DENON

SERVICE MANUAL

ELECTRONIC PIANO

MODEL
EP-3300

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NIPPON COLUMBIA CO., LTD.

CAUTIONS

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 it the resistance from chassis to either side of the power cord is less than 240 Kohms, the unit is defective.

WARNING:

- Parts marked with ⚠ ▒▒▒ this symbol have critical characteristics.
  Use ONLY replacement parts recommended by the manufacturer.
- DO NOT return the unit to the customer until the problem is located and corrected.

LIST OF P.C. Board UNIT

Name of P.C. Board	UNIT No.	Remarks
24 KEYS SWITCH BOARD	BP-380-2	
16 KEYS SWITCH BOARD	BP-383-2	
MAIN PCB	BP-421-2	
EFFECT BOARD	BP-422-1	
POWER BOARD	BP-419-1	
PANEL BOARD	BP-420-3	
L/FILTER BOARD	BP-393-2	U.S.A., Canada Models
	BP-393-3	Europe, U.K., Asia Models

EP-3300 CABINET MECHANICAL PARTS REMOVAL

Fig. 1

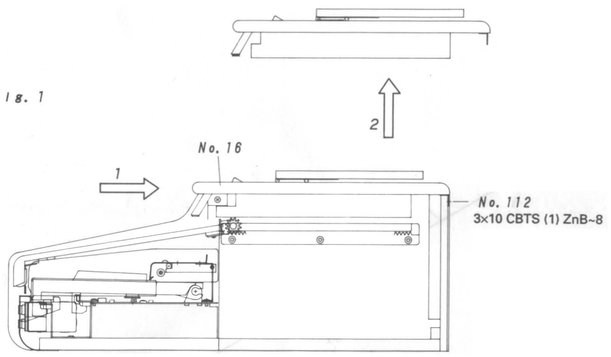


FIG. 2

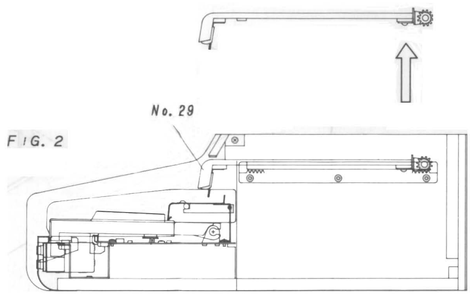
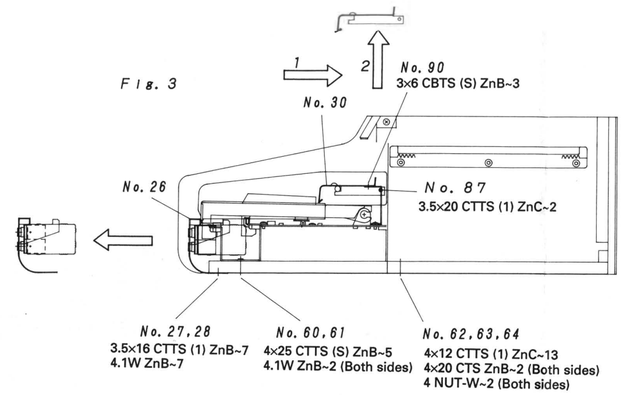


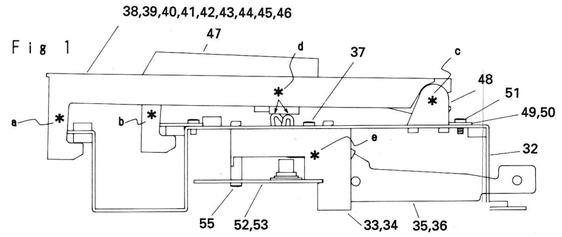
Fig. 3



1. Remove roof board semi-assembly 16. (Fig. 1)
   1) Remove eight (8) screws 112 (3 × 10 CBTS(1)).
   2) Move roof board semi-assembly 16 in the direction of arrow 1 and lift it in the direction of arrow 2.
2. Remove key cover assembly 29. (Fig. 2)
   1) Lift key cover assembly 29 to remove it.
3. Remove top panel semi-assembly 30 and front panel 26. (Fig. 3)
   1) Remove two (2) screws 87 (3.5 × 20 CTTS(1)) and three (3) screws 90 (3 × 6 CBTS(1)) and move top panel semi-assembly 30 in the direction of arrow 1 and then in the direction of arrow 2 to remove it.
   2) Remove seven (7) screws 27 (3.5 × 16 CTTS(1)) and four (4) washers 28 (4.1 W), then remove front panel 26 in the direction of the arrow.
4. Remove the keyboard unit. (Fig. 3)
   1) Remove five (5) screws 60 (4 × 25 CTTS(S)) and two (2) washers 61 (4.1W) from both ends.
   2) Remove two (2) screws 63 (4 × 20 CTS) and two (2) nuts 61 (4NUT-W) and then thirteen (13) screws 62 (4 × 12 CTTS(1)).

DISASSEMBLY OF KEY-148

Fig 1



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

(a) Slide way inside the while 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

Fig 2

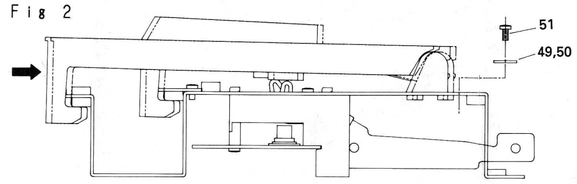


Fig 3

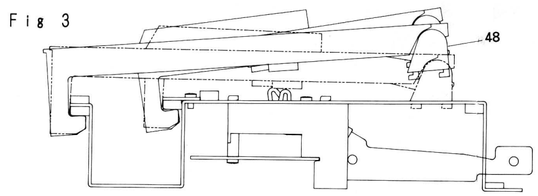


Fig 4

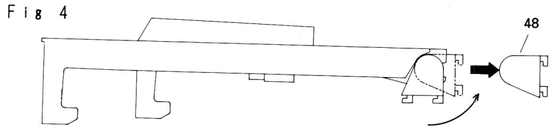


Fig 5

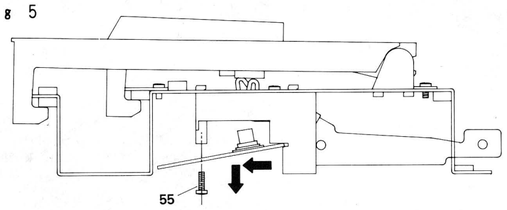


Fig 6

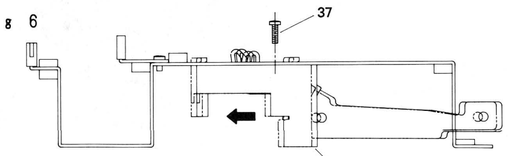


Fig 7

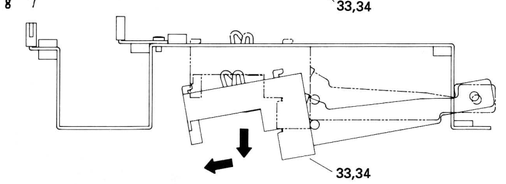
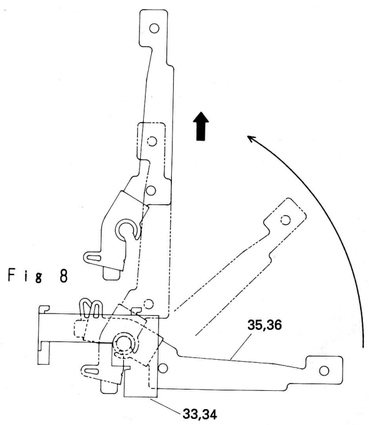


Fig 8



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 51, remove K/S stoppers 49,50. Push the keyboard toward the arrow. (Fig.2)
   2) Remove the key together with key shaft 48 from the chassis ass'y by lifting the rear part of the key in the arrow direction. (Fig.3)
   3) Remove the while key first, and then, the black key. For mounting them, mount the black key first.
   4) Remove the key shaft 48 backward by turning it 90° in the arrow direction. (Fig.4)

3. How to remove the switch board. (Fig.5)
   1) Remove screw 55, 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 37, and move the hammer flanges in the arrow direction. (Fig.6)
   2) Remove hammer flanges 33,34 (together with each hammer) by moving them in the arrow directions. (Fig.7)
   3) For removing the hammer flanges, all screws 37 can be removed by removing five white/black keys of octave G-B and four white/black keys on the high-pitched sound side.

5. How to remove the hammers
   1) Remove hammer 35,36 in the arrow direction by turning them upward by 90°.

EXPLODED VIEW

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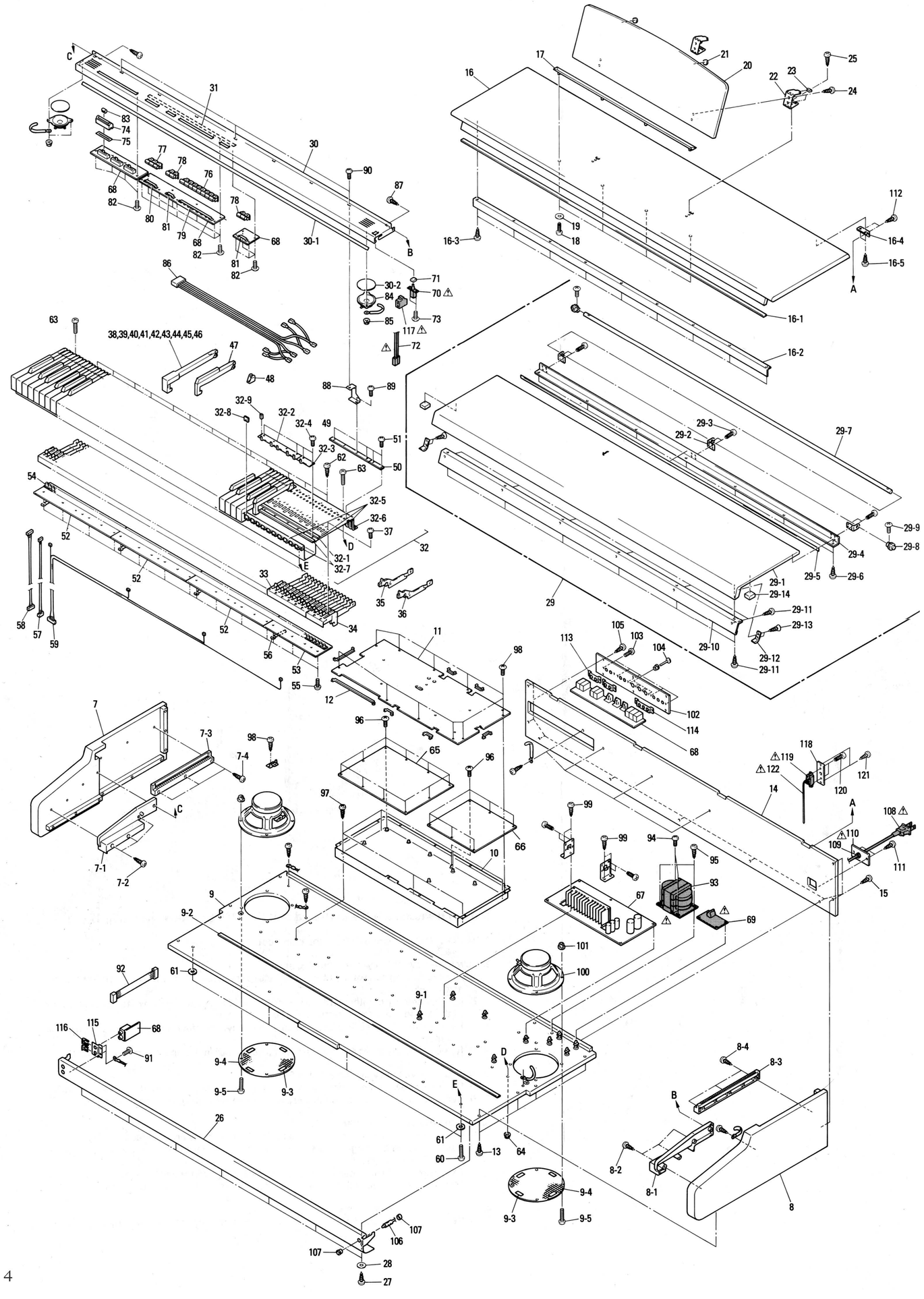
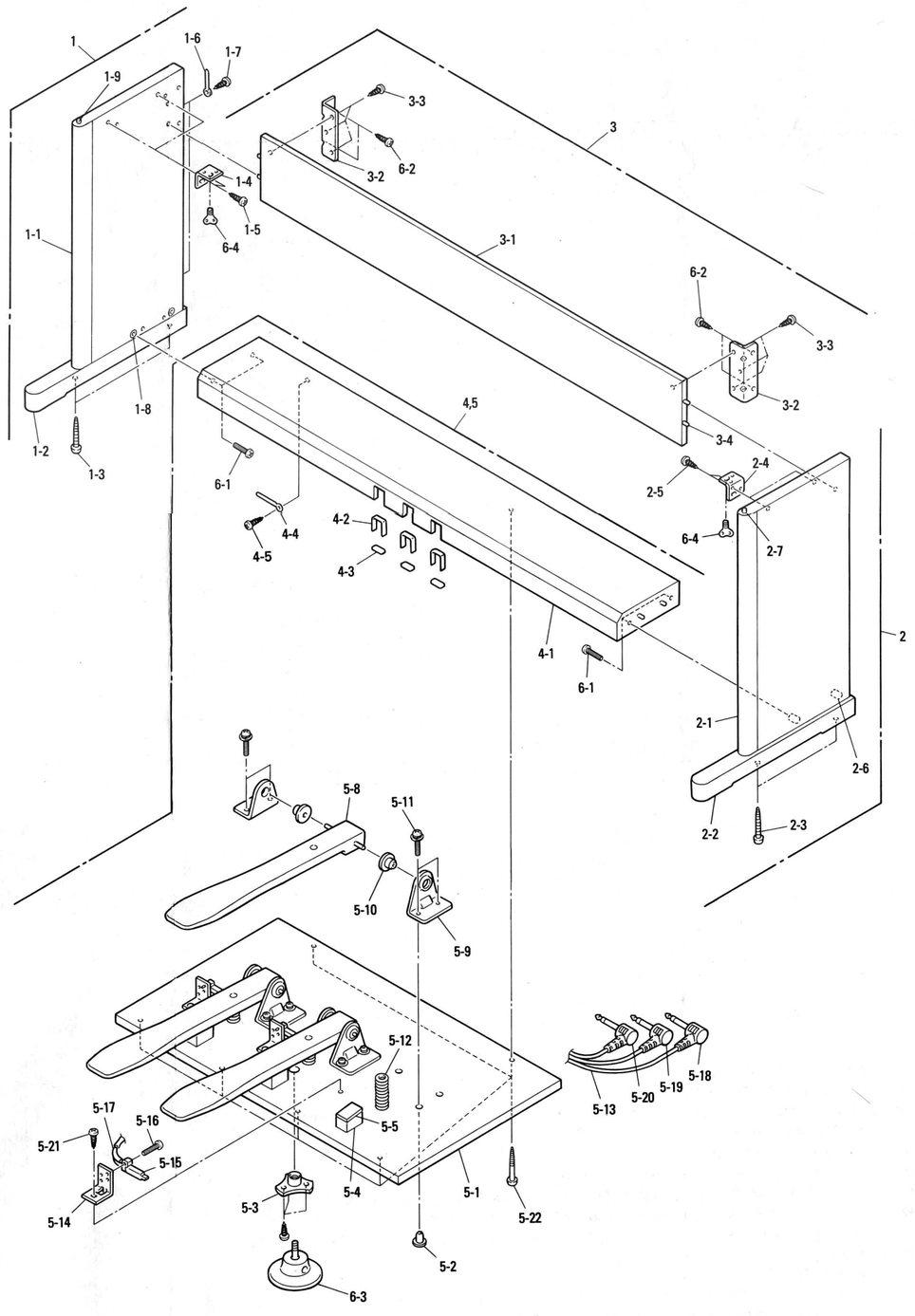




