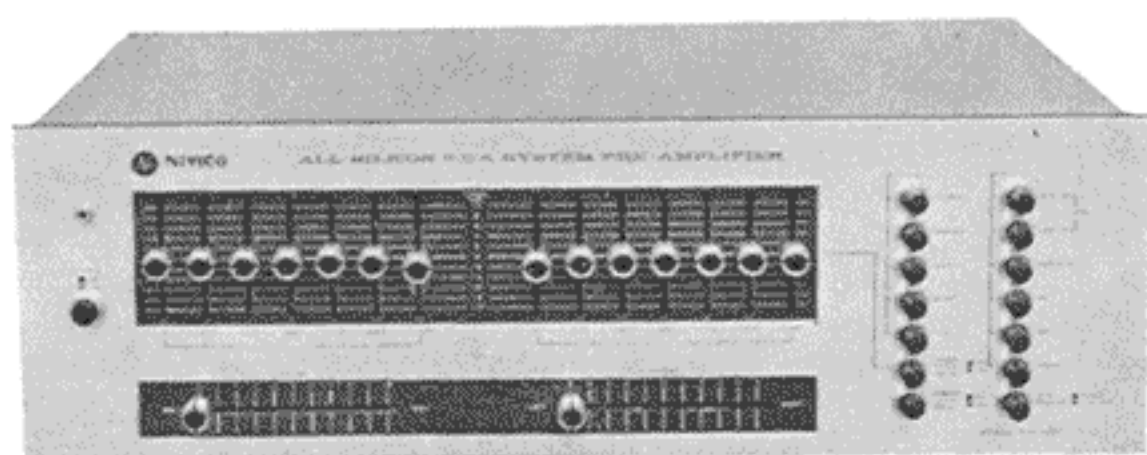




# NIVICO

No. 2145

## SERVICE MANUAL



5011/PST-1000E



5012/MST-1000E

### MODEL 5011/PST-1000E

STEREO PRE-AMPLIFIER WITH S.E.A. SYSTEM

### MODEL 5012/MST-1000E

ALL SILICON TRANSISTOR STEREO MAIN AMPLIFIER

DIMENSION :

	Height	Width	Depth
5011/PST-1000E	5-7/8"	18-7/8"	13-1/2"
5012/MST-1000E	5-7/8"	18-7/8"	13-1/2"

WEIGHT : 5011/PST-1000E 24.2 lbs.

5012/MST-1000E 35.6 lbs.

#### SPECIFICATIONS

##### MODEL 5011/PST-1000E

Type :	Stereo Pre-Amplifier with S.E.A. System	
Output Voltage :	3V (Distortion ; Less Than 0.03%, 10Hz~70KHz) 5V (Non-clip ; 10Hz~50KHz)	
Output Impedance :	1.1KΩ	
Frequency Response :	Aux, Tuner ; 10Hz~100KHz +0 dB -0.5 dB, Phono (Low, High) ; RIAA Equalizer Response ±0.5 dB (Adjustable ±3 dB at 10KHz)	
Sensitivity :	To Get 1.5V	
(Input Impedance at	Aux, Tuner	170mV (100KΩ)
Input Terminals)	(Adjustable by 250KΩ Semi-Variable Resistor)	

##### MODEL 5012/MST-1000E

Type :	All Silicon Transistor Stereo Main Amplifier	
Circuit Type of	Semi-Complementary, SEPP Triple	
Power Stage :	Push O.T.L. System	
Transistors :	2SC693×6, 2SD24×5, 2SC614×2, 2SA535×2, 2SD67×13, 2SC615×3, 2SC536×3	
Diodes :	SV-31×4, SZT-7×4, 1N60×8, DS-2M×4, FR-1M×1, SV-02×2	
Output Power		
Music Power :	80W+80W (±0.5 dB, 8Ω Load)	
Continuous Rated	60W+60W (±0.5dB, 8Ω Load)	
Power :	40W+40W (±0.5dB, 16Ω Load)	

— 5011/PST-1000E —

	X'TAL	120mV (330KΩ)
	Phono-High	3.2mV (50KΩ)
	Phono-Low	1mV (50KΩ)
	Tape Head	1.2mV (350KΩ)
	MIC	2mV (350KΩ)
<b>SEA Section :</b>		
<b>Impedance :</b>	Input	50KΩ
	Load	50KΩ
<b>Input Level :</b>	Standard	0.2V
<b>Output Level :</b>	Standard	0.3V
	Max.	3V
<b>Gain :</b>	3 dB (0 dB : Flat Level)	
<b>Frequency Response :</b>	±0.5 dB (20Hz~20KHz)	
<b>Harmonic Distortion :</b>	Less Than 0.05% (20Hz~20KHz, 0.3V Output)	
<b>S/N Ratio :</b>	Better Than 100 dB	
<b>Center Frequency :</b>	60Hz, 150Hz, 400Hz, 1KHz, of S.E.A. 2.4KHz, 6KHz, 15KHz	
<b>S.E.A. Control :</b>	±10 dB (2dB Step)	
<b>Ramble Filter :</b>	f <sub>c</sub> =30Hz, -30 dB/oct.	
<b>Tape Terminals :</b>	Rec. Out 160mV (Output 1.5V)	
<b>Output at DIN Rec. and Rep. Terminals</b>	Input Level	0.3V
	Output Level	22V
<b>Power Receptacles :</b>	Switched	.....3
	Uuswitch	.....2
<b>Crosstalk :</b>	Better Than 50 dB	
<b>Transistors :</b>	Ultra-Low Noise Transistor	32
<b>Diodes :</b>	Silicon Diode	4
<b>Power Source :</b>	Adjustable to AC 100V, 117V, 220V, 235V, 50Hz, 60Hz	
<b>Power Consumption :</b>	3 VA	

— 5012/MST-1000E —

<b>Output Impedance :</b>	4Ω~32Ω
<b>Distortion :</b>	20Hz~15KHz
	Less Than 0.07% (Output 60W)
	" 0.05% ( " 50W)
	" 0.05% ( " 100mW)
	10Hz~70KHz
	Less Than 0.5% (Output 60W)
<b>Harmonic Distortion :</b>	Less Than 0.2% (Output 60W)
	" 0.1% ( " 50W)
<b>Frequency Response :</b>	Power Output Stage
<b>(Output)</b>	10Hz~100KHz +0 -1 dB
	Over All (Cut off Below 30Hz by Ramble Filter.)
	40Hz~100KHz +0 -1 dB
<b>S/N Ratio :</b>	Better Than 115 dB
<b>Input Impedance :</b>	100KΩ (At Signal Input Terminals)
<b>Damping Factor :</b>	50Hz~30KHz
	Better Than 80 (8Ω Load)
	" 160 (16Ω Load)
<b>Input Sensitivity :</b>	1V (Output 60W)
<b>Safety Circuit :</b>	(1) Speaker Silent Circuit (CR Time-Constant Type)
	(2) Power Transistor Safety Circuit (One Shot Multi Type)
<b>VU Meter :</b>	Sensitivity is changeable by 4 Steps
<b>Input terminals :</b>	Signal Input (L, R) Gain is Ad- justable by Semi Variable Resistor RAMBLE FILTER ; Below 30Hz, -18 dB/oct.
<b>Output Terminals :</b>	(1) Speaker Output (L, R)
	(2) Stereo Headphone Monitor Terminal
<b>Power Receptacles :</b>	Switched .....2
	Unswitched .....1
<b>Power Source :</b>	Be able to select AC 100V, 117V, 220V, 240V, 50Hz, 60Hz
<b>Power Consumption :</b>	No Signal ; 45W (65VA)
	Output 60W ; 150W (190VA)
	" 120W ; 250W (320VA)

## HOW TO REMOVE THE CHASSIS ASS'Y & FRONT PANEL

When servicing chassis, remove the chassis assembly, referring to items shown below.

5011/PST-1000E

- Take off the case cover (2), removing 4 screws numbered (1).
- Take off the front panel in the direction of bold arrow, removing the parts in order of (3)~(8).

