音して、全てのモジュールの電圧が下がっていないことを確認する。

5. DCO チェック

[使用機器]

オシロスコープ (0.5V/DIV, 1ms/DIV)

[テスト・ポイント]

OUTPUT ジャック

[検査方法]

1. (WRITE) を押し、基本セッティングにする。
2. (TONE a-b) を一度押し、「T-all BASIC wave」にする。
3. A4 を 6 回発音して全てのモジュールの出力波形、レベルが同じであること。
4. (PARAMETER) を押しと「DCO RNG = 8'」と表示される。(VALUE) を押しごとに DCO RNG が 32' / 16' / 8' / 4' と変化する。同時に音程も変化するを確認する。

5. 以下同様にして確認する。

LCD 表示	押さえる SW	確認事項
DCO RNG = 8' → 8' PULSE = 01 PULSE = 01 → 00 SAWTOOTH = 00	PARAMETER VALUE PARAMETER VALUE	音は出なくなる。 音は出ない。
SAWTOOTH = 00 → 01 SAWTOOTH = 00 → 02 SAWTOOTH = 00 → 03 SAWTOOTH = 00 → 04 SAWTOOTH = 00 → 04	A4 6回 A4 6回 A4 6回 A4 6回 A4 6回	全てのモジュールの波形とレベルが同じであること。
SAWTOOTH = 00 → 00	PARAMETER	音は出ない。
オシロスコープのセッティングを 0.5V/DIV, 2m/DIV にする。		
SUB LEVEL = 00	VALUE	音は出ない。
SUB LEVEL = 00 → 01 SUB LEVEL = 00 → 02 SUB LEVEL = 00 → 03	A4 6回 A4 6回 A4 6回 PARAMETER	全てのモジュールの波形とレベルが同じであること。 表示されたレベルと共に、レベルが変わる。
SUB = 00 SUB = 00 → 01 SUB = 00 → 02 SUB = 00 → 03 SUB = 00 → 04 SUB = 00 → 05	VALUE A4 6回 A4 6回 A4 6回 A4 6回 A4 6回 PARAMETER	全てのモジュールの波形とレベルが同じであること。 表示された波形と共に波形が変わる。

PARAMETER	VALUE	PARAMETER	VALUE
DCO RNG	8'	DCO ENV	↘
DCO BEND	12	PULSE	01
PW/PWM	80	PWM RATE	80
HPF FREQ	01	VCF FREQ	127
VCF ENV	↘	VCF KYBD	14
VCA LEVEL	127	VCA ENV	↘
CHORUS	OFF	CRS RATE	64
LFO RATE	80	ENV L1	127
ENV L2	127	ENV L3	127
ENV T4	10		

— Test Keyboard —

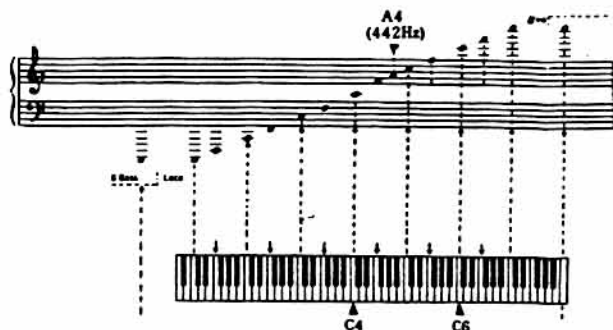
For the following tests, use of an external MIDI keyboard is recommended for simpler key operation, although VALUE button can be used to duplicate a one octave keyboard.

Assigned module number will appear at the right end of the LCD.

— VALUE Button as a Keyboard —

When the LCD is showing other than parameter, press the upper portion of the button, which will sound A4 (A above middle C).

When a parameter is shown, press TONE a-b (display will show T-all BASIC wave, but have no effects on key function) and then press upper portion of VALUE. To select the next parameter press PARAMETER.



4. VCF CUTOFF FREQUENCY

NOTE:

Start after 10-minute warmup period has passed.

4A. Test instrument . . . scope (0.5V/DIV, 1ms/DIV)
sound monitor system

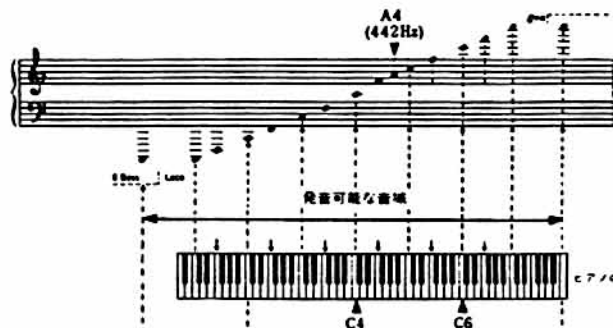
PARAMETER	VALUE	PARAMETER	VALUE
DCO RNG	8'	DCO ENV	↘
DCO BEND	12	PULSE	01
PW/PWM	80	PWM RATE	80
HPF FREQ	01	VCF FREQ	127
VCF ENV	↘	VCF KYBD	14
VCA LEVEL	127	VCA ENV	↘
CHORUS	OFF	CRS RATE	64
LFO RATE	80	ENV L1	127
ENV L2	127	ENV L3	127
ENV T4	10		

