

DENON

SERVICE MANUAL

ELECTRONIC PIANO

MODEL EP-3000

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NIPPON COLUMBIA CO., LTD.

IMPORTANT TO SAFETY

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:

1. Handle the power supply cord carefully

Do not damage or deform the power supply cord. If it is damaged or deformed, it may cause electric shock or malfunction when used. When removing from wall outlet, be sure to remove by holding the play attachment and not by pulling the cord.

2. Do not open the top cover

In order to prevent electric shock, do not open the cover. If problems occur, contact your authorized dealer.

3. Do not place anything inside

Do not place metal objects or spill liquid inside INSTRUMENTS. Electric shock or malfunction may result.

Please, record and retain the Model name and serial number of your INSTRUMENTS shown on the rating label.

Model No. EP-3000

NOTE: To allow you to enjoy music at a stable operation, it is recommended to use this in a room 10°C~35°C.

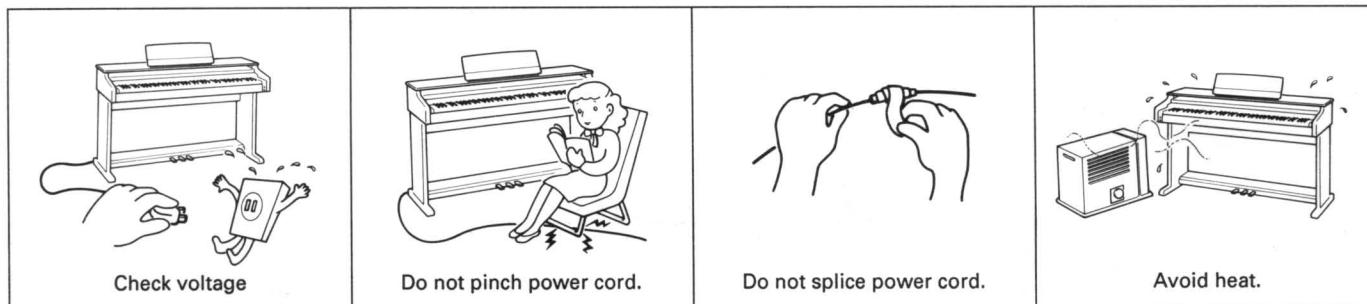
SAFETY INSTRUCTIONS FOR ELECTRONIC PIANO

■ INSTALLATION

- Operate the INSTRUMENTS only from a power source which is indicated on the rating label (indication) at the back of the INSTRUMENTS.
- Prayed cords and broken plugs may cause a fire or shock hazard.
 - Do not damage the power cord.
 - Do not cut and splice the power cord.
 - When removing the power cord from wall outlet, be sure to unplug by holding the play attachment and not by pulling the cord. Do not hold the plug with wet hands.
 - Call your service technician for replacement of damaged cords and plugs.

- Select a place so that the location or position does not interfere with the proper ventilation of the INSTRUMENTS for releasing heat generated during operation.

- Select a flat and level surface allowing enough space for setting up and operation.
- Never block the bottom ventilation holes placing the INSTRUMENTS on a bed, sofa, rug etc.
- Never place the INSTRUMENTS in a "built-in" enclosure unless proper ventilation is provided.
- Never place the INSTRUMENTS near a radiator, heat register or stove.
- Avoid locations where the INSTRUMENTS is exposed directly to the sun light.



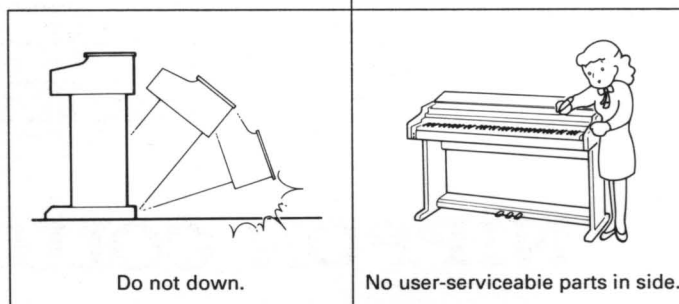
■ USE

- Do not expose the INSTRUMENTS to rain or water (liquid). Do not spill liquid or insert metal objects inside the set. Rain, water or liquid such as cosmetics as well as metal may cause electric shorts which can result in fire or shock hazard. If anything gets inside, unplug the power cord and have a authorized service technician check your set before further use.
- Never leave your INSTRUMENTS switched on when leaving the house. For added protection of your audio system during lightning storm or when the INSTRUMENTS is to be left unused for a long period of time, be sure to unplug the power cord from the wall outlet.
- Take care so that the INSTRUMENTS is not dropped to avoid damaging the cabinet which defeats safeguards or injuring yourself. If the INSTRUMENTS has been dropped or the cabinet has been damaged, unplug the INSTRUMENTS and have it checked by a authorized service technician to restore the safeguards.



■ SERVICING

- The servicing of the INSTRUMENTS must not be attempted by yourself beyond that described in the operating instructions. In case of problems that cannot be settled by referring to your operating instructions, unplug the power cord and contact your authorized dealer. No user serviceable parts are inside the INSTRUMENTS. Only qualified service technician can service inside your INSTRUMENTS.
- Refer to the operating instructions for maintenance and cleaning.



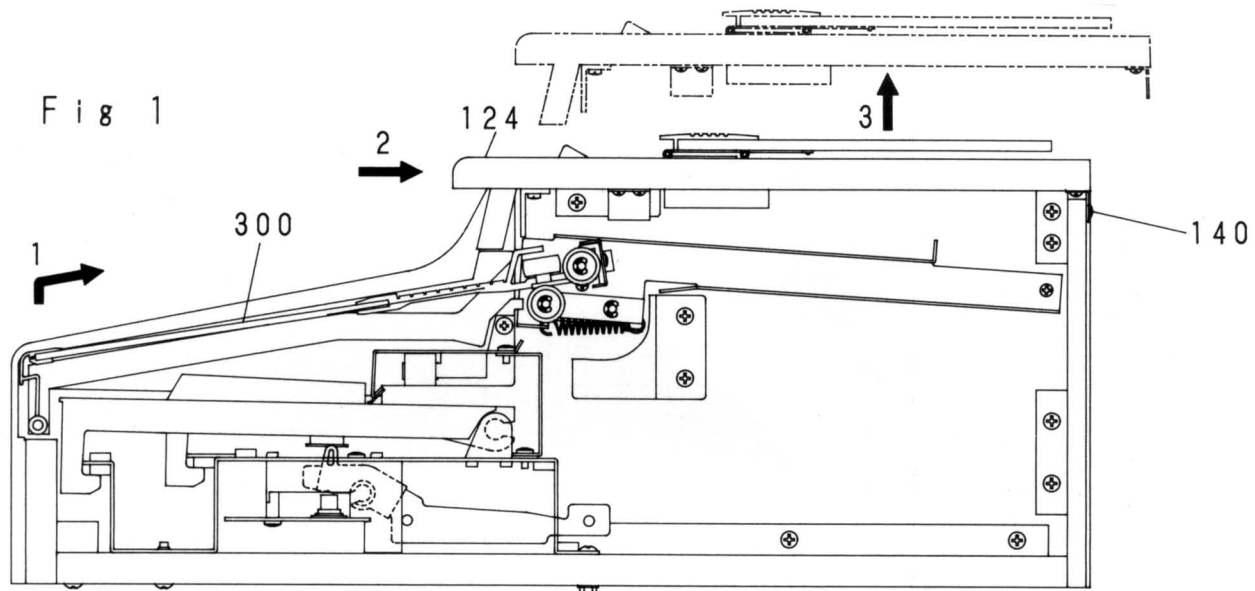


Fig 4

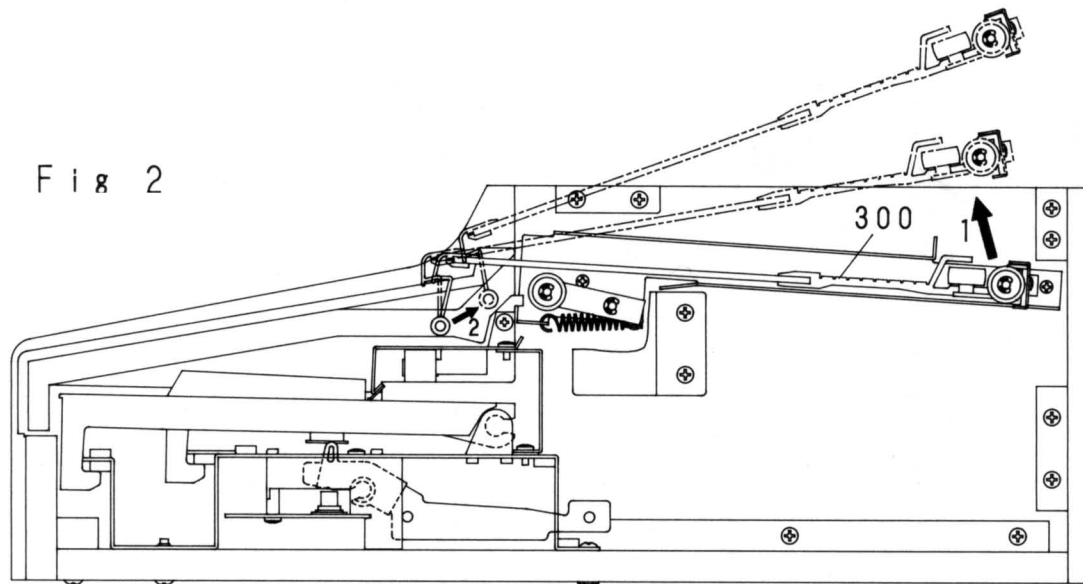
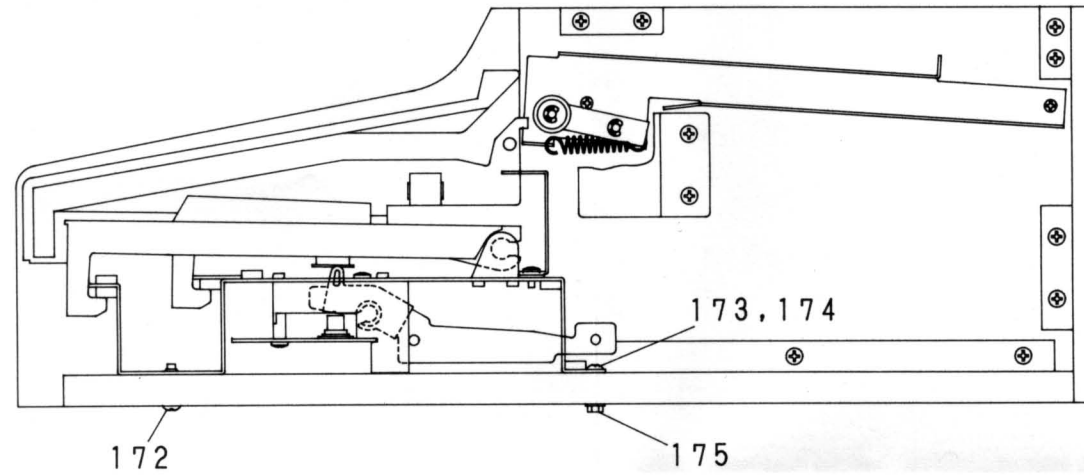
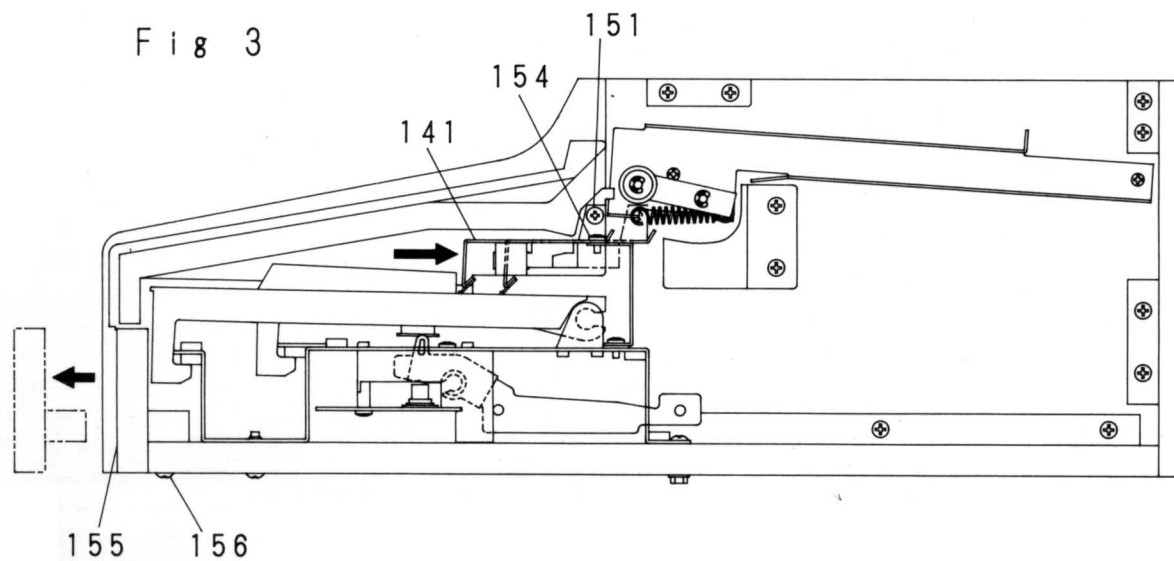


Fig 3



How to disassemble the cabinet.

1. Remove the roof board. (Fig.1)
 - 1) Move the lid ass'y 300 backward. (Arrow 1)
 - 2) Remove eight screws 140 (3 × 10 CBTS (1)).
 - 3) Remove roof board 124 in the arrow 3 direction by moving it in the arrow 2 direction.
2. Remove the lid ass'y. (Fig.2)
 - 1) Move the lid ass'y 300 backward, and lift its rear part toward arrow 1.
 - 2) Remove the lid ass'y by moving its front part toward arrow 2.
3. Remove the top panel semi-ass'y and front board ass'y.
 - 1) Remove right and left screws 151 (3.5 × 30 CTTS (1)), one each, and screw 154 (3 × 6 CBTS (s), 5pc.), and remove the top panel semi-ass'y 141 removing it toward the arrow.
 - 2) Remove five screws 156 (3.5 × 25 CTTS (1)), and remove the front board ass'y 155 toward the arrow.
4. Remove the keyboard unit. (Fig.4)
 - 1) Remove five screws 172 (4 × 20 CTS), two screws 174 (4 × 20 CTS), two nuts 175 (4NUT-W), and thirteen screws 173 (4 × 12CTTS (1).)

PARTS LIST OF EXPLODED VIEW

EP-3000 (Limited Edition)

No.	Parts Name	Europe		Canada, U.S.A.	
		Q'ty	Part No.	Q'ty	Part No.
1~34	KEY UNIT	(1)	KEY-148	(1)	←
101	SIDE BOARD (L) SEMI ASS'Y	(1)	1077356003	(1)	←
102	GUIDE RAIL (L) ASS'Y	(1)	4097016605	(1)	←
a	GUIDE RAIL (L) SEMI ASS'Y	1	4097015305	1	←
b	ROLLER ARM ASS'Y	1	4307104304	1	←
c	ROLLER ARM	1	4337003006	1	←
d	ROLLER SHAFT (C)	1	4227004005	1	←
e	GUIDE ROLLER (A)	1	4217001102	1	←
f	ROLLER ARM SPRING	1	4367293103	1	←
g	3 E RING	1	4761003009	1	←
103	3x12 CFTS (1)	2	4732306010	2	←
104	COVER GUIDE (L)	1	4097011516	1	←
105	3.5x20 CTTS (1)	3	4734806039	3	←
106	PROTECTION BRACKET	1	4097019000	1	←
107	3.5x12 CBTS (1)	2	4733804045	2	←
108	SIDE BOARD (R) SEMI ASS'Y	(1)	1077359000	(1)	←
109	GUIDE RAIL (R) ASS'Y	(1)	4097018603	(1)	←
a	GUIDE RAIL (R) SEMI ASS'Y	1	4097017303	1	←
b	ROLLER ARM ASS'Y	1	4307104304	1	←
c	ROLLER ARM	1	4337003006	1	←
d	ROLLER SHAFT (C)	1	4227004005	1	←
e	GUIDE ROLLER (A)	1	4217001102	1	←
f	ROLLER ARM SPRING	1	4367293103	1	←
e	3 E RING	1	4761003009	1	←
110	3x12 CFTS (1)	2	4732306010	2	←
111	COVER GUIDE (R)	1	4097012418	1	←
112	3.5x20 CTTS (1)	3	4734806039	3	←
113	PROTECTION BRACKET	1	4097019000	1	←
114	3.5x12 CBTS (1)	2	4733804045	2	←
115	BOTTOM BOARD	1	1077362107	1	←
a	SP NUT (M4)	4	SC-1123-1	4	←
b	SP NUT (M6)	4		4	←
116	LOCKING SUPPORT	8	4498079005	8	←
117	BOTTOM CUSHION	1	1247090034	1	←
118	RUBBER FOOT	4	1047037006	4	←
119	3.1x16 CRWS (W)	4	4700035009	4	←
120	FIX BOLT (M4x30)	8	SC-1136J-1	8	←
121	EARTH BRACKET (L)	2	4127179001	2	←
122		-		-	
123	EARTH BRACKET (R)	1	4733804003	1	←
124	EARTH BRACKET (S)	1	4127180100	1	←
125	3.5x10 CBTS (1)	14	4733804003	14	←
126-1	ROOF BOARD ASS'Y	(1)	1077411100	(1)	←
126-2	ROOF BOARD SEMI ASS'Y	(1)	1077365201	(1)	←
127	ROOF BOARD	1	1077366006	1	←
128	ANGLE BRACKET	4	4037010001	4	←
129	3x12 CBRTS (1)	8	4730306012	8	←
130	ROOF BOARD BRACKET	2	2010023J	2	←
131	3x12 CBRTS (1)	4	4730306012	4	←
132	MUSIC STOPPER	1	4397035108	1	←
133	3x18 CBTS (P)	4	4737500060	4	←
134	3.5 W	4	4751134001	4	←
135	SCORE HOLDER	1	4397022124	1	←
136	SCORE HINGE	2	4017022111	2	←
137	3x6 CBTS (P)	4	4737508004	4	←
138	SCORE SUPPORT	1	1037055014	1	←
139	PROTECTION SHEET	2	1247123008	2	←
140	3x10 CBTS (1)	4	4733814006	4	←
141	REAR BOARD ASS'Y	1	1077417007	1	←
142	3.5x20 CTTS (1)	9	4734806000	9	←
143		-		-	
144		-		-	
145	3x10 CBTS (1)	8	4733814006	8	←
146	T.P SUPPORTER	1	4337004005	1	←
147	3x6 CBTS (S)	1	4737002034	1	←
148	3x6 CBTS (S)	1	4737002034	1	←
149	TOP PANEL SEMI ASS'Y	(1)	1027216203	(1)	←
a	TOP PANEL	1	1027217008	1	←
b	KEY FELT	1	1247095068	1	←
c	SPEAKER HIMERON	2	1227032009	2	←
150	PT-1 (TWEETER)	2	3017023006	2	←
151	3 NUT-W	4	SC-1082-2	4	←
152	6 WASHER	4	4777038000	4	←
153	SWITCH BUTTON	1	1137030104	1	←
154	SWITCH BUTTON (S)	1	1137032005	1	←
155	SWITCH BUTTON (S)	1	1137032018	1	←
156	3x6 CBTS (S)	9	4737002034	9	←
157	3.5x30 CTTS (1)	2	4734806042	2	←
158	FRONT BOARD ASS'Y	1	1077367005	1	←
159	3.5x25 CTTS (1)	5	4734804002	5	←
160	MAIN BOARD UNIT	1	3997011015	1	←
161	CONTROL BOARD UNIT	1	3997008002	1	←
162		-		-	
163	POWER BOARD UNIT	1	3997009014	1	←
164	3.5x10 CBTS (1)	4	4733804003	4	←
165	L/FILTER BOARD UNIT	1	BP-393-3	1	BP-393-2