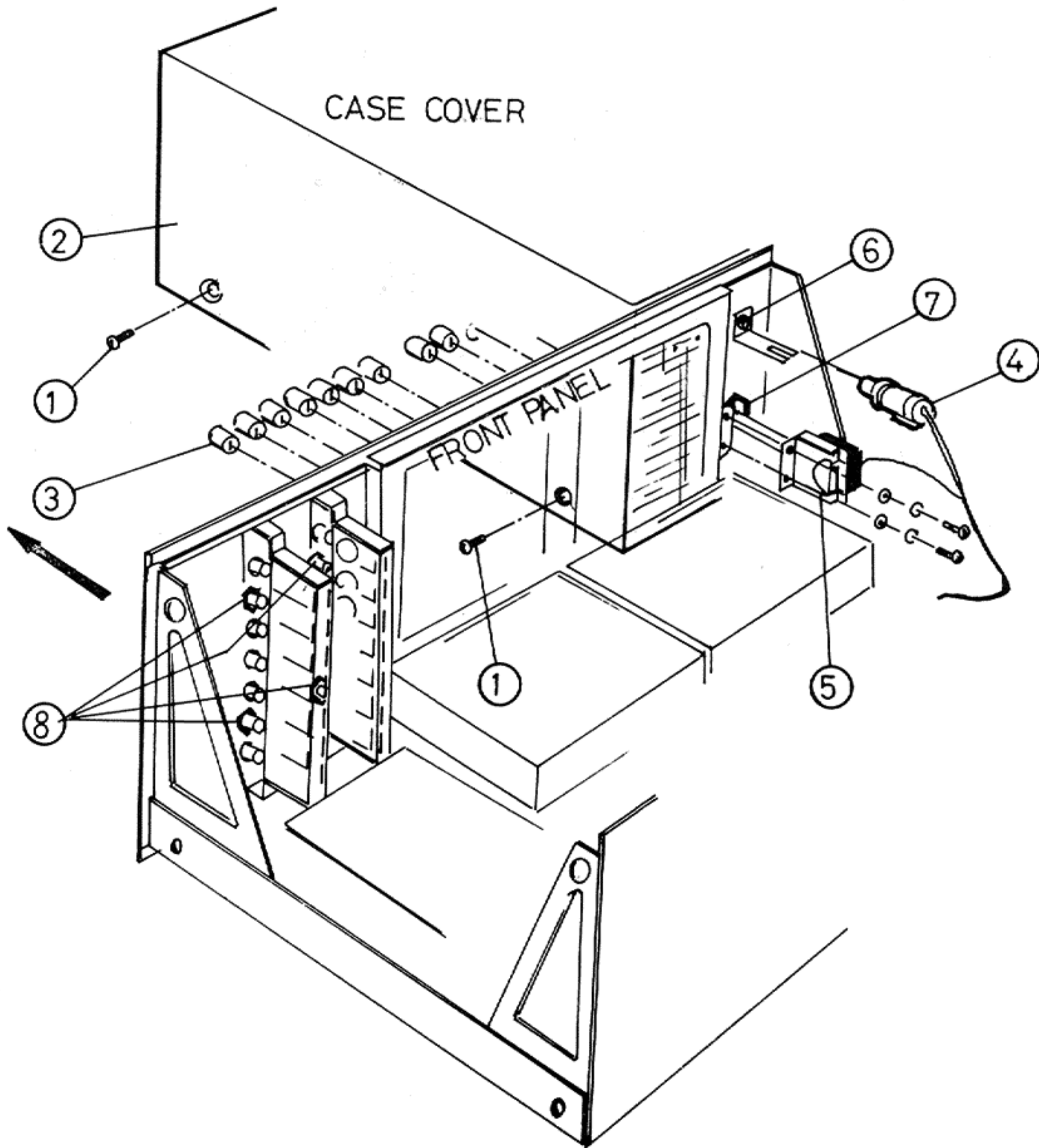


Fig. 1

- Take off the case cover ②, removing 4 screws numbered ①.
- Take off the front panel in the direction bold screw, removing in sequence of ③~⑨.

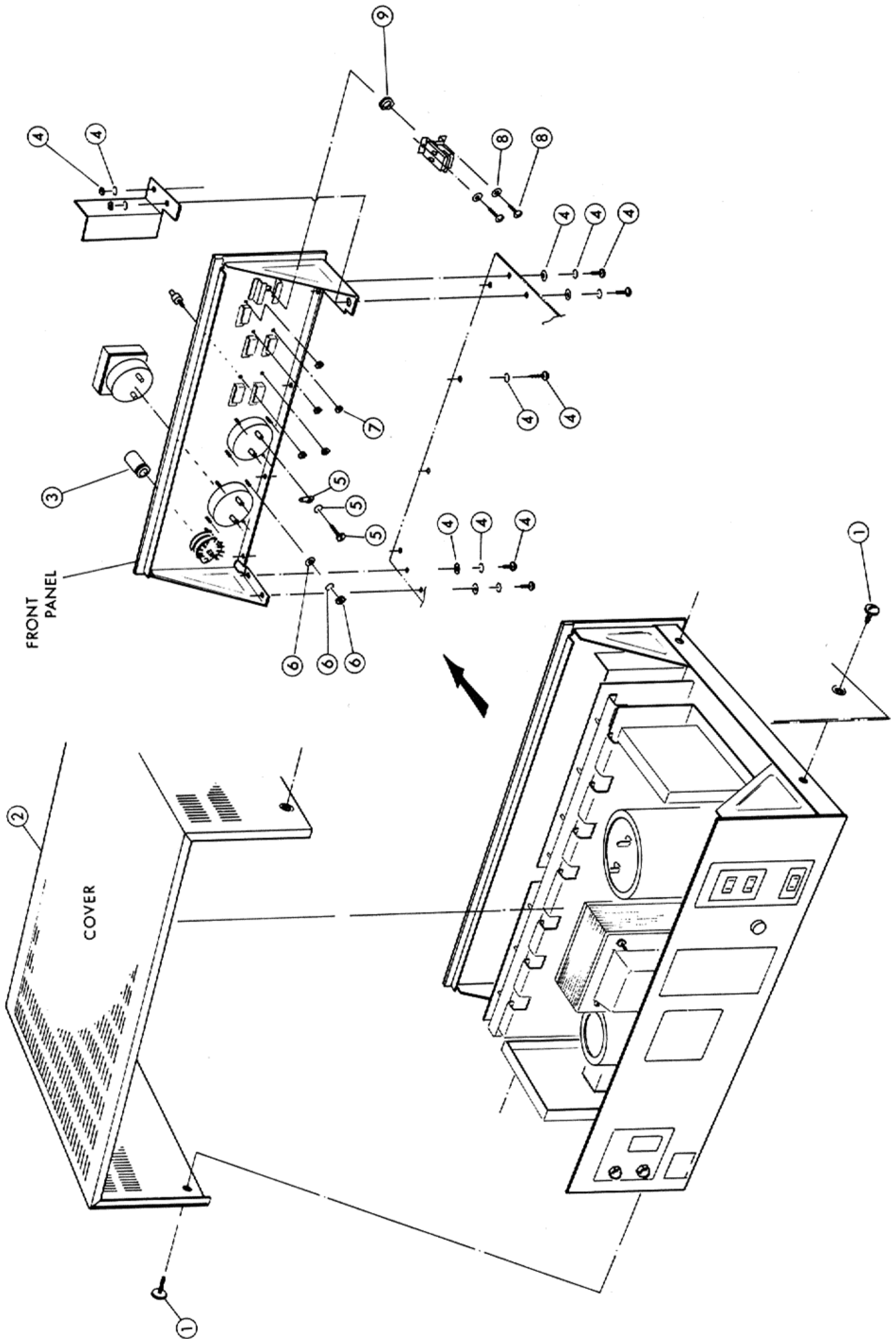


Fig. 2

# MAIN PARTS ARRANGEMENT

5011/PST-1000E

## PARTS ARRANGEMENT OF FRONT VIEW

Front Panel (5011/PST-1000E)