音を出すには外部に MIDI キーボードを接続して行なう方法と、本体で行なう方法とがありますが、外部キーボードを使用した方が便利です。

本体で行なう場合、テスト・モード表示の時とパラメーター表示の時とは操作が異なります。

- ・テスト・モード表示の時は (VALUE) の上側を押すと A4 が発音します。
- ・パラメーター表示の時は、一度 (TONE a-b) を押してから (VALUE) の上側を押すと A4 が発音します。表示は変わりますが問題ありません。次にパラメーターを選択する場合は (PARAMETER) を押して下さい。

テスト・モードの場合、音を出すとディスプレイの右端にアサインされたモジュール・ナンバーを表示します。

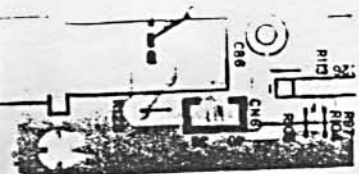


4. VCF カットオフ・フリケンシー調整

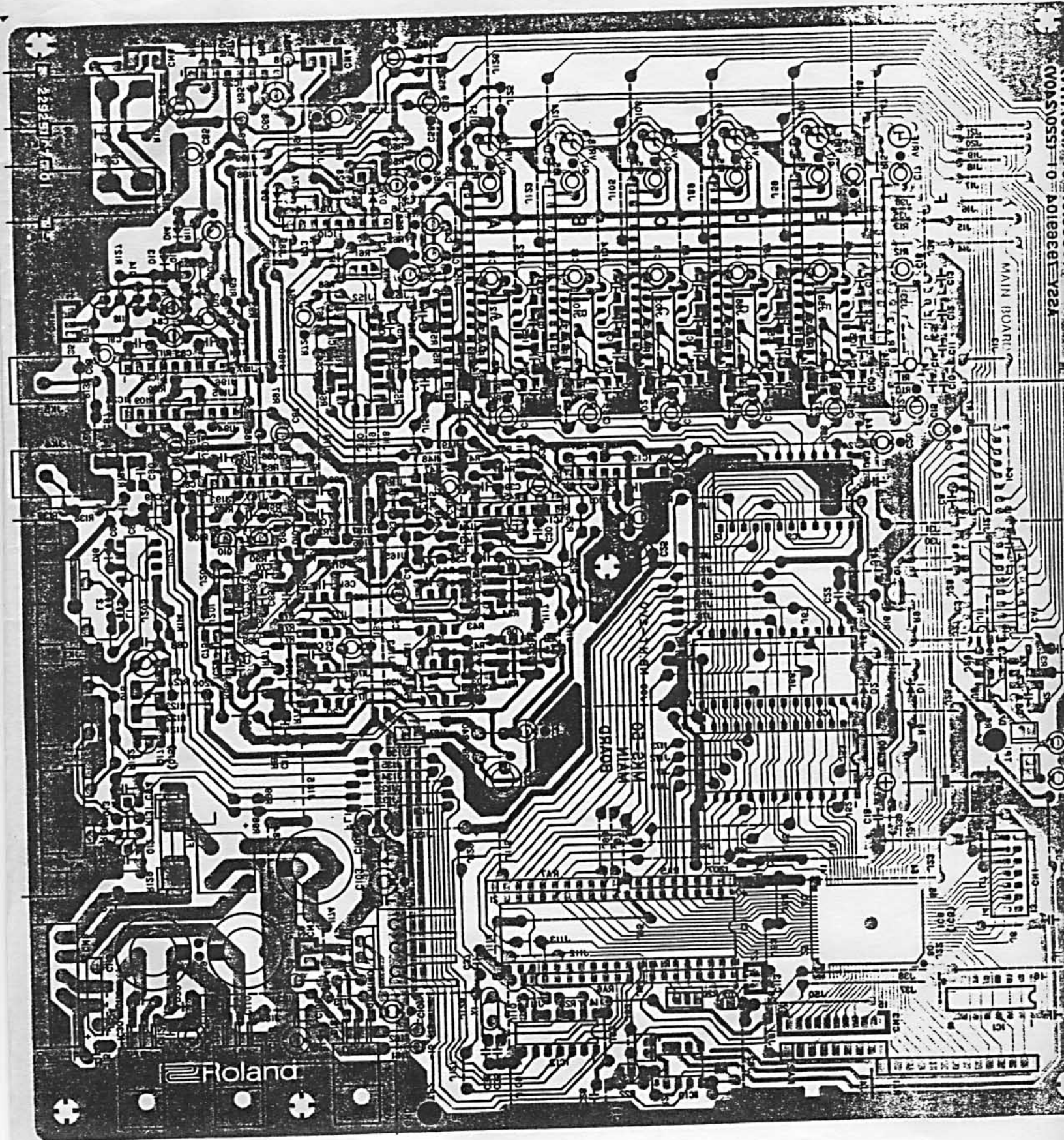
★注★ この調整は、通電後最低10分間たってから行なうこと。

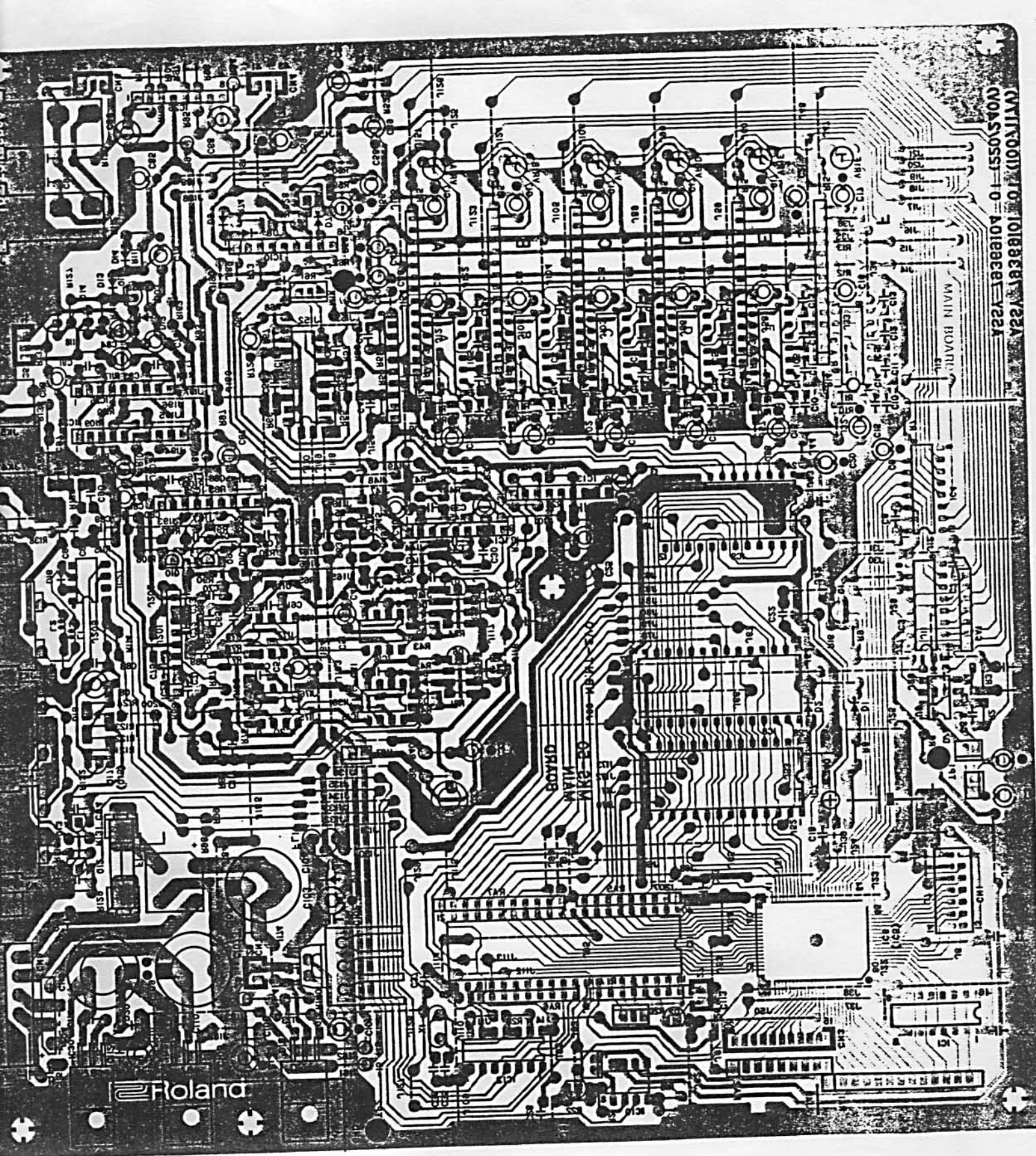
〔使用機器〕

オシロスコープ (0.5V/DIV, 1ms/DIV)



(4) bcpq vli.