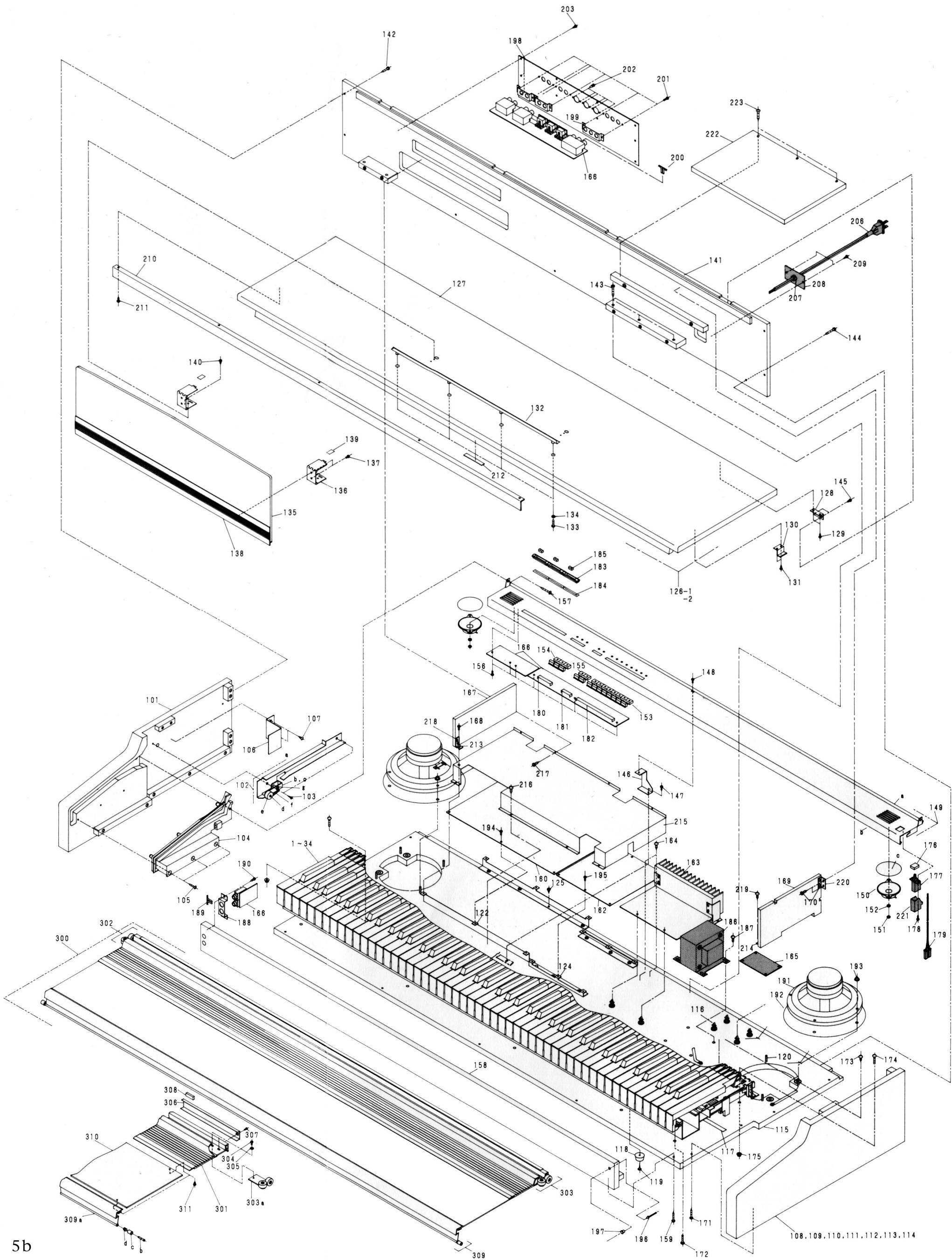
No.	Parts Name	Europe		Canada, U.S.A.	
		Q'ty	Part No.	Q'ty	Part No.
166	MULTIPLEX P. C. B UNIT	1	BP-410-3	1	←
167	PARTITION BOARD (L)	1	1077426001	1	←
168	3x8 CBTS (S)	1	4737002018	1	←
169	PARTITION BOARD (R)	1	1077428009	1	←
170	3x8 CBRS (1)	8	4730304014	8	←
171	3.5x25 CTTS (1)	8	4734804002	8	←
172	4x20 CTS	5	4714410021	5	←
173	4x12 CTTS (1)	13	4734406015	13	←
174	4x20 CTS	2	4714410021	2	←
175	4 NUT-W	2	4756131009	2	←
176	PUSH BUTTON	1	1137015048	1	←
△	177 POWER SWITCH	1	2128590018	1	←
178	3x6 CBTS (S)	1	4737002034	1	←
△	179 SW. CONNECTOR ASS'Y	1	2033505114	1	←
180	BLIND SHEET	1	1227029177	1	←
181	BLIND SHEET	1	1227029135	1	←
182	BLIND SHEET	1	1227029164	1	←
183	VOLUME PANEL	3	1037092103	3	←
184	BLIND SHEET	3	1227027108	3	←
185	SLIDE VOLUME KNOB	3	1137031103	3	←
△	186 POWER TRANS	1	2333537002	1	←
187	4x14 CTS	4	4714408017	4	←
188	H/J BRACKET	1	4127165002	1	←
189	SNAP PLATE	1		1	←
190	3.5x12 CBTS (1)	2	4733804045	2	←
191	16RG03M (SPEAKER)	2	3017017009	2	←
192	SPEAKER NET	2	1097035003	2	←
193	4 NUT-W	8	SC-1050H	8	←
194	3x6 CBTS (S)	6	4777002034	6	←
195	3x6 CBTS (S)	6	4777002034	6	←
196	LED ASS'Y	1	3937018094	1	←
197	LED BUSHING	1	4430310007	1	←
198	AUX PANEL	1	1027193009	1	←
199	JACK BRACKET	1	4127185008	1	←
200	SNAP PLATE	3		3	←
201	3x8 CBTS (S)	6	4737002021	6	←
202	PUSH RIVET	6	4770210003	6	←
203	3x10 CBTS (1)	8	4733814006	8	←
204	BLIND BOARD	1	1077429008	1	←
205	3x10 CBTS (1)	6	4733814006	6	←
△	206 AC CORD WITH PLUG	1	2062002031	1	2062021009
△	207 BUSHING	1	MD-3802	1	←
208	BUSHING PLATE	1	4127121017	1	←
209	3x10 CBTS (1)	2	4733814006	2	←
210	REFORM RAIL	1	4097020206	1	←
211	3.5x12 CBTS (1)	5	4733804045	5	←
212	PROTECTION SHEET	1	1247118000	1	←
213	STAY ANGLE (L)	1	GCF7049H	1	←
214	STAY ANGLE (R)	1	GCF7050H	1	←
215		-		-	
216		-		-	
217		-		-	
218	3x8 CBRTS (1)	4	4730304014	4	←
219	3.5x10 CBTS (1)	1	4733804003	1	←
220	ANGLE BRACKET	2	4037010001	2	←
△	221 SWITCH COVER	-		1	4157006005
300	LID ASS'Y	(1)	1037094004	(1)	←
301	REAR LID	1	1037054316	1	←
302	R/BRACKET (L) ASS'Y	(1)	4397025406	(1)	←
a	ROLLER BRACKET (L)	1	4397033003	1	←
b	GUIDE ROLLER (A)	2	4217001102	2	←
c	ROLLER SHAFT (C)	2	4227004005	2	←
303	R/BRACKET (R) ASS'Y	(1)	4397026405	(1)	←
a	ROLLER BRACKET (R)	1	4397033016	1	←
b	GUIDE ROLLER (A)	2	4217001102	2	←
c	ROLLER SHAFT (C)	2	4227004005	2	←
304	3x8 CBTS (S)	4	4737002018	4	←
305	3 W	4	4751003006	4	←
306	COVER SUPPORTER	1	4337005004	1	←
307	3x6 CBTS (P)	5	4737500002	5	←
308	PANEL FELT	2	1247096025	2	←
309	FRONT LID ASS'Y	(1)	1037095003	(1)	←
a	FRONT LID	1	1037052211	1	←
b	ROLLER SHAFT (B)	2	4227002201	2	←
c	GUIDE ROLLER (B)	2	4217002004	2	←
d	SPRING	2	4367294102	2	←
310	WINDOW	1	1037053304	1	←
311	3x5 CBTS (B)	14	4733814006	14	←

PARTS LIST OF EXPLODED VIEW

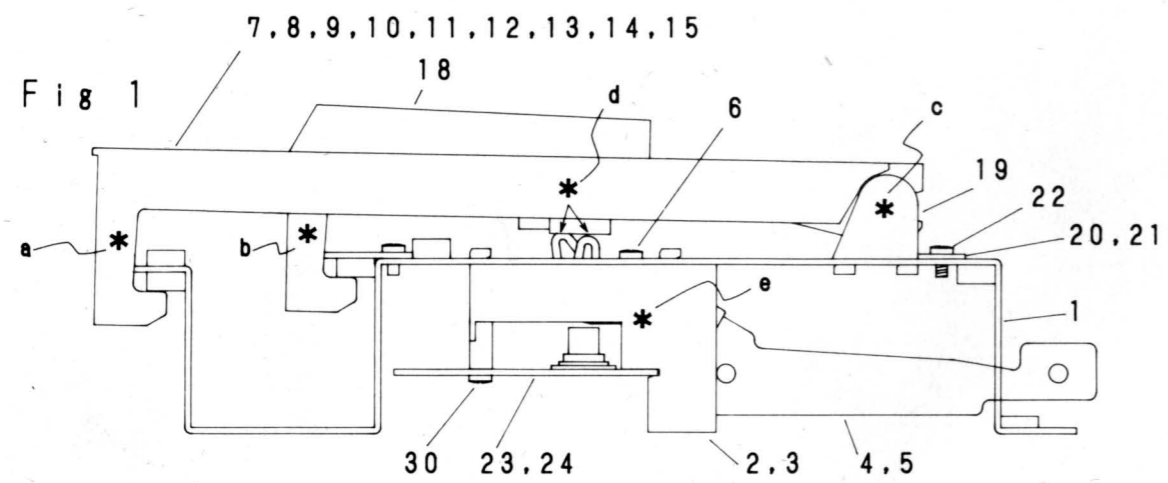
EP-3000

No.	Parts Name	Europe		Canada, U.S.A.	
		Q'ty	Part No.	Q'ty	Part No.
1-34	KEY UNIT	(1)	KEY-148	(1)	←
101	SIDE BOARD (L) SEMI ASS'Y	(1)	1077356003	(1)	←
102	GUIDE RAIL (L) ASS'Y	(1)	4097016605	(1)	←
a	GUIDE RAIL (L) SEMI ASS'Y	1	4097015305	1	←
b	ROLLER ARM ASS'Y	1	4307104304	1	←
c	ROLLER ARM	1	4337003006	1	←
d	ROLLER SHAFT (C)	1	4227004005	1	←
e	GUIDE ROLLER (A)	1	4217001102	1	←
f	ROLLER ARM SPRING	1	4367293103	1	←
g	3 E RING	1	4761003009	1	←
103	3x12 CFTS (1)	2	4732306010	2	←
104	COVER GUIDE (L)	1	4097011516	1	←
105	3.5x20 CTTS (1)	3	4734806039	3	←
106	PROTECTION BRACKET	1	4097019000	1	←
107	3.5x12 CBTS (1)	2	4733804045	2	←
108	SIDE BOARD (R) SEMI ASS'Y	(1)	1077359000	(1)	←
109	GUIDE RAIL (R) ASS'Y	(1)	4097018603	(1)	←
a	GUIDE RAIL (R) SEMI ASS'Y	1	4097017303	1	←
b	ROLLER ARM ASS'Y	1	4307104304	1	←
c	ROLLER ARM	1	4337003006	1	←
d	ROLLER SHAFT (S)	1	4227004005	1	←
e	GUIDE ROLLER (A)	1	4217001102	1	←
f	ROLLER ARM SPRING	1	4367293103	1	←
g	3 E RING	1	4761003009	1	←
110	3x12 CFTS (1)	2	4732306010	2	←
111	COVER GUIDE (R)	1	4097012418	1	←
112	3.5x20 CTTS (1)	3	4734806039	3	←
113	PROTECTION BRACKET	1	4097019000	1	←
114	3.5x12 CBTS (1)	2	4733804045	2	←
115	BOTTOM BOARD	1	1077410305	1	←
115a	SP NUT (M4)	4	SC-1123-1	4	←
115b	SPNUT (M6)	4		4	←
116	LOCKING SUPPORT	8	4498079005	8	←
117	BOTTOM CUSHION	1	1247090034	1	←
118	RUBBER FOOT	4	1047037006	4	←
119	3.1x16 CRWS (W)	4	4700035009	4	←
120	FIX BOLT (M4x30)	8	SC-1136J-1	8	←
121		—		—	
122	EARTH BRACKET (A)	2	4127196000	2	←
123		—		—	
124	EARTH BRACKET (S)	2	4127180100	2	←
125	3.5x10 CBTS (1)	14	4733804003	14	←
126-1	ROOF BOARD ASS'Y	(1)	1077411100	(1)	←
126-2	ROOF BOARD SEMI ASS'Y	(1)	1077365201	(1)	←
127	ROOF BOARD	1	1077366006	1	←
128	ANGLE BRACKET	4	4037010001	4	←
129	3x12 CBRTS (1)	8	4730306012	8	←
130	ROOF BOARD BRACKET	2	2010023J	2	←
131	3x12 CBRTS (1)	4	4730306012	4	←
132	MUSIC STOPPER	1	4397035108	1	←
133	3x18 CBTS (P)	4	4737500060	4	←
134	3.5 W	4	4751134001	4	←
135	SCORE HOLDER	1	4397022111	1	←
136	SCORE HINGE	2	4017027108	2	←
137	3x6 CBTS (P)	4	4737508004	4	←
138	SCORE SUPPORT	1	1037055014	1	←
139	PROTECTION SHEET	2	1247123008	2	←
140	3x10 CBTS (1)	4	4733814006	4	←
141	REAR BOARD ASS'Y	1	1077412206	1	←
142	3.5x20 CTTS (1)	4	4734806000	4	1077423004
143	3.5x25 CTTS (1)	5	4734806026	5	←
144	3.5x25 CTTS (1)	5	4734804002	5	←
145	3x10 CBTS (1)	8	4733814006	8	←
146	T.P SUPPORTER	1	4337004005	1	←
147	3x6 CBTS (S)	1	4737002034	1	←
148	3x6 CBTS (S)	1	4737002034	1	←
149	TOP PANEL SEMI ASS'Y	(1)	1027216216	(1)	←
a	TOP PANEL	1	1027217008	1	←
b	KEY FELT	1	1247095068	1	←
c	SPEAKER HIMERON	2	1227032009	2	←
150	PT-1 (TWEETER)	2	3017023006	2	←
151	3 NUT-W	4	SC-1082-2	4	←
152	6 WASHER	4	4777038000	4	←
153	SWITCH BUTTON	1	1137030104	1	←
154	SWITCH BUTTON (S)	1	1137032005	1	←
155	SWITCH BUTTON (S)	1	1137032018	1	←
156	3x6 CBTS (S)	12	4737002034	12	←
157	3.5x30 CTTS (1)	2	4734806042	2	←
158	FRONT BOARD ASS'Y	1	1077367005	1	←
159	3.5x25 CTTS (1)	5	4734804002	5	←
160	MAIN BOARD UNIT	1	BP-416	1	←
161		—		—	
162	EFFECT BOARD UNIT	1	BP-414	1	←
163	POWER BOARD UNIT	1	BP-415-1E2	1	BP-415-1EU
164	3.5x10 CBTS (1)	4	4733804003	4	←
165	L/FILTER BOARD UNIT	1	BP-393-3	1	BP-393-2

No.	Parts Name	Europe		Canada, U.S.A.	
		Q'ty	Part No.	Q'ty	Part No.
166	MULTIPLEX P. C. B UNIT	1	BP-410-2	1	←
167	PARTITION BOARD (L)	1	1077427000	1	←
168	3x8 CBTS (S)	1	4737002018	1	←
169	PARTITION BOARD (R)	1	1077428009	1	←
170	3x8 CBRS (1)	8	4730304014	8	←
171	3.5x25 CTTS (1)	8	4734804002	8	←
172	4x20 CTS	5	4714410021	5	←
173	4x12 CTTS (1)	13	4734406015	13	←
174	4x20 CTS	2	4714410021	2	←
175	4 NUT-W	2	4756131009	2	←
176	PUSH BUTTON	1	1137015048	1	←
177	POWER SWITCH	1	2128590018	1	←
178	3x6 CBTS (S)	1	4737002034	1	←
179	SW. CONNECTOR ASS'Y	1	2033505114	1	←
180	BLIND SHEET	1	1227029177	1	←
181	BLIND SHEET	1	1227029135	1	←
182	BLIND SHEET	1	1227029164	1	←
183	VOLUME PANEL	3	1037092103	3	←
184	BLIND SHEET	3	1227027108	3	←
185	SLIDE VOLUME KNOB	3	1137031103	3	←
186	POWER TRANS	1	2333537002	1	←
187	4x14 CTS	4	4714408017	4	←
188	H/J BRACKET	1	4127165002	1	←
189	SNAP PLATE	1		1	
190	3.5x12 CBTS (1)	2	4733804045	2	←
191	16RG03M (SPEAKER)	2	3017017009	2	←
192	SPEAKER NET	2	1097035003	2	←
193	4 NUT-W	8	SC-1050H	8	←
194	3x6 CBTS (S)	6	4777002034	6	←
195	3x6 CBTS (S)	6	4777002034	6	←
196	LED ASS'Y	1	3937018094	1	←
197	LED BUSHING	1	4430310007	1	←
198	AUX PANEL	1	1027225100	1	←
199	JACK BRACKET	1	4127185008	1	←
200	SNAP PLATE	3		3	
201	3x8 CBTS (S)	6	4737002021	6	←
202	PUSH RIVET	6	4770210003	6	←
203	3x10 CBTS (1)	11	4733814006	11	←
204		—		—	
205		—		—	
206	AC CORD WITH PLUG	1	2062002031	1	2062021009
207	BUSHING	1	4450047004	1	←
208	BUSHING PLATE	1	4127121017	1	←
209	3x10 CBTS (1)	2	4733814006	2	←
210	REFORM RAIL	1	4097020206	1	←
211	3.5x12 CBTS (1)	5	4733804045	5	←
212	PROTECTION SHEET	1	1247118000	1	←
213	STAY ANGLE (L)	1	GCF7049H	1	←
214	STAY ANGLE (R)	1	GCF7050H	1	←
215	SHIELD CASE	1	4147019206	1	←
216	3.5x10 CBTS (1)	4	4733804003	4	←
217	3x8 CBRTS (1)	4	4730304014	4	←
218	3x8 CBRTS (1)	4	4730304014	4	←
219	3.5x10 CBTS (1)	1	4733804003	1	←
220	ANGLE BRACKET	2	4037010001	2	←
221	SWITCH COVER	—		1	4157006005
222	PROTECTOR	—		1	1077421006
223	3.5x20 CTTS (1)	—		3	4734806000
300	LID ASS'Y	(1)	1037094004	(1)	←
301	REAR LID	1	1037054316	1	←
302	R/BACKET (L) ASS'Y	(1)	4397025406	(1)	←
a	ROLLER BRACKET (L)	1	4397033003	1	←
b	GUIDE ROLLER (A)	2	4217001102	2	←
c	ROLLER SHAFT (C)	2	4227004005	2	←
303	R/BACKET (R) ASS'Y	(1)	4397026405	(1)	←
a	ROLLER BRACKET (R)	1	4397033016	1	←
b	GUIDE ROLLER (A)	2	4217001102	2	←
c	ROLLER SHAFT (C)	2	4227004005	2	←
304	3x8 CBTS (S)	4	4737002018	4	←
305	3 W	4	4751003006	4	←
306	COVER SUPPORTER	1	4337005004	1	←
307	3x6 CBTS (P)	5	4737500002	5	←
308	PANEL FELT	2	1247096025	2	←
309	FRONT LID ASS'Y	(1)	1037095003	(1)	←
a	FRONT LID	1	1037052211	1	←
b	ROLLER SHAFT (B)	2	4227002201	2	←
c	GUIDE ROLLER (B)	2	4217002004	2	←
d	SPRING	2	4367294102	2	←
310	WINDOW	1	1037053304	1	←
311	3x5 CBTS (B)	14	4733814006	14	←