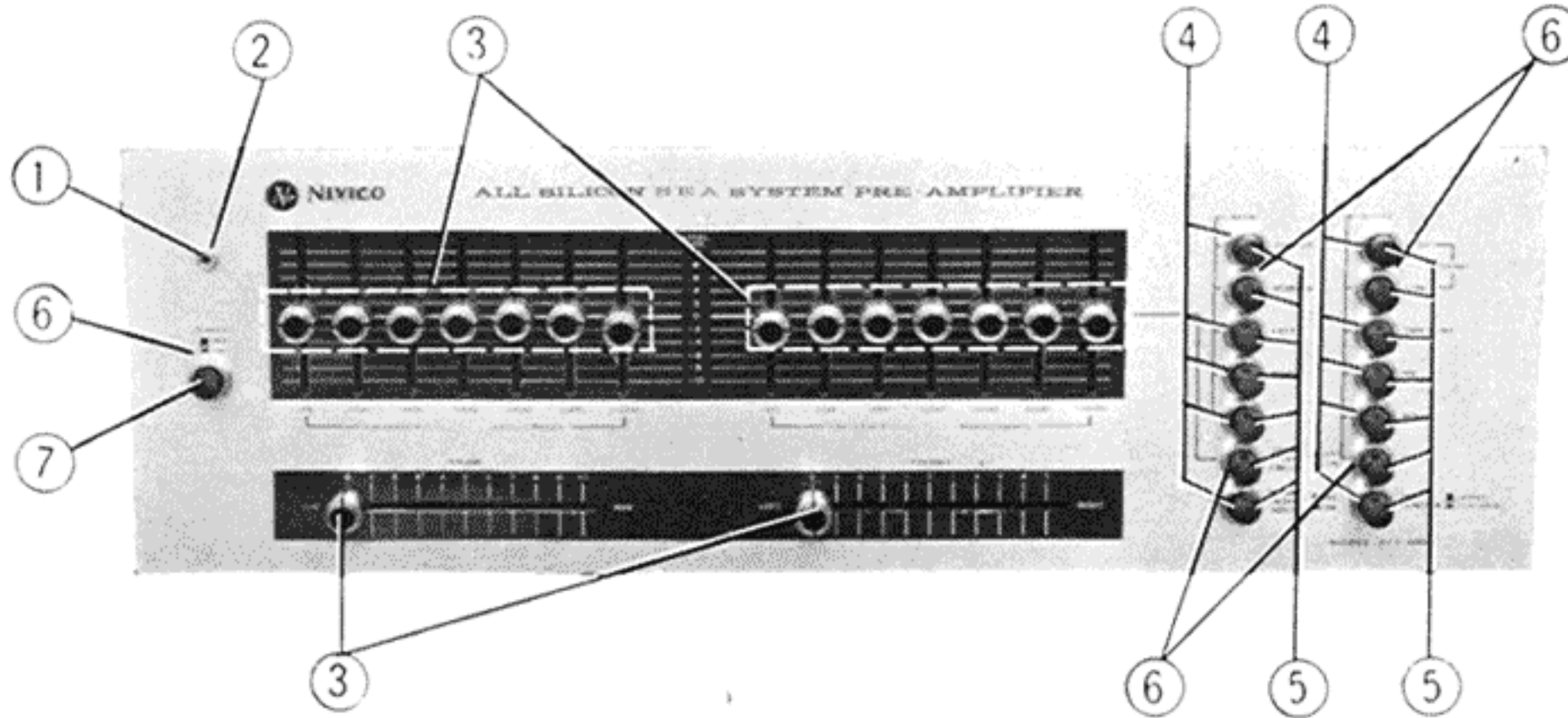


Fig. 3

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E50573	Rabbit Eye	5	E40885	Push Button Knob
2	E50572	Escutcheon Ring	6	E50570	Escutcheon Ring
3	E40736	Slide Knob	7	E40886	Push Button Knob
4	E50570-1	Escutcheon Ring			

## PARTS ARRANGEMENT OF BACK VIEW

Back Panel (5011/PST-1000E)

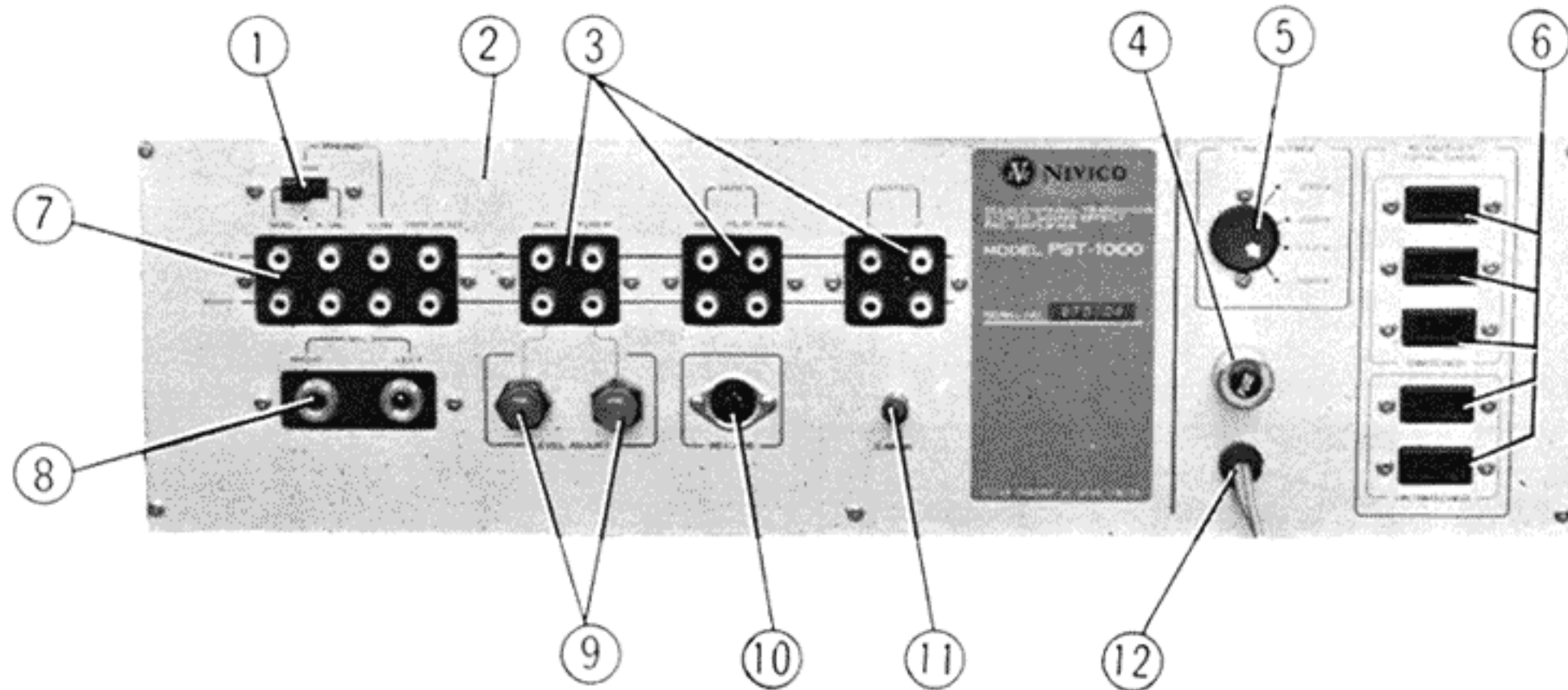


Fig. 4

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	Q03749-1	Slide Switch	7	E03043-80	Pin Jack Ass'y
2	E2794	Back Panel	8	Q03961-1	Mic. Jack Ass'y
3	E03043-40	Pin Jack Ass'y	9	E50573	Cap
4	E04035-C	Fuse Socket Ass'y	10	Q03967	DIN Socket Ass'y
5	Q30050-1	2 Pin Plug Ass'y	11	E04069	Push Terminal
6	Q30044-2	AC Socket Ass'y	12	E40922	Power Cord Stopper

PARTS ARRANGEMENT OF UPSIDE VIEW (5011/PST-1000E)