WTIR001 10 1018881 Y2A
00AS0551-10 4018881 Y2A

MAIN BOARD

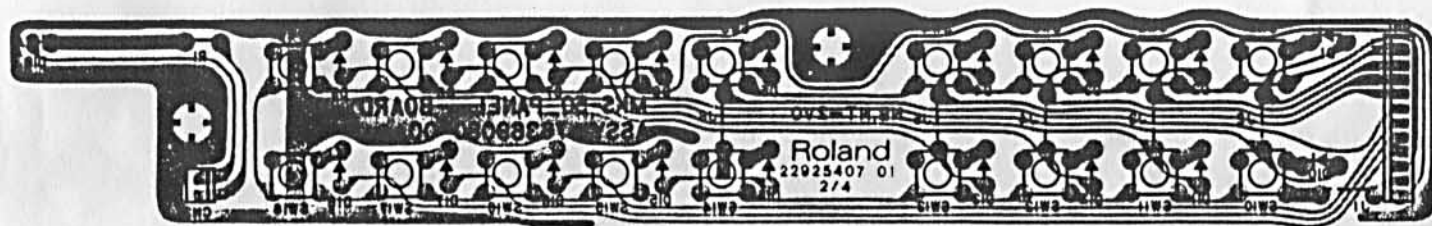
Roland

View from front

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34

Panel Board
7636908000
(pcb 2292540701 2/4)

100/117V
20/240V
1 1/4)



View from foil side

Reset scope inputs to 0.5V/DIV, 2ms/DIV		
SUB LEVL = 00	VALUE	No sounds
SUB LEVL = 00 → 01 SUB LEVL = 00 → 02 SUB LEVL = 00 → 03	A4 6 times A4 6 times A4 6 times PARAMETER SELECT	Waveform and its level unchanged Sound level keeps with value display
SUB = 00 SUB = 00 → 01 SUB = 00 → 02 SUB = 00 → 03 SUB = 00 → 04 SUB = 00 → 05	VALUE A4 6 times A4 6 times A4 6 times A4 6 times A4 6 times PARAMETER	Waveform and level will not change Waveform changes as value changes
Reset scope to 0.5V/DIV, 1ms/DIV		
SUB LEVL = 03 SUB LEVL = 03 → 00	VALUE PARAMETER	No sounds
NOIS LVL = 00 → 03	A4 6 times VALUE	All modules have the same noise level
NOIS LVL = 03 → 00 PULSE = 00	PARAMETER VALUE	No sounds heard
PULSE = 00 → 03	A4 6 times	PWM effect on all modules

6. HPF

6A. Test instrumentscope (0.5V/DIV, 1ms/DIV)

6B. Test pointone of OUTPUT jacks
(no connection for the other)

6-1. Press WRITE.

6-2. Press TONE a-b: The display will show T-all BASIC wave.

6-3. Press PARAMETER to call HPF FREQ parameter.

6-4. While watching the scope screen, press VALUE repeatedly to change the values from 00 to 01, 02 and 03. The waveform should change just as like below.

オシロスコープのセッティングを 0.5V/DIV, 1m/DIV にする。		
SUB LEVL = 03 SUB LEVL = 03 → 00	VALUE PARAMETER	音は出ない。
NOIS LVL = 00 → 03	A 4 6回 VALUE	全てのモジュールのレベルが同じであること
NOIS LVL = 03 → 00 PULSE = 00	PARAMETER VALUE	音は出ない。
PULSE = 00 → 03	A4 6回	全モジュールに PWM がかかっている。

6. HPF チェック

〔使用機器〕

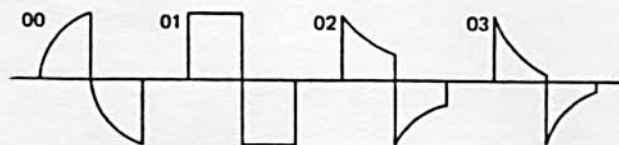
オシロスコープ (0.5V/DIV, 1ms/DIV)

〔テスト・ポイント〕

OUTPUT ジャック

〔検査方法〕

1. (WRITE) を押し、基本セッティングにする。
2. (TONE a-b) を一度押し、「T-all BASIC wave」にする。
3. (PARAMETER) を押し、「HPF FREQ」のパラメーターを選択する。
4. (VALUE) で「00 → 01 → 02 → 03」と変えて波形が変わること。



7. OUTPUT レベルチェック

〔使用機器〕

オシロスコープ (0.5V/DIV, 1ms/DIV)

〔テスト・ポイント〕

左右両方の OUTPUT ジャック

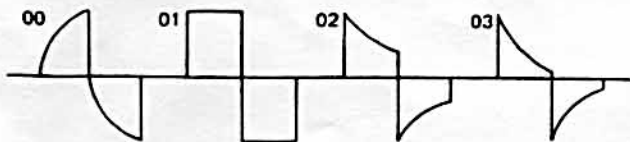
〔検査方法〕

1. (WRITE) を押し、基本セッティングにする。
2. 本体の VOLUME を最大にして、A4 を発音させたとき左右両方のレベルが 0.8~1.5V の範囲内であり、かつ左右のレベル差が 0.1V 以内であること。

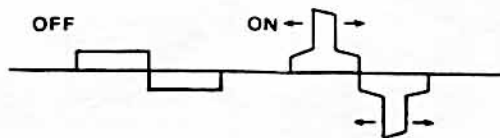
8. CHORUS チェック

〔使用機器〕

オシロスコープ (0.5V/DIV, 1ms/DIV)



- 8-1. Press WRITE.
- 8-2. Press TONE a-b.
- 8-3. Press PARAMETER to call CHORUS parameter.
- 8-4. Press VALUE and verify waveshape changes.