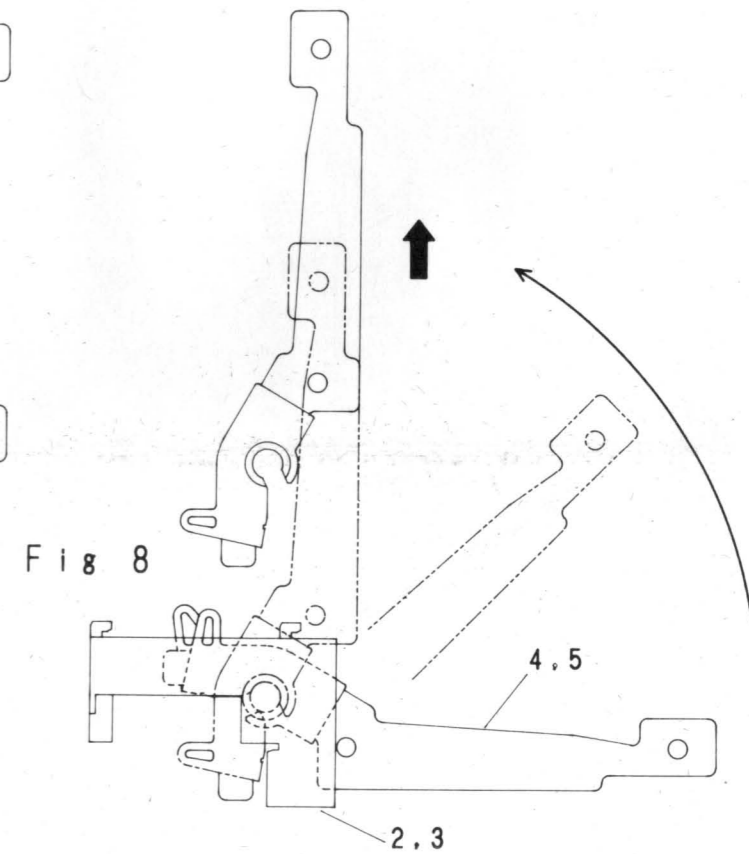
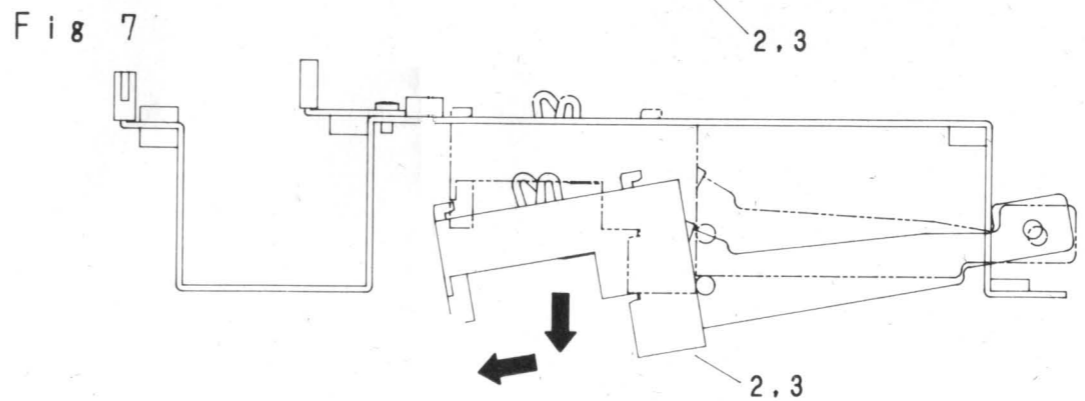
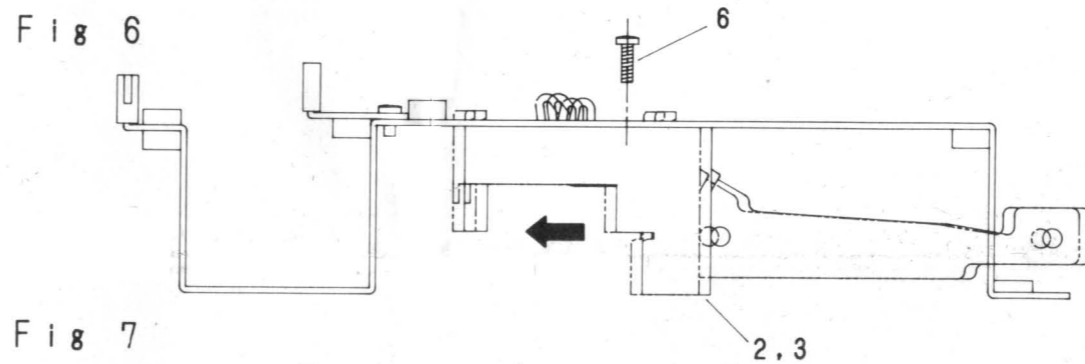
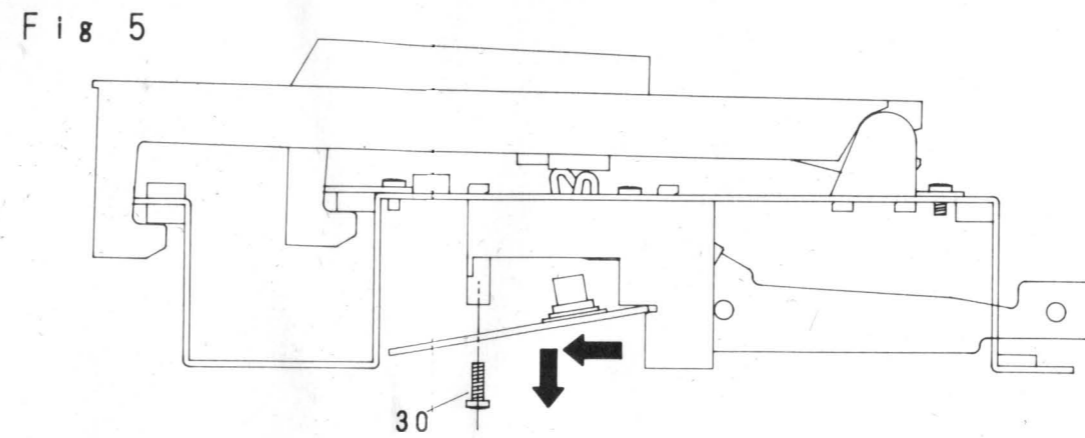
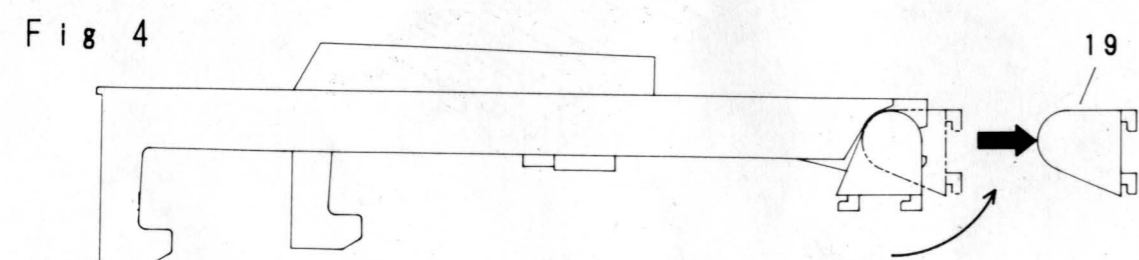
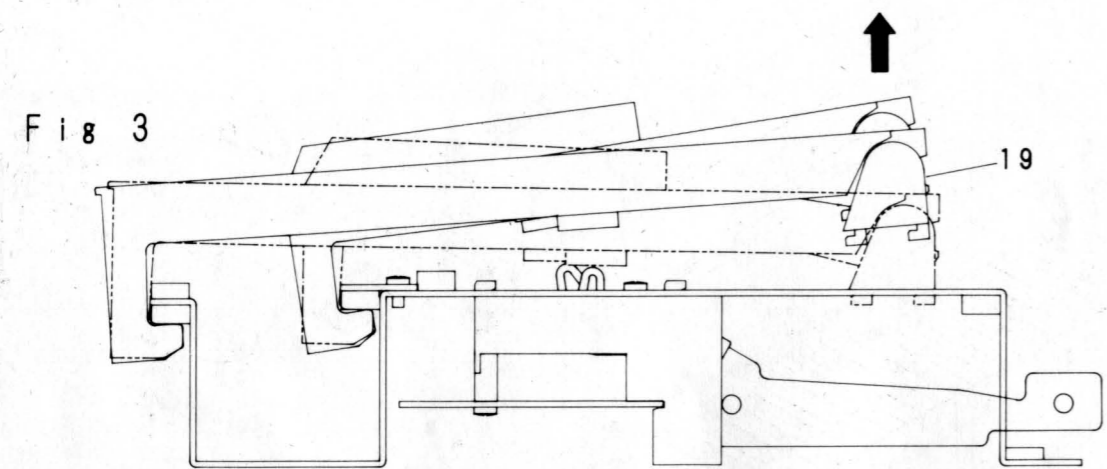
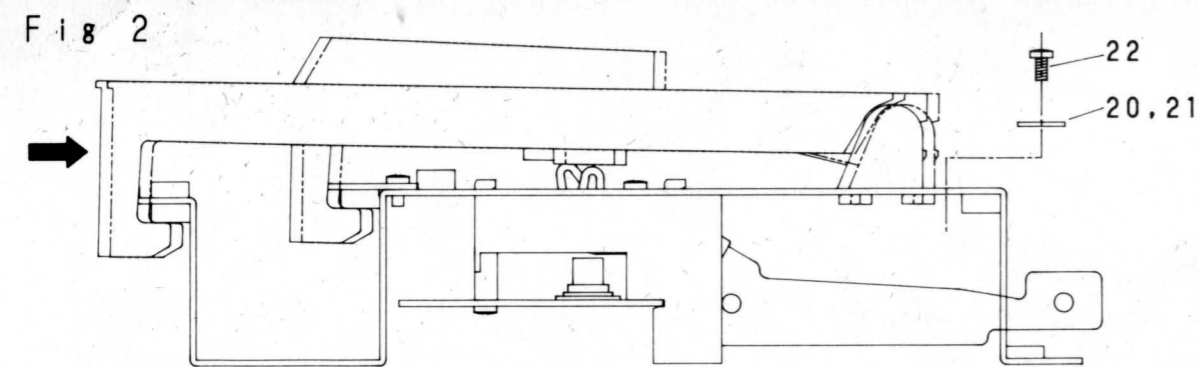
DISASSEMBLY OF KEY-148



Apply a coat of grease to the portions marked with (*).

- (a) Slide way inside the white key and key guide (w)
- (b) Slide way inside the black key and key guide (B)
- (c) Fit portion of key shaft and key
- (d) Slide way of hammer and slide cushion
- (e) Fit portion of hammer and hammer flange

Lubricate them with silicon grease SB-1. — Shinetsu silicone grease G30M
 — Shinetsu silicone oil KF96H 100,000CS — Mixing ratio: 1:1



How to disassemble the keyboard unit KEY-148 Sectional view (Fig. 1)

1. Remove the keyboard unit from the piano body.
2. How to remove the keyboard (Fig. 2, 3, and 4)
 - 1) After removing screws 22 remove K/S stoppers 20, 21. Push the keyboard toward the arrow. (Fig. 2)
 - 2) Remove the key together with key shaft 19 from the chassis ass'y by lifting the rear part of the key in the arrow direction. (Fig. 3)
 - 3) Remove the white key first, and then, the black key. For mounting them, mount the black key first.
 - 4) Remove the key shaft 19 backward by turning it 90° in the arrow direction. (Fig. 4)
3. How to remove the switch board. (Fig. 5)
 - 1) Remove screw 30, and then, remove the switch board by moving it toward the arrow.
 - 2) Removal of the keyboard is not necessary when removing the switch board only.
4. How to remove the hammer (Fig. 6, 7)
 - 1) Remove screws 6, and move the hammer flanges in the arrow direction. (Fig. 6)
 - 2) Remove hammer flanges 2, 3 (together with each hammer) by moving them in the arrow directions. (Fig. 7)
 - 3) For removing the hammer flanges, all screws 6 can be removed by removing five white/black keys of octave G-B, four white/black keys (key 76) on the low-pitched sound side and four white/black keys (keys 88) on the high-pitched sound side.
5. How to remove the hammers
 - 1) Remove hammer 4, 5 in the arrow direction by turning them upward by 90°.

Troubleshooting of Key-148

1. A keyboard does not return normally.

- a) The keyboard itself does not move normally.
- b) Its hammer does not function normally.
- c) Both keyboard and hammers function normally when they are not combined with each other, but they don't function normally together when they are combined with each other.

△ How to locate its cause

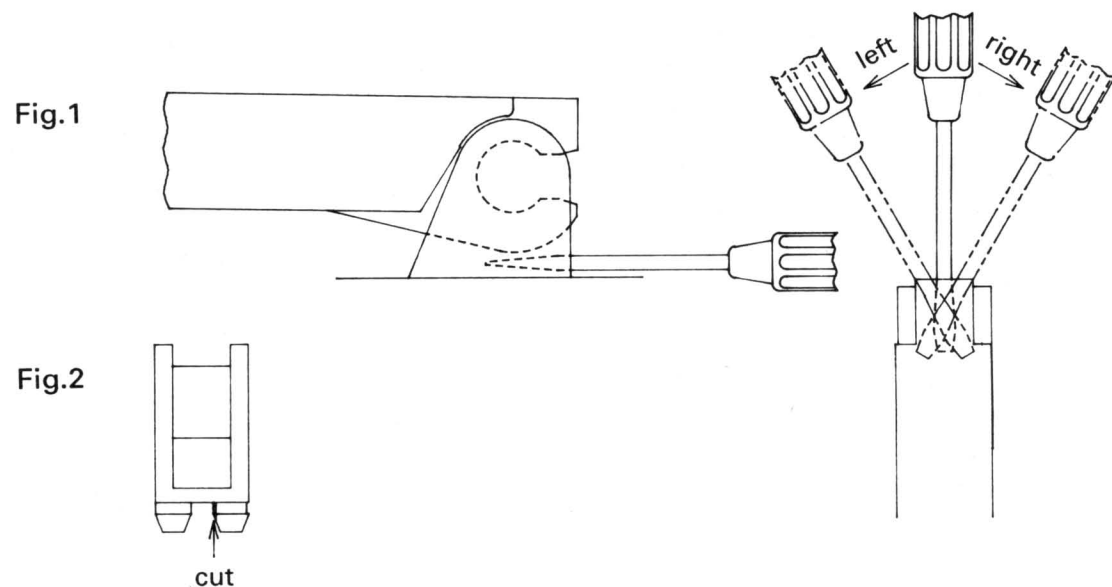
Lift the hammer tip. If the keyboard lowers due to its own weight, the trouble is not caused by (a).
 If the keyboard does not lower, the trouble is caused by (a).
 After fixing the keyboard under its lifted condition, lift the hammer up and down to check if a feeling of resistance of the hammer exists. If yes, the trouble is caused by (b).
 If the keyboard lowers due to its own weight without any feeling of resistance of the hammer, the trouble is caused by (c)

Causes of (a)

- 1) Malfunction due to the friction force between the key guide and the keyboard.

Repair method

Insert a small minus screwdriver into the key shaft rear part as shown in Fig.1, and position the key for normal movement while tilting it left ward or right ward.
 If the key shaft can fully adjusted right ward, but it cannot fully be adjusted left ward, cut the inside of the rear lead of the key shaft by using a cutter knife as shown in Fig.2.
 Fig.1 Left Right Fig.2 Cut



- 2) The fit portion of the key and the key shaft is not lubricated with grease.Apply a coat of grease SB-1.
- 3) The portion between the key and the key guide is not lubricated with grease.Apply a coat of a grease SB-1.
- 4) Tilting of key guide (in case of a black key, in particular).Repair the tilted condition.

Causes of (b)

- 1) Malfunction with the hammer flange due to the bending of hammer.Replace the hammer.
- 2) A contact to the chassis due to the bending of hammer.Replace the hammer.
- 3) A contact to the chassis due to the exfoliation of the hammer cushion.Replace the hammer cushion.
- 4) The fit portion of the hammer and hammer flange is not lubricated with grease.Apply a coat of grease. (SB-1)

Causes of (c)

- 1) Deformation of hammer (key contact part).Replace the hammer.
- 2) Wrinkle of slide cushion.Replace the slide cushion.

2. Action noises

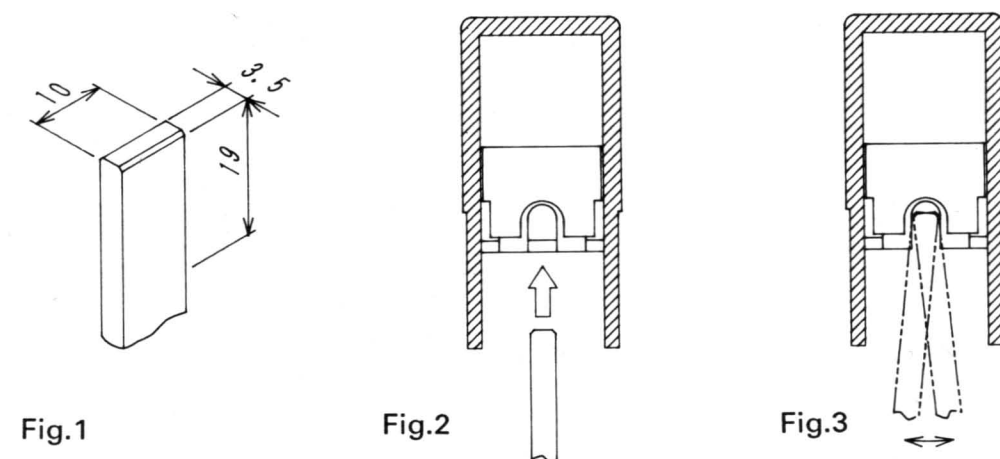
- 1) The fit portion of the key shaft and key is out lubricated with grease.
- 2) The fit portion SB-1 of the hammer and hammer flange is not lubricated with grease. SB-1
- 3) No slide cushion exists. (Either hammer or key lowers.)
- 4) A tightening failure of key guide rail screw (key touches the screw head when pressing it, or noises are produced when key returns).