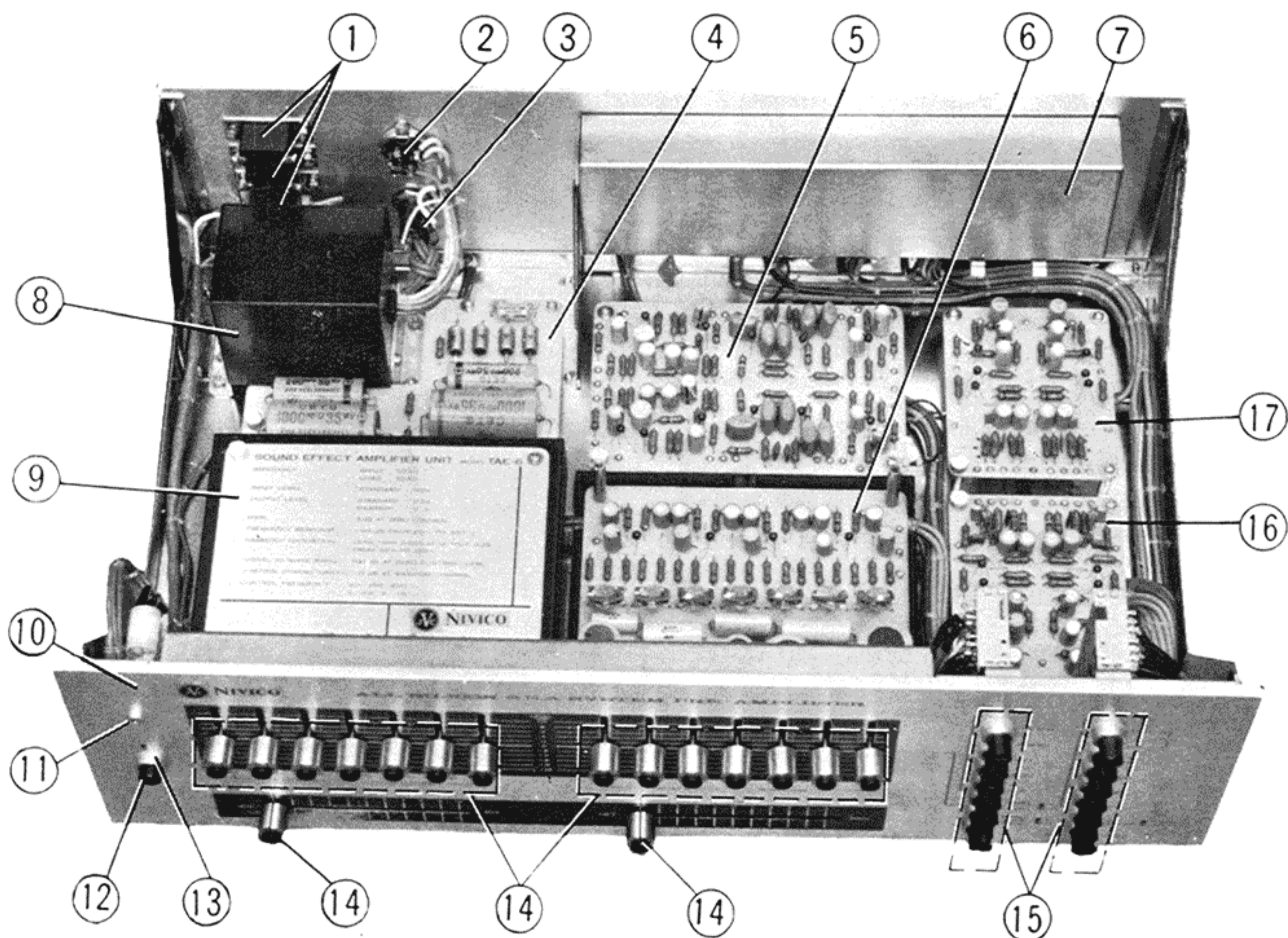


Fig. 5

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	Q30044-2	AC Socket Ass'y	10	E2793-2	Front Panel
2	Q04933-1E	9-Pin Socket Ass'y	11	E50573	Rabbit Eye
3	E04035-C	Fuse Socket Ass'y		E50572	Escutcheon Ring
4	—	Power Circuit Board	12	E40886	Push Button Knob
5	(TAC-9)	Control Amp. Circuit Board	13	E50570-2	Escutcheon Ring
6	(TAE-6)	S. E. A. Circuit Board	14	E40736	Slide Knob
7	E30625	Shield Cover	15	E40885	Push Button Knob
8	E03045	Power Transformer	16	(TAE-5)	Equalizer Amp. Circuit Board
9	E30630-2	Name Plate	17	(TAE-4)	Equalizer Amp. Circuit Board

PARTS ARRANGEMENT OF UPSIDE VIEW (5011/PST-1000E)

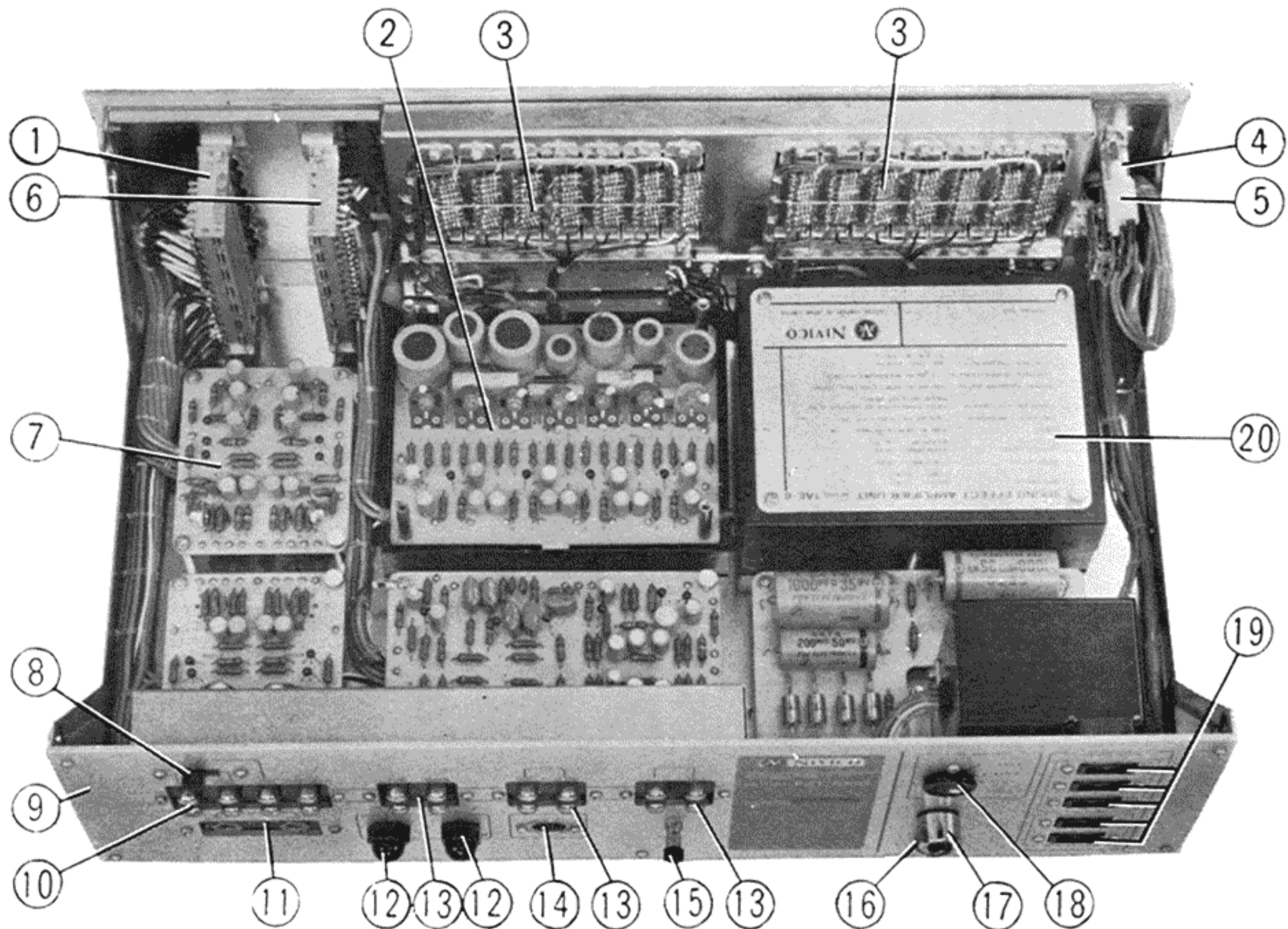


Fig. 6

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	Q02726-1	7 Key Push Switch	11	Q03961-1	Mic Jack Ass'y
2	(TAE-6)	S. E. A. Circuit Board	12	E50576	Cap
3	E03051	Slide Switch	13	E03043-40	Pin Jack Ass'y
4	Q04967-3	Pilot Lamp	14	Q03967	DIN Socket Ass'y
5	A30668-B	Pilot Lamp Socket	15	E04069	Push Terminal
6	Q02725-1	7 Key Push Switch	16	E40922	Power Cord Stopper
7	(TAE-5)	Equalizer Amp. Circuit Board	17	E04035-C	Fuse Socket Ass'y
8	Q03749-1	Slide Switch	18	Q30050-1	2-Pin Plug
9	E2794-2	Back Panel	19	Q30044-2	AC Socket Ass'y
10	E03043-80	Pin Jack Ass'y	20	E30630-2	Name Plate

**PARTS ARRANGEMENT OF FRONT VIEW**

Front Panel (5012/MST-1000E)