7. OUTPUT LEVEL

7A. Test instrumentscope (0.5V/DIV, 1ms/DIV)

7B. Test points.OUTPUT jacks

7-1. Press WRITE.

7-2. Turn up VOLUME to maximum.

7-3. Generate A4 sound. Read OUTPUTs. The levels should be 0.8-1.5Vp-p.

The difference between two readings must be less than 0.1Vp-p.

8. CHORUS

8A. Test instrumentscope (0.5V/DIV, 1ms/DIV)

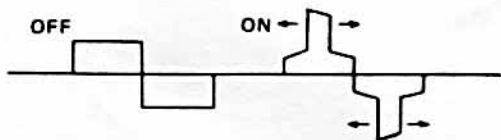
8B. Test pointone OUTPUT jack with the other plugged with an open-circuit plug

[テスト・ポイント]

OUTPUT ジャック (片方の OUTPUT ジャックに空プラグを差す。)

[検査方法]

1. (WRITE) を押し、基本セッティングにする。
2. (TONE a-b) を一度押し、「T-all BASIC wave」にする。
3. (PARAMETER) を押し、「CHORUS」のパラメーターを選択する。
4. (VALUE) で ON にすると波形の山が動くことを確認する。



MODEL MKS-50 MIDI Implementation

Date: Sep. 05 1986
Version: 1.0

1. TRANSMITTED DATA

Status	Second	Third	Description
1111 0000	1111 0111	SYSTEM EXCLUSIVE

Note :
See Section 3. TRANSMITTED EXCLUSIVE MESSAGES.

2. RECOGNIZED RECEIVE DATA

Status	Second	Third	Description
1000 nana	0kkk kkkk	0vvv vvvv	Note OFF, velocity ignored
1001 nana	0kkk kkkk	0000 0000	Note OFF kkkkkk = 12 - 108 *1
1001 nana	0kkk kkkk	0vvv vvvv	Note ON kkkkkk = 12 - 108 *1 vvvvvv = 1 - 127
1011 nana	0000 0001	0vvv vvvv	Modulation vvvvvv = 0 - 127 *2
1011 nana	0000 0101	0vvv vvvv	Portamento Time vvvvvv = 0 - 127 *2
1011 nana	0000 0110	0vvv vvvv	Data Entry (MSB) *3
1011 nana	0000 0111	0vvv vvvv	Main volume vvvvvv = 0 - 127 *2, *4
1011 nana	0100 0000	01xx xxxx	Hold1 ON *2
1011 nana	0100 0000	00xx xxxx	Hold1 OFF *2
1011 nana	0100 0001	01xx xxxx	Portamento ON *2
1011 nana	0100 0001	00xx xxxx	Portamento OFF *2
1011 nana	0110 0100	0000 0000	RPC (LSB) *3
1011 nana	0110 0101	0000 0000	RPC (MSB) *3
1100 nana	0ppp pppp		Program Change pppppp = 0 - 127 *5
1101 nana	0vvv vvvv		Channel After Touch vvvvvv = 0 - 127 *2
1110 nana	0bbx xxxx	0bbb bbbb	Pitch Bend Change *2
1011 nana	0111 1011	0000 0000	ALL NOTES OFF *6, *7
1011 nana	0111 1100	0000 0000	OMNI OFF *6
1011 nana	0111 1101	0000 0000	OMNI ON *6
1011 nana	0111 1110	0000 0000	MOMO ON *6
1011 nana	0111 1111	0000 0000	POLY ON *6
1111 0000	1111 0111	SYSTEM EXCLUSIVE *8
1111 1110			Active Sensing

Notes :
*1 Note numbers outside the range 12 - 108 are transposed to the nearest octave inside this range.

While key assign mode is 'CHORD MEMORY', modified notes with CHORD MEMORY are sounded.

*2 Recognized if the corresponding PATCH MIDI function switch is ON.

*3 RPC and value (Data Entry) are recognized as follows.

RPC #	value MSB	value LSB	Description
0	0vvv vvvv	0xxx xxxx	BEND RANGE (0-24 semitone, 1 semitone step) xxxxxxx is ignored.

*4 The volume of the sound can be controlled by main volume message within level which adjusted by the panel volume knob.

*5 Recognized if MIDI PROG.CG in the TUNE/MIDI function is on.

0 - 63 : PATCH-A GROUP
64 - 127 : PATCH-B GROUP

*6 Note Messages (123 - 127) are also recognized as ALL NOTES OFF.