3. Others

- 1) Key arrangement adjustment failure
- 2) Key fluctuates Key shaft is brokenReplace the key shaft.
- 3) Key shaft is unstable longitudinally.
- 4) Slide cushion is worn. Neither slide cushion nor hammer slide portion is lubricated with grease, or they are lubricated insufficiently.Apply a coat of grease (SB-1)

Adjusting method

- 1) This action is not adjustable basically, except for the horizontal key arrangement.
- 2) For adjusting the key arrangement, insert the tool shown in Fig.1 into the groove key guide as shown in Fig.2 and 3, and wrench the groove toward the desired moving direction.
 (After this adjustment lift each, and check if key moves normally.)



PARTS LIST OF KEYS (KEY-148 UNIT)

No.	Parts Name	KEY-148 (88 KEYS)			
		EP-3000 (Limited Edition)		EP-3000	
		Q'ty	Part No.	Q'ty	Part No.
1	KEY CHASSIS ASS'Y	(1)	4117100417	(1)	←
a	KEY CHASSIS	1	4117098202	1	←
b	KEY GUIDE RAIL	7	4367278005	7	←
c	KEY GUIDE RAIL (S)	1	4367286000	1	←
d	3×6 CBTS (S)	18	4737002034	18	←
e	KEY CUSHION	3	1247114004	3	←
f	KEY CUSHION	1	1247114017	1	←
g	KEY CUSHION	2	1247114046	2	←
h	KEY GUIDE (W)	52	4317003204	52	←
i	KEY GUIDE (B)	36	4317004203	36	←
2	HAMMER FLANGE	7	4367284109	7	←
3	HAMMER • FLANGE (S)	1	4367285108	1	←
4	HAMMER (W) ASS'Y	(52)	4367299107	(52)	←
a	HAMMER (W)	52	4367297109	52	←
b	HAMMER WEIGHT (W)	52	4367295004	52	←
c	HAMMER CUSHION	52	1247116002	52	←
5	HAMMER (B) ASS'Y	(36)	4367300106	(36)	←
a	HAMMER (B)	36	4367298108	36	←
b	HAMMER WEIGHT (B)	36	4367296003	36	←
c	HAMMER CUSHION	36	1247116002	36	←
6	3×10 CBTS (Bo)	16	4733814019	16	←
7	KEY ASS'Y (W)	(7)	4367290203	(7)	←
a	KEY A	7	4367265209	7	←
b	SLIDE CUSHION	7	1247115100	7	←
8	KEY ASS'Y (W)	(8)	4367301202	(8)	←
a	KEY B	8	4367266208	8	←
b	SLIDE CUSHION	8	1247115100	8	←
9	KEY ASS'Y (W)	(7)	4367301202	(7)	←
a	KEY C	7	4367262707	7	←
b	SLIDE CUSHION	7	1247115100	7	←
c	FENDER	7	1247122009	7	←
10	KEY ASS'Y (W)	(7)	4367290232	(7)	←
a	KEY D	7	4367268206	7	←
b	SLIDE CUSHION	7	1247115100	7	←
11	KEY ASS'Y (W)	(7)	4367290245	(7)	←
a	KEY E	7	4367269205	7	←
b	SLIDE CUSHION	7	1247115100	7	←

No.	Parts Name	KEY-148 (88 KEYS)			
		EP-3000 (Limited Edition)		EP-3000	
		Q'ty	Part No.	Q'ty	Part No.
12	KEY ASS'Y (W)	(7)	4367301215	(7)	←
a	KEY F	7	4367270207	7	←
b	SLIDE CUSHION	7	1247115100	7	←
c	FENDER	7	1247122009	7	←
13	KEY ASS'Y (W)	(7)	4367290261	(7)	←
a	KEY G	7	4367271206	7	←
b	SLIDE CUSHION	7	1247115100	7	←
14	KEY ASS'Y (W)	(1)	4367291202	(1)	←
a	KEY A'	1	4367272205	1	←
b	SLIDE CUSHION	1	1247115100	1	←
15	KEY ASS'Y (W)	(1)	4367301228	(1)	←
a	KEY C'	1	4367273204	1	←
b	SLIDE CUSHION	1	1247115100	1	←
c	FENDER	1	1247122009	1	←
16	—	—	—	—	←
17	—	—	—	—	←
18	KEY ASS'Y (B)	(36)	4367292308	(36)	←
a	KEY A#	36	4367276308	36	←
b	SLIDE CUSHION	36	1247115100	36	←
19	KEY SHAFT	88	4367277200	88	←
20	K/S STOPPER	7	4367279004	7	←
21	K/S STOPPER (S)	1	4367287009	1	←
22	3×6 CBTS (S)	16	4737002034	16	←
23	24 KEYS SWITCH BOARD	3	BP-380-2	3	←
24	16 KEYS SWITCH BOARD	1	BP-383-2	1	←
25	—	—	—	—	←
26	—	—	—	—	←
27	RUBBER SWITCH 8	11	2128598007	11	←
28	—	—	—	—	←
29	—	—	—	—	←
30	3×10 CBTS (Bo)	15	4733814019	15	←
31	CORD HOLDER	3	EP-4772	3	←
32	11P WIRE ASS'Y	1	2047430000	1	2047420117
33	6P WIRE ASS'Y	1	2041435014	1	←
34	10P WIRE ASS'Y	1	2045037010	1	←
35	CORD HOLDER	1	EP-6214	1	←

Fig 2

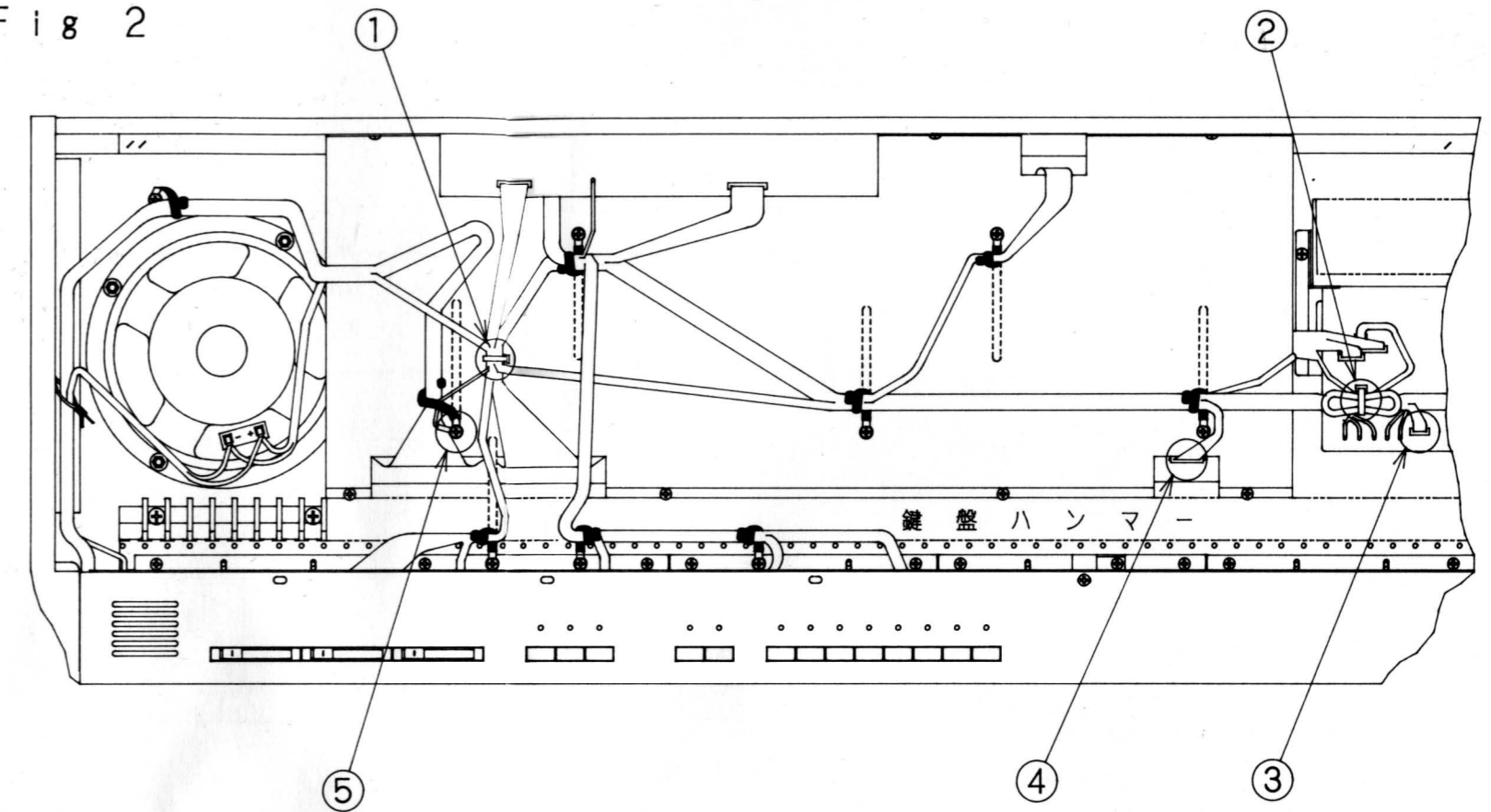
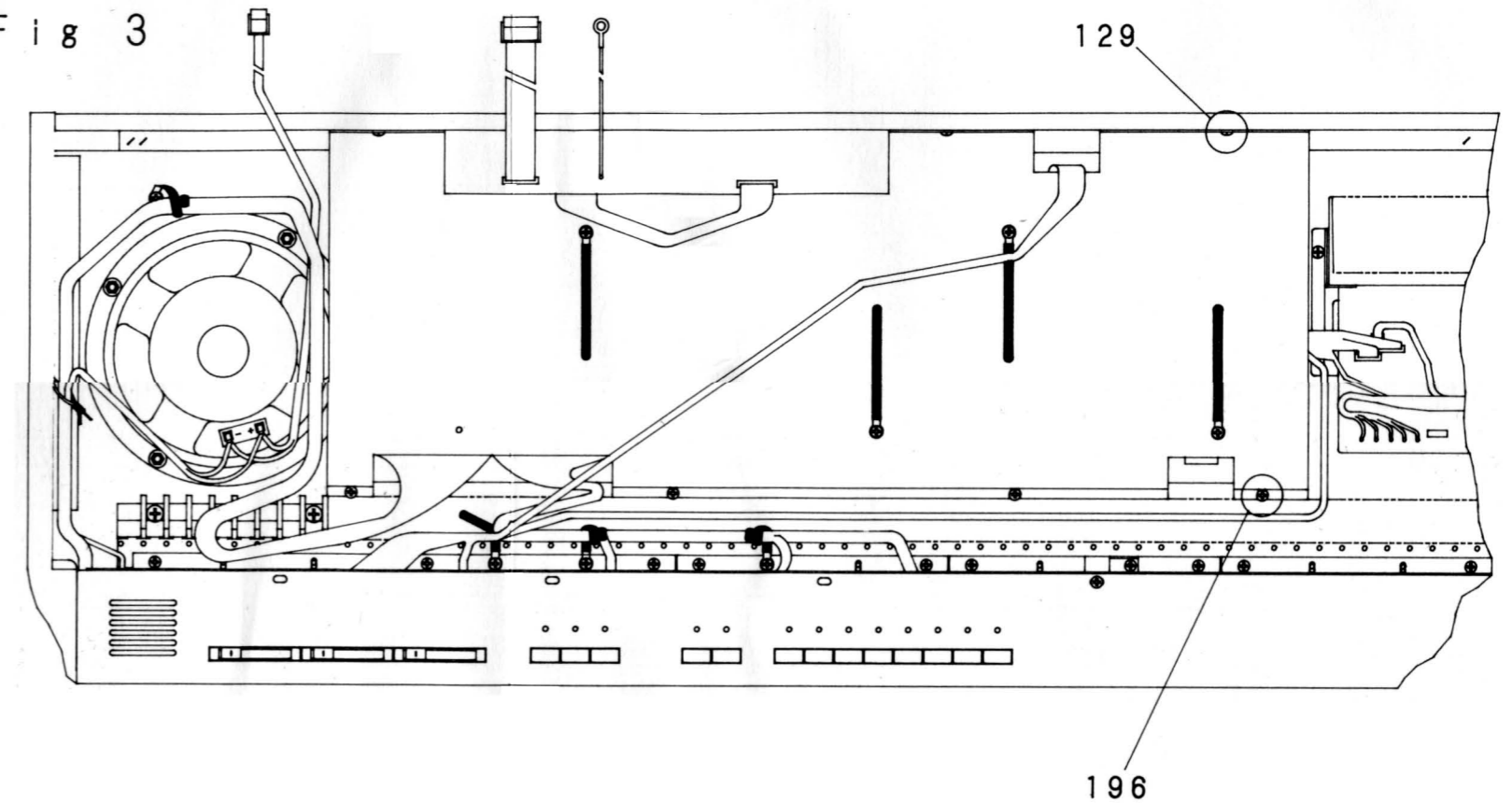
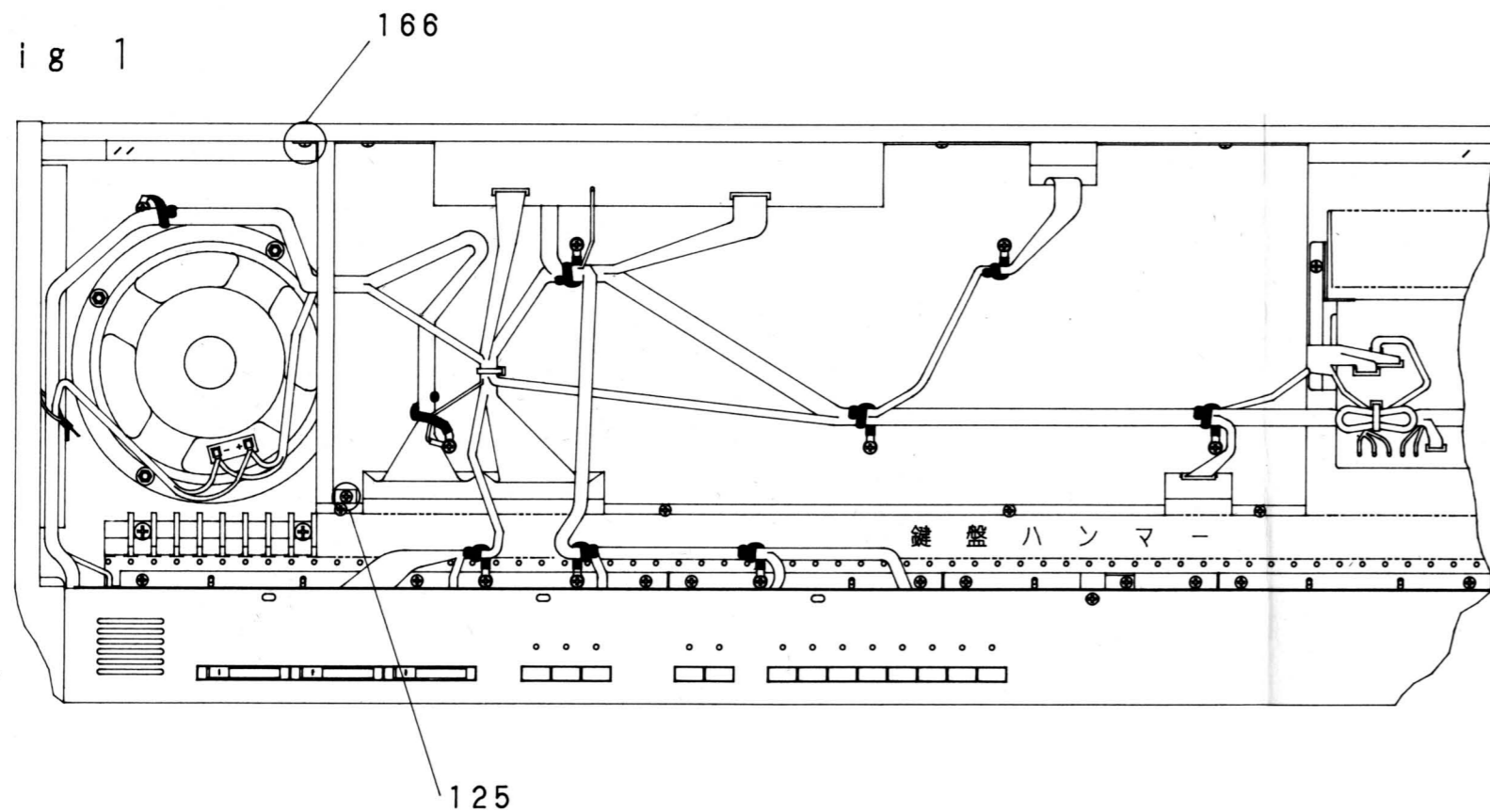


Fig 3



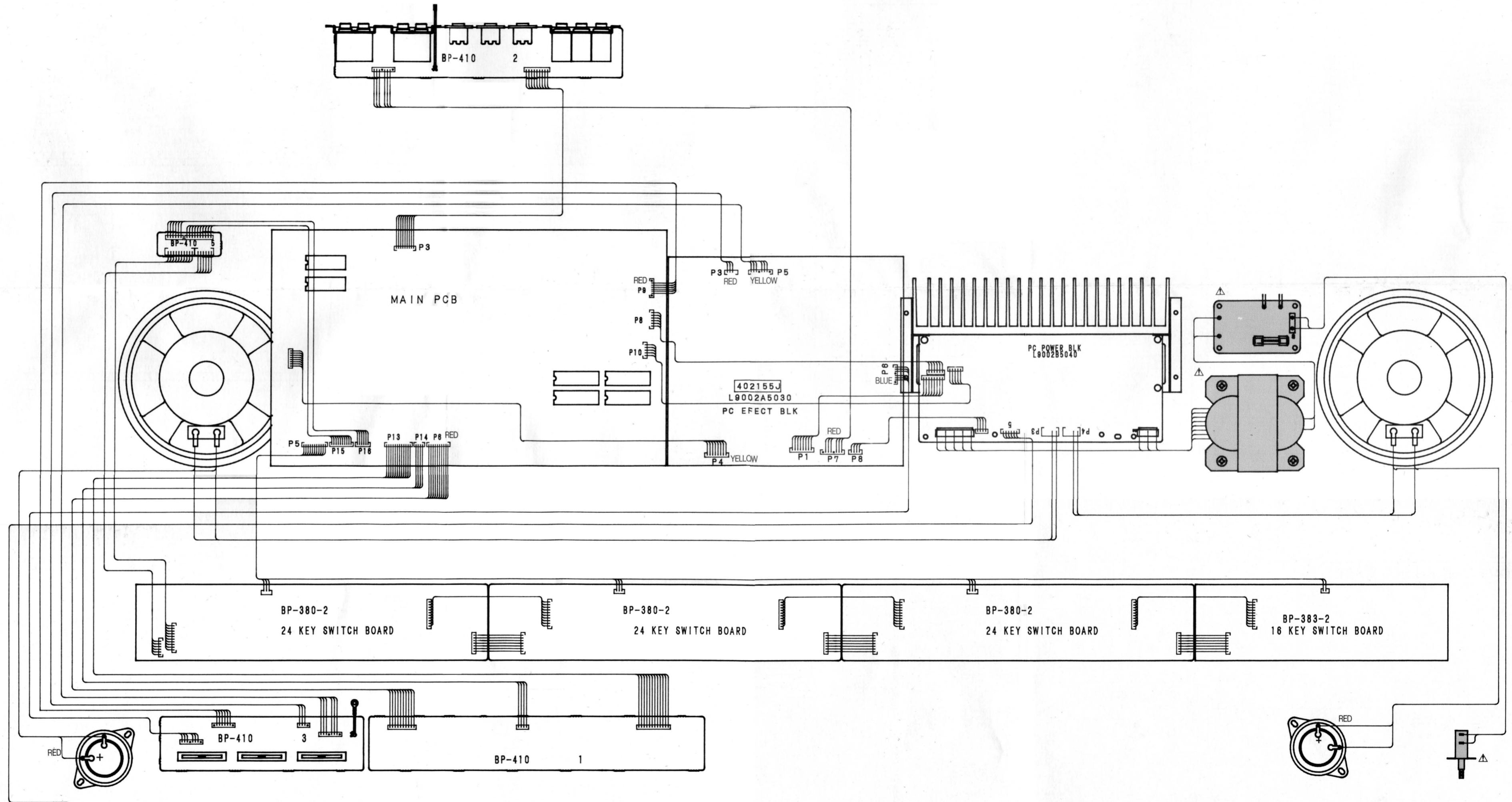
TO REMOVE THE SHIELD CASE

Fig 1



To Remove the Shield Case

- Remove the partition (left). (Fig. 1)
 - Remove screw 125 (3×6 CBTS(S)) and two screws 166 (3×8 CBRT(1)).
 - Remove the partition.
- Release the bundled wires. (Fig. 2)
 - Release the six cord holders as shown in the figure.
 - Cut clamp bands ① and ② as shown in the figure.
 - Disconnect connectors ③ and ④ as shown in the figure and remove the wires shield case.
 - The cord holder and ground wire are tightened together at section ⑤ in the figure. Remove screw (3×6 CBTS(S)) and then the ground wire.
- Remove the shield case. (Fig. 3)
 - Remove four screws 129 (3×8 CBRTS(1)) and four screws 196 (3.5×10 CBRTS(1)).
 - Remove components other than the wires left on the shield case as shown in the figure, from the shield case.
 - Lift the shield case from the direction of the keyboard hammer to remove it gradually and then take out the case so that go under the remaining wires.



