# DENON

### **SERVICE MANUAL**

### **ELECTRONIC PIANO**

## MODEL EP-700

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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 WURLITZER 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.

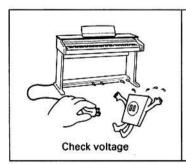
Model No. EP-913R

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

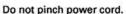
### SAFETY INSTRUCTIONS FOR ELECTRONIC PIANO

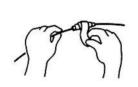
#### **■ INSTALLATION**

- 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 INSTRU-MENTS 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.

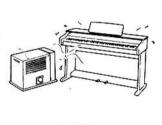








Do not splice power cord.



Avoid heat.

#### ■ USE

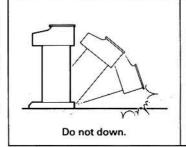
- Do not expose the INSTRUMENTS to rain or water (liquid). Do not spill liquid or insert metal objects
  inside the set. Rain, water or liquid such as cosmetics as well as metal may cause electric shorts
  which can result in fire or shock hazard. If anything gets inside, unplug the power cord and have
  a WURLITZER 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 WURLITZER service technician to restore the safeguards.



Remove power in your absence.

### **■ SERVICING**

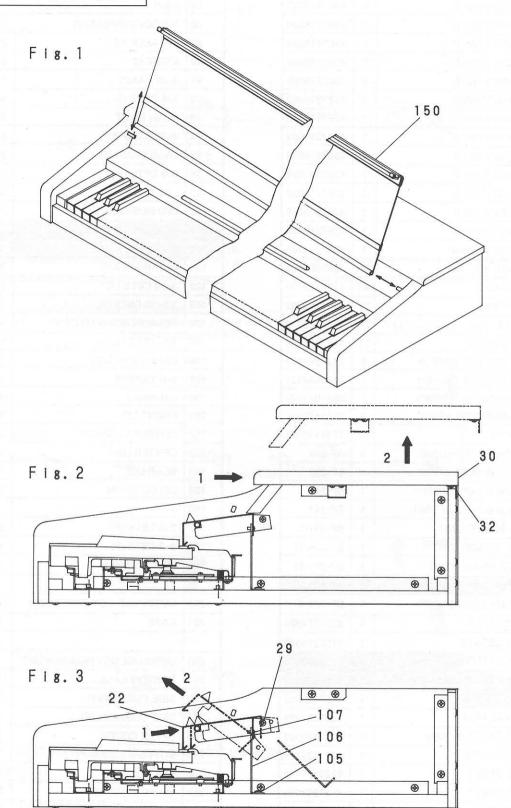
- The servicing of the INSTRUMENTS must not be attempted by yourself beyond that described in the operating instructions. In case of problems that cannot be settled by referring to your operating instructions, unplug the power cord and contact your WURLITZER dealer. No user serviceable parts are inside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

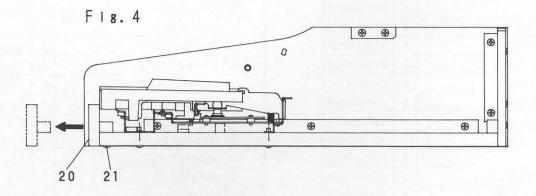


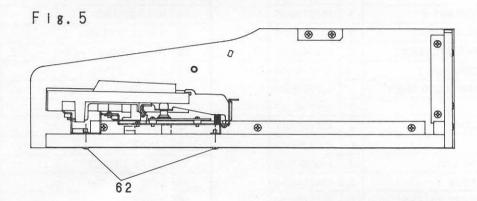


No user-serviceable parts in side.

### **DISASSEMBLY**







### **Cabinet Disassembly**

- 1. Remove lid assembly 150. (Fig.1)
  - 1) Open lid assembly 150 as shown in the figure and lift its left end and slide the entire assembly to remove it.
- 2. Remove roof board 30. (Fig.2)
  - 1) Remove six (6) screws 32 (3 × 10, CBTS(1)).
  - 2) Move roof board 30 in the direction of arrow 1 and remove it in the direction of arrow 2.
- 3. Remove top panel assembly 22. (Fig.3)
  - 1) Remove screw 107 (3 × 6, TAPTITE) and two (2) screws 105 (3.5 × 10, CBTS(1)), then remove earth bracket 106.
  - 2) Remove screw 29 (3.5  $\times$  10, CBTS (1)) and push top panel assembly 22 in the direction of arrow 1.
  - 3) Lift the front of top panel assembly 22 and move the entire assembly in the direction of arrow 2 to remove it.
- 4. Remove front board assembly 20. (Fig.4)
  - 1) Remove five (5) screws (3.5 × 25, CTTS(1)) and move front board assembly 20 in the direction of the arrow to remove it.
- 5. Remove the key unit. (Fig.5)
  - 1) Remove twelve (12) screws 62 and lift the key unit to remove it.