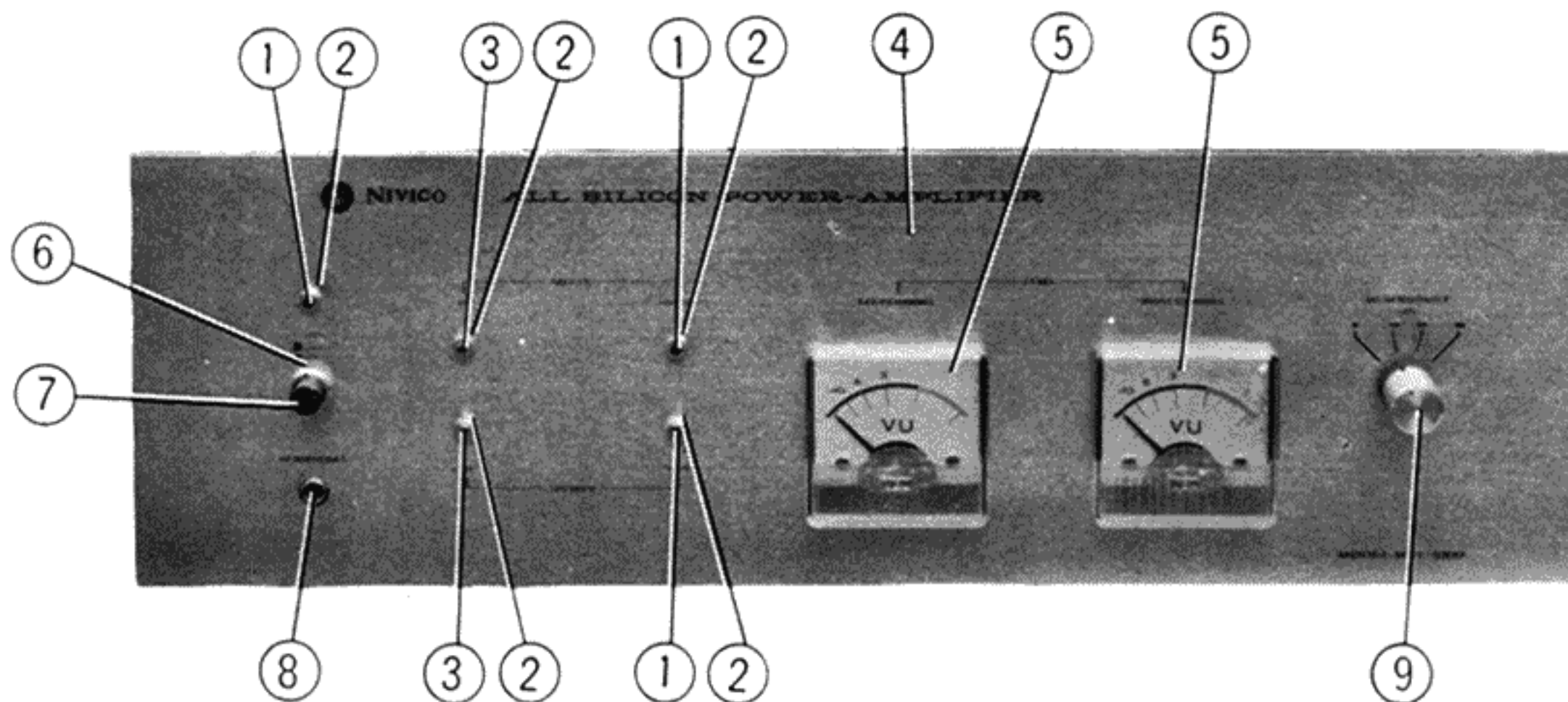


Fig. 7

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E50573-1	Rabbit Eye	6	E50570-2	Escutcheon Ring
2	E50572	Escutcheon Ring	7	E40886	Push Button Knob
3	E50573-2	Rabbit Eye	8	Q03964-1	Head Phone Jack Ass'y
4	E2766-2	Front Panel	9	E40693-1	Knob
5	E03055	VU Meter			

**PARTS ARRANGEMENT OF BACK VIEW**

Back Panel (5012/MST-1000E)

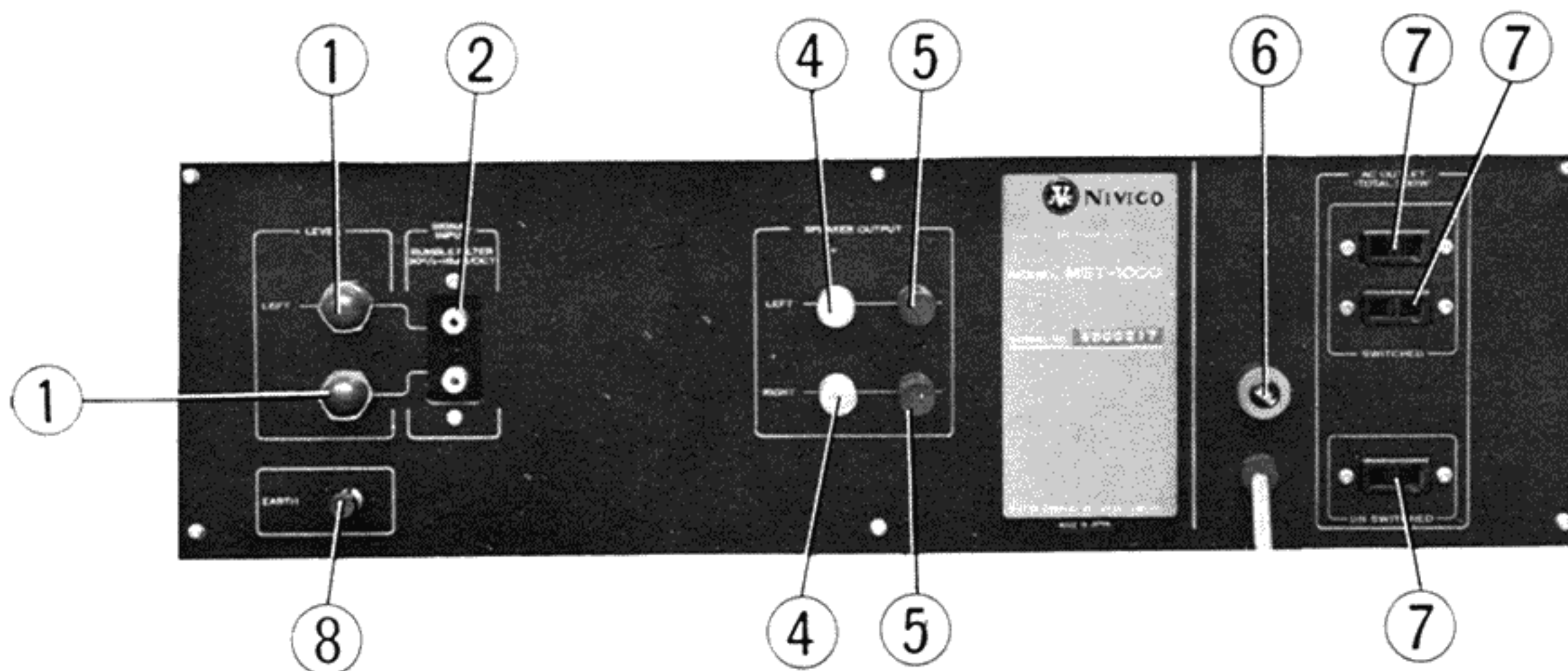


Fig. 8

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E50576	Cap	6	E04035-C	Fuse Socket Ass'y
2	E04083	Pin Jack Ass'y	7	Q30044-2	AC Socket Ass'y
4	E04087-B	One Touch Terminal	8	E04069	Push Terminal
5	E04087-A	One Touch Terminal			



PARTS ARRANGEMENT OF UPSIDE VIEW (5012/MST-1000E)