This model uses the circuits boards in the EP-5000.
 The 10-pin and 6-pin key switch wires of the EP-3000 are used as they are.
 The following wires have been changed.

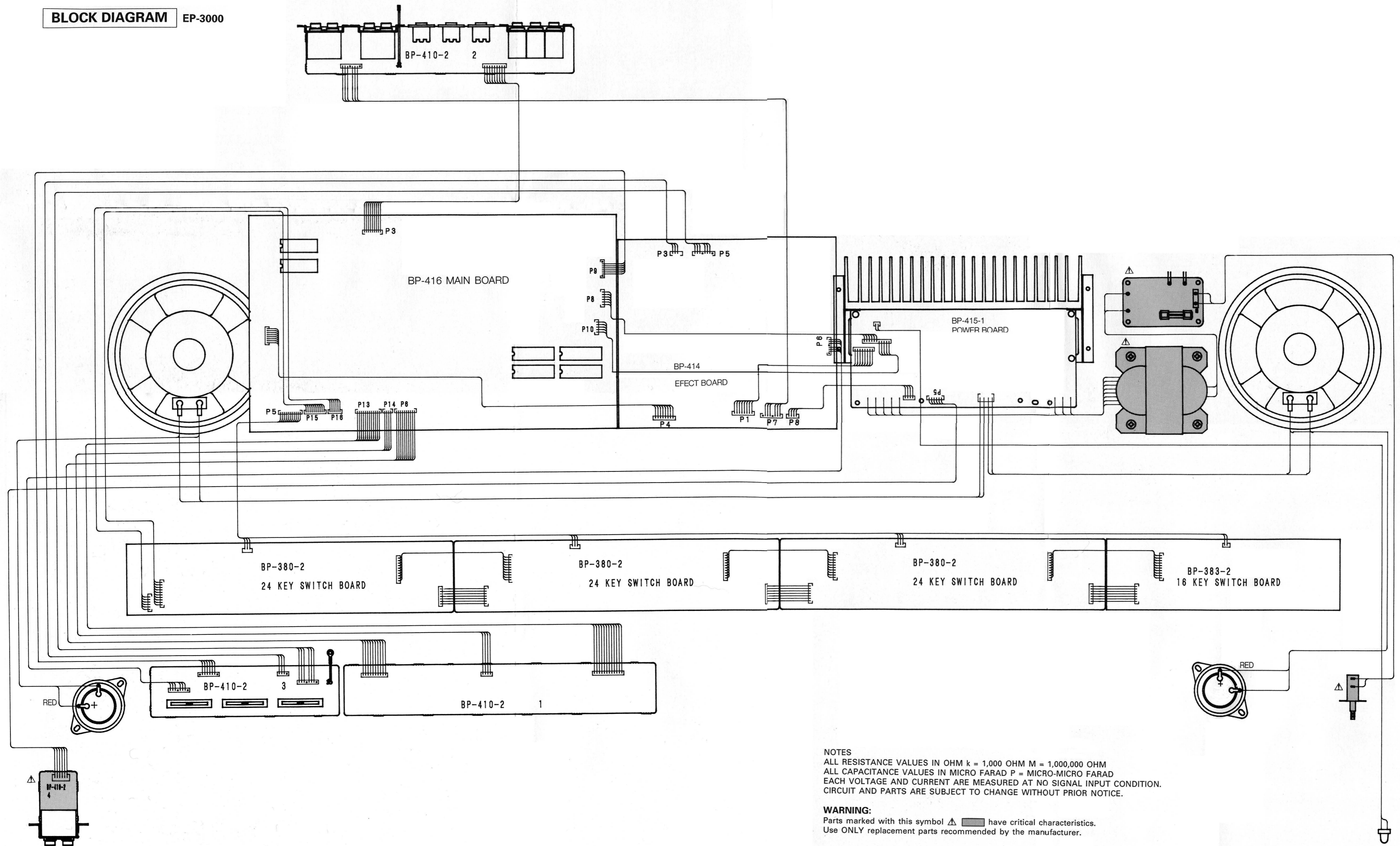
EP-3000 limited product	Use
2047430000 11-pin connector assembly	Key Switch wire
2037477002 4-pin connector assembly (right)	Speaker wires
2037478001 4-pin connector assembly (left)	Speaker wires
3937018094 LED assembly (1900 mm)	LED wire

NOTES
 ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.


WARNING:
 Parts marked with this symbol Δ have critical characteristics.
 Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
 Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from shassis to either side of the power cord is less than 240 k ohm, the unit is defective.

WARNING:
 DO NOT return the unit to the customer until the problem is located and corrected.

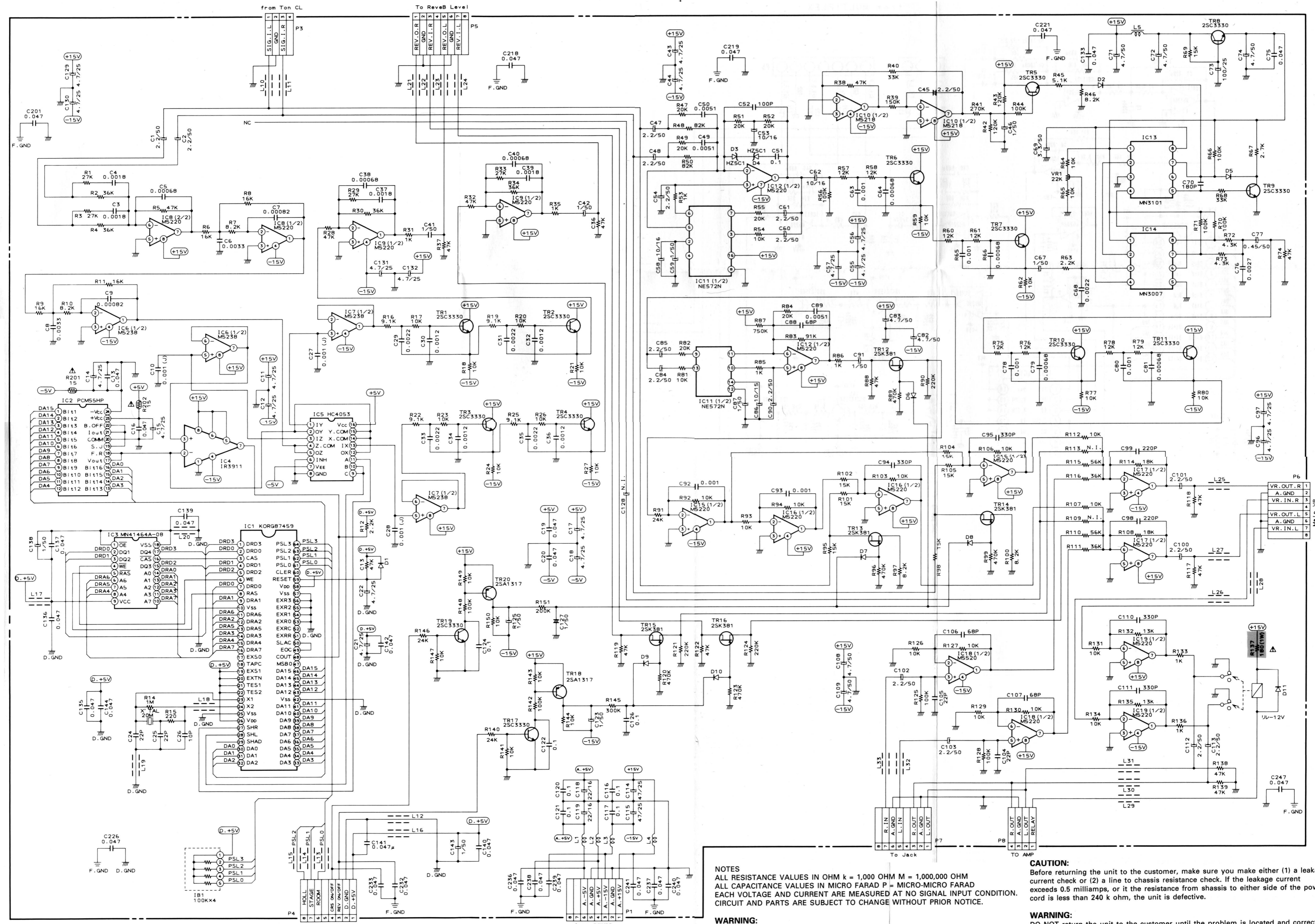


NOTES
 ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
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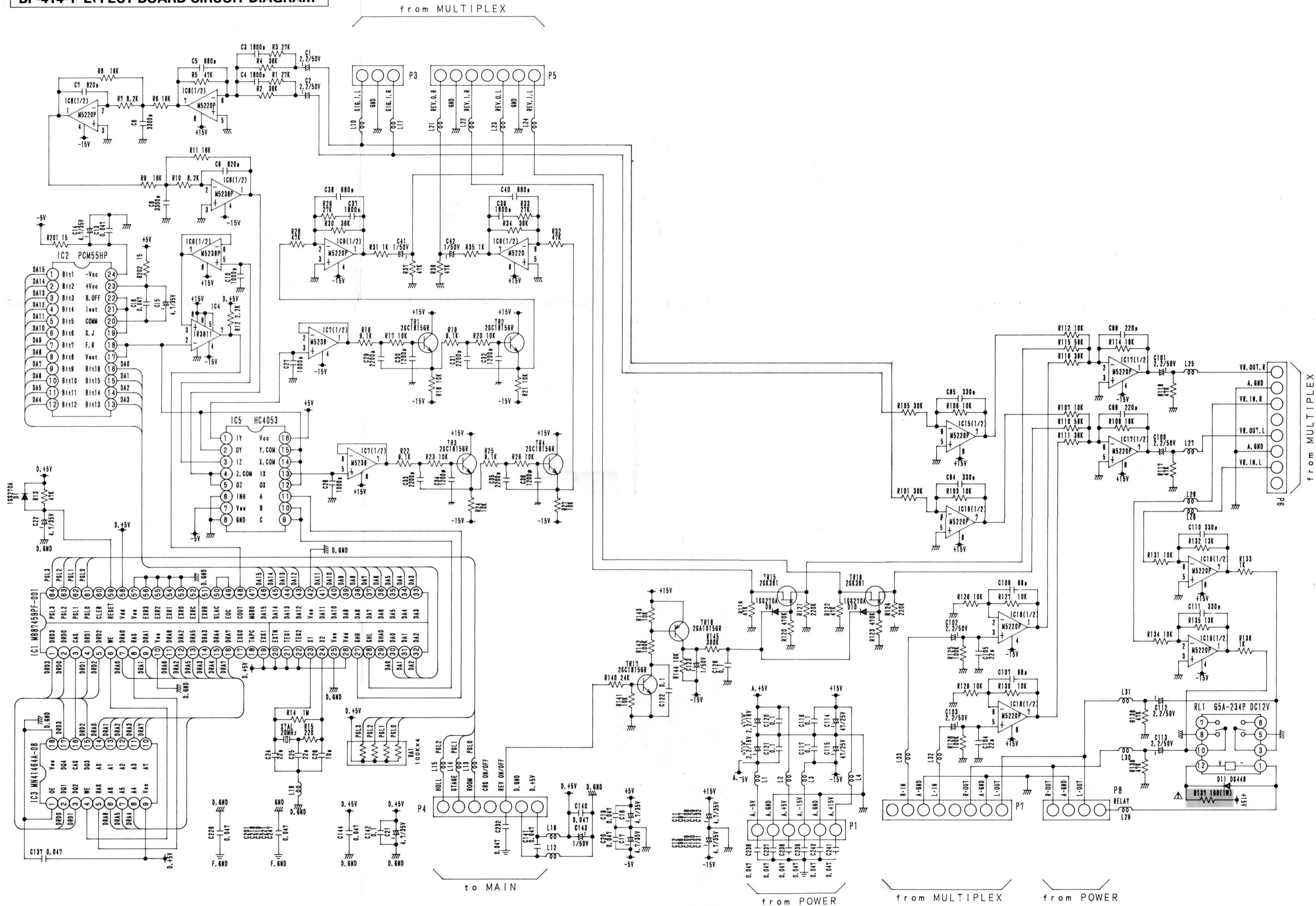
NOTES
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BP-414-1 EFFECT BOARD CIRCUIT DIAGRAM



NOTES

ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:

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 Use ONLY replacement parts recommended by the manufacturer.

CAUTION:

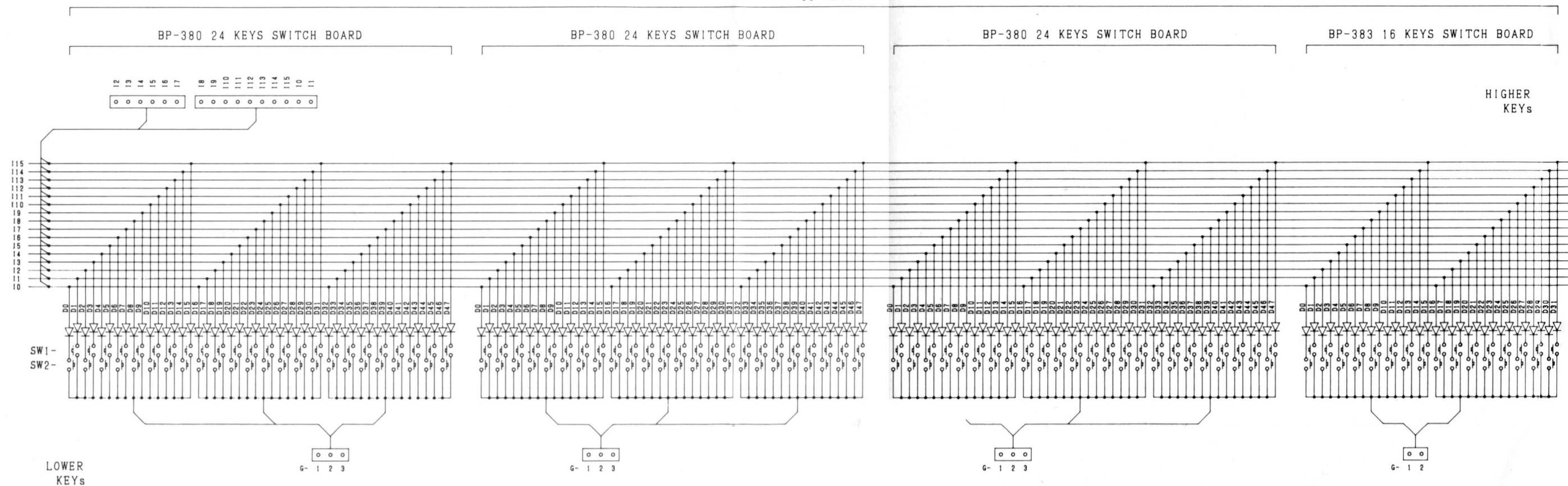
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from shassis to either side of the power cord is less than 240 k ohm, the unit is defective.

WARNING:

DO NOT return the unit to the customer until the problem is located and corrected.