### PARTS LIST OF EXPLODED VIEW

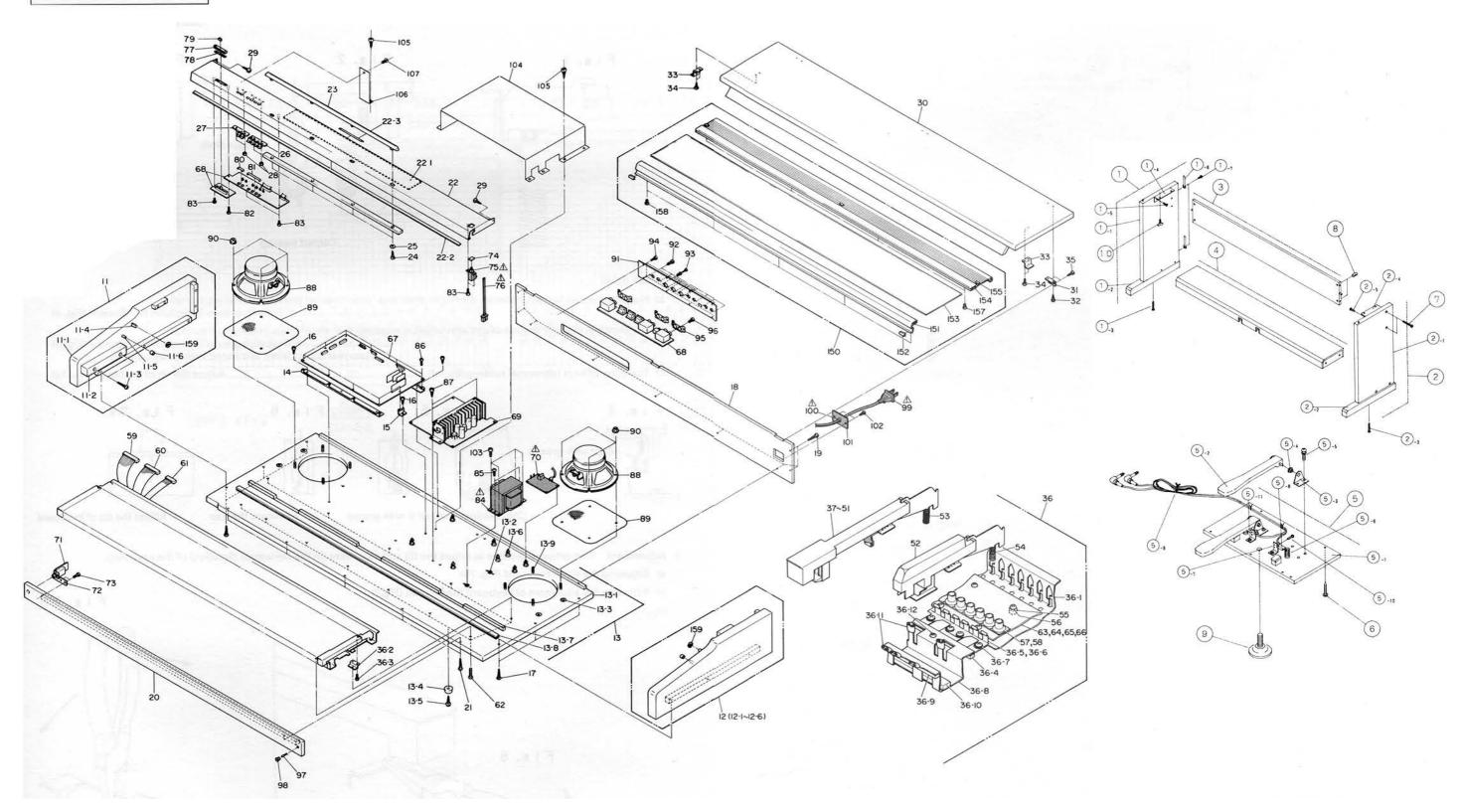
		1	ED 700
No.	Part Name	0/4	EP-700
1	SIDE PANEL (L) ASS'Y	Q'ty	Part No.
-1		(1)	1077326004
-2	SIDE PANEL (L)	1	1077327003
-3	FOOT	1	1077328002
	4×40 CTTS (1)	2	4734803032
-4	JOINT BRACKET	1	4127142106
-5	3.5×16 CTTS (1)	3	4734806026
-6	CORD HOLDER	2	EP-4772
-7	3.1×16 CRWS	2	4720309029
2	SIDE PANEL (R) ASS'Y	(1)	1077329001
-1	SIDE PANEL (R)	1	1077330003
-2	FOOT	1	1077328002
3	4×40 CTTS (1)	2	4734803032
-4	JOINT BRACKET	1	4127142106
-5	3.5×16 CRWS	3	4734806026
3	REAR BOARD ASS'Y	1	1017738005
4,5	PEDAL BOX ASS'Y	1	1077331002
4	PEDAL BOX SEMI ASS'Y	1	1077332001
5	PEDAL BOARD ASS'Y	(1)	1017746204
-1	PEDAL BOARD SEMI ASS'Y	1	1077075106
-2	PEDAL	2	4367263007
-3	PEDAL FLANGE	4	4367082000
-4	PF. BUSH	4	4367083106
-5	4×14 CPS (W,SW)	8	4700021026
-6	PEDAL SPRING	2	4367148009
-7	PEDAL SWITCH BRACKET	2	4127160104
-8	PEDAL SWITCH	2	2127001003
-9	H/P PLUG	1	2039455103
-10	2×10 CPS	2	4711810006
-11	3.5×10 CBTS (1)	2	4733804003
6	3.5×25 CRWS	7	4720411014
7	6×45 CBS	6	4713827013
8	CROSS DOWEL	2	MMP1140
9	ADJUSTER	1	1047038005
10	PRESS WING SCREW	4	MMP1142
		1	1011011 11142
11	SIDE BOARD (L) ASS'Y	(1)	1077306008
-1	SIDE BOARD (L)	1	1077307007
-2	KEY BLOCK (L)	1	1077307007
-3	4×35 CTTS (1)	2	
-4	LID PIN	1	4734803058
-5	Processor Control		4017030108
	FIX PIN	1	4437015004
-6	KEY GUIDE	1	4317002001
12	SIDE BOARD (R) ASS'Y	(1)	1077309005
-1	SIDE BOARD (R)	1	1077310007
-2	KEY BLOCK (R)	1	1077311006
-3	4×35 CTTS (1)	2	4734803058
-4	LID PIN (B)	1	4227007002
-5	FIX PIN	1	4437015004
-6	KEY GUIDE	1	4317002001

No.	Part Nama		EP-700	
NO.	Part Name		Part No.	
13	BOTTOM BOARD ASS'Y	(1)	1077343003	
-1	BOTTOM BOARD	1	1077313004	
-2	SP NUT (M4)	2	SC-1123-1	
-3	SP NUT (M6)	4		
-4	RUBBER FOOT	4	1047037006	
-5	3.1×16 CRWS (W)	4	4700035009	
-6	LOCKING SUPPORT	8	4498079005	
-7	BOTTOM CUSHION	1	1247090018	
-8	KEY CUSHION	1	1247089003	
-9	FIX BOLT (M4×30)	8	SC-1136J-1	
14	BRACKET (A)	2	4127158006	
15	BRACKET (B)	2	4127159005	
16	3.5×10 CBTS (1)	8	4733804003	
17	3.5×25 CTTS (1)	6	4734804002	
18	REAR BOARD	1	1077344002	
19	3.5×20 CTTS (1)	9	4734806000	
20	FRONT BOARD ASS'Y	1	1077315002	
21	3.5×25 CTTS (1)	5		
22	TOP PANEL SEMI ASS'Y	1	4734804002 1027210212	
-1	PANEL DAMPER	+		
-2	KEY FELT		1297012004	
-3	CUSHION	1	1247095071	
23			1247113021	
22.00	MUSIC STOPPER	1	4397007110	
24	3×10 CBTS (Bo)	4	4733814019	
25	3.5W	4	4751134001	
26	SWITCH BUTTON	1	1137020004	
27	SWITCH BUTTON (B)	1	1137022002	
28	3 LN	4	4756007007	
29	3.5×10 CBTS (1)	2	4733804003	
30		1	1077317000	
31	ANGLE BRACKET	3	4037010001	
32	3×12 CBTRS (1)	6	4730306012	
33	TOP BRACKET	2	2010023J	
34	3×12 CBTRS (1)	4	4730306012	
35	3×10 CBTS (1)	6	4733814006	
36	KEY CHASSIS ASS'Y	(1)	4117095108	
-1	KEY CHASSIS	1	4117090103	
-2	KEY CHASSIS BRACKET	5	4127128007	
-3	3×6 TAPTITE	10	4770152006	
-4	KEY CUSHION	1	1247089016	
-5	FRICTION SPRING (F)	5	4367245009	
-6	FRICTION SPRING (S)	1	4367246008	
-7	3×6 CUP SCREW	39	4738007012	
-8	FRONT GUIDE RAIL	1	4367237101	
-9	KEY CUSHION	1	1247089016	
-10	KEY CUSHION	1	1247089003	
	KEY CLUDE	76	1002000 - 10000 WA 9710	
-11	KEY GUIDE	76	4317002001	
-11 -12	3×6 TAPTITE	13	4770152006	