Note Messages are recognized as follows:

POLY ON (127)	: MONO ON (126)	: MONO ON (126)	: MONO ON (126)
OMNI OFF (124)	: OMNI = OFF	: OMNI = OFF	: OMNI = OFF
OMNI ON (125)	: OMNI = ON	: OMNI = ON	: OMNI = ON

** set 'CHORD MEMORY' key assign

*** nana : MONO CHANNEL RANGE

0	:	6
1 - 6	:	1 - 6
7 - 16	:	6
17 - 127	:	ignore

Note event, Pitch bend change and Velocity change on each channel is recognized by each tone module. Other voice messages on only basic channel are recognized by all tone modules.

*7 Ignored in MOMO mode.

*8 See Section 3. RECOGNIZED EXCLUSIVE MESSAGES.

3. TRANSMITTED EXCLUSIVE MESSAGES

3.1 All Parameters (APR)

3.1.1 All Tone Parameters with Tone names (APR)

Transmitted if EXCL in the PATCH MIDI function is on and TX TONE APR in the TUNE/MIDI function is on.

When the PATCH or TONE Group, Bank or Number is changed.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Excland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nana	Unit # = MIDI basic channel, nana = 0 - 15 where nana + 1 = channel #
e 0010 0011	Format type (JU-1, JU-2, MS-10, MS-80, MKS-50)
f 0010 0000	Level # = 1
g 0000 0001	Group #
h 0vvv vvvv	Value (0 - 127) *1
i 00tt tttt	In sequence (36 bytes total) Tone name (8 - 63)
j 1111 0111	In sequence (10 bytes total) End of System Exclusive

3.1.2 All Patch Parameters with Patch names (APR)

Transmitted if EXCL in the PATCH MIDI function is on and TX PATCH APR in the TUNE/MIDI function is on.

When the PATCH Group, Bank or Number is changed.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Excland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nana	Unit # = MIDI basic channel, nana = 0 - 15 where nana + 1 = channel #
e 0010 0011	Format type (JU-1, JU-2, MS-10, MS-80, MKS-50)
f 0011 0000	Level # = 2 (used MKS-50 only)
g 0000 0001	Group #
h 0vvv vvvv	Value (0 - 127) *2
i 00tt tttt	In sequence (13 bytes total) Tone name (8 - 63)
j 1111 0111	In sequence (10 bytes total) End of System Exclusive

3.1.3 All Chord Memory Parameters (APR)

Transmitted if EXCL in the PATCH MIDI function is on and TX CM APR in the TUNE/MIDI function is on.

When the PATCH Group, Bank or Number is changed.

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Excland ID #
c 0011 0101	Operation code = APR (all parameters)
d 0000 nana	Unit # = MIDI basic channel, nana = 0 - 15 where nana + 1 = channel #
e 0010 0011	Format type (JU-1, JU-2, MS-10, MS-80, MKS-50)
f 0100 0000	Level # = 3 (used MKS-50 only)
g 0000 0001	Group #
h 0vvv vvvv	Value (0 - 127) *3
i 00tt tttt	In sequence (6 bytes total) End of System Exclusive

Notes :

*1 Tone Parameter

#	Function	Value
0	DCO ENV MODE	0 = ENV normal 1 = ENV inverted 2 = ENV normal with dynamics 3 = ENV inverted with dynamics
1	VCF ENV MODE	0 = ENV normal 1 = ENV inverted 2 = ENV normal with dynamics 3 = dynamics
2	VCA ENV MODE	0 = ENV 1 = GATE 2 = ENV with dynamics 3 = GATE with dynamics
3	DCO WAVEFORM PULSE	0 - 3
4	DCO WAVEFORM SAWTOOTH	0 - 5
5	DCO WAVEFORM SUB	0 - 5
6	DCO RANGE	0 = 4' 1 = 8' 2 = 12' 3 = 16'
7	DCO SUB LEVEL	0 - 3
8	DCO NOISE LEVEL	0 - 3
9	MFF CUTOFF FREQ	0 - 3
10	CMORUS	0 = OFF 1 = ON
11	DCO LFO MOD DEPTH	0 - 127
12	DCO ENV MOD DEPTH	0 - 127
13	DCO AFTER DEPTH	0 - 127
14	DCO PM/PWM DEPTH	0 - 127
15	DCO PWM RATE	0 = PW manual 1 - 127 = PWM LFO RATE
16	VCF CUTOFF FREQ	0 - 127
17	VCF RESONANCE	0 - 127
18	VCF LFO MOD DEPTH	0 - 127
19	VCF ENV MOD DEPTH	0 - 127
20	VCF KEY FOLLOW	0 - 127
21	VCF AFTER DEPTH	0 - 127
22	VCA LEVEL	0 - 127
23	VCA AFTER DEPTH	0 - 127
24	LFO RATE	0 - 127
25	LFO DELAY TIME	1 - 127