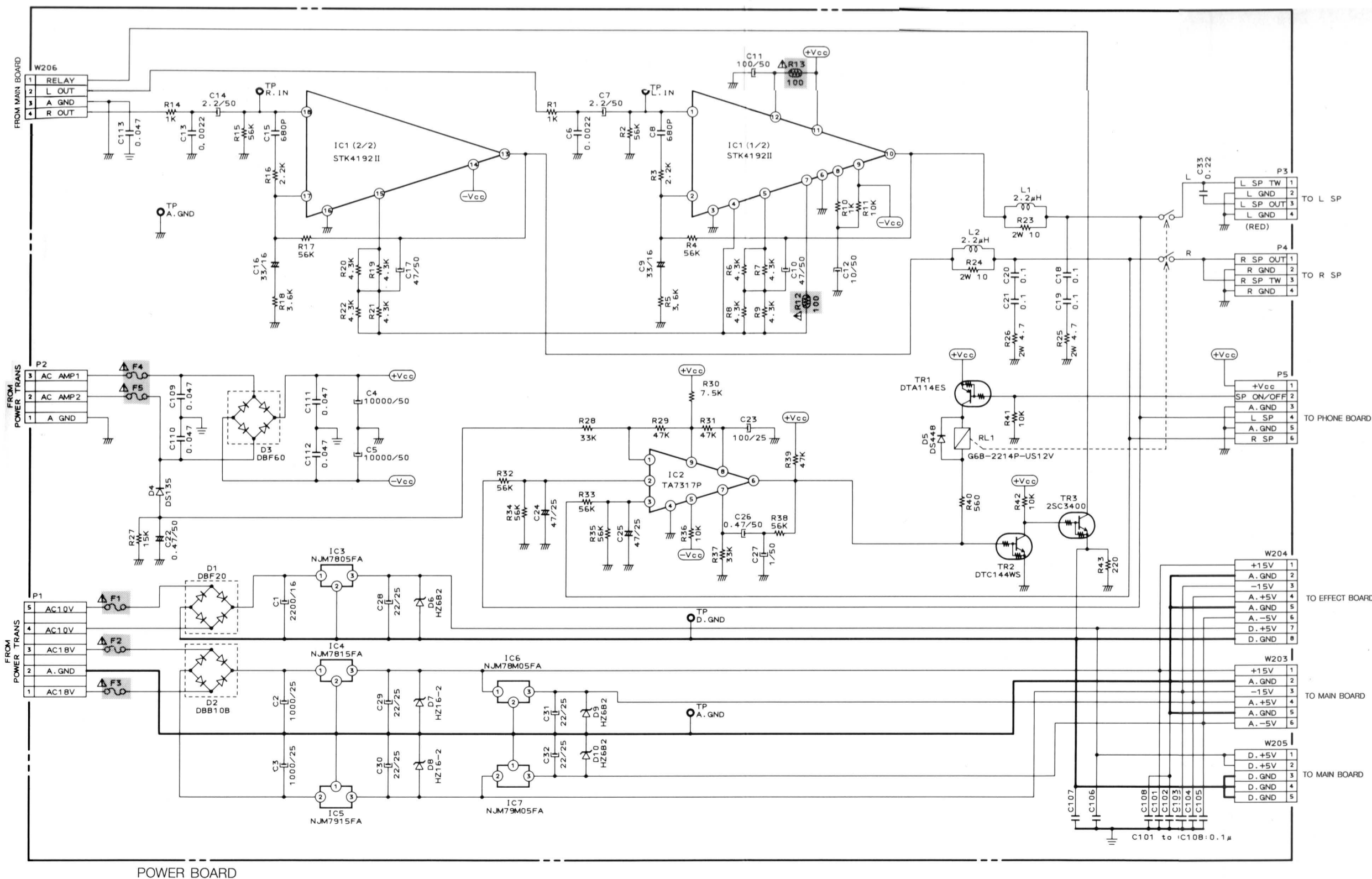
KEY SWITCH BOARDS CIRCUIT DIAGRAM

88 KEYS

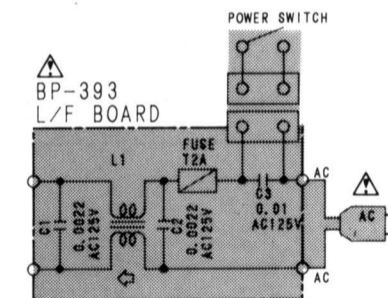


3997009027 POWER BOARD CIRCUIT DIAGRAM

(Limited Edition)



BP-393-2 L/FILTER BOARD CIRCUIT DIAGRAM

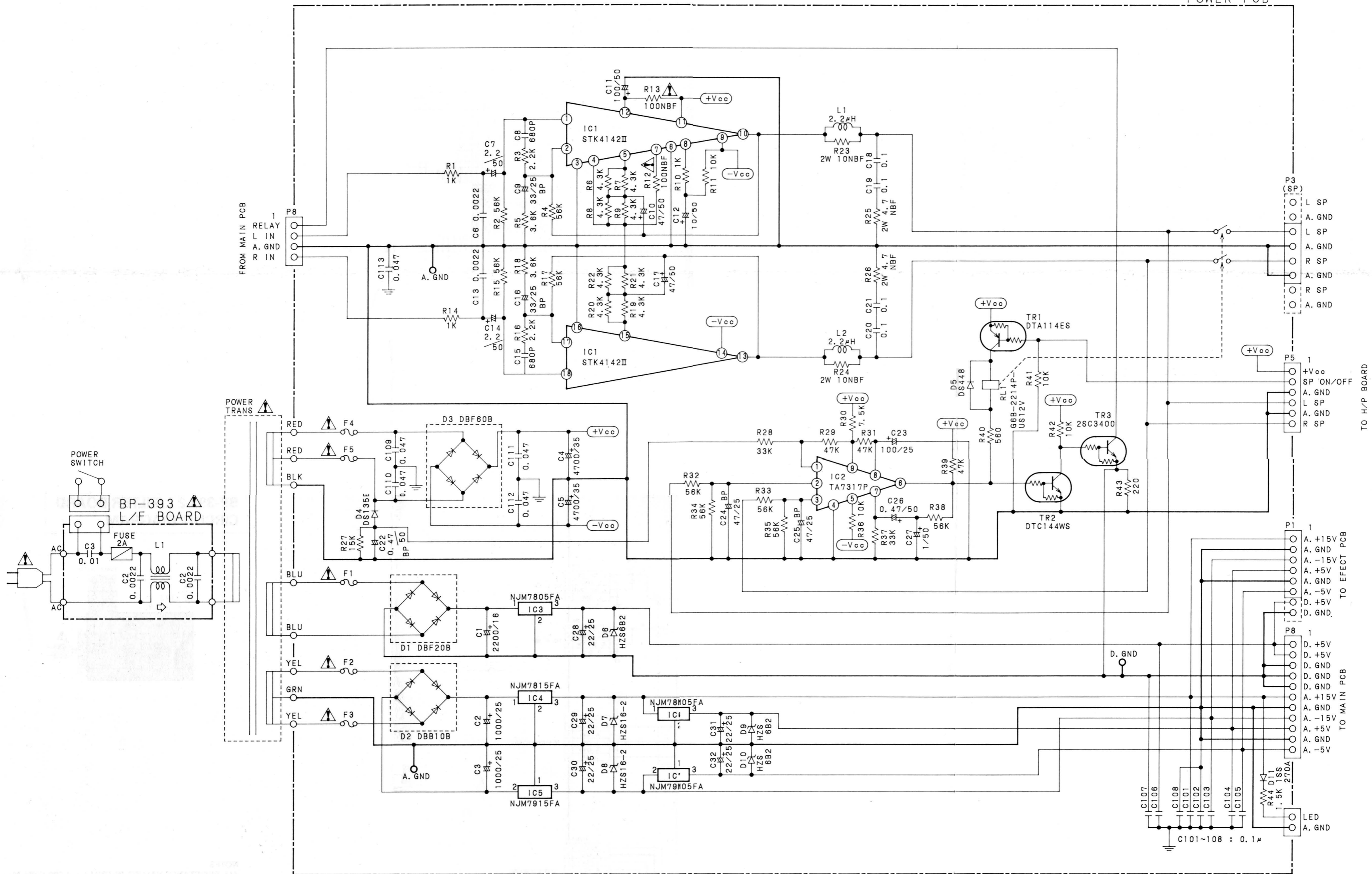


NOTES
 ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:
 Parts marked with this symbol Δ have critical characteristics.
 Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
 Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 k ohm, the unit is defective.

WARNING:
 DO NOT return the unit to the customer until the problem is located and corrected.



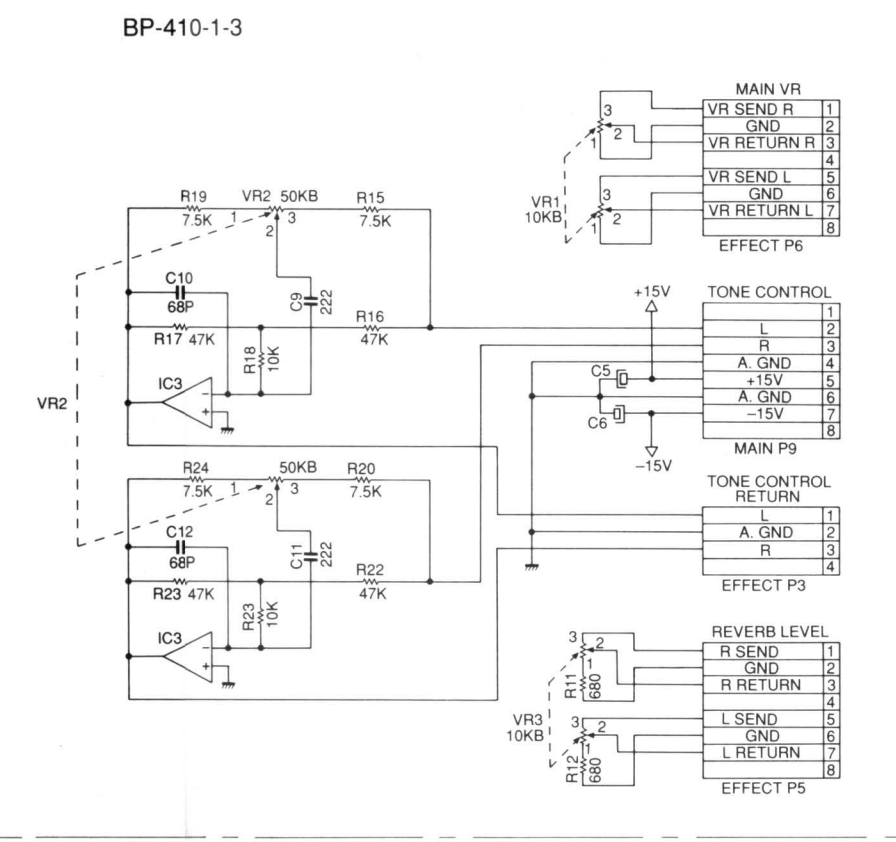
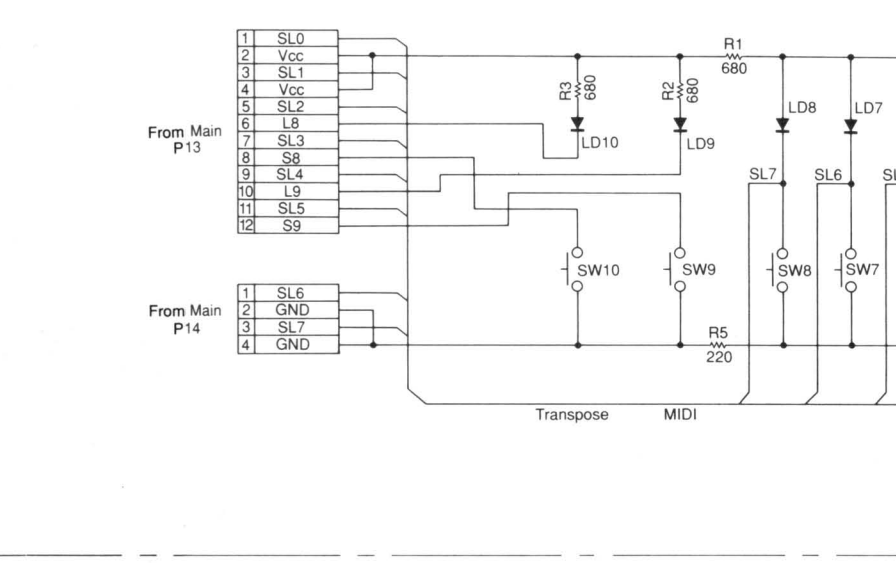
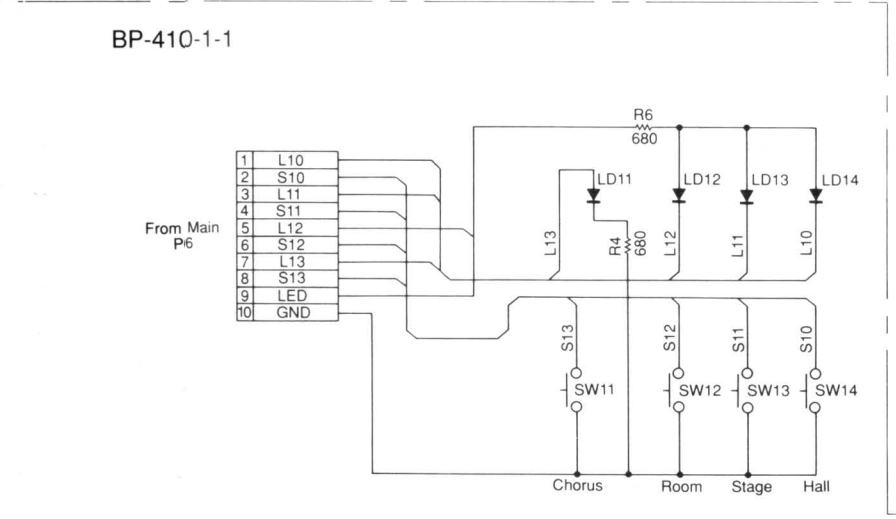
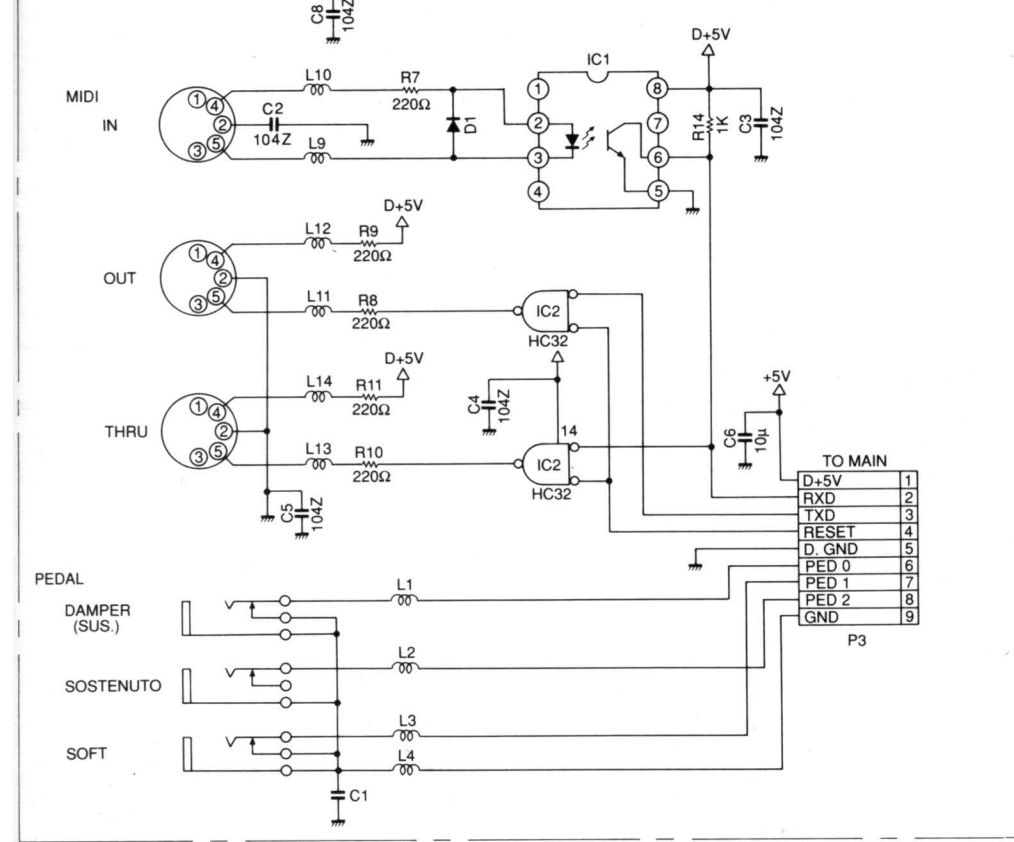
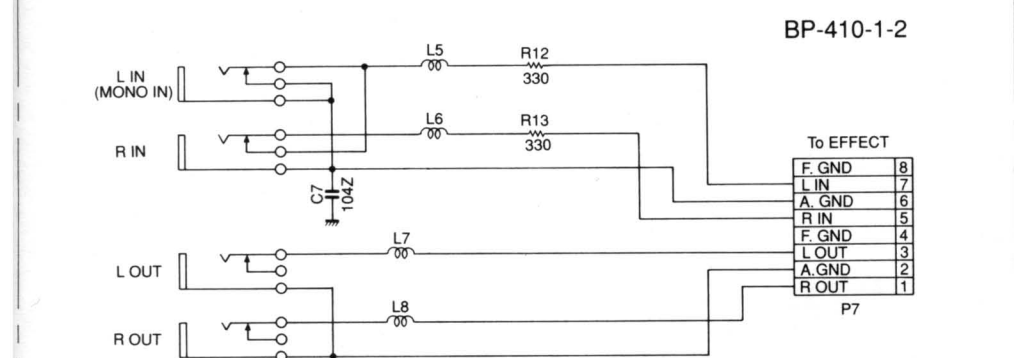
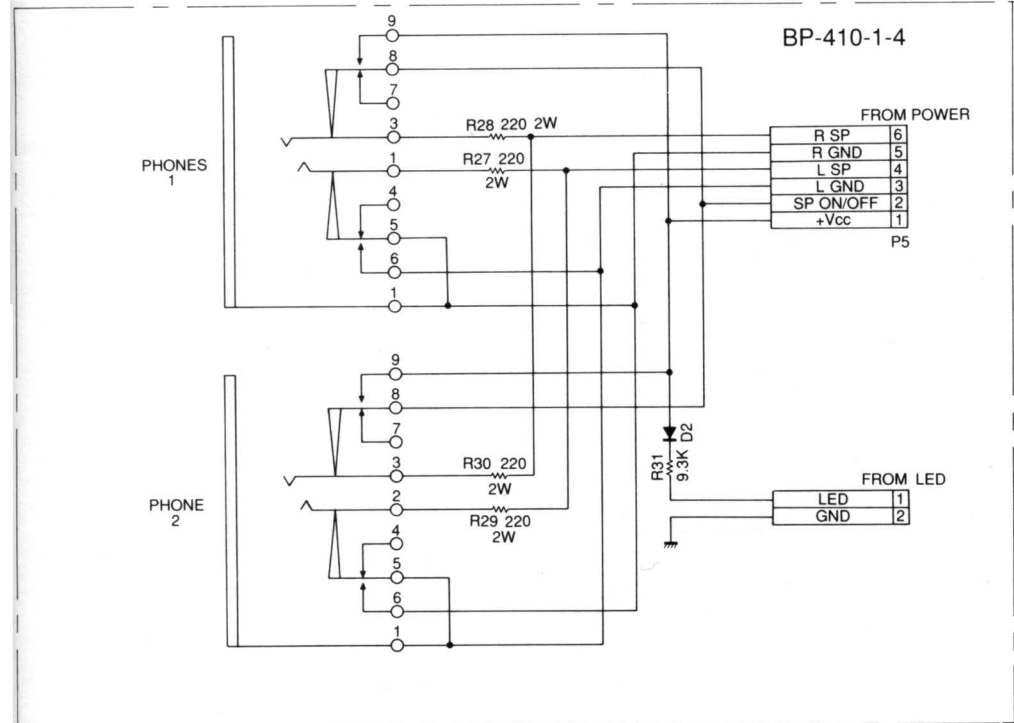
NOTES
 ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:
 Parts marked with this symbol  have critical characteristics.
 Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
 Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 k ohm, the unit is defective.

WARNING:
 DO NOT return the unit to the customer until the problem is located and corrected.