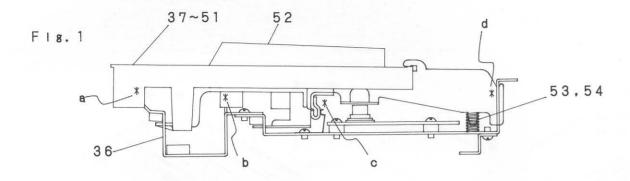
No.	Part Name		EP-700
		Q'ty	Part No.
38	KEY ASS'Y (W) B	5	4367318017
39	KEY ASS'Y (W) C	5	4367318020
40	KEY ASS'Y (W) D	5	4367318033
41	KEY ASS'Y (W) E	5	4367318046
42	KEY ASS'Y (W) F	6	4367318059
43	KEY ASS'Y (W) G	6	4367318062
44	KEY ASS'Y (W) E'	1	4367318075
45	KEY ASS'Y (W) A	1	4367319003
46	KEY ASS'Y (W) B	1	4367319016
47	KEY ASS'Y (W) C	1	4367319029
48	KEY ASS'Y (W) D	1	4367319032
49	KEY ASS'Y (W) E	1	4367319045
50	KEY ASS'Y (W) F	1	4367319058
51	KEY ASS'Y (W) G'	1	4367319061
52	KEY ASS'Y (B) A#	31	4367257000
53	KEY SPRING	45	4367212100
54	KEY SPRING	31	4367213002
55	COLLAR	24	4497023010
56	3×10 TAPTITE	24	4737005002
57	8 KEY RUBBER SWITCH	9	2128582107
58	4 KEY RUBBER SWITCH	1	2128584121
59	11P CONNECTOR ASS'Y	1	2047413014
60	10P CONNECTOR ASS'Y	1	
61	6P CONNECTOR ASS'Y	1	2045031029
62	4×20 CTS	1	2041432017
63	SWITCH BOARD I UNIT	12	4714410021
64	2	1	BP-338
055	SWITCH BOARD III UNIT	1	BP-339
65	SWITCH BOARD III UNIT	1	BP-340
66	SWITCH BOARD IV UNIT	1	BP-342
67	TONE BOARD UNIT	1	BP-401-3
68	PANEL BOARD UNIT	1	BP-336-11
69	POWER BOARD UNIT	1	BP-391-11
70	L/FILTER BOARD UNIT	1	BP-393-2
71	H/PHONE BOARD UNIT	1	BP-389-4
72	H/P BRACKET	1	4127114008
73	3.5×10 CBTS (1)	2	4733804004
74	PUSH BUTTON	1	1137015048
75	POWER SWITCH	1	2128590018
76	SW. CONNECTOR ASS'Y	1	2033505172
77	VOLUME PANEL	1	1037025002
78	BLIND SHEET	1	1227027108
79	SLIDE VOLUME KNOB	1	1137019002
80	BLIND SHEET	1	1227029106
81	BLIND SHEET	1	1227029122
82	3×8 TAPTITE	1	4737002018
83	3×6 TAPTITE	5	4770152006
84	POWER TRANS	1	2338530004
85	4×14 CTS	2	4714408017
86	3×6 TAPTITE	10	4770152006

				FD 765
	No.	Part Name	0"	EP-700
í	87	3.5×10 CBTS (1)	Q'ty	Part No.
			2	4733804003
3	88	16RG04M (SPEAKER)	2	3017018008
2	89	SPEAKER NET	2	1097020005
- 3	90	4 NUT-W	8	SC-1050H
	91	AUX PANEL	1	1027121110
ļ	92	3×6 CBTS (S)	6	4737002034
- 1	93	PUSH RIVET	6	4770210003
	94	3×10 CBTS (1)	6	4733814006
	95	JACK BRACKET	3	4127138000
	96	3×8 CPTS (Bo)	3	4733814006
	97	LED ASS'Y	1	3937018049
	98	LED BUSHING	1	4430310007
Δ	99	AC CORD WITH PLUG	1	2062021009
Δ	100	BUSHING	1	4450047004
	101	BUSHIG PLATE	1	4127133005
	102	3×10 CBTS (1)	2	4733814006
	103	3.5×10 CBTS (1)	4	4733804003
	104	TOME PCB SHIELD CASE	1	4147018003
	105	3.5×10 CBTS (1)	10	4733804004
	106	EARTH BRACKET	1	4127194002
	107	3×6 TAPTITE	1	4770152006
	150	LID ASS'Y	(1)	1037102006
- (	151	FRONT LID	1	1037046405
	152	RUBBER CUSHION	2	4617037006
	153	CENTER LID	1	1037047404
	154	REAR LID	1	1037068205
	155	LID CUSHION	3	1247124007
	156	_		
	157	3×6 CBTS (P)	5	4737508004
	158	3×6 CBTS (P)	4	4737508004
	159	FELT WASHER	2	1247125006
ı	200	CARTON CASE ASS'Y (PIANO STAND)	(1)	5017422003
- 1	201	CASE	1	5027423021
	202	CUSHION ASS'Y	1	5027370006
1				
i	250	CARTON CASE ASS'Y (PIANO MAIN UNIT)	(1)	5017410109
	251	CARTON CASE	1	5017400012
	252	SIDE CUSHION (L)	1	5027482004
	253	SIDE CUSHION (R)	1	5027483003
	254	UPPER COVER	1	5027484109
	255	BOTTOM CUSHION	1	5027485001
	256	KEY CUSHION	1	5027486000
i	257	FRONT CUSHION	1	5027487009
	258	OUT CARTON	1	5027487009
	230	O TOMITON	10	3017412026
- 9	301	INSTRUCTION MANUAL (PIANO STAND)	1	E117224007
i			1	5117234007
, 1	302	OWNERS MANUAL (PIANO MAIN UNIT)	1	5117233008