PARTS LIST OF EXPLODED VIEW

No.	Part Name	EP-3300 Q'ty	EP-3300 Part No.	Remarks
1	SIDE PANEL (L) ASS'Y	(1)	1077545005	
-1	SIDE PANEL (L)	1	1077546004	
-2	FOOT (L)	1	1077547003	
-3	4 × 40 CTTS (1)	2	4734803032	
-4	JOINT BRACKET	2	4127184009	
-5	3.5 × 16 CTTS (1)	4	4734806026	
-6	CORD HOLDER	2	EP-4772	
-7	3.1 × 16 CRWS	2	4720309029	
-8	WOOD ANCHOR	4	4770150008	
-9	DOWEL ϕ6 × 30	1		
2	SIDE PANEL (R) ASS'Y	(1)	1077548002	
-1	SIDE PANEL (R)	1	1077549001	
-2	FOOT (R)	1	1077547003	
-3	4 × 40 CTTS (1)	2	4734803032	
-4	JOINT BRACKET	2	4127184009	
-5	3.5 × 16 CTTS (1)	4	4734806026	
-6	WOOD ANCHOR	4	4770150008	
-7	DOWEL ϕ6 × 30	1		
3	REAR BOARD ASS'Y	(1)	1077550003	
-1	REAR BOARD	1	1077551002	
-2	JOINT BRACKET	2	4127142106	
-3	3.5 × 12 CTTS (1)	6	4734804015	
-4	DOWEL ϕ8 × 30	4		
4, 5	PEDAL BOX ASS'Y	(1)	1077552001	
4-1	PEDAL BOX	1	1077554009	
-2	PEDAL FELT	3	1247117111	
-3	PEDAL FELT	3	1247119009	
-4	CORD HOLDER	1	EP-4772	
-5	3 × 8 CBRTS (1)	1	4730304014	
5-1	PEDAL BOARD	1	1077380008	
-2	SPECIAL NUT	12	SC-1123-1	
-3	NUT	1	OJ-0103M	
-4	PEDAL STOPPER	3	1017960006	
-5	STOPPER FELT	3	1247112006	
-8	PEDAL	3	4367263023	
-9	PEDAL FALNGE	6	4367082000	
-10	PF. BUSH	6	4367083106	
-11	4 × 14 CPS (WITH W. SW)	12	4700021026	
-12	PEDAL SPRING	3	4367148009	
-13	3P PEDAL WIRE	1	2039458003	
-14	PEDAL SW BRACKET	3	4127160104	
-15	PEDAL SWITCH	3	2127001003	
-16	2 × 10 CPS	3	4711810006	
-17	UL TUBE 14mm	3	MRB-1089	
-18	DAN. PLUG SHEET	1	5137146007	
-19	SOF. PLUG SHEET	1	5137147006	
-20	SOS. PLUG SHEET	1	5137148005	
-21	3.5 × 10 CBTS (1)	3	4733804003	
-22	3.5 × 25 CRWS	6	4720411014	
6	ENVELOPE ASS'Y	(1)	5057064007	
-1	6 × 35 CTS	4	4714804022	
-2	6 × 16 CTS	4	4714609023	
-3	ADJUSTER	1	1047038005	
-4	PRESS WING SCREW	4	MMP1142	
7	SIDE BOARD (L) SEMI	(1)	1077476307	
-1	KEY BLOCK (L)	1	1037131103	
-2	3.5 × 16 CTTS (1)	3	4734806071	
-3	RACK (L)	1	4357011104	
-4	3.5 × 20 CTTS (1)	3	4734806039	
8	SIDE BOARD (R) SEMI	(1)	1077480306	
-1	KEY BLOCK (R)	1	1037132102	
-2	3.5 × 16 CTTS (1)	3	4734806071	
-3	RACK (R)	1	4357012103	
-4	3.5 × 20 CTTS (1)	3	4734806039	
9	BOTTOM BOARD ASS'Y	(1)	1077485301	
-1	LOCKING SUPPORT	9	4498079005	
-2	BOTTOM CUSHION	1	1247090034	
-3	HIMELON	8	1247073006	
-4	SPEAKER NET	2	1097035003	

No.	Part Name	EP-3300 Q'ty	EP-3300 Part No.	Remarks
-5	FIX BOLT (M4 × 30)	8		
10	SHIELD CASE ASS'Y	1	4147025203	
11	SHIELD COVER	1	4147024408	
12	EDGING 365mm	1		
13	3.5 × 25 CTTS (1)	8	4734804002	
14	REAR BOARD	1	1077487105	
15	3.5 × 20 CTTS (1)	9	4734806000	
16	ROOF BOARD SEMI ASS'Y	(1)	1077489404	
-1	PROTECTION FELT	1	1247146001	
-2	REFORM RAIL	1	4097020206	
-3	3.5 × 12 CBTS (1)	9	4733804045	
-4	ANGLE BRACKET	4	4037010001	
-5	3 × 12 CBRTS (1)	8	4730306012	
17	MUSIC STOPPER	1	4397035108	
18	3 × 18 CBTS (P)	4	4737500060	
19	3.5 W	4	4751134001	
20	SCORE HOLDER ASS'Y	(1)	1077464005	
21	LID CUSHION	2	4617026017	
22	SCORE HINGE	2	4017027108	
23	PROTECTION SHEET	2	1247123008	
24	3 × 8 CBTS (1)	4	4733830006	
25	3 × 10 CBTS (1)	4	4733804006	
26	FRONT PANEL	1	1027233503	
27	3.5 × 16 CTTS (1)	7	4734806013	
28	4.1 WASHER	7	4751152009	
29	KEY COVER ASS'Y	(1)	1077492307	
-1	KEY COVER	1	1077463006	
-2	BRACKET (A)	3	4127202208	
-3	3 × 6 CBTS (S)	6	4737002005	
-4	BRACKET (B)	1	4127203207	
-5	HIMELON SHEET	1	1247142018	
-6	3.5 × 10 CBTS (1)	7	4733804003	
-7	SHAFT	1	4357010105	
-8	GEAR	2	4247001101	
-9	3 × 8 CBTS (S)	2	4737002018	
-10	FRONT COVER	1	1027229203	
-11	3.5 × 10 CBTS (1)	1	4733804003	
-12	PROTECTER	2	4317005202	
-13	2.6 × 10 CFTS (1)	4	4732205027	
-14	STOPPER RUBBER	2	1247144003	
30	TOP PANEL SEMI ASS'Y	(1)	1027235307	
-1	KEN OSAE FELT	1	1247095068	
-2	SPEAKER HIMELON	2	1227032009	
31	HIMELON SHEET	1	1247142021	
	[KEY-148]			
32	KEY CHASSIS ASS'Y	(1)	4117100611	
-1	KEY CHASSIS	1	4117098309	
-2	KEY GUIDE RAIL	7	4367278005	
-3	KEY GUIDE RAIL (S)	1	4367286000	
-4	3 × 6 CBTS (S)	16	4737002034	
-5	KEY CUSHION	3	1247114004	
-6	KEY CUSHION	1	1247140007	
-7	KEY CUSHION	2	1247114046	
-8	KEY GUIDE (W)	52	4317003204	
-9	KEY GUIDE (B)	36	4317004300	
33	HAMMER FLANGE	7	4367284109	
34	HAMMER FLANGE (S)	1	4367285108	
35	HAMMER (W) ASS'Y	(52)	4367299204	
-1	HAMMER (W)	52	4367297109	
-2	HAMMER WEIGHT (W)	52	4367295004	
-3	HAMMER CUSHION	52	1247116109	
36	HAMMER (B) ASS'Y	(36)	4367300203	
-1	HAMMER (B)	36	4367298108	
-2	HAMMER WEIGHT (B)	36	4367296003	
-3	HAMMER CUSHION	36	1247116109	
37	3 × 10 CBTS (Bo)	16	4733814019	
38	KEY ASS'Y (W)	(7)	4367290203	
-1	KEY A	7	4367265209	
-2	SLIDE CUSHION	7	1247115100	
39	KEY ASS'Y (W)	(8)	4367290216	

No.	Part Name	EP-3300 Q'ty	EP-3300 Part No.	Remarks
-1	KEY B	8	4367266208	
-2	SLIDE CUSHION	8	1247115100	
40	KEY ASS'Y (W)	(7)	4367301309	
-1	KEY C	7	4367267207	
-2	SLIDE CUSHION	7	1247115100	
-3	FENDER FELT	7	1247147000	
41	KEY ASS'Y (W)	(7)	4367290232	
-1	KEY D	7	4367268206	
-2	SLIDE CUSHION	7	1247115100	
42	KEY ASS'Y (W)	(7)	4367290245	
-1	KEY E	7	4367269205	
-2	SLIDE CUSHION	7	1247115100	
43	KEY ASS'Y (W)	(7)	4367301312	
-1	KEY F	7	4367270207	
-2	SLIDE CUSHION	7	1247115100	
-3	FENDER FELT	7	1247147000	
44	KEY ASS'Y (W)	(7)	4367290261	
-1	KEY G	7	4367271206	
-2	SLIDE CUSHION	7	1247115100	
45	KEY ASS'Y (W)	(1)	4367291202	
-1	KEY A'	1	4367272205	
-2	SLIDE CUSHION	1	1247115100	
46	KEY ASS'Y (W)	(1)	4367301325	
-1	KEY C'	1	4367273204	
-2	SLIDE CUSHION	1	1247115100	
-3	FENDER FELT	1	1247147000	
47	KEY ASS'Y (B)	(36)	4367292502	
-1	KEY A#	36	4367276502	
-2	SLIDE CUSHION	36	1247115100	
48	KEY SHAFT	88	4367277200	
49	K/S STOPPER	7	4367279004	
50	K/S STOPPER (S)	1	4367287009	
51	3 × 6 CBTS (S)	16	4737002034	
52	24 KEYS SWITCH BOARD	3	BP-380-2	
53	16 KEYS SWITCH BOARD	1	BP-383-2	
54	RUBBER SWITCH 8-II	11	2128598104	
55	3 × 10 CBTS (Bo)	15	4733814019	
56	CORD HOLDER	4	EP-4772	
57	6P CONNECTOR ASS'Y	1	2041435043	
58	10P CONNECTOR ASS'Y	1	2045037049	
59	11P CONNECTOR ASS'Y	1	2047420133	
60	4 × 25 CTTS (S)	5		
61	4.1 WASHER	2	4751152009	
62	4 × 12 CTTS (1)	13	4734406015	
63	4 × 20 CTS	2	4714410021	
64	4 NUT-W	2	4756131009	
65	MAIN PCB UNIT	1	BP-421-1	
66	EFFECT PCB UNIT	1	BP-423	
67	POWER PCB UNIT	I	BP-419-2	
68	PANLL PCB UNIT	1	BP-420-2	
⚠ 69	L/FILTER PCB UNIT	1	BP-393-2	U.S.A.,Canada
⚠ 69	L/FILTER PCB UNIT	1	BP-393-3	Asia,Europe U.K.
⚠ 70	POWER SWITCH	1	2128590018	
71	PUSH BUTTON	1	1137015048	
⚠ 72	SW. CONNECTOR ASS'Y	1	2033512055	
73	3 × 6 CBTS (S)	2	4737002034	
74	VOLUME PANEL	3	1037092116	
75	BLIND SHEET	3	1227027108	
76	SWITCH BUTTON	1	1137030117	
77	SWITCH BUTTON (S)	1	1137032021	
78	SWITCH BUTTON (S)	2	1137032034	
79	BLIND SHEET	1	1227029164	
80	BLIND SHEET	1	1227029177	
81	BLIND SHEET	2	1227029135	
82	3 × 6 CBTS (S)	18	4737002034	
83	SLIDE VOLUME KNOB	3	1137031116	
84	PT-01M	2	3017023006	
85	3 NUT-W	4	SC-1082-2	
86	4P CONNCTOR ASS'Y	1	2037475017	

No.	Part Name	EP-3300 Q'ty	EP-3300 Part No.	Remarks
87	3.5 × 20 CTTS (1)	2	4734806000	
88	T.P SUPPORTER	3	4337004005	
89	3 × 6 CBTS (S)	3	4737002034	
90	3 × 6 CBTS (S)	3	4737002034	
91	3 × 6 CBTS (S)	2	4737002034	
92	5P CONNECTOR ASS'Y	1	2039460017	
⚠ 93	POWER TRANS	1	2338539005	U.S.A.,Canada
⚠ 93	POWER TRANS	1	2338542005	Asia
⚠ 93	POWER TRANS	1	2338544003	Europe
⚠ 93	POWER TRANS	1	2338541006	U.K.
94	4 × 14 CTS	2	4714408017	
95	4 × 12 CTTS (1)	2	4734406015	
96	3 × 6 CBTS (S)	12	4777002034	
97	3.5 × 10 CBTS (1)	6	4733804003	
98	3 × 6 CBTS (S)	11	4777002034	
99	3.5 × 10 CBTS (1)	4	4733804003	
100	16RG03M	2	3017017009	
101	4 NUT-W	8	SC-1050H	
102	AUX PANEL (BLACK COATING)	1	1027193012	
102	AUX PANEL (VINYL CHLORIDE STEEL PLATE)	1	1027252005	
103	3 × 8 CBTS (S)	6	4737002021	
104	PUSH RIVET	6	4770210003	
105	3 × 10 CBTS (1)	8	4733814006	
106	LED ASS'Y	1	3937019019	
107	LED BUSHING	1	4430310007	
⚠ 108	AC CORD WITH PLUG	1	2062021009	U.S.A.,Canada
⚠ 108	AC CORD WITH PLUG	1	2062002031	Asia,Europe
⚠ 108	AC CORD WITH PLUG	1	2007057009	U.K.
⚠ 109	BUSHING	1	4450047004	U.S.A.,Canada Asia,Europe
110	BUSHING PLATE	1	4127133005	U.S.A.,Canada Asia,Europe
110	BUSHING PLATE	2	4127223009	U.K.
111	3 × 10 CBTS (1)	2	4733814006	
112	3 × 10 CBTS (1)	8	4733814006	
113	JACK BRACKET	2	4127138000	
114	JACK BRACKET	1	4121185008	
115	H/J BRACKET	1	4127207106	
116	SNAP PLATE	2		
⚠ 117	SWITCH COVER	1	4157006005	
118	SWITCH PLATE	1	4127199007	Asia
⚠ 119	VOLTAGE SELECTOR SW.	1	2122001008	Asia
120	3 × 10 CBTS (P)	2	4737508017	Asia
121	3 × 10 CBTS (1)	2	4733804006	Asia
⚠ 122	1 WAY WIRE ASS'Y	1	2031448011	Asia

WARNING:

Parts marked with ⚠ [ ] this symbol have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.
DO NOT return the unit to the customer until the problem is located and corrected.