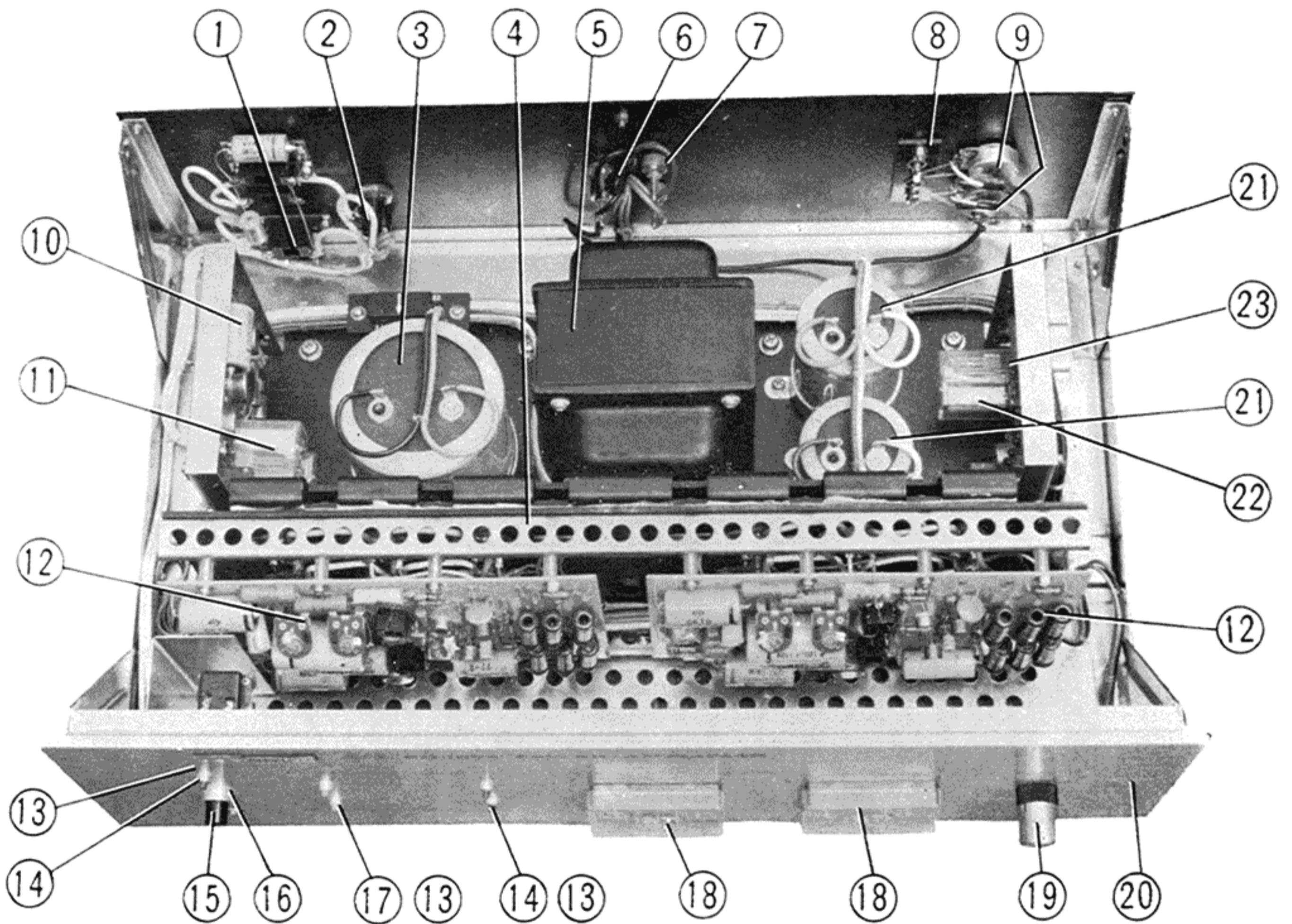


Fig. 9

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	Q30044-2	AC Socket Ass'y	13	E50572	Escutcheon Ring
2	E04035-C	Fuse Socket Ass'y	14	E50573-1	Rabbit Eye
3	E03052	Electrolytic Capacitor	15	E40886	Push Button Knob
4	E2940	Radiation Plate	16	E50570-2	Escutcheon Ring
5	E03077-1	Power Transformer	17	E50573-2	Rabbit Eye
6	E04087-A	One Touch Terminal	18	E03055	VU Meter
7	E04087-B	One Touch Terminal	19	E40693-1	Knob
8	E04083	Pin Jack Ass'y	20	E2766-2	Front Panel
9	E03060	Variable Resistor	21	E03053	Electrolytic Capacitor
10	(TAP-12)	DC Power Source Circuit Board	22	E03018-5	Relay
11	E03018-4	Relay	23	(TAC-23)	Safety Circuit Board
12	(TAD-10)	Power Drive Amp. Circuit Board			

PARTS ARRANGEMENT OF UPSIDE VIEW (5012/MST-1000E)

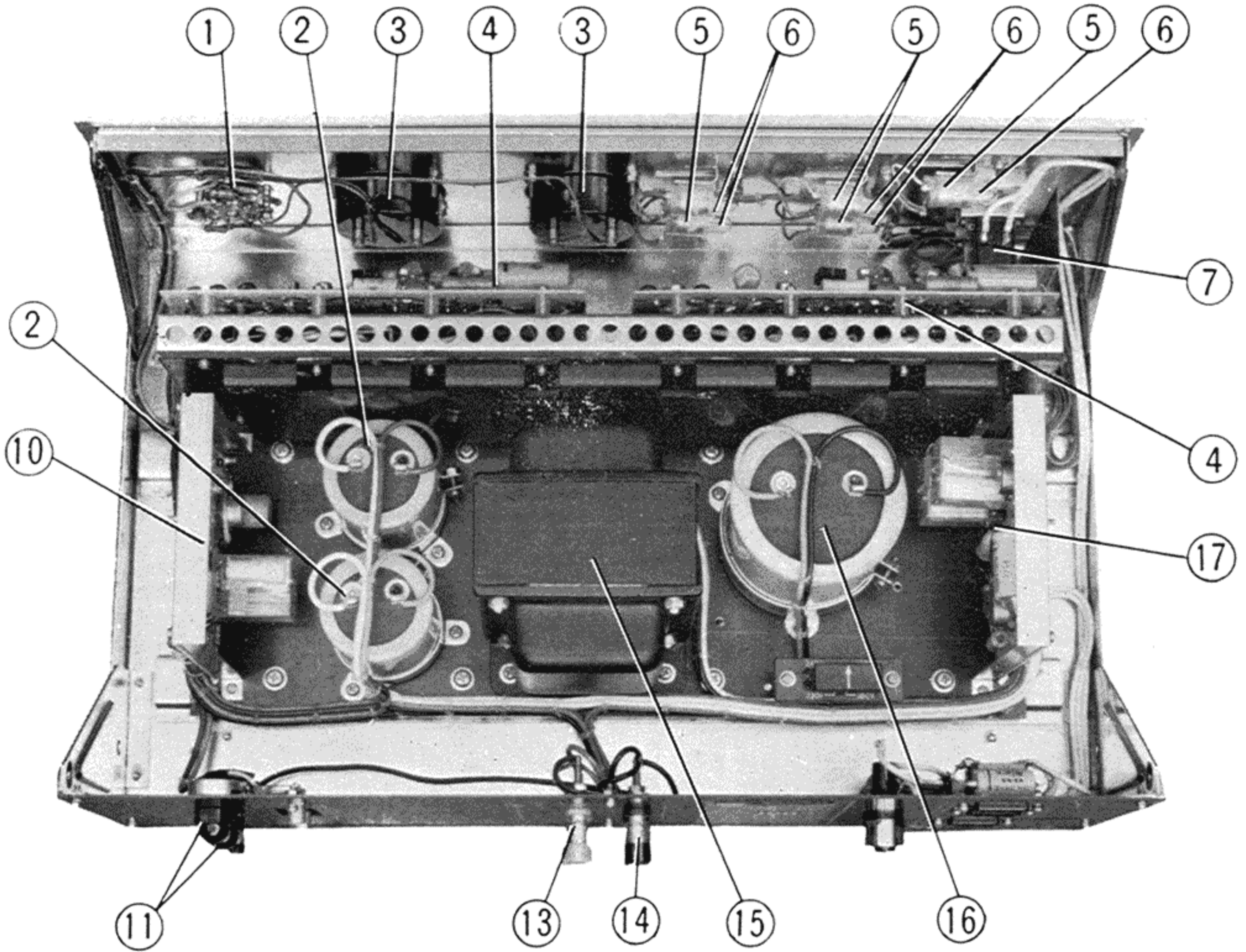


Fig. 10

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	Q03714-1	Rotary Switch	10	(TAC-23)	Safely Circuit Board
2	E03053	Electrolytic Capacitor	11	E50576	Cap
3	E03055	VU Meter	13	E04087-B	Push Terminal
4	(TAD-10)	Power Drive Amp. Circuit Board	14	E04087-A	Push Terminal
5	Q30110-A	Pilot Lamp Socket	15	E03077-1	Power Transformer
6	Q04767-2	Pilot Lamp	16	E03052	Electrolytic Capacitor
7	Q03783-1	Power Switch	17	(TAP-12)	DC Power Source Circuit Board

# ALIGNMENT INSTRUCTION

5011/PST-1000E

1. When adjusting the semi-variable resistors ( $100\Omega$ )  $R_{627} \sim 633$  on the circuit board of SEA (TAE-6), follow the order shown below.

- Using an ohmmeter, adjust resistance between the points indicated by the arrows as in Fig. 11 for  $100\Omega$ .
- After adjusting, lock the shafts of the resistors with lacquer paint.