### **EXPLODED VIEW**



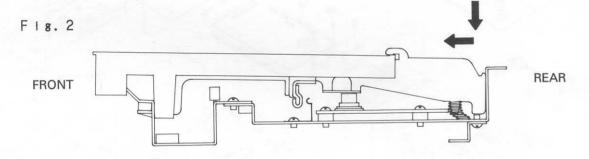
### **DISASSEMBLY AND ADJUSTMENT OF KEYS**

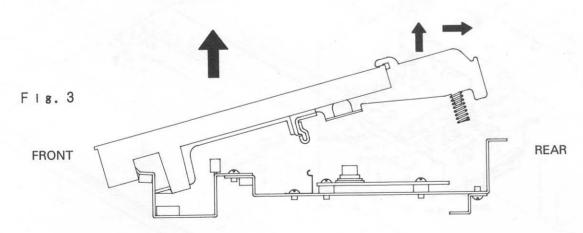


### Coat sections marked \* with grease

- a. Contact between the inside of natural key and key guide b. Contact between the inside of chromatic key and key guide
- c. Contact between the finger and friction spring
- d. Contact between the key assembly and chassis





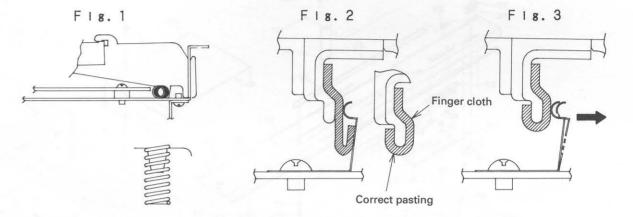


### Keyboard Disassembly - Cross-sectional view (Fig.1)

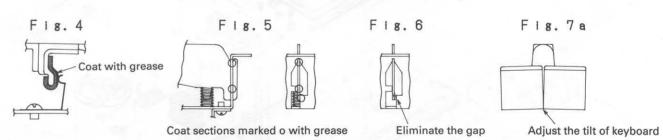
- \* Remove natural keys first, and install chromatic keys first.
- 1. Keyboard removal (Fig. 2, 3)
- 1) Depress the rear of key assemblies (W) 37-51 in the direction of the arrow and then move the assemblies forward. (Fig.2)
- 2) Lift the rear of the aseembly in the direction of the arrow and move it backward, then lift the whole assembly to remove it. (Fig.3)
- 3) Remove key assembly (B) 52 in the same way.

### Causes of Defect, Remedies and Adjustments

- 1. Key does not return a) Key spring comes off. . Install the key spring correctly. (Fig. 1)
- b) Finger cloth peels off. ... Re-paste the finger cloth. (Fig. 2)
- c) No grease at the key guide . . Coat with grease (silicon grease SB-1 \* white)
- .Bend the friction spring in the direction of d) Pressure of contact between the finger and friction spring is too hight . the arrow to decrease the pressure. (Fig. 3)

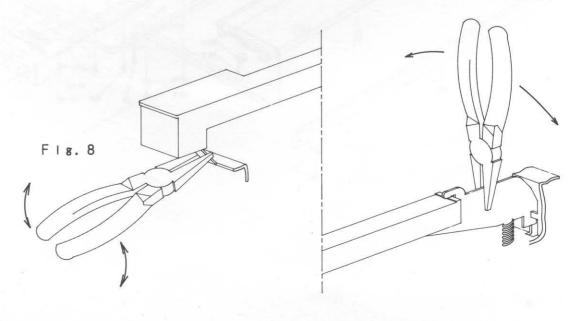


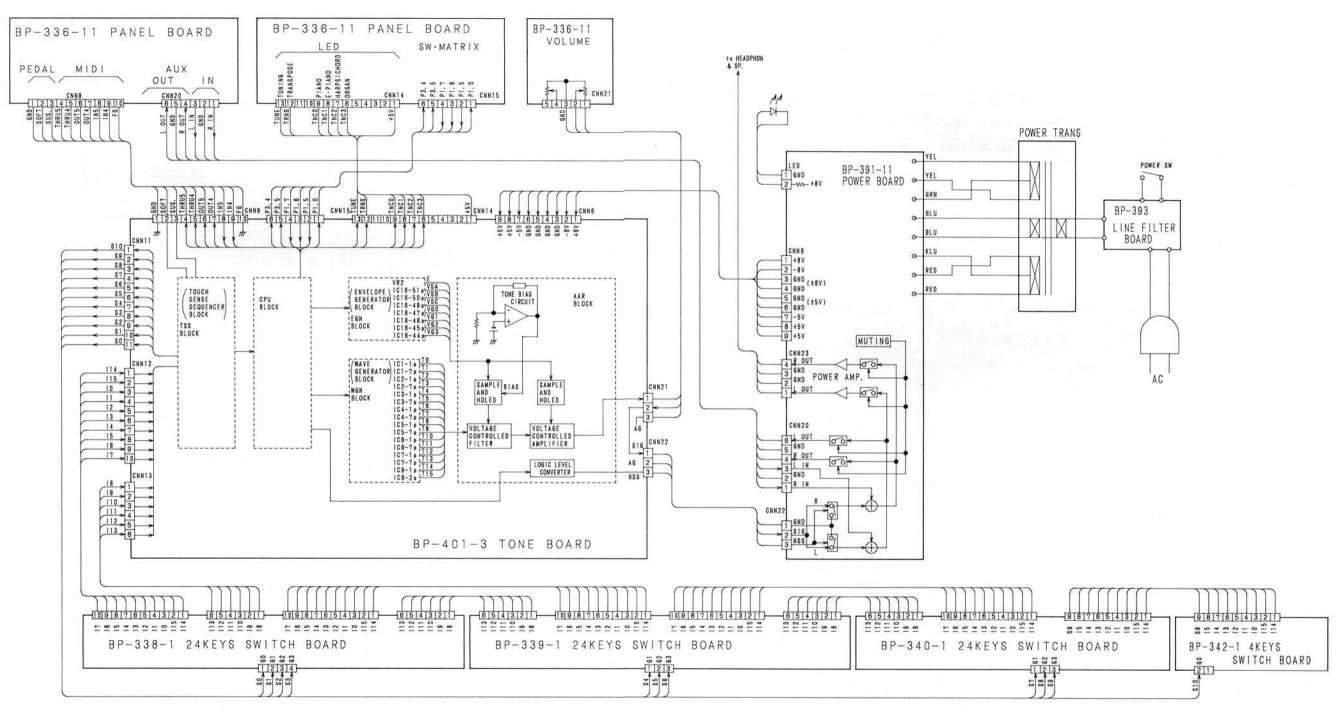
- 2. Action noise
- a) No grease at the contact between the finger cloth and friction spring (abnormal rubbing sound) . Coat with grease (Plastilube EP \*Brown) (Fig. 4)
- b) No grease at the rear section of key arm which is engaged with the chassis (mechanical sound) .. Coat with grease (Plastilube EP \*Brown) (Fig. 5) \*If abnormal sound is not elimirated with grease (Fig. 6)
- c) Touching of keys (abnormal rubbing sound) .. Adjust the tilt of keyboard (Fig. 7a)