ADJUSTMENT

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 lowers, 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

Fig.1

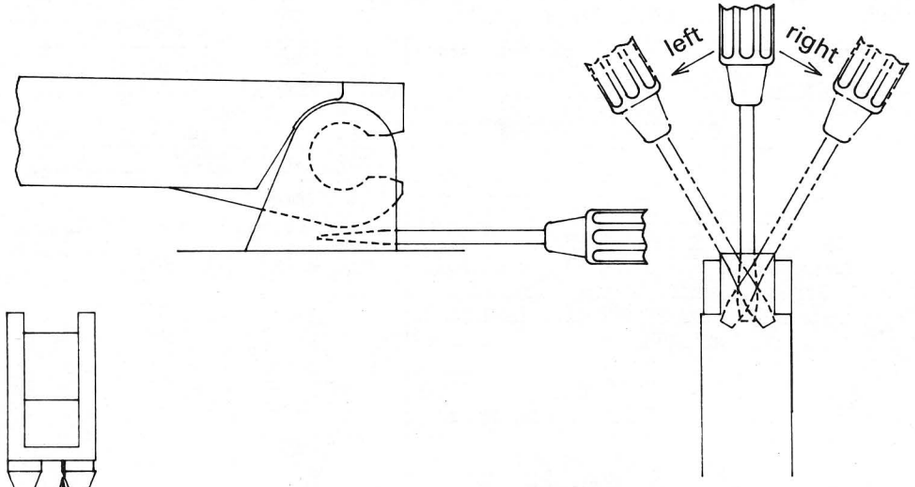


Fig.2

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
3) Key shaft is unstable longitudinally.
4) Slide cushion is worn.

Key shaft is broken ..... Replace the key shaft.

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.)

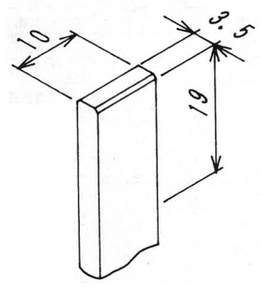


Fig.1

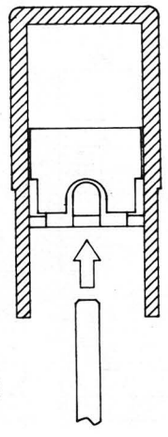


Fig.2

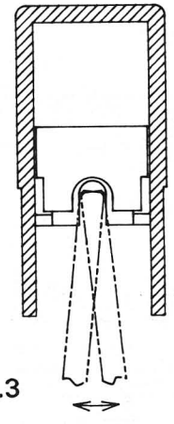


Fig.3

TEST MODE AND ADJUSTMENT

BP-421 MAIN PCB

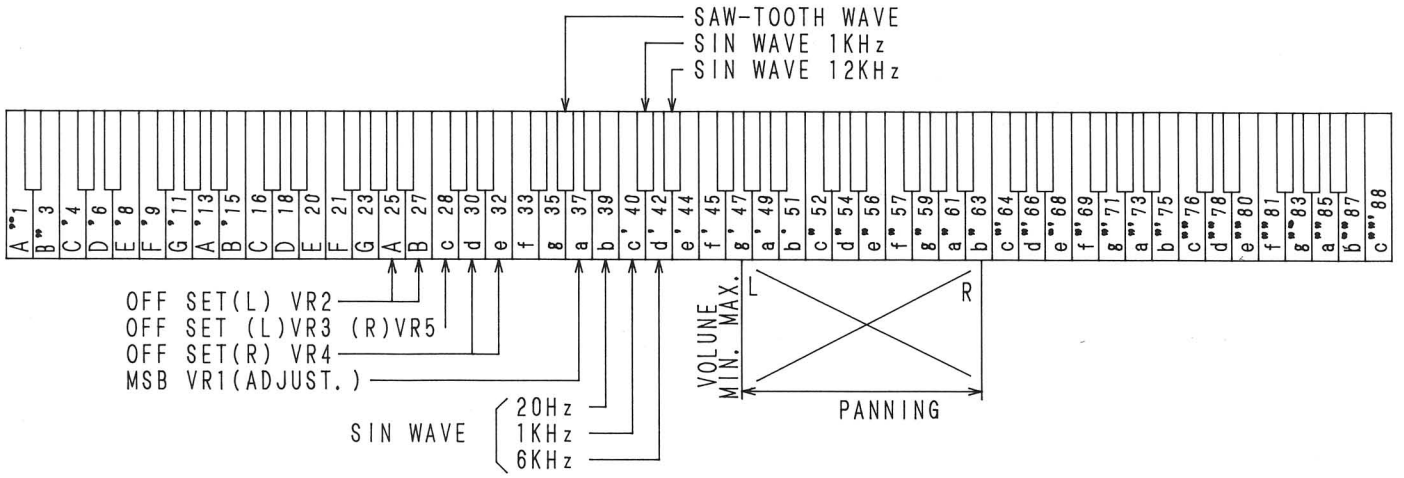
Test Mode

(1) How to set to the test mode:
Press the BASS button and hold it, then set the POWER switch to ON. Only the PIANO 1 indicator lights.

(2) How to clear the test mode:
Press the timbre select button once or set the POWER switch to OFF and then ON again.

(3) Details of test mode
OFFSET adjustment
MSB adjustment
Sine-wave outputs (20Hz, 1kHz, 6kHz, 12kHz)
Sine-wave outputs (higher than the above at 1kHz)
Panning

(4) Relationship between test mode and keyboard
See the diagram below.



Adjustment

(1) Test equipment necessary for adjustment
Millivoltmeter

(2) Before starting
Warm up for 5 minutes and set to the test mode before starting adjustment.

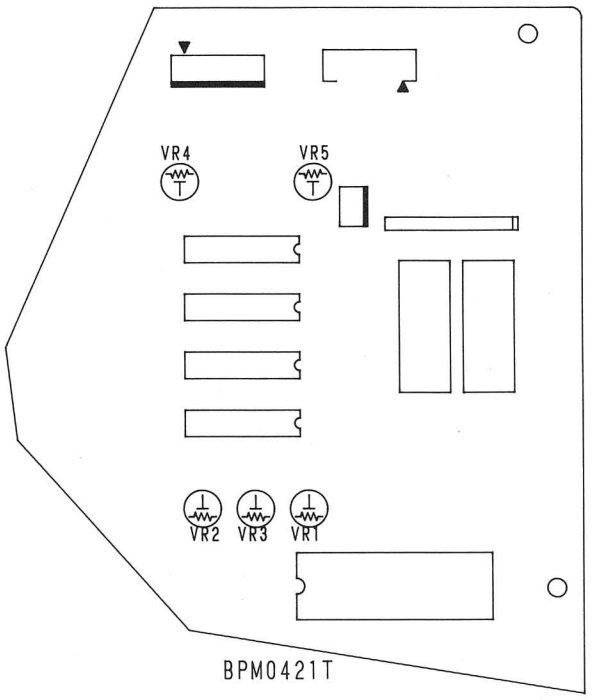
(3) Adjustment point locations
See the diagram on the right.

(4) Order of adjustments

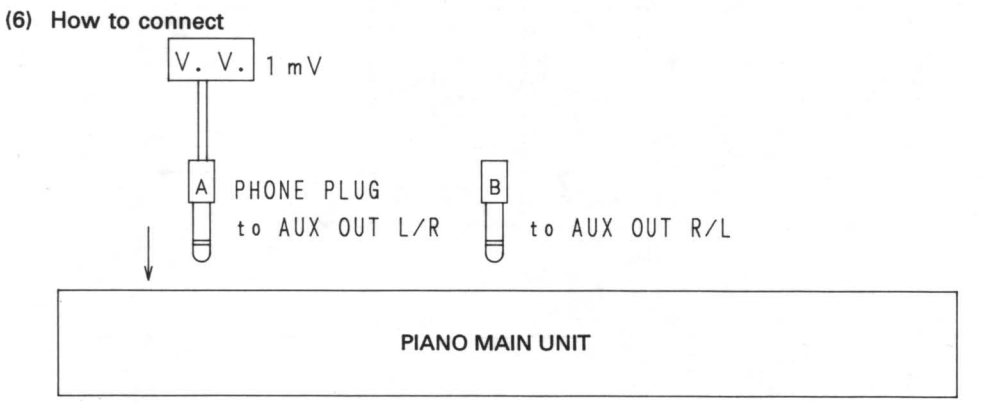
1	Warm up	More than 5 minutes	
2	Test mode		
3	MSB adjustment	VR1	
4	OFFSET adjustment	1	VR5 (R Side)
		2	VR4 (R Side)
		3	VR3 (L Side)
		4	VR2 (L Side)