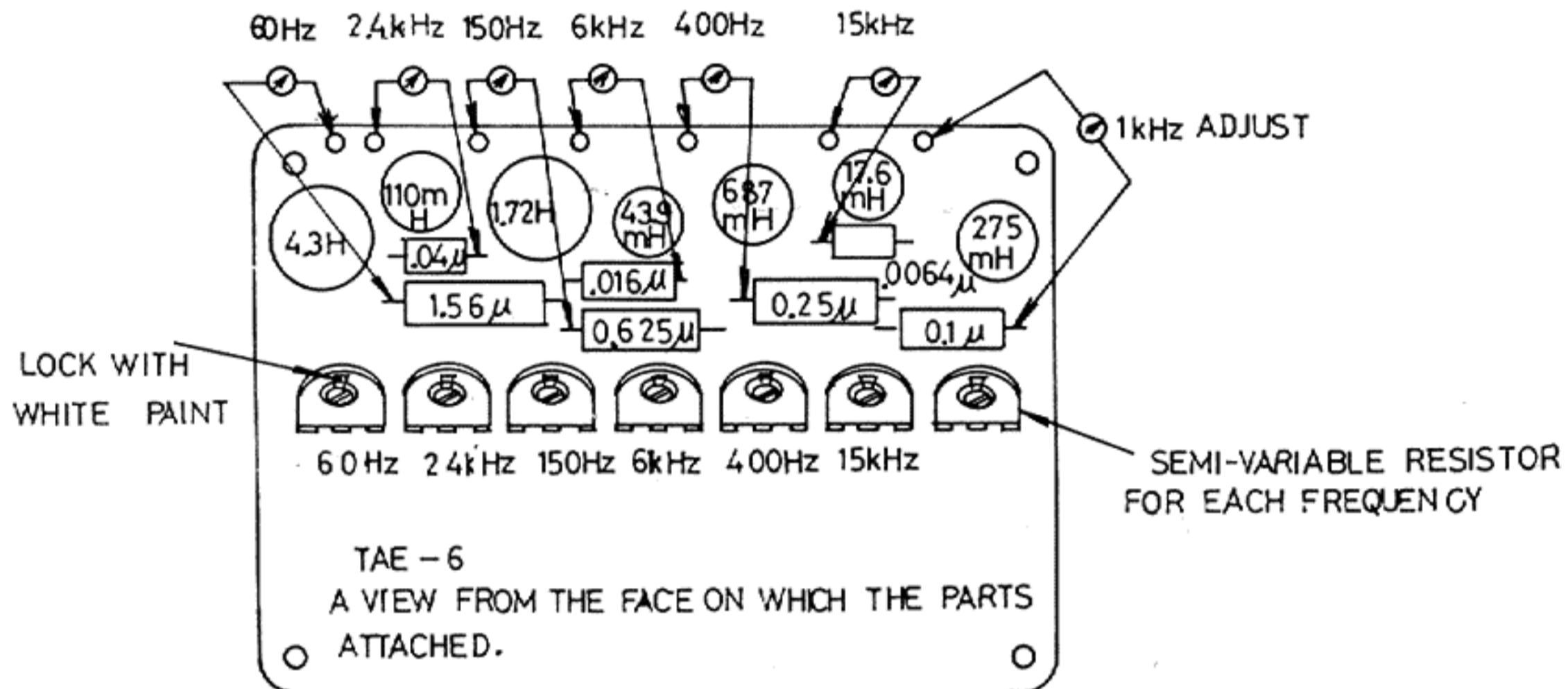
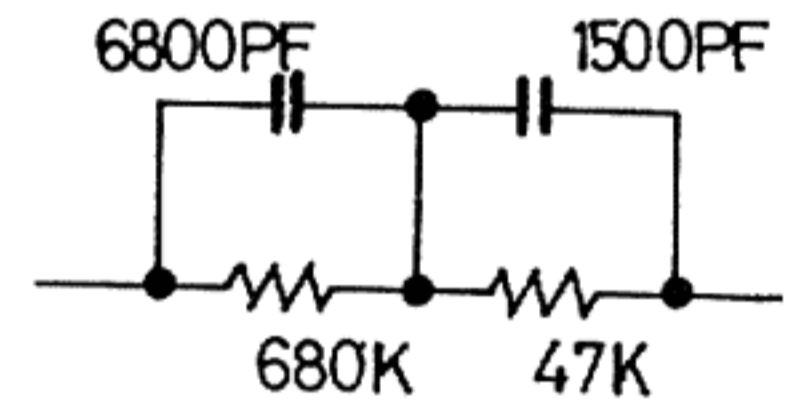


Fig. 11

2. Selection of C., R. on equalizer circuit board (TAE-4).

•  $R_{423, 424}$  47KΩ

- (1) Divide the resistors into two groups: a group of 0~+5% and a group of 0~-5%.
- (2) If you use a resistor from a group of 0~+5% for one channel, use a resistor from the same group for the other channel on the same circuit board, and if you use a resistor from a group of 0~-5% for one channel, use a resistor from a group of 0~-5% for the other channel.



SELECT FROM  $\left\{ \begin{array}{l} R ; Q04803 (\pm 5\%) \\ C ; Q03244 (\pm 10\%) \end{array} \right.$   
PHONO HIGH LEVEL RIAA

Fig. 12

•  $R_{421, 422}$  680KΩ

Use the resistors from a group of 0~-5% only for R. and L. channel on the same circuit board.

•  $C_{411, 412}$  1500pF

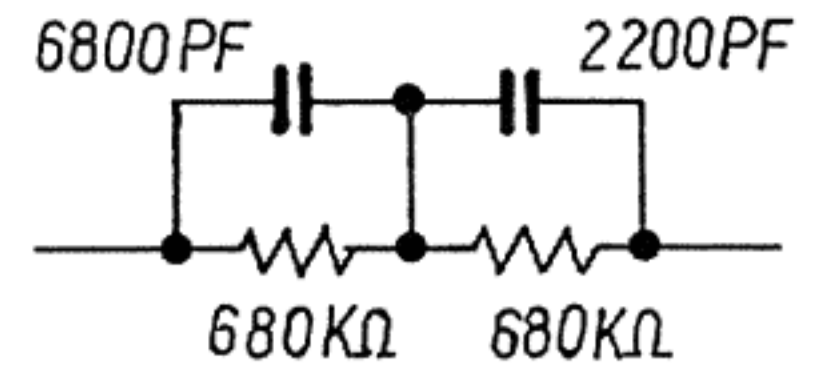
- (1) Divide the capacitors into two groups: a group of +6~-1% and a group of -1~-6%.
- (2) Select and use the capacitors as described in item " $R_{423, 424}$  (2)".

•  $C_{409, 410}$  6800pF

- (1) Divide the capacitors into two groups: a group of +3~-1% and group of -1~-6%.
- (2) Select and use the capacitors as described in the item " $R_{423, 424}$  47KΩ, (2)".

3. Selection of C. R. on equalizer circuit board (TAE-5).

- $R_{529, 530}$  33K $\Omega$ ,  $R_{527, 528}$  680K $\Omega$  (Refer to Fig. 13)  
Select and use as described in the item " $R_{423, 424}$  47K $\Omega$ , (1) and (2)".
- $C_{511, 512}$  680pF (Refer to Fig. 13)  
(1) Divide the capacitors into two groups: a group of +12~+6% and a group of +6~+2%.
- (2) Select and use the capacitors as described in item " $R_{423, 424}$  47K $\Omega$ , (2)".
- $C_{513, 514}$  2200pF (Refer to Fig. 13)  
Select and use as described in the item " $R_{423, 424}$  47K $\Omega$  (1) and (2)".
- $R_{523, 524}$  1.2M $\Omega$  (Refer to Fig. 14)  
— ditto —
- $C_{509, 510}$  4700pF (Refer to Fig. 14)  
Select and use as described in the item " $C_{411, 412}$ ".
- $R_{525, 526}$  20K $\Omega$  Semi-Variable Resistor, Adjust to 10K $\Omega$ .
- $R_{521, 522}$  22K $\Omega$  (Q04803) — Mic Flat Amp.  
Select and use as described in item " $R_{423, 424}$  47K $\Omega$  (1) and (2)".

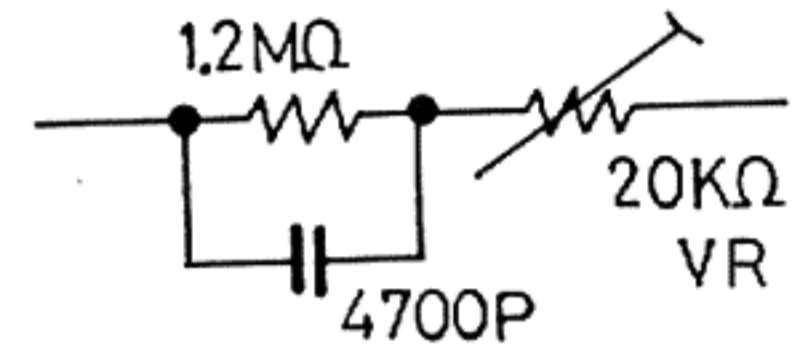


SELECT FROM

- R : Q04803 ( $\pm 5\%$ )
- 2200pF : Q03244 ( $\pm 10\%$ )
- 6800pF : Q03244 ( $\pm 10\%$ ),  
Q03246 ( $\pm 20\%$ )

PHONO LOW LEVEL RIAA

Fig. 13



SELECT FROM

- 1.2M $\Omega$  : Q04803 ( $\pm 5\%$ )
- 4700pF : Q03244 ( $\pm 10\%$ )

TAPE HEAD NAB

Fig. 14

5012/MST-1000

1. Check before turning the power on.

- Check and confirm that the collector of power transistor is not touching the ground.
- Check that the varistor and the thermistor are not snapped.