MODEL MKS-50 MIDI Implementation Chart

Date: Sep, 05 1986
Version: 1.0

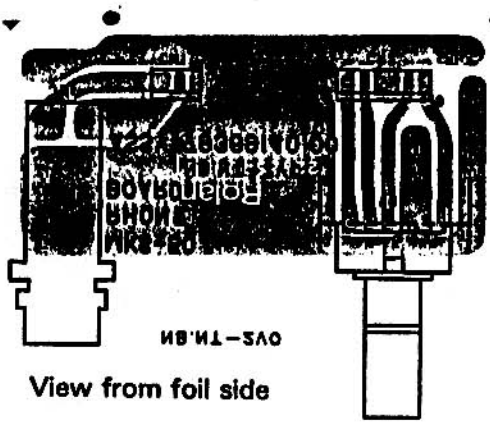
Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	memorized
Mode	Default Messages Altered	Mode 3 POLY, OMNI OFF *****	Mode 1, 2, 3, 4 MONO, POLY, OMNI, ON/OFF	
Note Number	True voice	X *****	0-127 12-108	
Velocity	Note ON Note OFF	X X	O v=1-127 X	
After Touch	Key's Ch's	X X	X .	
Pitch Bender		X	* 0-24 semi-tone	9 bit resolution
Control Change	1 5 6 7 64 65 100 101	X X X X X X X X	* Mod. depth . O ** Volume * Hold . O O	Modulation Portamento Time Data Entry (MSB) Hold-1 Portamento Switch RPC (LSB) RPC (MSB)
Prog Change	True #	X *****	* 0-127 0-127	
System Exclusive		.	.	
System Common	Song Pos Song Sel Tune	X X X	X X X	
System Real Time	Clock Commands	X X	X X	
Aux Messages	Local ON/OFF All Notes OFF Active Sense Reset	X X X X	X O (123-127) O X	
Notes		<ul style="list-style-type: none"> * Can be set to O or X and memorized. ** Can adjust the volume of the sound within the level set with the panel volume knob. <p>RPC-PITCH BEND SENSITIVITY only</p>		

Mode 1 : OMNI ON POLY
Mode 3 : OMNI OFF POLY

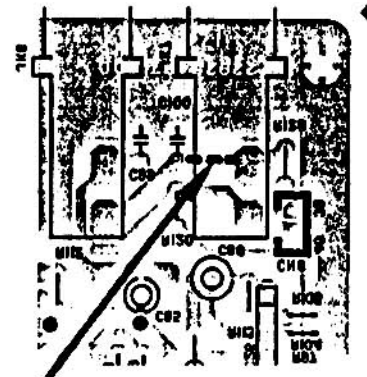
Mode 2 : OMNI ON MONO
Mode 4 : OMNI OFF MONO

O : Yes
X : No

Phone Board
7936914000
 (pcb 2292540701 4/4)

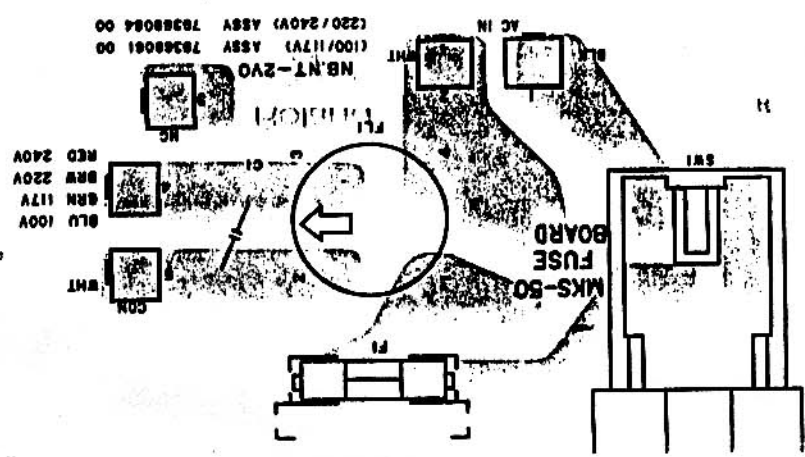


Main Board
7936910101 100/117V
7936910401 220/240V
 (pcb 2292540701 1/4)



Jumper wire on early pcbs
 (2292540700 1/4)