(5) Settings of VRs on panel

Name of VR	VOLUME	BRILLIANCE
Setting	MAX.	BRIGHT



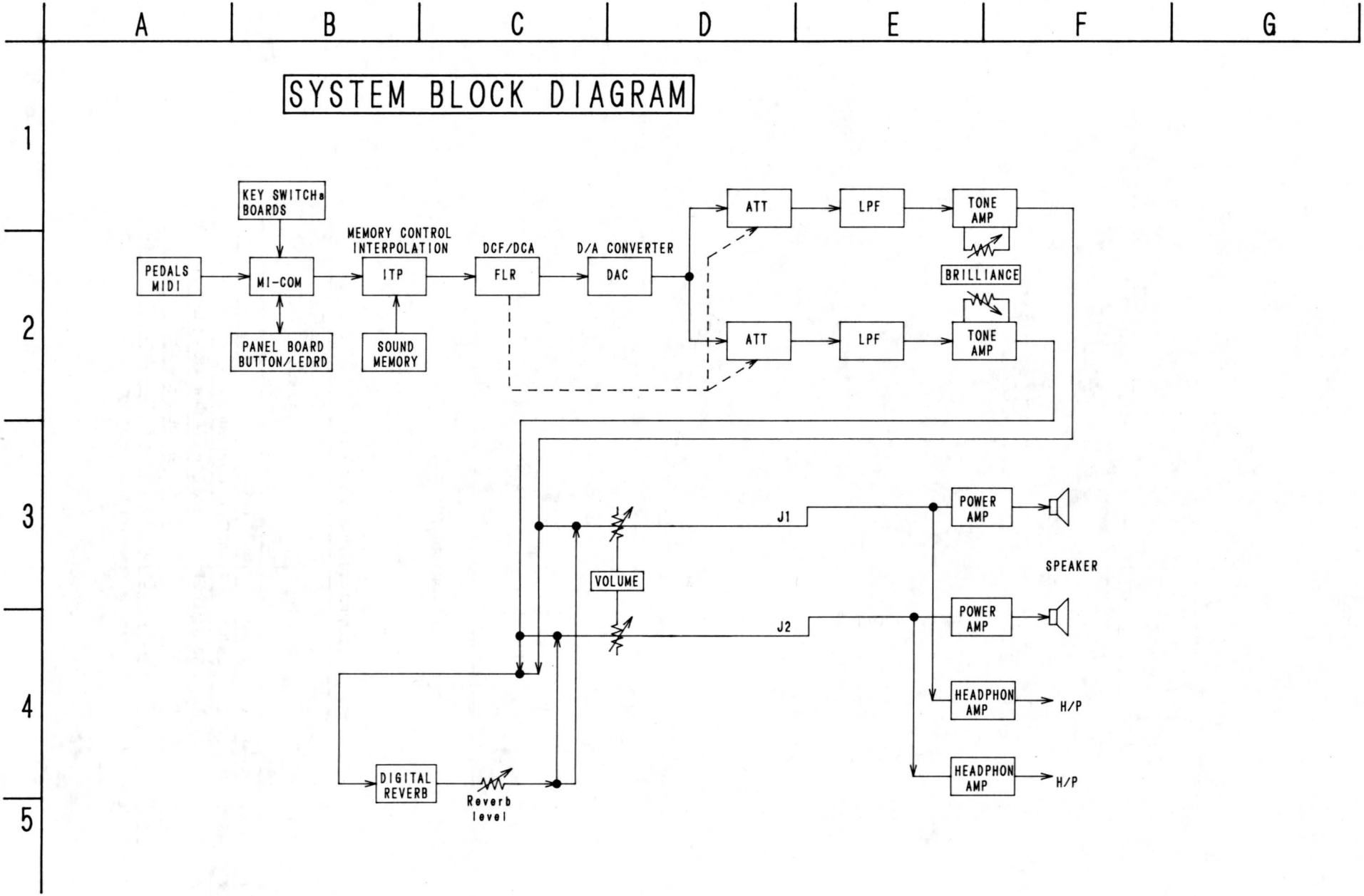
(6) How to connect



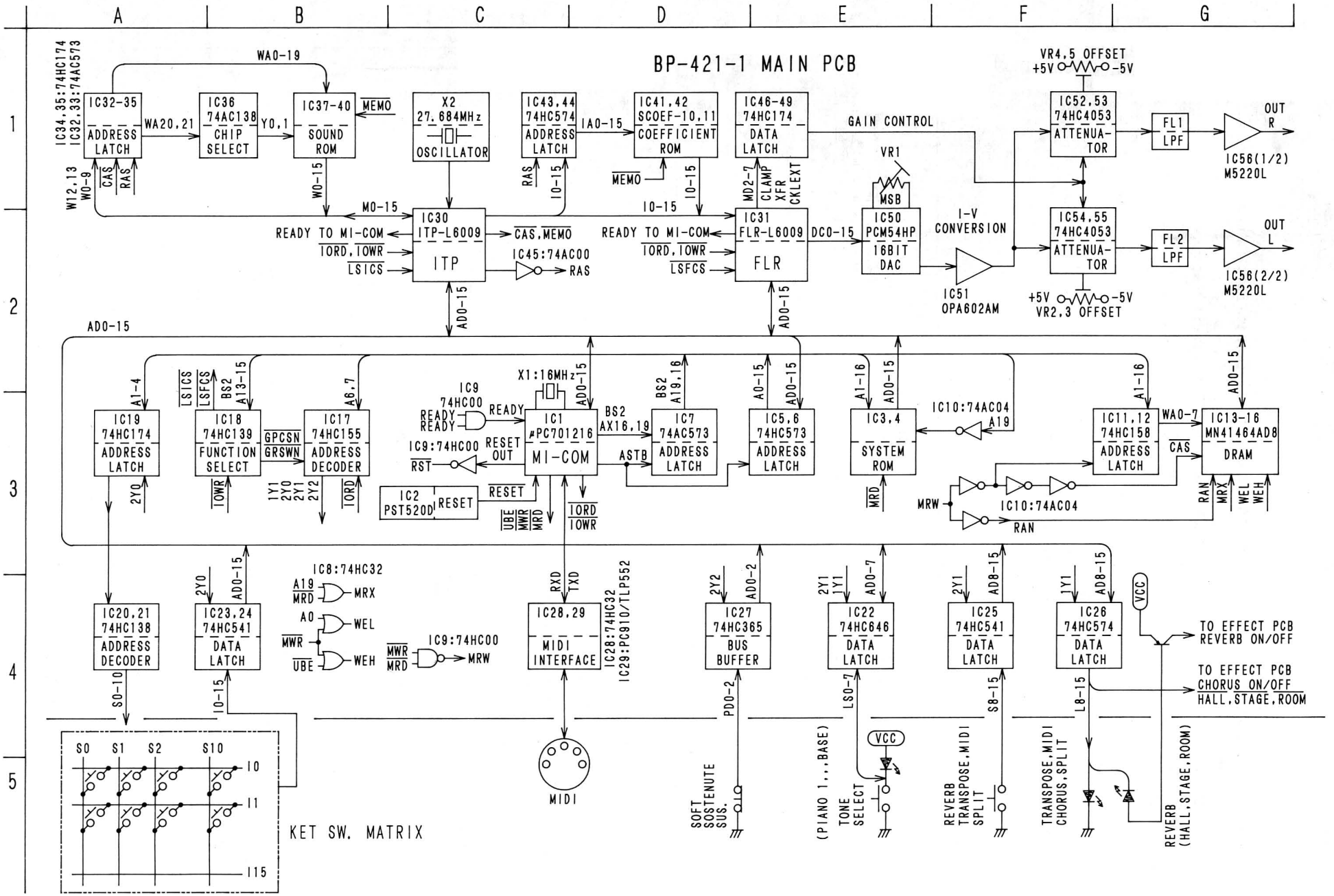
(7) Adjustment procedure
Adjust the VRs so the millivoltmeter reading is minimum.

	VR No.	Plug positions (AUX OUT)		No. of keys	Operation
		A	B		
1	VR1	R	L	37 (A)	Set A to ON.
2	VR5	R	L	28 (C)	Set C to ON repeatedly.
3	VR4	R	L	30, 32 (D, E)	Set D and E to ON alternately and repeatedly.
4	VR3	L	R	28 (C)	Set C to ON repeatedly.
5	VR2	L	R	25, 27 (A, B)	Set A and B to ON alternately and repeatedly.

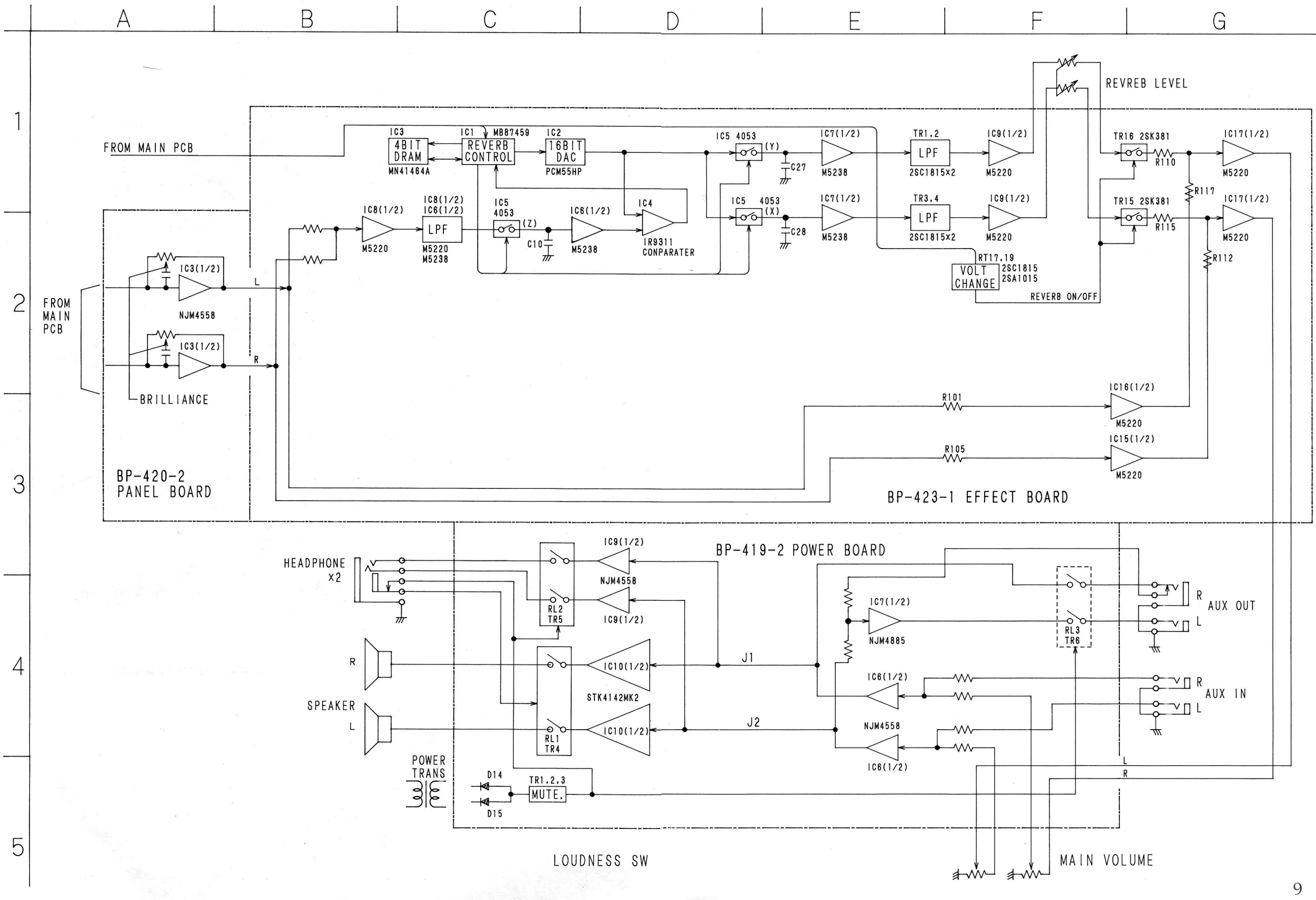
Note: For item 1 adjust to the volume is minimum when listening.


A
B
C
D
E
F
G
1
2
3
4
5
SYSTEM BLOCK DIAGRAM
KEY SWITCHs BOARDS
PEDALS MIDI
MI-COM
PANEL BOARD BUTTON/LEDRD
MEMORY CONTROL INTERPOLATION
ITP
SOUND MEMORY
DCF/DCA
FLR
D/A CONVERTER
DAC
ATT
LPF
TONE AMP
BRILLIANCE
ATT
LPF
TONE AMP
VOLUME
J1
J2
POWER AMP
POWER AMP
SPEAKER
HEADPHON AMP
H/P
HEADPHON AMP
H/P
DIGITAL REVERB
Reverb level

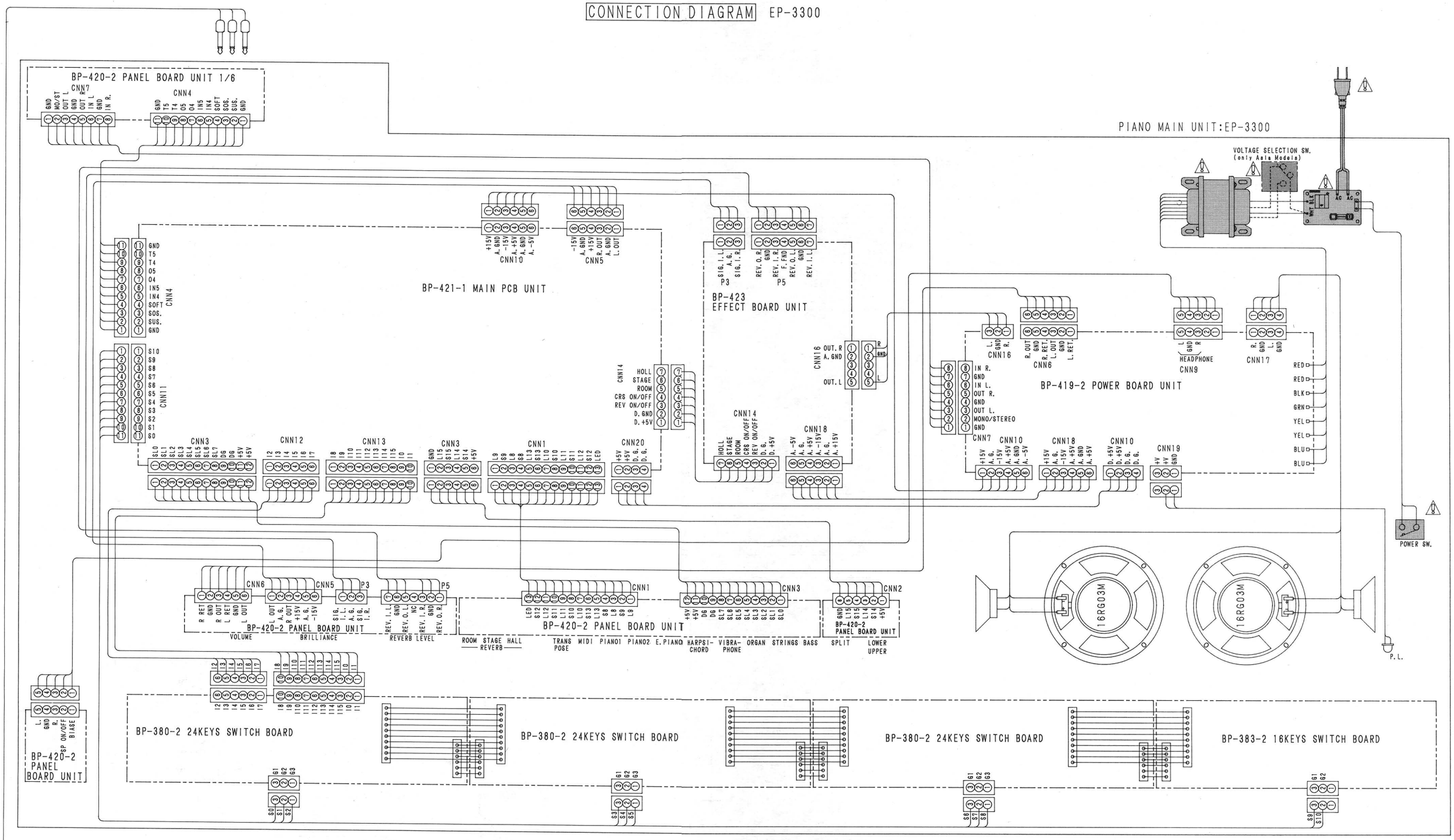
CONTROL SYSTEM & D/A CONVERTER BLOCK DIAGRAM



BLOCK DIAGRAM SOUND SYSTEM



CONNECTION DIAGRAM EP-3300



NOTES
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITH OUT PRIOR NOTICE.

WARNING:
Parts marked with ⚠ ▭ have critical characteristics.
Use ONLY replacement parts recommended by the manifacture.