BP-410 MULTIPLE BOARD CIRCUIT DIAGRAM

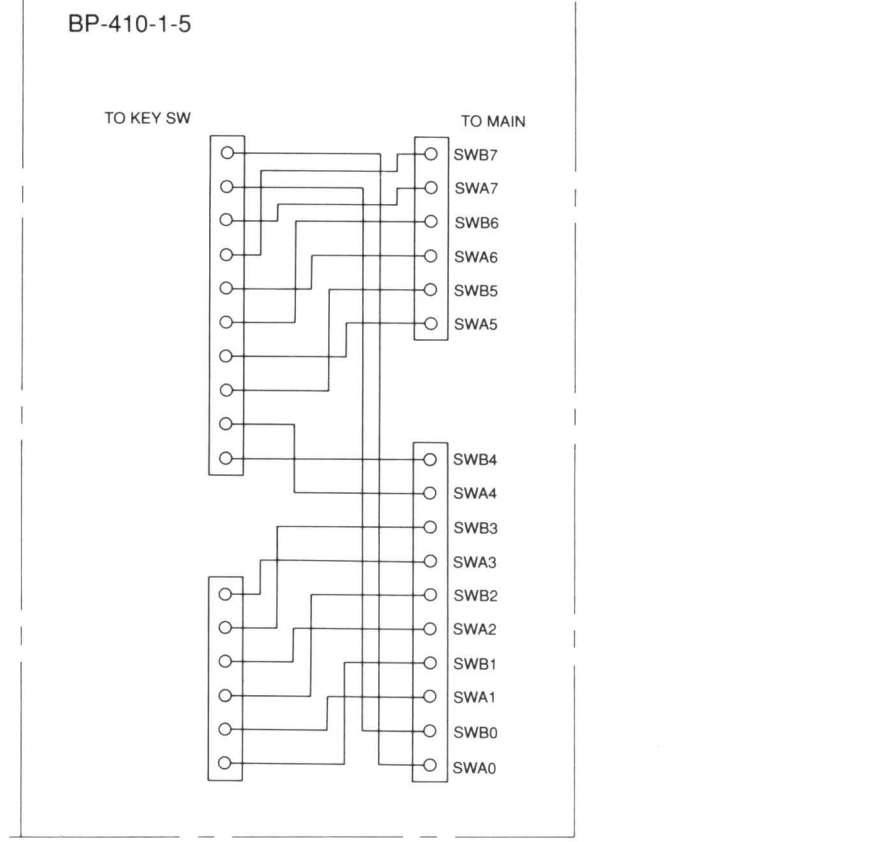


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ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
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TION. CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

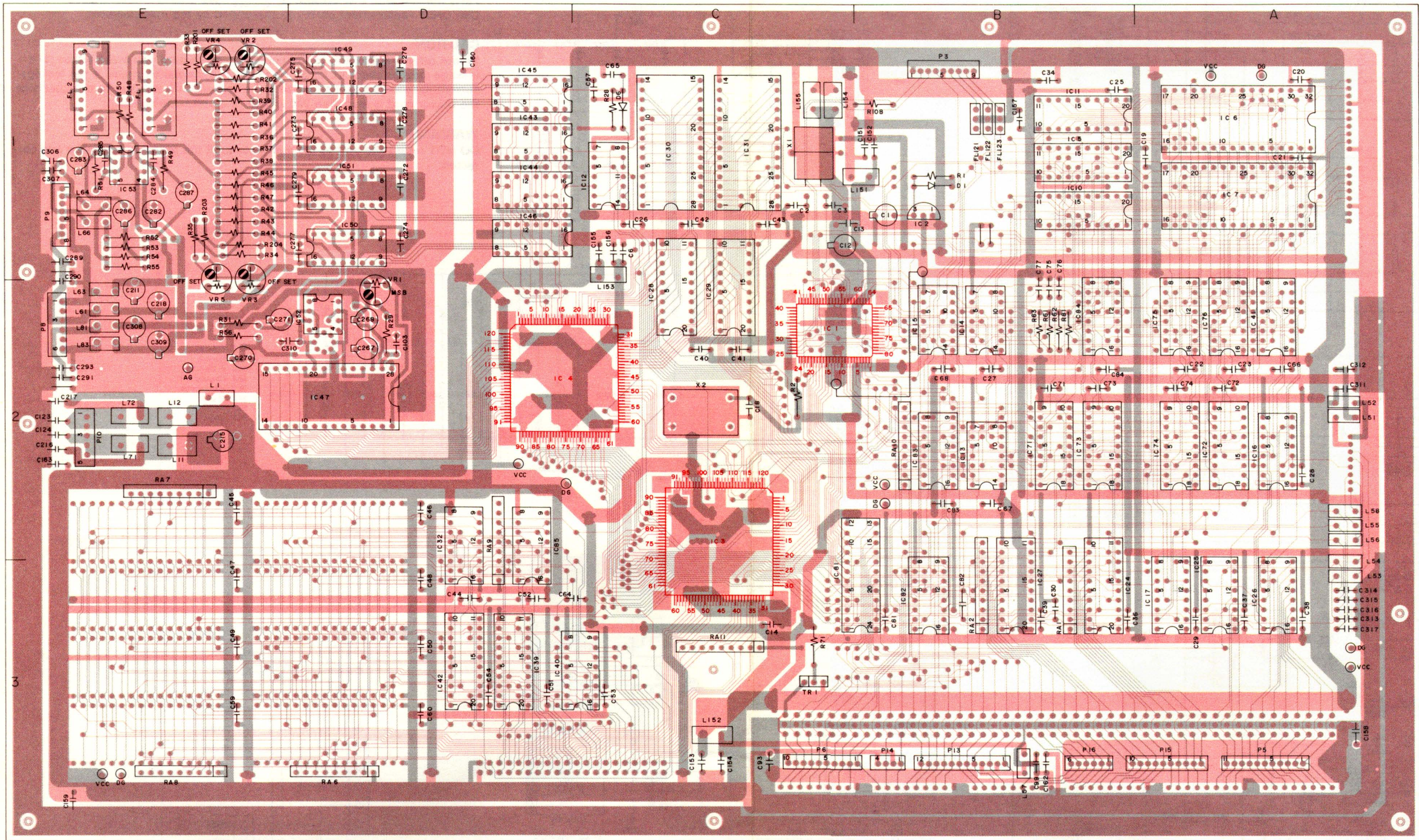
WARNING:
Parts marked with this symbol have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 k ohm, the unit is defective.

WARNING:
DO NOT return the unit to the customer until the problem is located and corrected.



3997011015 MAIN BOARD UNIT



PRINCIPAL PARTS LOCATION

ICS	Location
IC 1	B,C2
IC 2	B1
IC 3	C2,3
IC 4	C,D2
IC 5	B1
IC 6	A1
IC 7	A1
IC 10	B1
IC 11	B1
IC 12	C1
IC 13	B2
IC 14	B2
IC 15	B2
IC 16	A2
IC 17	A3
IC 24	B2,3
IC 25	A3
IC 26	A3
IC 27	B2,3
IC 28	C1,2
IC 29	C1,2
IC 30	C1
IC 31	C1
IC 32	D2,3
IC 39	D3
IC 40	C,D3
IC 41	A2
IC 42	D3
IC 43	D1
IC 44	D1
IC 45	D1
IC 46	D1
IC 47	D,E2
IC 48	D1
IC 49	D1
IC 50	D1
IC 51	D1
IC 52	D2
IC 53	E1
IC 57	E3
IC 58	D,E3
IC 71	B2
IC 72	A2
IC 73	B2
IC 74	A2
IC 75	A2
IC 76	A2
IC 81	B2,3
IC 82	B3
IC 83	B2
IC 84	B2
IC 85	D2,3

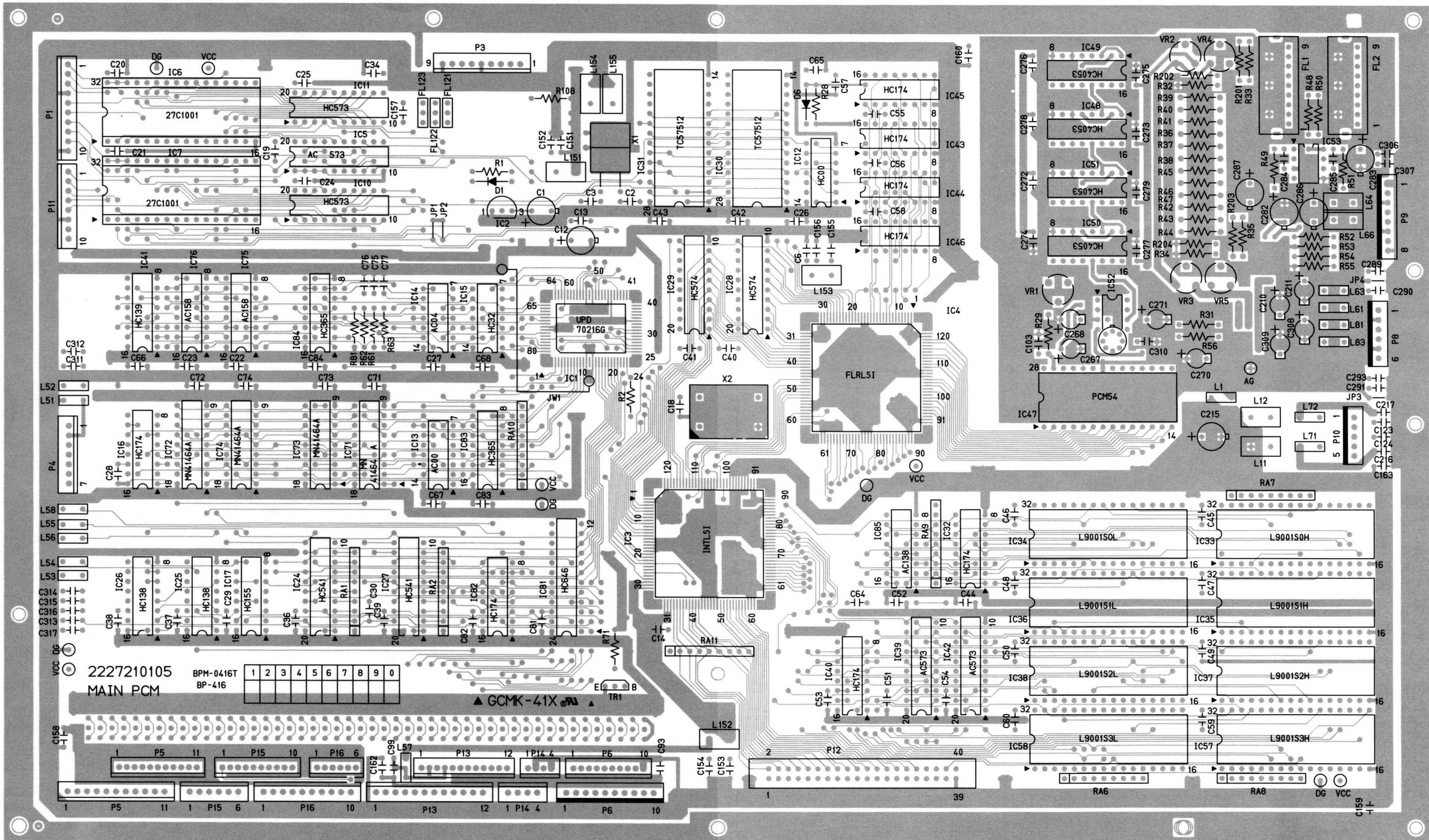
CONNECTORS

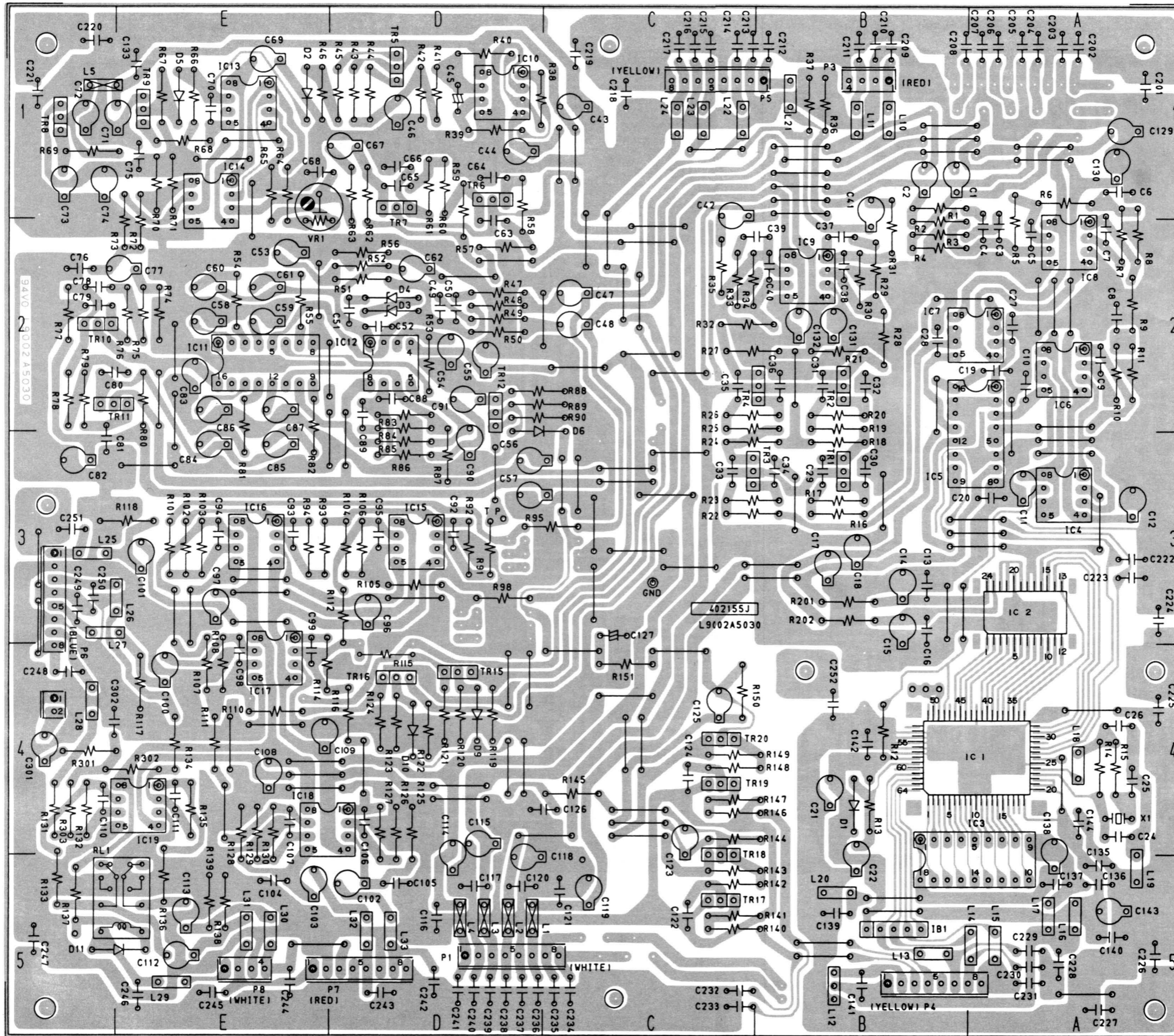
P3	B1
P5	A3
P6	C3
P8	E2
P9	E1
P10	E2
P13	B3
P14	B3
P15	A3
P16	B3

TRANSISTOR

TR1	C3
-----	----

MAIN PCB L9002A5010





PRINCIPAL PARTS LOCATION

- ICS
 IC1 A,B4
 IC2 A3
 IC3 A,B5
 IC4 A3
 IC5 A,B2
 IC6 A2
 IC7 A,B2
 IC8 A2
 IC9 B2
 IC10 D1
 IC11 E2
 IC12 D2
 IC13 E1
 IC14 E1
 IC15 D3
 IC16 E3
 IC17 E4
 IC18 D,E4
 IC19 E4

CONNECTORS

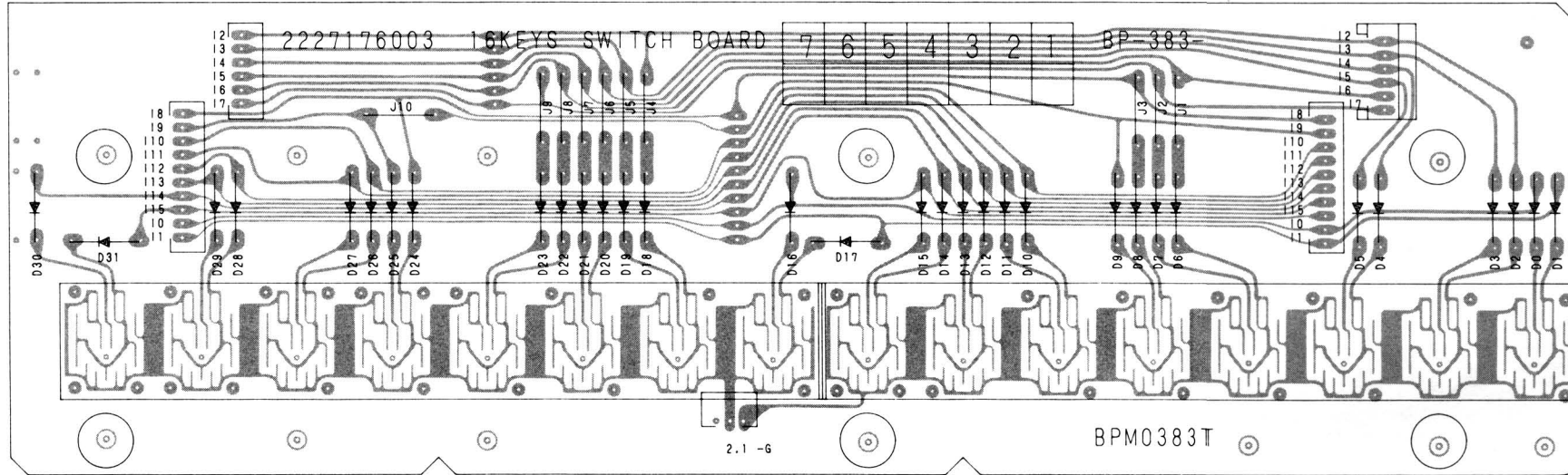
- P1 D5
 P3 B1
 P4 B5
 P5 C1
 P6 F3
 P7 D5
 P8 E5

TRANSISTORS

- TR1 B3
 TR2 B2
 TR3 C3
 TR4 B,C2
 TR5 D1
 TR6 D1
 TR7 D1
 TR8 F1
 TR9 E1
 TR10 F2
 TR11 E,F2
 TR12 D2
 TR15 D4
 TR16 D4
 TR17 C5
 TR18 C5
 TR19 C4
 TR20 C4