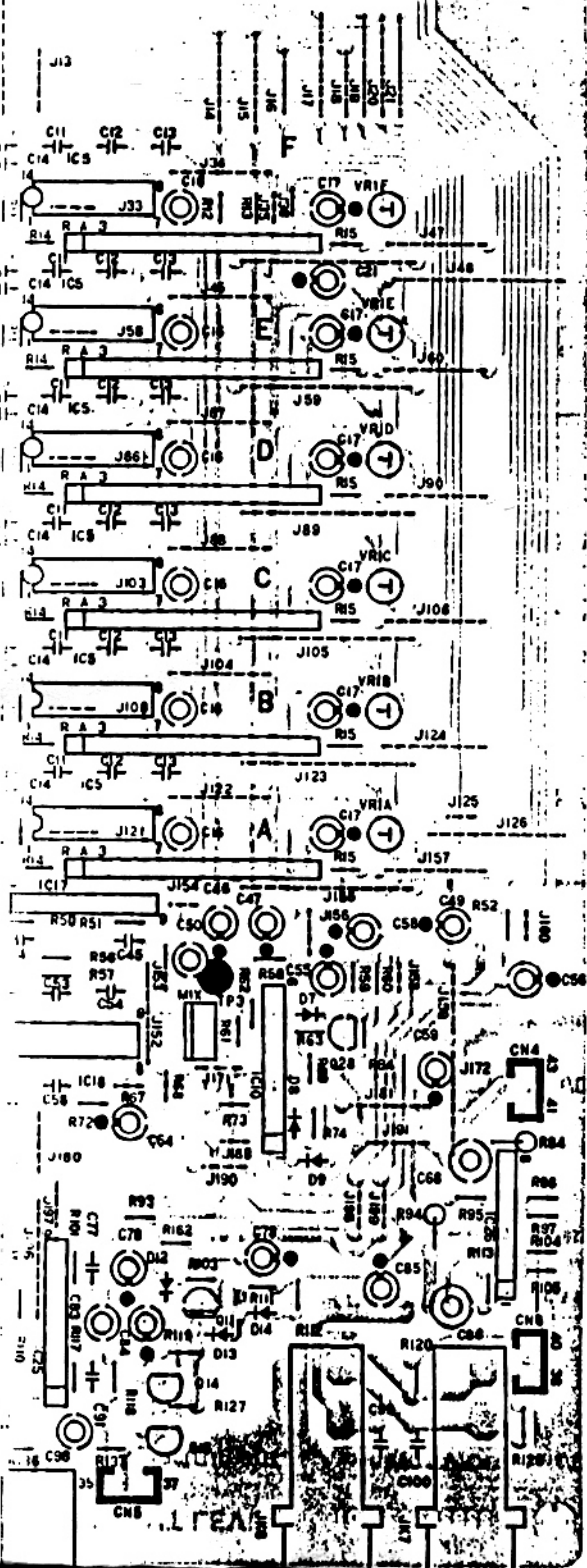
Fuse Board
7936906100 100/117V
7936906400 220/240V
 (pcb 2292540701 3/4)



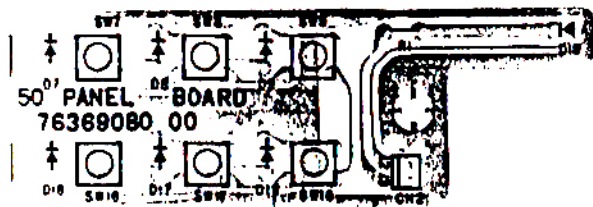
View from component side

F1		
12559412	SD6 200mA	100/117V
12559538	CEE-100mAT	220/240V

ASSY 79369101 01 (100/117V)
ASSY 79369104 01 (220/240V)



Panel Board
7636908000
(pcb 2292540701 2/4)



View from foil side

EXPLODED VIEW / 分解図

No	PART NAME (部品名)		PART. NO.
1	Front Panel	フロント・パネル	(222155300)
2	Knob	ボリュウム・ツマミ	(2247026200)
3	Jack Holder	ジャック・ホルダ	(22195917)
4	Phone Board	フォン・ボード	(7936914000)
5	Panel Bracket	パネル・ホルダー	(22195916)
6	LCD Cover	LCD カバー	(22025782)
7	Button Assy A	ボタン組立品 A	(22475966)
8	Button Assy B	ボタン組立品 B	(22475967)
9	Button Assy C	ボタン組立品 C	(22475968)
10	Button Assy D	ボタン組立品 D	(22475969)
11	Escutcheon	エスカッション	(2222031900)
12	Button	AC スイッチ・ボタン	(2247024000)
13	Panel Board	パネル・ボード	(7936908000)
14	LCD Unit	LCD ユニット	(15029441)
15	Top Cover	トップ・カバー	(22025330)
16	Rack Angle	アングル	(2212356800)
17	Bracket	AC スイッチ・ホルダー	(22195919)
18	Fuse Board	ヒューズ・ボード	100/117V (7936906100) 220/240V (7936906400)
19	Insulating Shield	絶縁 シート	(22345216)
20	AC Inlet	AC インレット	117/220V (13429710) 240V (13429709)
	Cord Bushing	コード・フッシュ	100V (12369504)
	Cord Holder	コード・ホルダー	100V (22195744)
21	Bottom Cover	ボトム・カバー	(22025331)
22	Sleeve	AC スイッチ・スリーブ	(2215040400)
23	Extension Shaft	AC スイッチ・アーム	(2214021900)
24	Power Transformer	トランス	100/117V (22455467N0)
			220/240V (22455466D0)
25	Main Board	メイン・ボード	100/117V (7936910101)
			220/240V (7636910401)
26	Center Bracket	センター・ホルダー	(22195918)
27	Rubber Foot	ゴム足	(2235031300)