LIST OF P.C. BOARD

PARTS LIST Printed Circut Board:EP-3300

BP-421-1 MAIN PCB

Ref. No.	Part No.	Part Name	Remarks
IC1	2621535004	μPD70216GF-8-3B8	
IC2	2630803002	PST520D-2	
IC3	2621726062	27C512-3300-2.0-L	
IC4	2621727061	27C512-3300-2.0-M	
IC5,6	2621313006	TC74HC573AP	
IC7,32,33	2621538001	CD74AC573E	
IC8,28	2621321001	TC74HC32AP	
IC9	2621318001	TC74HC00AP	
IC10	2621542000	HD74AC04P	
IC11,12	2621552003	HD74AC158P	
IC13-16	2621551004	MN4164A-08	
IC17	2621544008	TC74HC155AP	
IC18	2621159008	TC74HC139AP	
IC19,34, 35,46-49	2621543002	TC74HC174AP	
IC20,21	2621160000	TC74HC138AP	
IC22	2621077009	TC74HC646AP	
IC23-25	2621315004	TC74HC541AP	
IC26,43,44	2621314005	TC74HC574AP	
IC27	2621553002	TC74HC365AP	
IC29	3939330000	TLP552/PC910	
IC30	2621536003	ITP-L6009	
IC31	2621537002	FLR-L6009	
IC36	2621592005	TC74AC138P	
IC37	2621730003	LH538K13 AWV-100-3	
IC38	2621731002	LH538K14 AWV-100-4	
IC39	2621728002	LH538K11 AWV-100-1	
IC40	2621729001	LH538K12 AWV-100-2	
IC41	2621545007	SCOEF10-512 9743-081	
IC42	2621546006	SCOEF11-512 9743-081	
IC45	2621541001	HD74AC00P	
IC50	2620672007	PCM54HP	
IC51	2630804001	OPA602AM	
IC52-55	2621550005	CD74HC4053E	
IC56	2630226003	M5220L	
FL1,2	2610123003	LP YC258BLR-5589N	
⚠ R20,21	2412315035	RD14B2E330GFRF	33Ω
⚠ R38-41	2412371011	RD14B2E150GFRF	15Ω
X1		HC-49/U-S 16.000MHz	
X2	3997002008	COX-042C 27.684MHz	
RA1-3	2462045038	RK99=1H103JP8	10KΩ×8
RA4	2462085001	RK99=1H103JP3	10KΩ×3
VR1	2116089010	K07PB105	B-1MΩ
VR2-5	2116089007	K07PB502	B-5KΩ

BP-423-1 EFFECT BOARD

Ref. No.	Part No.	Part Name	Remarks
D1,9,10	2760432000	1SS270A	
TR1-4,17	2730198028	2SC1815(GR)	
TR15,16	2750048006	2CK381(D/E)	
TR18	2710102021	2SA1015(GR)	
IC1	2631486001	MB87459PF-001	
IC2	2621561007	PCM55HP	
IC3	2621551004	MN41464A-08	
IC4	2630806009	IR9311	
IC5	2621562006	TC74HC4053AP	
IC6,7	2630679000	M5238P	
IC8,9,15 16,17	2630317006	M5220P	
X1	3997002024	HC-49/U-S 20.000MHz	
⚠ R201,202	2412371011	RD14B2E150GFRF	15Ω
RA1	2462077006	RK99=1H104JP4	100KΩ×4
L10-16,19 21-25,27	2350023007	BL02RN2-R62	
L1-4	2350090001	SBT-0240	

BP-420-2 PANEL BOARD

Ref. No.	Part No.	Part Name	Remarks
IC3	2630081002	NJM4558D	
SW1-10 12-16	2124388004	TACT SWITCH	
LD1-10, 12-16,	3939490005	LN221RP	
VR1,3	2117050006	J3020VBB103	B-10KΩ
VR2	2117050019	J3020VBB503	B-50KΩ
L1-12	2350050009	BEAD INDUCTOR	
⚠ R29-32	2412314007	RD14B2E101JNBF	100Ω
MIDI	2049431007	DIN SOCKET	
AUX IN	2049437001	PHONE JACK	
AUX OUT	2049436002	PHONE JACK	
PEDAL	2049444007	PHONE JACK	
HEADPHONE	2049443008	PHONE JACK	

EP-419-2 POWER BOARD

Ref. No.	Part No.	Part Name	Remarks
IC1	2360053006	NJM7805FA	
IC2	2630561001	NJM7915FA	
IC3	2630560002	NJM7815FA	
IC4	2630567005	NJM78M05FA	
IC5	2630501003	NJM79M05FA	
IC6,7	2630405002	NJM4558S	
IC9	2630485006	NJM4556S	
IC10	2650074002	STK4142MK2	
⚠ D1	2760505005	DBA20B	
D2,3,5-12 14-19	2760432000	1SS270A	
⚠ D4	2760504006	DBA10C	
⚠ D13	2760576005	DBA40C	
ZD1	2760468003	HZS9B-(1)	
TR1,4-6	2730198028	2SC1815(GR)	
TR2,3	2710102021	2SA1015(GR)	
RL1	2140146000	G6B2214P-US DC12V	
RL2,3	2140148008	G5A-234P DA12	
⚠ F1,2	2081039082	FUSE 4A 125V	U.S.A.,Canada
⚠ F1,2	2081015087	FUSE 4A 125V	Europe,U.K.
⚠ F1,2	2081035070	FUSE 4A 125V	Asia
⚠ F3,4	2081039021	FUSE 500mA 125V	U.S.A.,Canada
⚠ F3,4	2081015003	FUSE 500mA 250V	Europe,U.K.
⚠ F3,4	2081035083	FUSE 630mA 125V	Asia
⚠ F5	2081039034	FUSE 1A 125V	U.S.A.,Canada
⚠ F5	2081015029	FUSE 1A 250V	Europe,U.K.
⚠ F5	2081053007	FUSE 1A 125V	Asia
⚠ R69,78	2412314007	RD14B2E101JNBF	100Ω
⚠ R76,77	2452381003	RN14B3D4R7JNBF	4.7Ω
⚠ R80	2412321029	RD14B2E152JNBF	1.5KΩ
⚠ R92	2412314081	RD14B2E561JNBF	560Ω
⚠ R95,96	2412321087	RD14B2E121JNBF	120Ω
L1-5	2350050009	BEAD INDUCTOR	

BP-380-2 24KEYS SWITCH BOARD

Ref. No.	Part No.	Part Name	Remarks
D0-47	2760049008	1S2706	
	2128598104	RUBBER SWITCH-II	

BP-383-2 16KEYS SWITCH BOARD

Ref. No.	Part No.	Part Name	Remarks
D0-31	2760049008	1S2706	
	2128598104	RUBBER SWITCH-II	

BP-393-2 L/FILTER BOARD(U.S.A./Canada)

Ref. No.	Part No.	Part Name	Remarks
⚠ F	2061058004	FUSE 2A 125V	
⚠	2397001008	LINE FILTER	
⚠ C1,2	2538012005	CK45F2GAC222M	
⚠ C3	2538015002	CK45F2GAC103P	
⚠ SW	2033518004	2P CONNECTOR BASE	

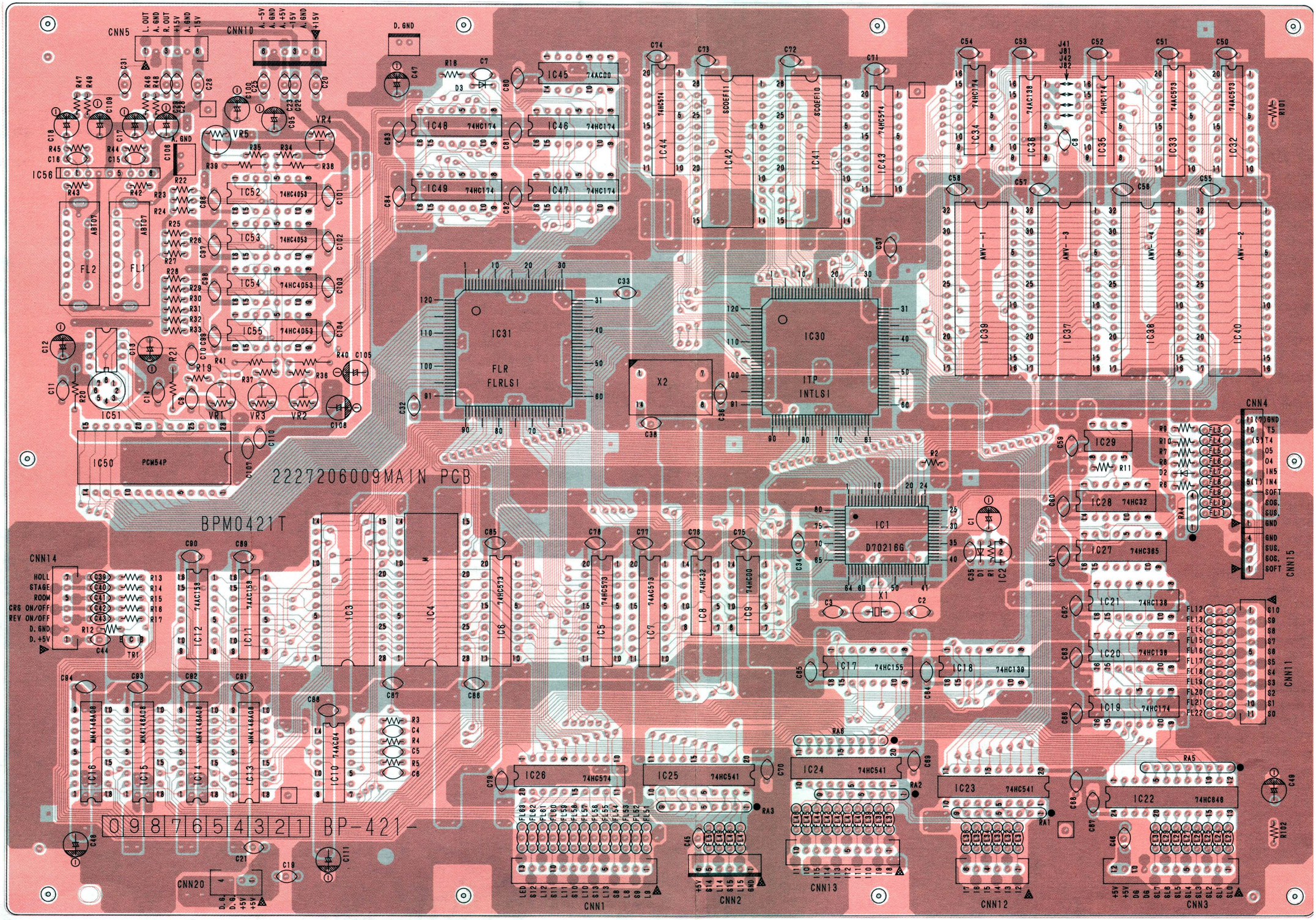
BP-393-3 L/FILTER BOARD(Europe,U.K.,Asia)

Ref. No.	Part No.	Part Name	Remarks
⚠ F	2061015061	FUSE 2A 250V	
⚠	2020014003	FUSE CLIP	
⚠	2397001008	LINE FILTER	
⚠ C1,2	2538012005	CK45F2GAC222M	
⚠ C3	2538015002	CK45F2GAC103P	
⚠ SW	2033518004	2P CONNECTOR BASE	

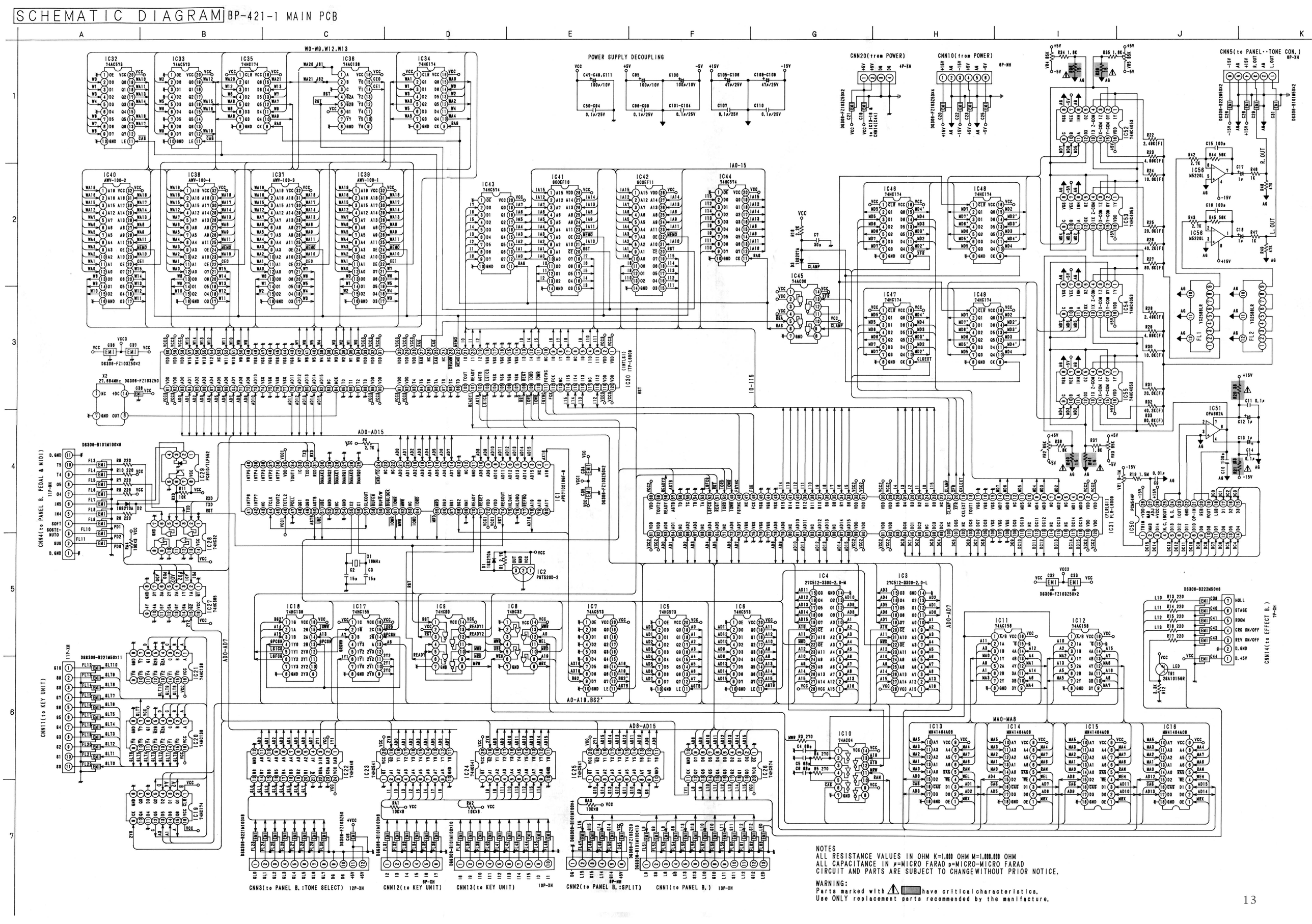
WARNING:
Parts marked with ⚠ ▭ have critical characteristics.
Use ONLY replacement parts recommended by the manifacture.