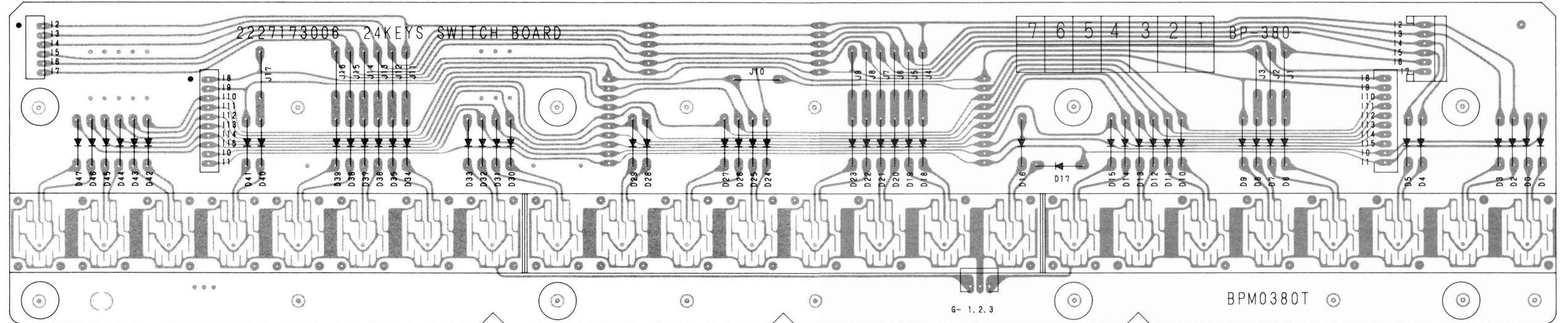
BP-383-2 16 KEYS SWITCH BOARD

Pattern Side

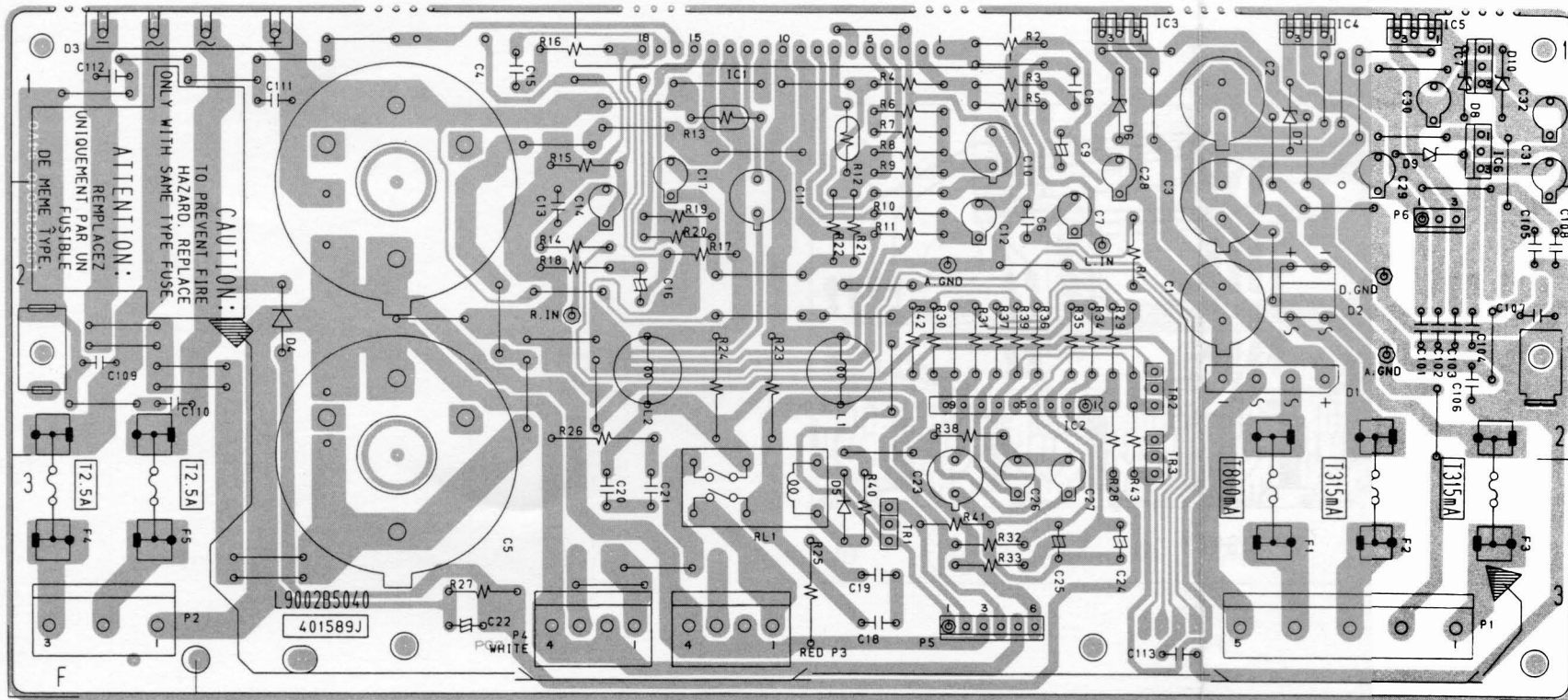


BP-380-2 24 KEYS SWITCH BOARD

Pattern Side

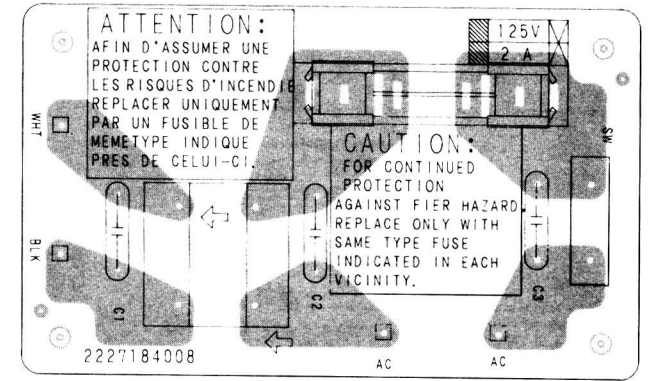


3997009027 POWER BOARD UNIT Pattern Side

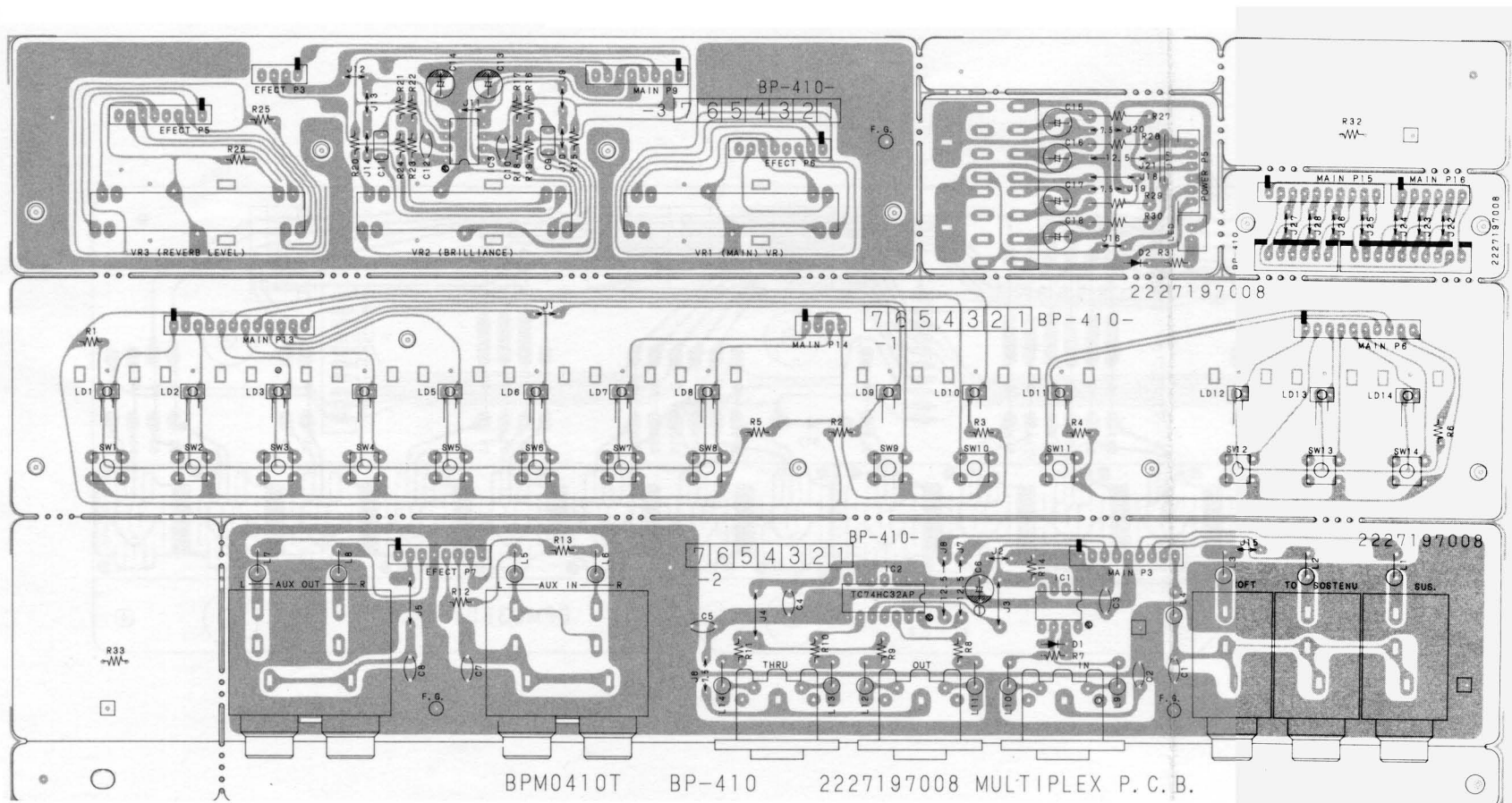


POWER PCB L9002B5040

BP-393-2 L/FILTER BOARD UNIT Pattern Side

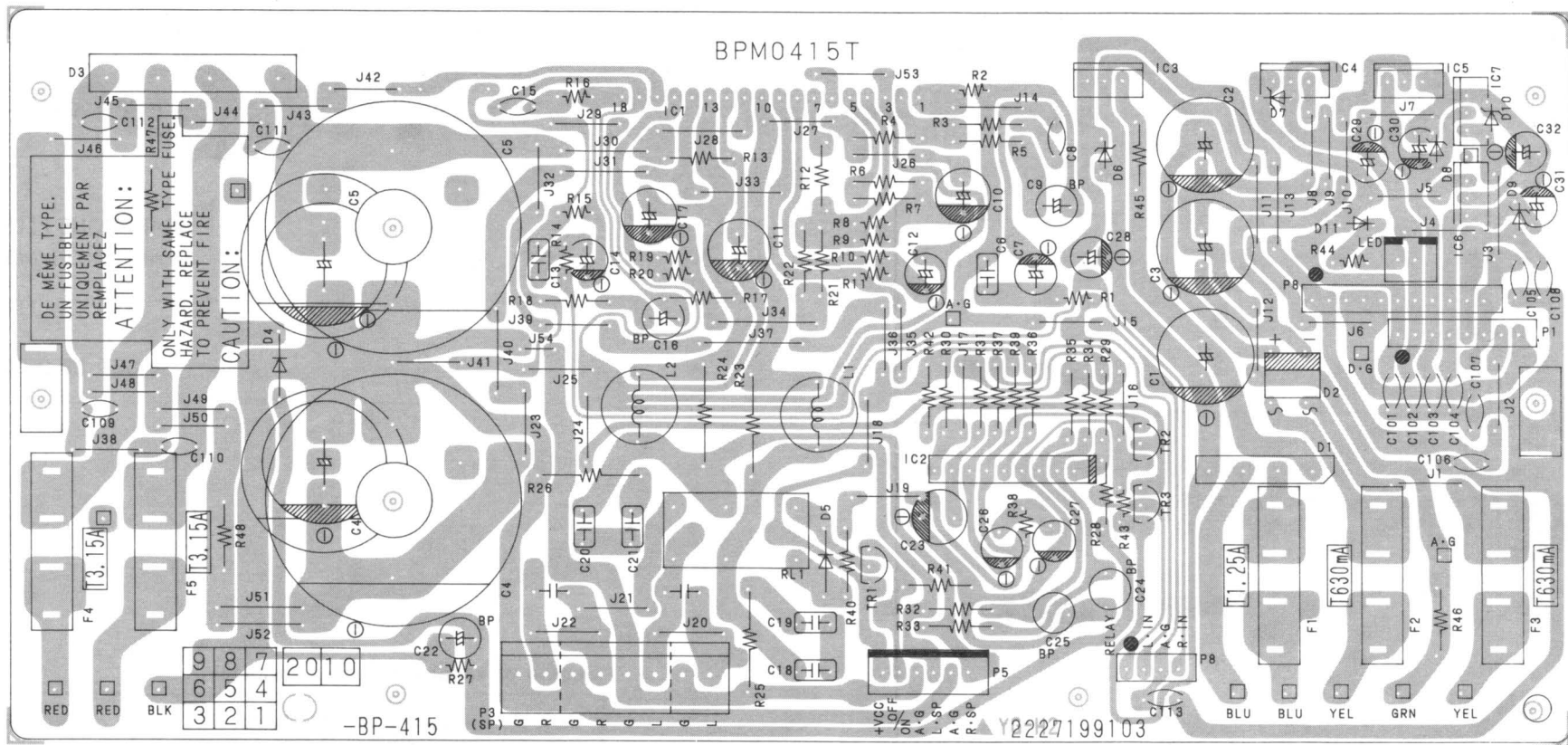


BP-410 MULTIPLEX BOARD UNIT Pattern Side



BP-415 POWER BOARD UNIT

Pattern Side



VOLUME ADJUSTMENT

Test Mode and Adjustment EP-3000 MAIN BOARD

Test mode

How to set to the test mode:

Press the CHOIR button and hold it, then turn the power switch on.

Only the PIANO 1 indicator lights.

How to release the test mode:

Press the tone select button or turn the power switch off and then on again.

Details of test mode:

Offset adjustment

MSB adjustment

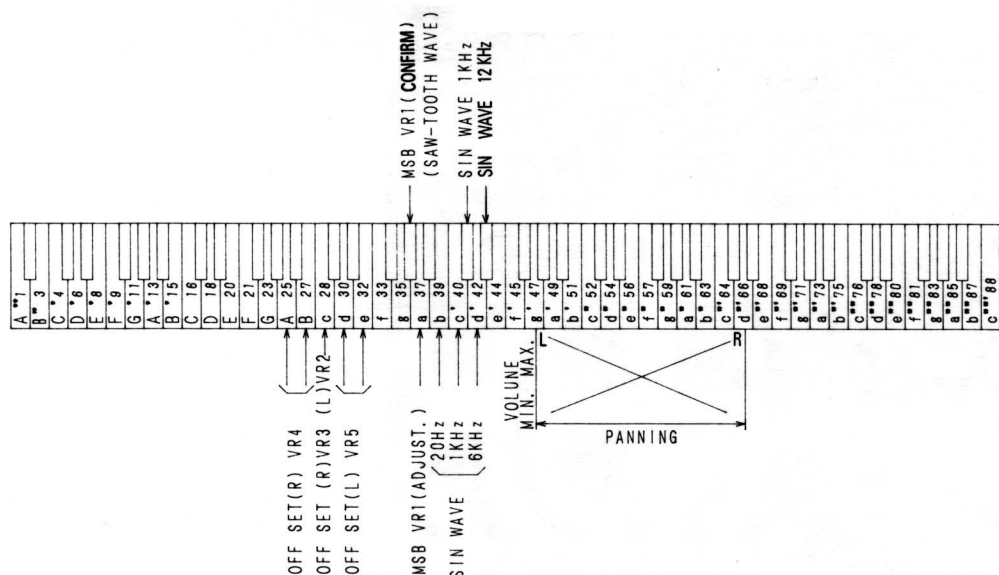
Sine-wave output (20Hz, 1kHz, 6kHz, 12kHz)

Sine-wave output (1kHz, output higher than above)

Panning

Relationship between the test mode and keyboard

See below.



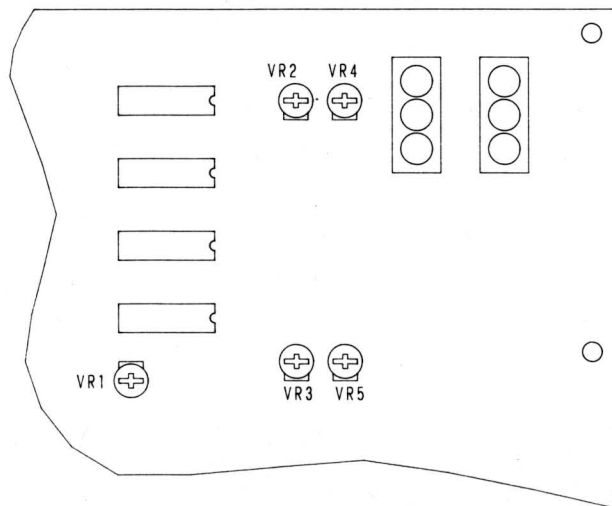
Adjustment

(1) Test equipment necessary for adjustment

Millivoltmeter

(2) Warm up the instrument for mode than 5 minutes and set it to the test mode, then start adjustments.

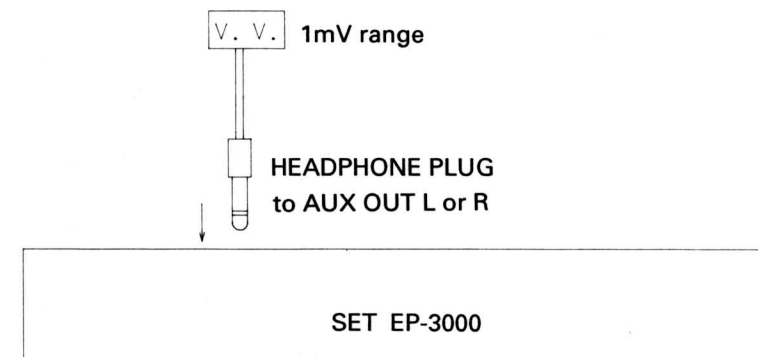
(3) Locations of adjustment components



(4) Order of adjustments

1. Warm up	more than 5 minutes
2. Teat mode	
3. Offset adjustment	1 VR2 (R Side)
	2 VR3 (L Side)
	3 VR4 (R Side)
	4 VR5 (L Side)
4. MSB adjustment	VR1

Adjustment



Setting of variable resistors on panel

Variable resistor	VOLUME	BRILLIANCE
Setting	MAX.	BRIGHT

Adjustment

Adjust the variable resistors so the reading of the V.V. is minimum.

	Adjustment	Plug Position (AUX OUT)	KEY No.	Opration
1	VR2	R	28 (C)	VR2 Turn C on repeatedly.
2	VR3	L	28 (C)	VR3 Turn C on repeatedly.
3	VR4	R	30, 32 (D, E)	VR4 Turn D and E on alternately and repeatedly.
4	VR5	L	25, 27 (A,B)	VR5 Turn A and B on alternately and repeatedly.
5	VR1	L	37 (A)	VR1 Turn A on. (Adjust so the volume is minimum when hearing.)

SPECIFICATIONS

Model EP-3000

Keyboards	88 Keys (A ₂ ~c ⁵)		
Sound range	7 octaves 1/4		
Voices	Piano 1•2, E.Piano, Harpsichord Vibraphone, Organ, Strings, Choir		
Effects	Reverb Chorus		
Controls	Volume, Tuning, Transpose		
Connecting Jacks	AUX IN (monaural, stereo)		
	AUX OUT (stereo)		
	Headphone terminal × 2		
	Sustain pedal, Soft pedal, Sostenuato pedal		
	MIDI IN, MIDI OUT, MIDI THRU		
Speakers	16 cm × 2, Tweeter × 2		
Output	25 W + 25 W		
Dimensions	Width	Height	Depth
	1360 mm	860 mm	520 mm
Weight	56 Kg		

Note: The specifications and appearance are subject to changes with out notice.

LIST OF P. W. BOARD No.

Name of Model Name of P. W. Board	EP-3000 (Limited Edition) (SERIAL NO. 1001, 1002 8001~8008)		EP-3000 (SERIAL NO. 8009~, 1082300001~)		Quantity
	Europe	Canada, U.S.A.	Europe	Canada, U.S.A.	
24 KEYS SWITCH BOARD	BP-380-2	←	←	←	3 set
16 KEYS SWITCH BOARD	BP-383-2	←	←	←	1 set
MAIN BOARD	3997011015	←	BP-416	←	1 set
EFFECT BOARD	—	—	BP-414	←	1 set
CONTROL BOARD	3997008002	←	—	—	1 set
POWER BOARD	3997009014	←	BP-415	←	1 set
MULTIPLEX BOARD	BP-410-3	←	BP-410-2	←	1 set
LINE FILTER BOARD	BP-393-3	BP-393-2	BP-393-3	BP-393-2	1 set