- 3. Adjustment This action is feasible to adjust the tilt and alignment (in the horizontal direction) of the keyboard.
  - a) Adjusting the tilt of keyboard (Fig. 7b)
- b) Adjusting the alignment of keyboard (horizontal) (Fig.8)

Fig. 7b





#### 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.

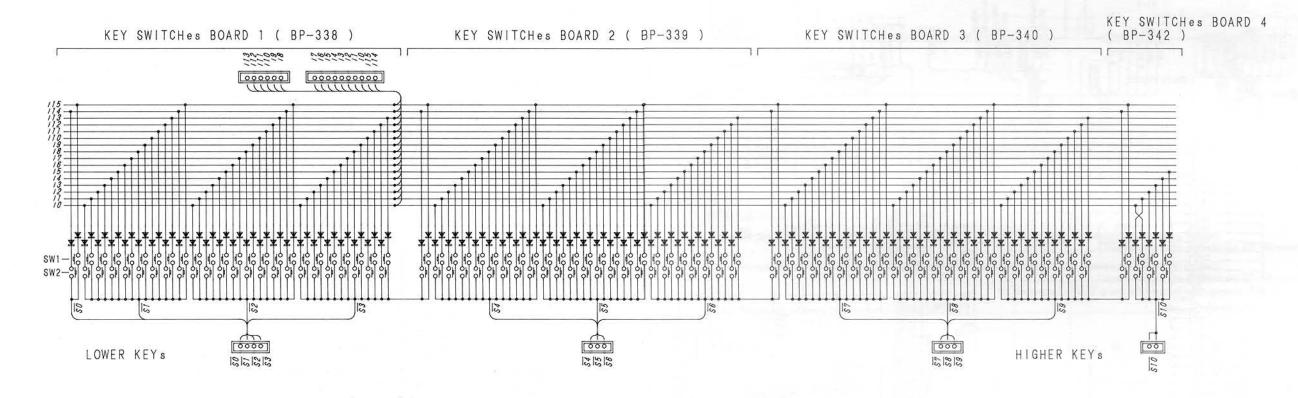
### WARNING:

Parts marked with this symbol  $\triangle$  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 it the resistance from shassis to either side of the power cord is less than 240 k ohm, the unit is defective.

#### WARNING



### KEY SWITCHes BOARDs ( 76 KEYs MATRIX

KEY SWITCH ; 900

#### **NOTES**

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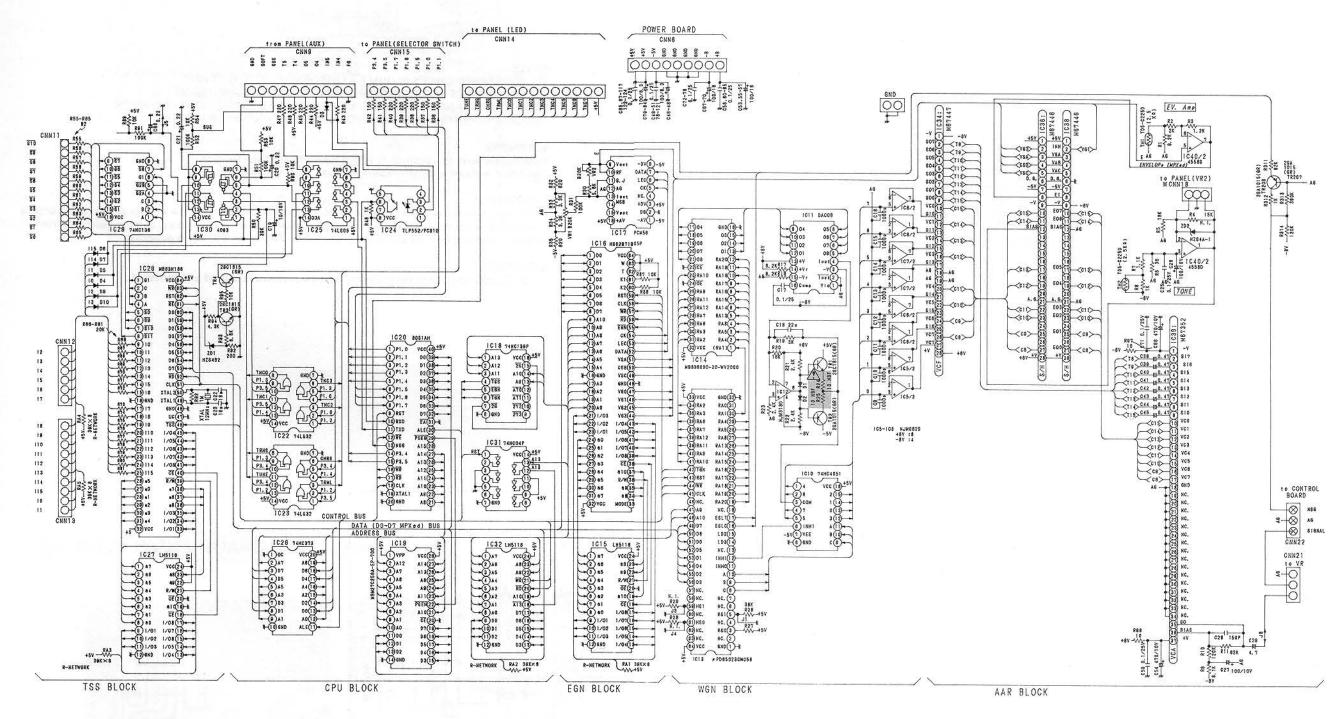
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#### WARNING:

### **BP-401-3 TONE BOARD CIRCUIT DIAGRAM**



#### NOTES

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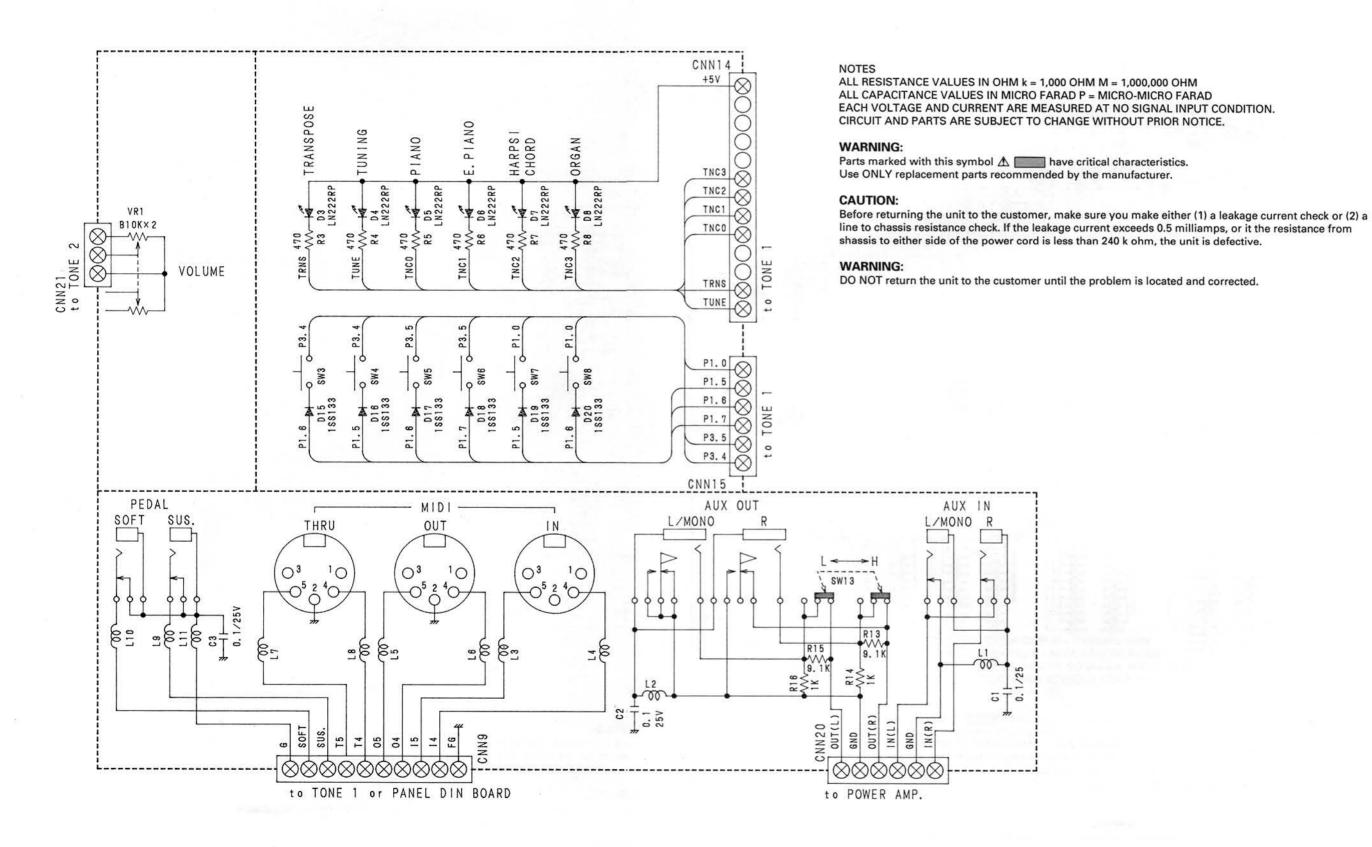
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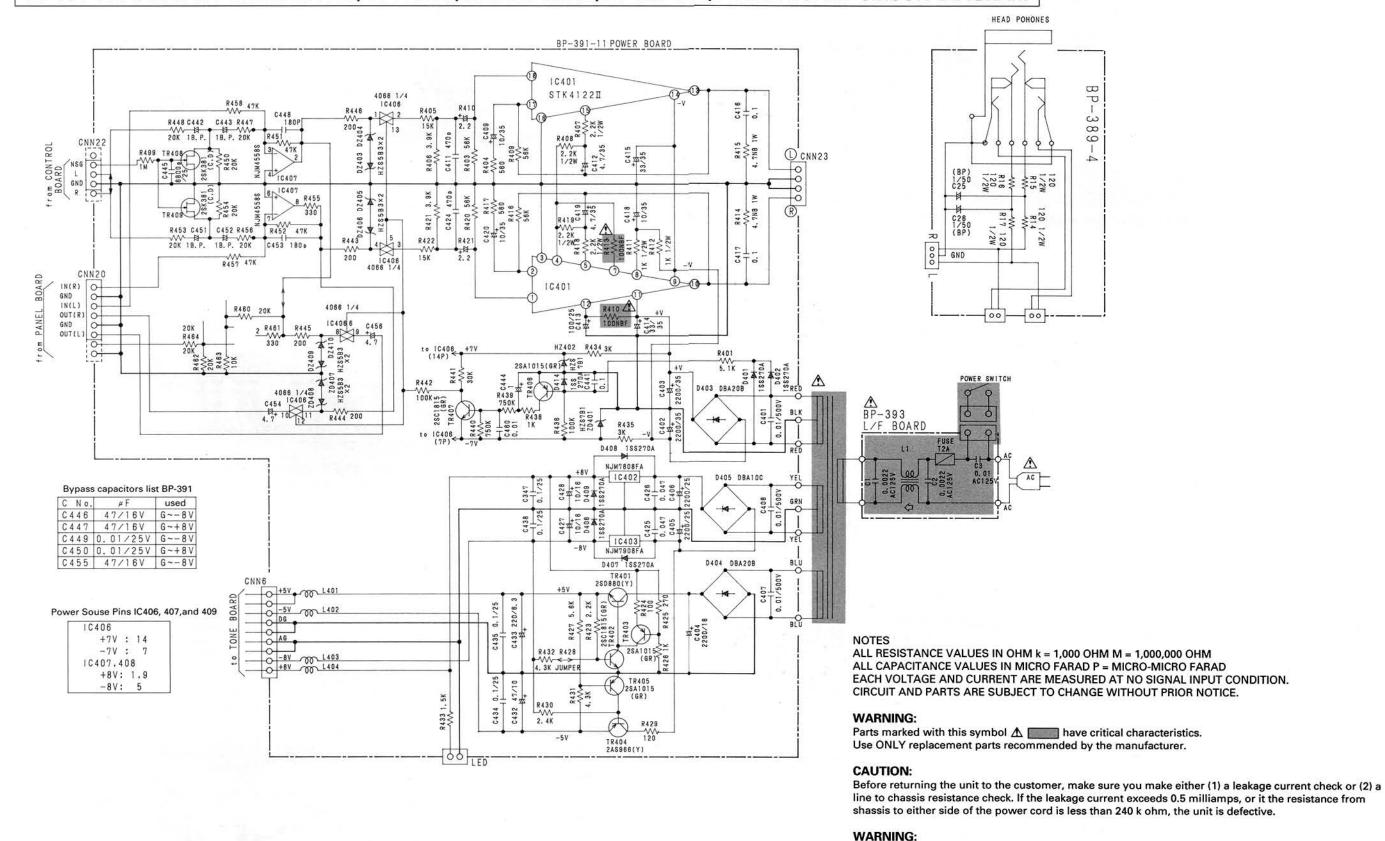
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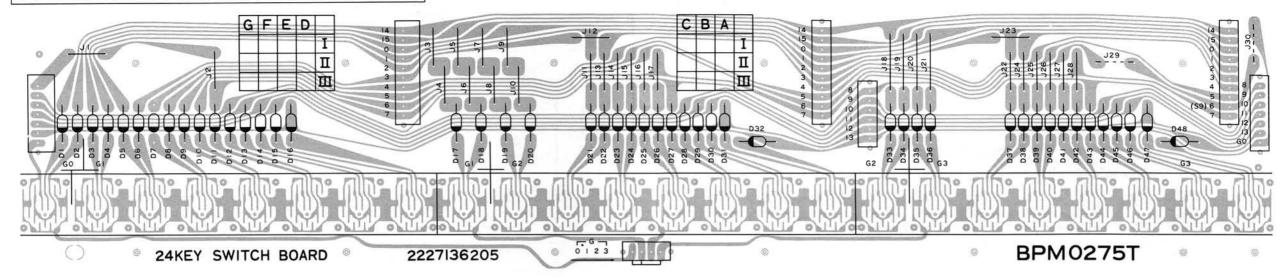
#### WARNING:



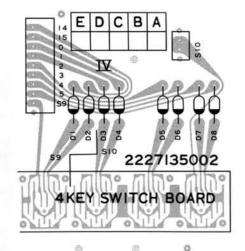
### BP-391-11 POWER & POWER SUPPLY, BP393-2 L/FILTER BOARD, BP-389-4 H/PHONE BOARD CIRCUIT DIAGRAM



### BP-338, 339, 340 KEY SWITCH BOARD UNIT

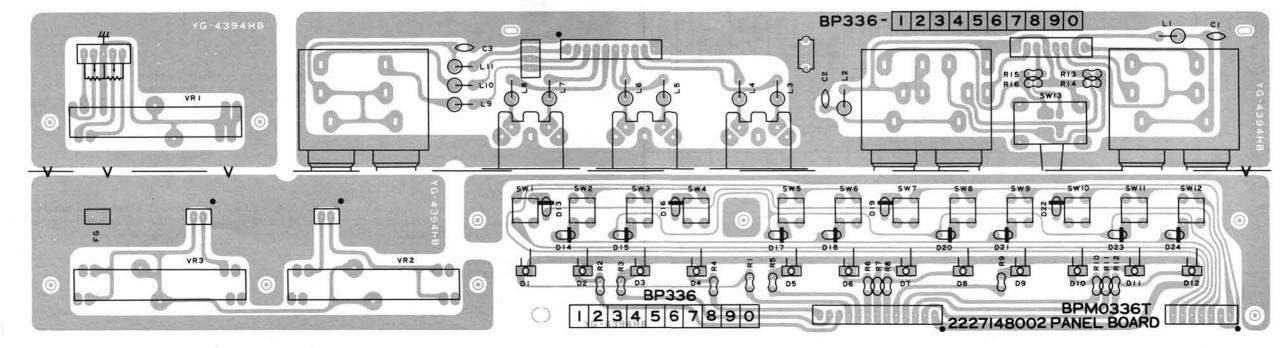


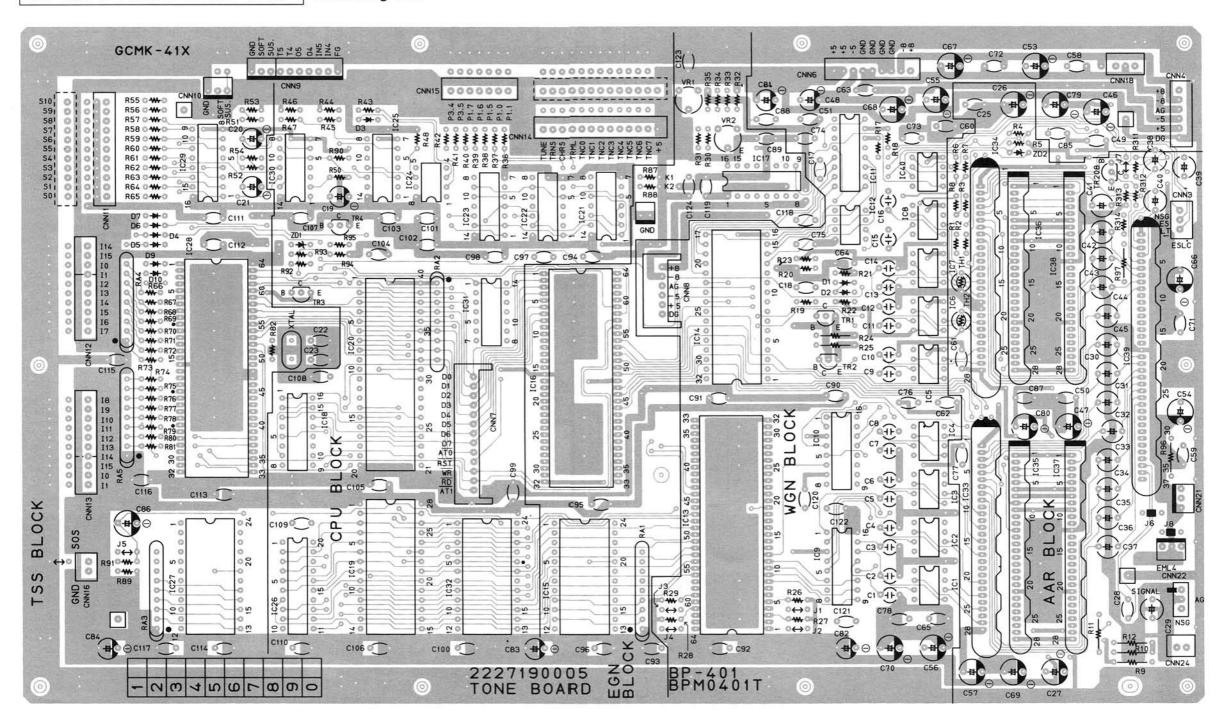
### **BP-342 KEY SWITCH BOARD UNIT**

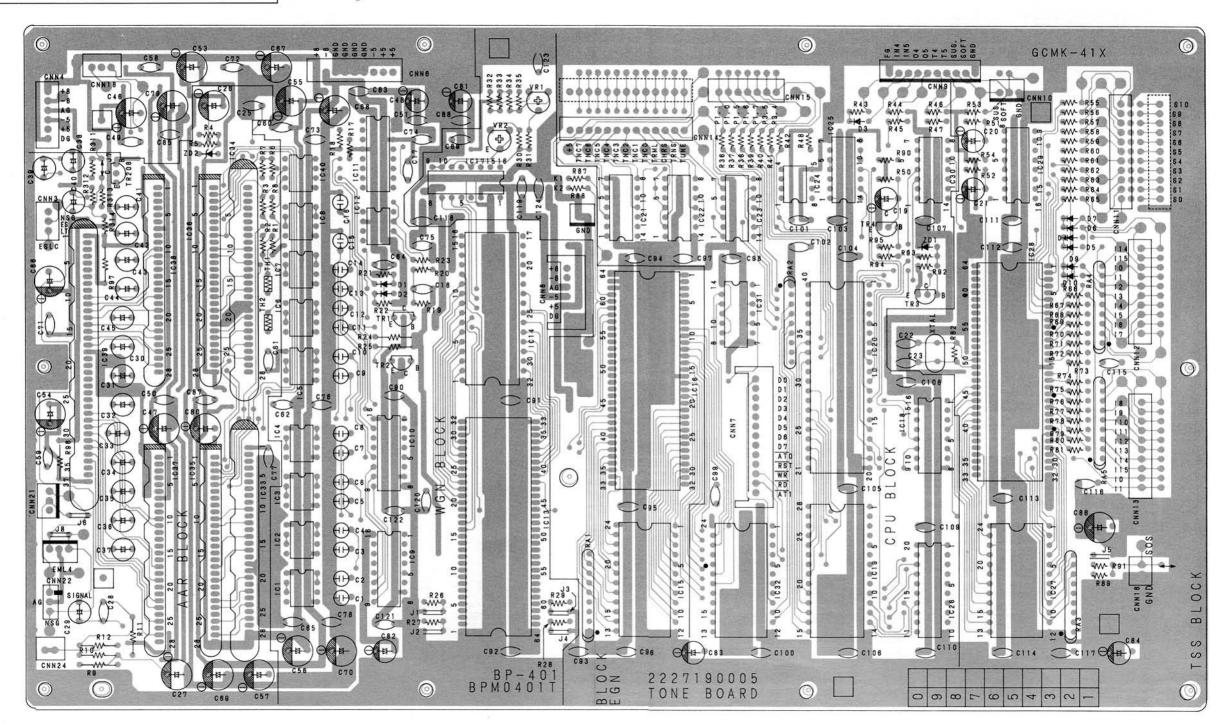


### **BP-336-11 PANEL BOARD UNIT**

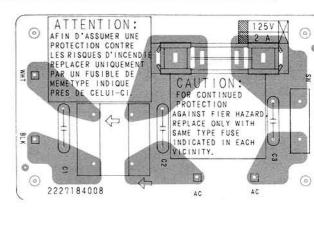
Pattern Side





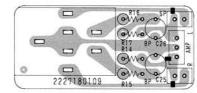


### **BP-393-2 L/FILTER BOARD UNIT**

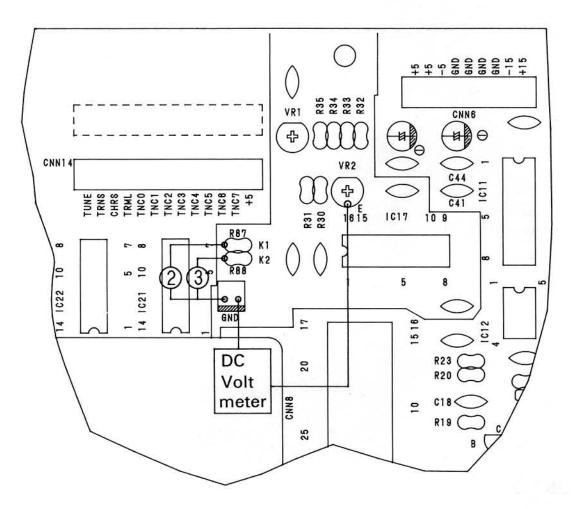


### **BP-389-4 HEADHPONE BOARD UNIT**

Pattern Side



### **VOLUME ADJUSTMENTS VR1, VR2 (TONE BOARD)**



### DC Volt meter

- Turn the MAIN volume to the minimum setting.
   This is necessary because if your finger touches a key during adjustments, a big sound is generated unless the MAIN volume is set at this minimum position.
- 1. Connect the DC voltmeter as illustrated above.
- 2. Short the opposite side of the K1 of R87 to GND, and adjust VR1 to obtain 0±10mV.