BP–421 MAIN PCB UNIT Soldering side

Mounting Side



SCHEMATIC DIAGRAM BP-421-1 MAIN PCB

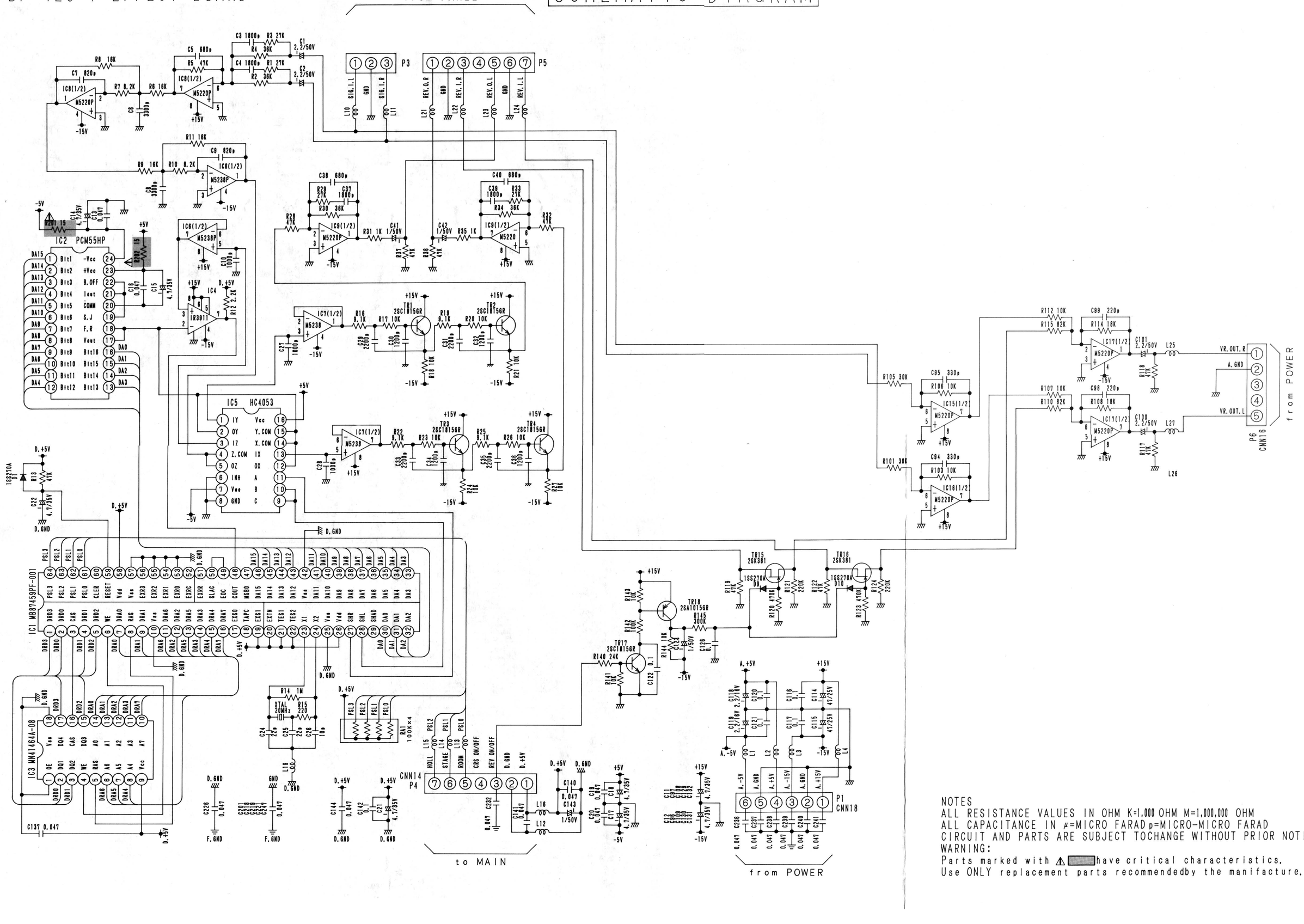


NOTES
ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
ALL CAPACITANCE IN μ=MICRO FARAD p=MICRO-MICRO FARAD
CIRCUIT AND PARTS ARE SUBJECT TO CHANGEWITHOUT PRIOR NOTICE.

WARNING:
Parts marked with ⚠ and ▮ have critical characteristics.
Use ONLY replacement parts recommended by the manifacture.

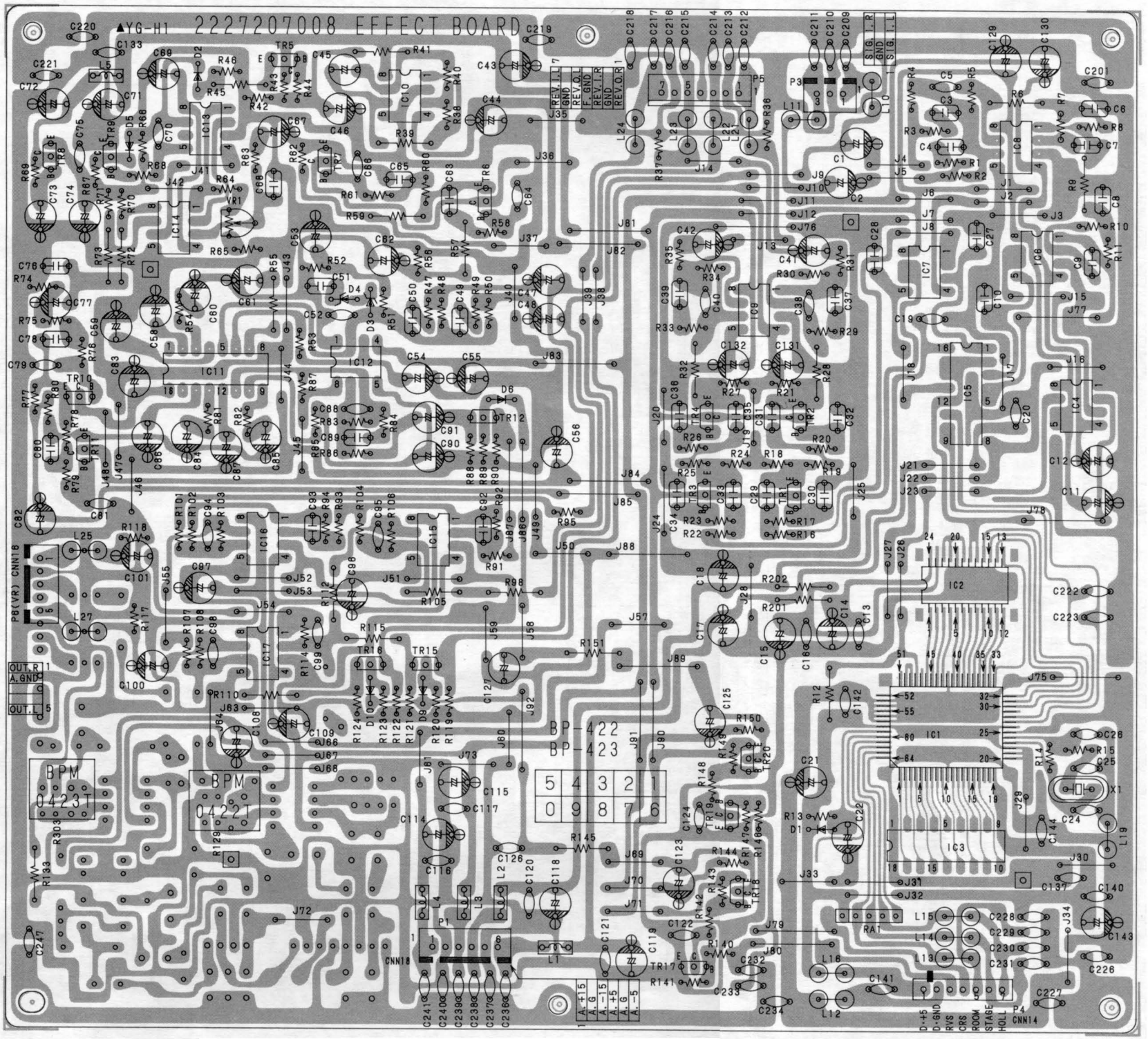
BP-423-1 EFFECT BOARD

SCHEMATIC DIAGRAM



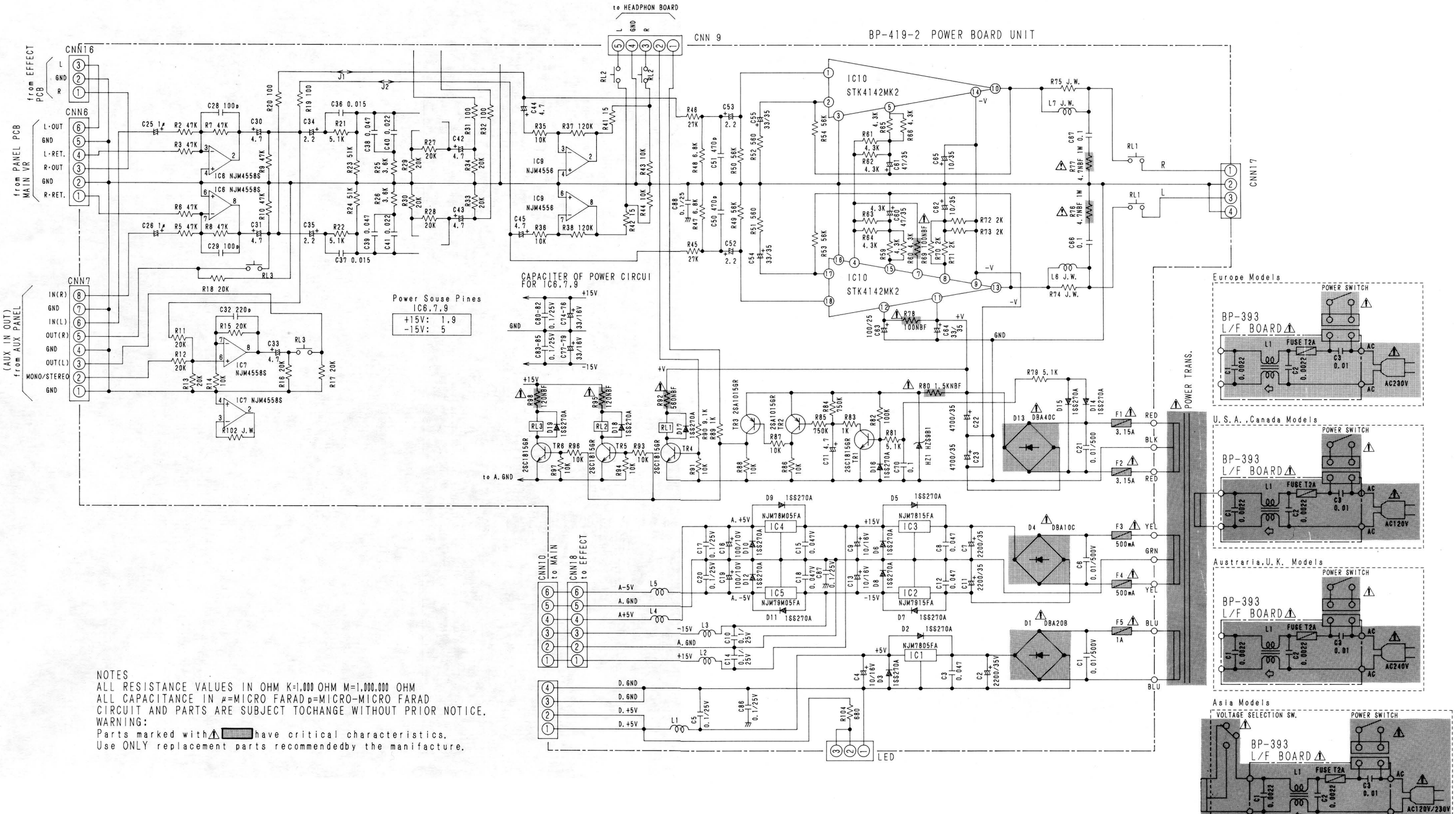
NOTES
ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
ALL CAPACITANCE IN μ=MICRO FARAD p=MICRO-MICRO FARAD
CIRCUIT AND PARTS ARE SUBJECT TOCHANGE WITHOUT PRIOR NOTICE.
WARNING:
Parts marked with ⚠ ▭ have critical characteristics.
Use ONLY replacement parts recommendedby the manifacture.

BP–422, BP–423 EFFECT BOARD UNIT Pattern side



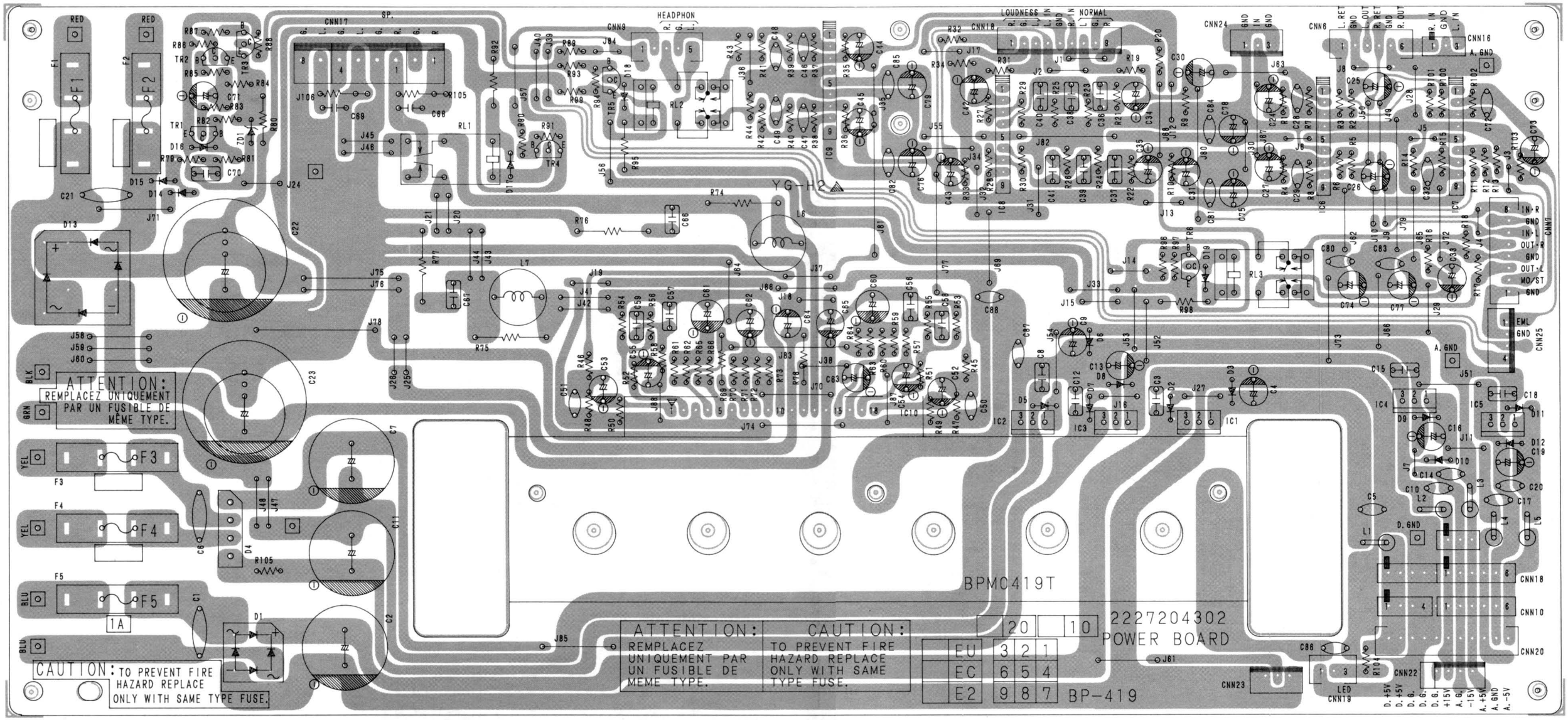
SCHEMATIC DIAGRAM

BP-419-2 POWER BOARD & BP-393 L/FILTER

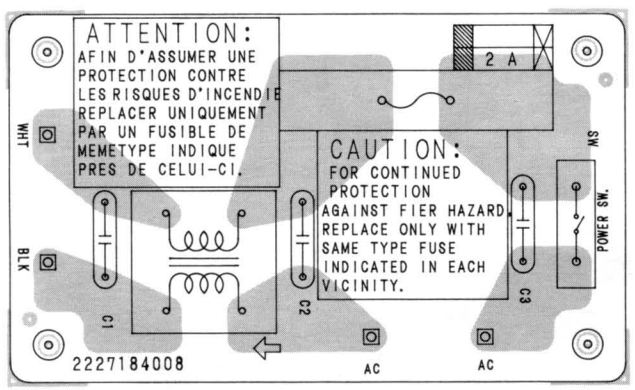


NOTES
ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
ALL CAPACITANCE IN μ=MICRO FARAD p=MICRO-MICRO FARAD
CIRCUIT AND PARTS ARE SUBJECT TOCHANGE WITHOUT PRIOR NOTICE.
WARNING:
Parts marked with ⚠ [redacted] have critical characteristics.
Use ONLY replacement parts recommendedby the manifacture.

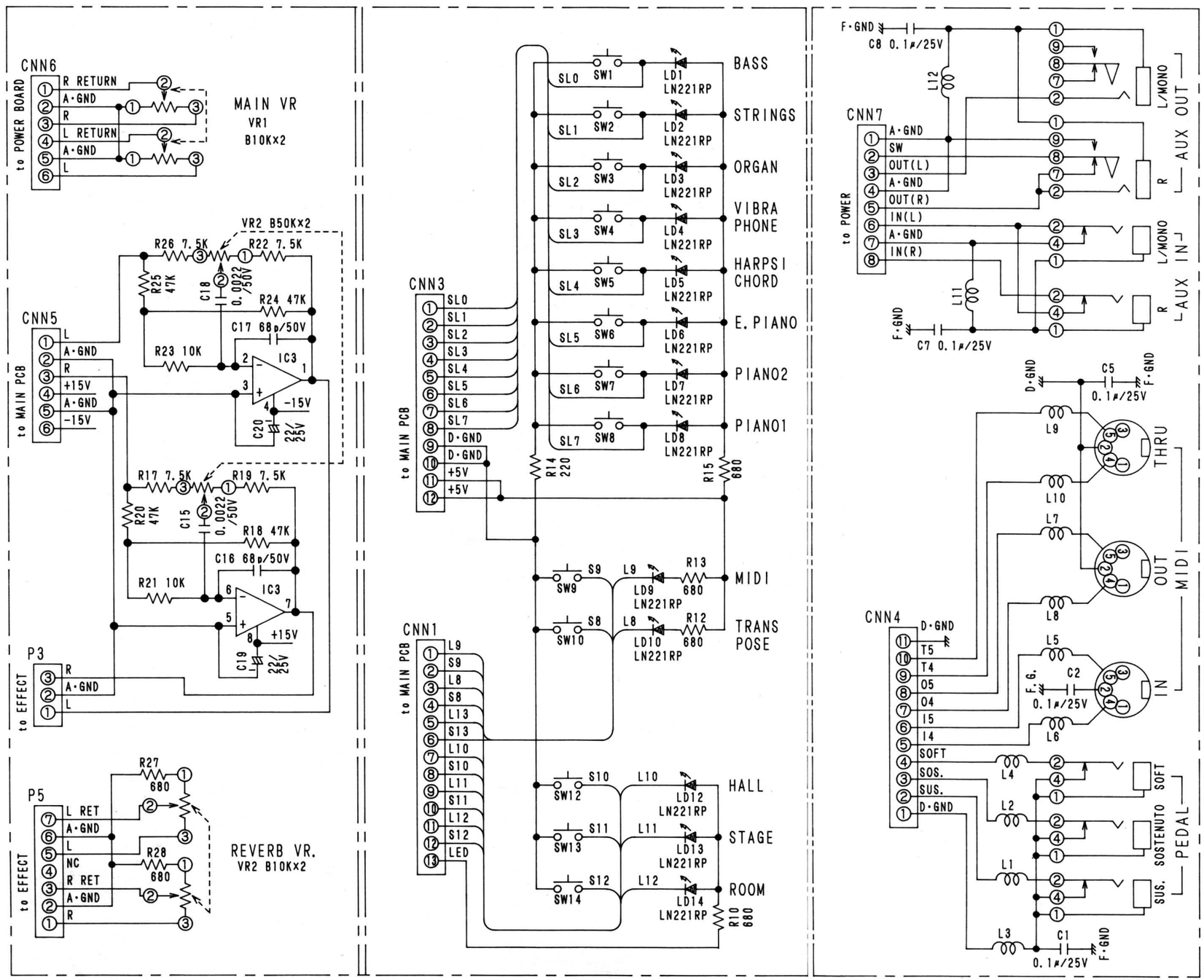
BP–419 POWER BOARD UNIT Pattern side



BP–393 L/FILTER BOARD Pattern side

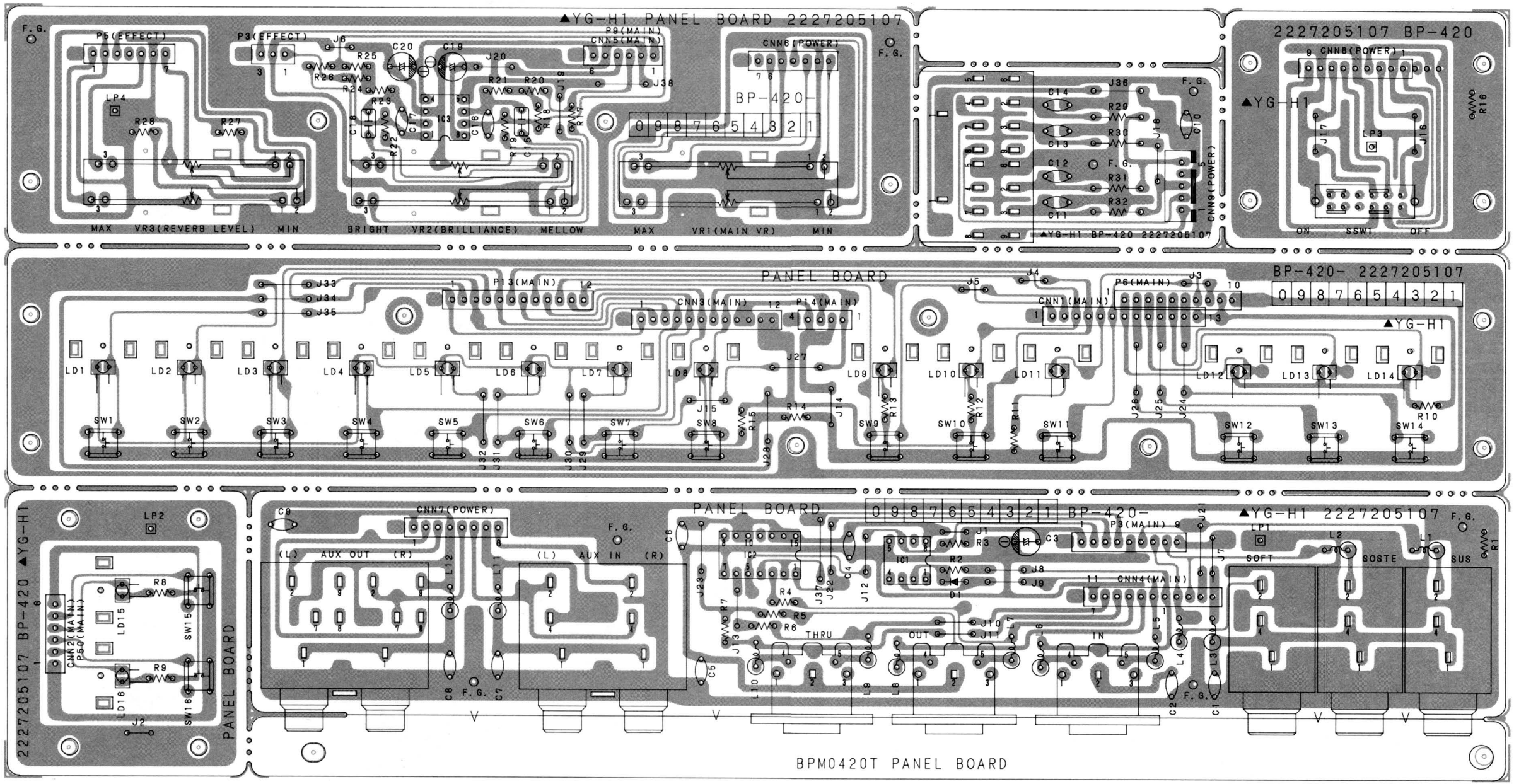


SCHEMATIC DIAGRAM BP-420-2 PANEL BOARD



NOTES
ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
ALL CAPACITANCE IN μ=MICRO FARAD p=MICRO-MICRO FARAD
CIRCUIT AND PARTS ARE SUBJECT TOCHANGE WITHOUT PRIOR NOTICE.
WARNING:
Parts marked with ⚠ have critical characteristics.
Use ONLY replacement parts recommendedby the manifacture.

BP-420 PANEL BOARD UNIT Pattern side

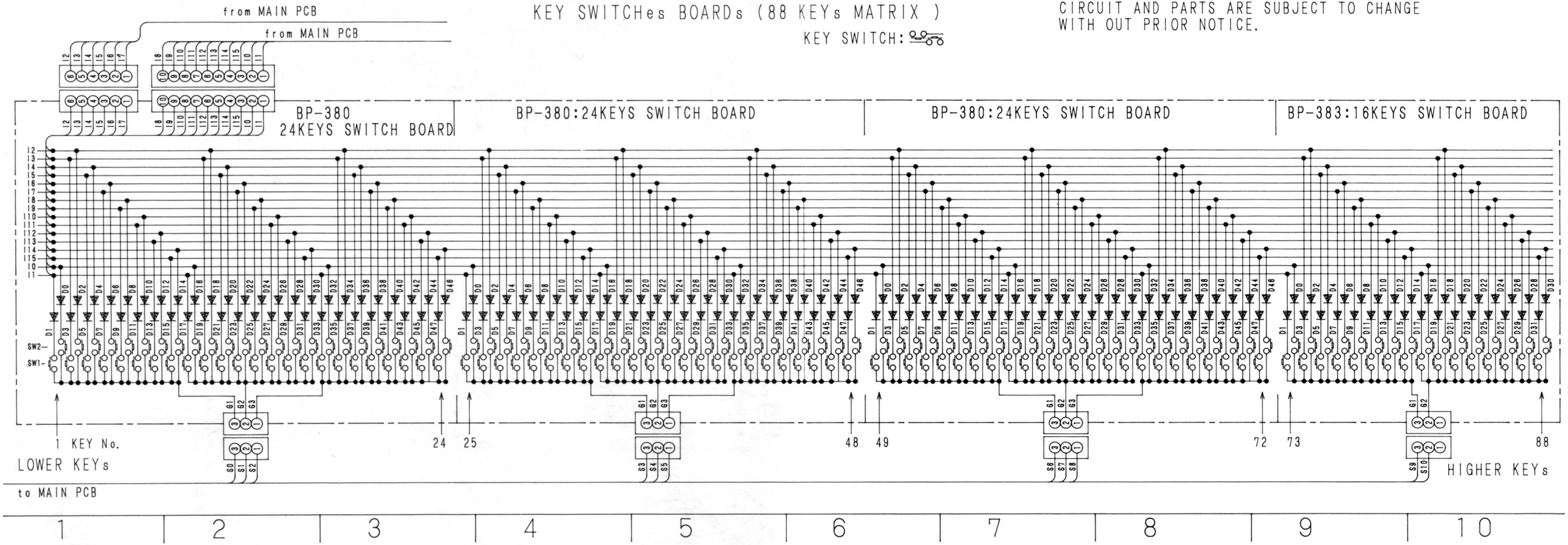


SCHEMATIC DIAGRAM REAL HAMMER ACTION TYPE

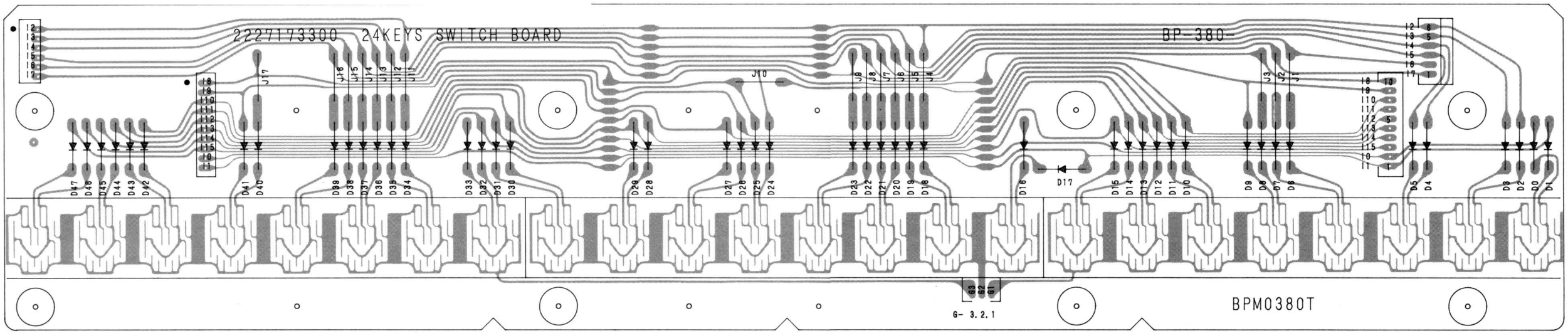
KEY SWITCHes BOARDs (88 KEYs MATRIX)

KEY SWITCH:

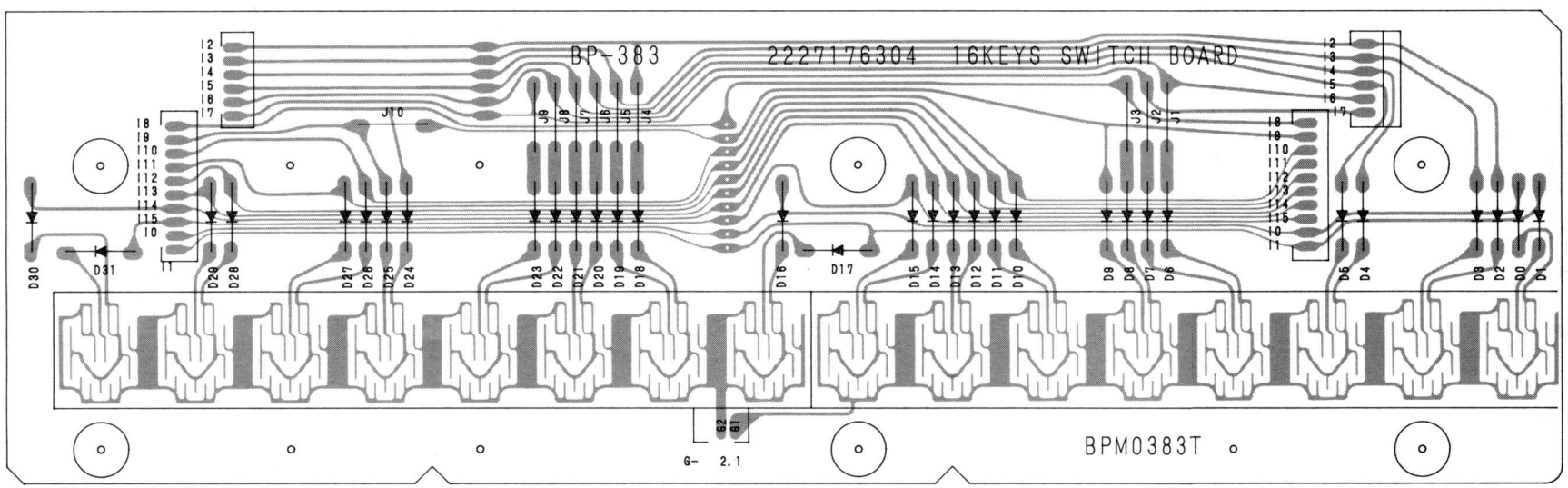
NOTES
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE
WITH OUT PRIOR NOTICE.