- 3. Short the opposite side of K2 of R88 to GND, and turn VR2 to obtain -2.325  $\pm 0.025$ V.

### Notes:

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- 1. Always adjust VR1 first and then VR2.
- 2. Re-adjustment is required only when IC 17 (PCM56P) has been replaced.

### **SPECIFICATIONS**

### Model EP-700

Keyboards	76keys (E <sub>1~g</sub> 4)		
Sound range	6 octaves 1/4		
Voices	Piano, E.Piano, Harpsichord, Organ		
Controls	Volume, Tuning, Transpose		
Connecting Jacks	AUX IN (monaural, steleo)		
	AUX OUT × 2		
	Headphone terminal × 1		
	Sustain pedal, Soft pedal		
	MIDI IN, MIDI OUT, MIDI THRU		
Others	Output level selector switch		
Speakers	16cm×2		
Output	20W+20W		
Dimensions	Width	Height	Depth
Dimensions	1185mm	795mm	475mm
Weight	36Kg	-	

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

### LIST OF P.W.BOARD No.

Name of P.W.BOARD	P.W.BOARD No.	
SWITCH BOARD I UNIT	BP-338	
SWITCH BOARD II UNIT	BP-339	
SWITCH BOARD III UNIT	BP-340	
SWITCH BOARD IV UNIT	BP-342	
TONE BOARD UNIT	BP-401-3	
PANEL BOARD UNIT	BP-336-11	
POWER BOARD UNIT	BP-391-11	
L/FILTER BOARD UNIT	BP-393-2	
H/PHONE BOARD UNIT	BP-389-4	