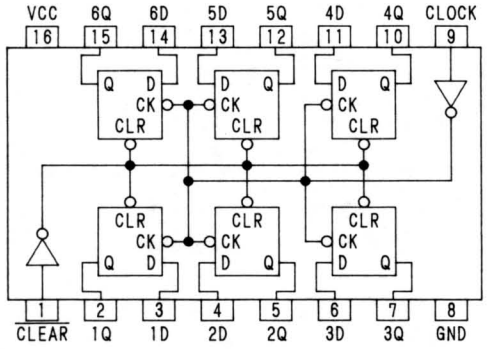
BP–344, BP–339, BP–343 SWITCH BOARD Soldering side



BP–341 SW BOARD IV Soldering side



74HC174
HEX D-TYPE FLIP FLOP WITH CLEAR

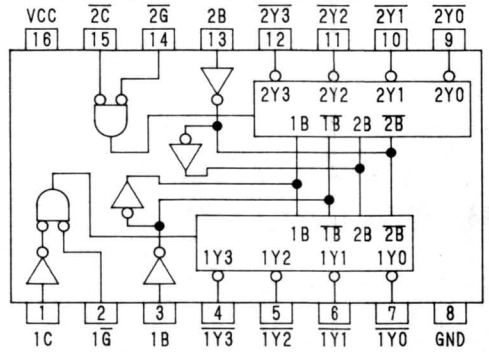


FUNCTION TABLE

INPUT			OUTPUT	FUNCTION
$\overline{CLEAR}$	D	CLOCK	Q	
L	X	X	L	CLEAR
H	L	↑	L	—
H	H	↑	H	—
H	X	↓	Qo	NO CHANGE

X:Don't care

74HC155
DUAL 2-TO-4 LINE DECORDER



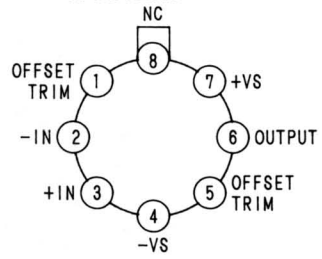
FUNCTION TABLE

INPUT				OUTPUT			
1B	2B	1G	1C	1Y0	1Y1	1Y2	1Y3
X	X	H	X	H	H	H	H
L	L	L	H	L	H	H	H
L	H	L	H	H	L	H	H
H	L	L	H	H	H	L	H
H	H	L	H	H	H	H	L
X	X	X	L	H	H	H	H

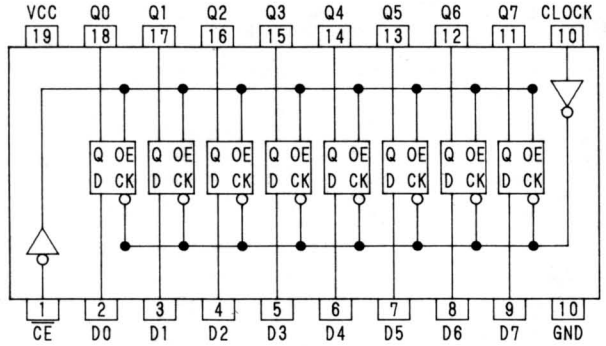
X:Don't care

INPUT				OUTPUT			
1B	2B	2G	2C	2Y0	2Y1	2Y2	2Y3
X	X	H	X	H	H	H	H
L	L	L	L	L	H	H	H
L	H	L	L	H	L	H	H
H	L	L	L	H	H	L	H
H	H	L	L	H	H	H	L
X	X	X	H	H	H	H	H

OPA602AM



74HC574
OCTAL D-TYPE FLIP FLOP WITH 3-STAGE OUTPUT

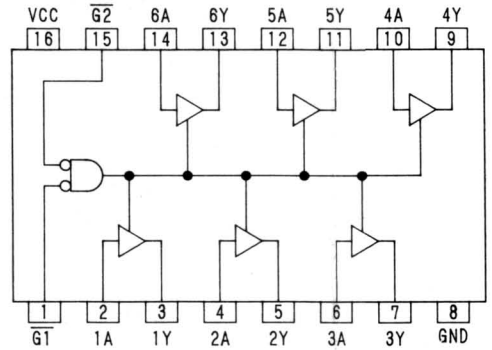


FUNCTION TABLE

INPUT			OUTPUT
$\overline{OE}$	CK	D	Q
H	X	X	Z
L	↓	X	Qo
L	↑	L	L
L	↑	H	H

X:Don't care
Z:HIGH-IMPEDANCE
Qo:NO CHANGE

74HC365
HEX BUS DRIVERS WITH 3-STAGE OUTPUTS

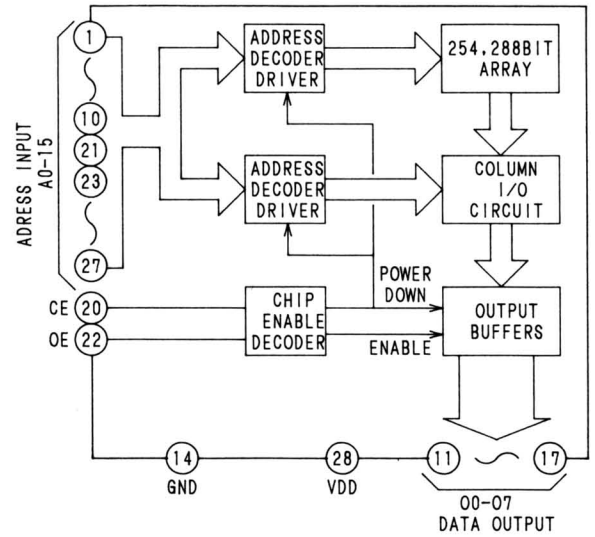


FUNCTION TABLE

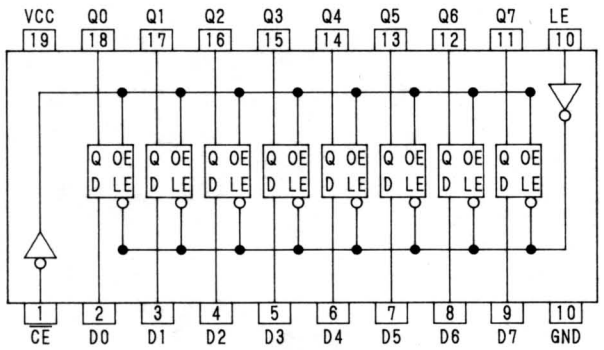
INPUT			OUTPUT
$\overline{G1}$	$\overline{G2}$	An	Y
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

X:Don't care
Z:HIGH-IMPEDANCE

SCOEF10-512/SCOEF11-512
(512K BIT C-MOS MASK PROGRAMMABLE ROM)



74HC573:74AC573
OCTAL D-TYPE LATCH WITH 3-STAGE OUTPUT

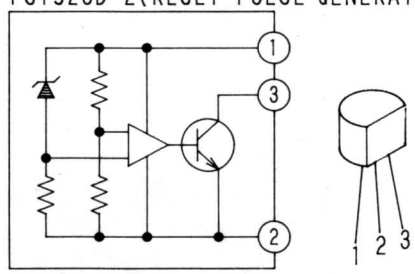


FUNCTION TABLE

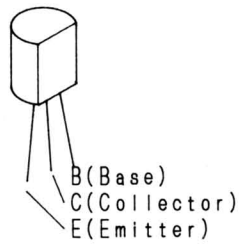
INPUT			OUTPUT
$\overline{OE}$	CK	D	Q
H	X	X	Z
L	L	X	Qo
L	H	L	L
L	H	H	H

X:Don't care

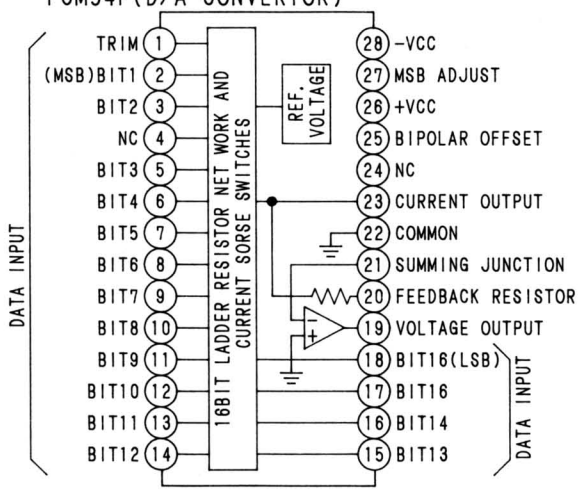
PST520D-2(RESET PULSE GENERATOR)



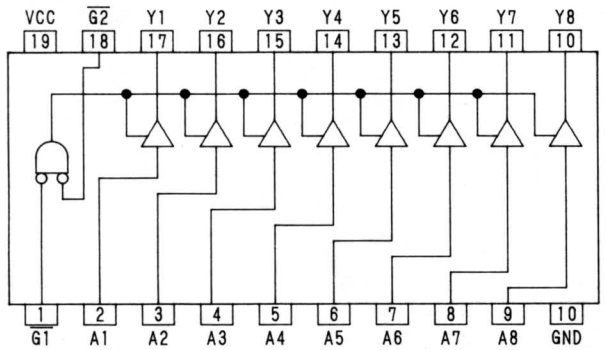
2SA1015(GR)
2SC1815(GR)



PCM54P(D/A CONVERTOR)



74HC541
OCTAL BUSE BUFFERS WITH 3-STAGE OUTPUTS

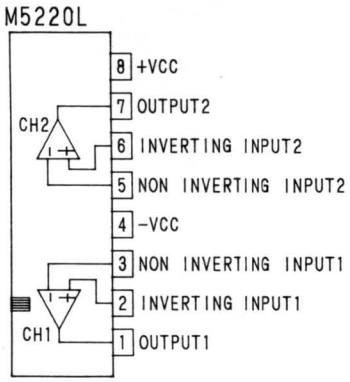


FUNCTION TABLE

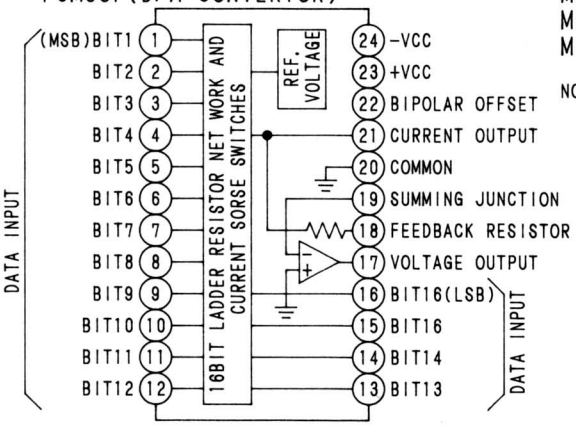
INPUT			OUTPUT
$\overline{G1}$	$\overline{G2}$	An	Y
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

X:Don't care
Z:HIGH-IMPEDANCE

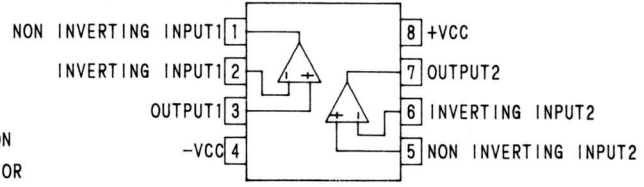
M5220L



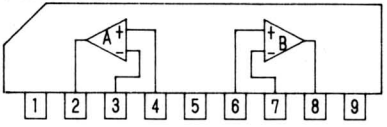
PCM55P(D/A CONVERTOR)



M5220P(LOW NOISE DUAL OPERATIONAL AMP.
M5238P(J-FET INPUT DUAL OPE. AMP.)
M5218P(DUAL OPE. AMP.)

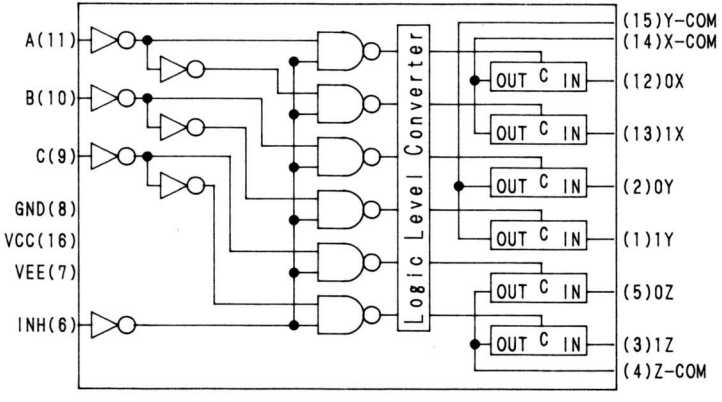


NJM4556S
NJM4558S



1:+V
2:A OUTPUT
3:A-INPUT
4:A+INPUT
5:-V
6:B+INPUT
7:B-INPUT
8:B OUTPUT
9:+V

74HC5043



FUNCTION TABLE

INHIBIT	C	B	A	"ON" CHANNEL
L	L	L	L	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	X	X	X	NONE

X:DON'T CARE