2. Steps after check.

- Connect speaker loads of 8~16 $\Omega$  to each speaker terminal.
- Connect an 1A D. C. amperemeter [AL], [AR] in series with B<sub>1</sub> wirings for L. channel and R. channel respectively as shown in Fig. 16.
- Set the shaft of semi-variable resistors on the circuit board (TAD-10) as shown in Fig. 17.  
.....both L. and R. channel.
- Connect a 150V D.C. voltmeter in parallel to C<sub>3</sub> 5000 $\mu$ F/125SV electrolytic capacitor as shown in Fig. 18.

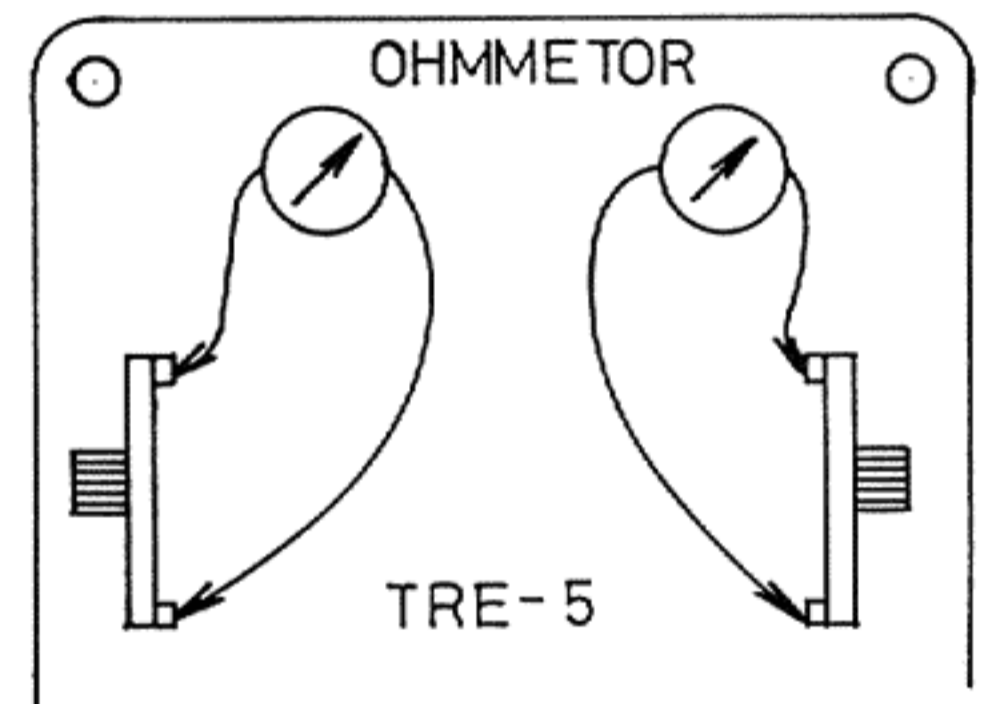


Fig. 15

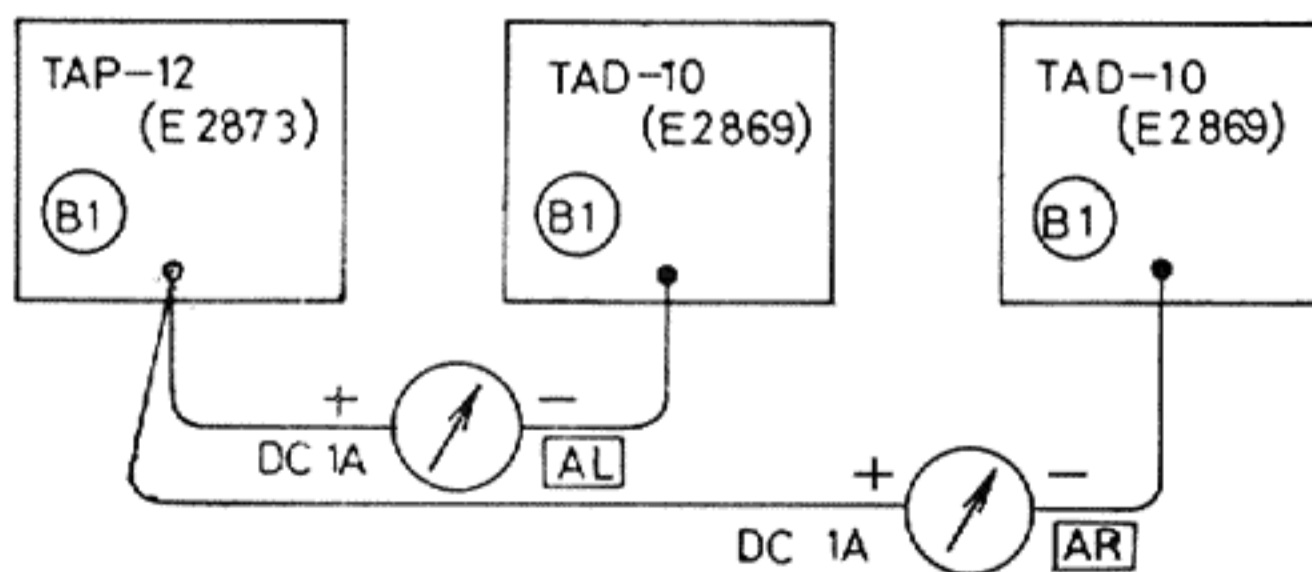


Fig. 16

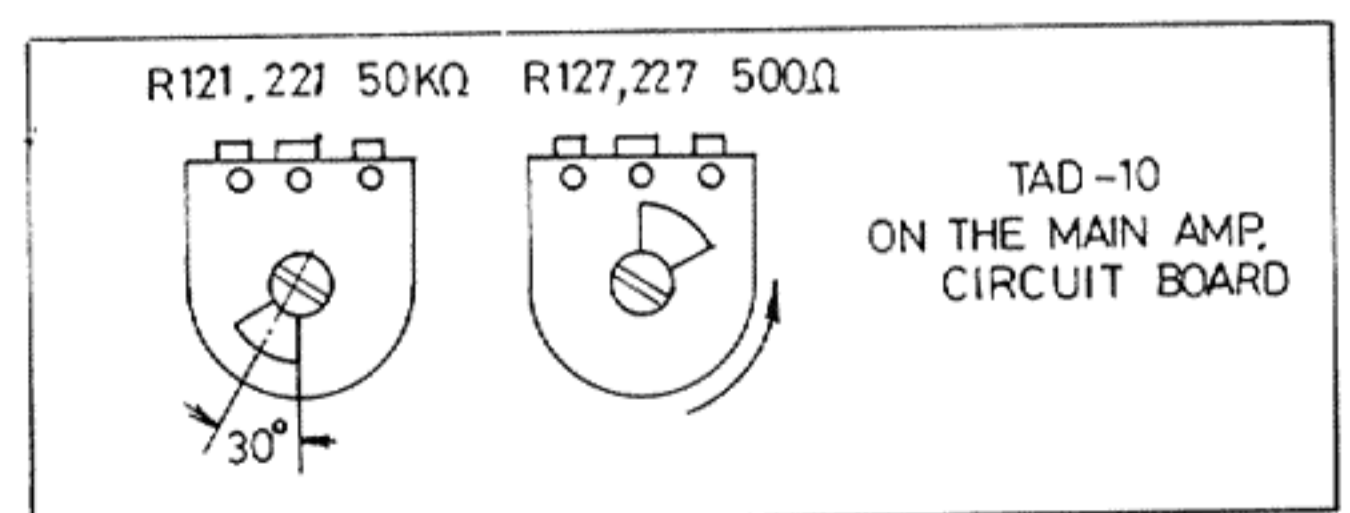


Fig. 17

- Prepare a variable transformer and set its output voltage to zero. Connect the power cord plug of 5012/PST-1000E to the variable transformer.
- Increase the voltage across  $C_3$  to 5V~10V. If then the current through  $A_L$  or  $A_R$  exceeds 200mA, something may be out of order.
- Increase the voltage across  $C_3$  from 10V to 50V. If nothing occurs, again increase the voltage to 98V (now AC voltage will be 100V). Then the current through  $A_L$  and  $A_R$  should be 10mA respectively.
- Check the voltage between the  $\oplus$  terminal of output coupling capacitor ( $C_{410}$  2000 $\mu$ F/1000SV) to speaker and the ground is  $98/2=49$  (V).
- Cut the power switch on the front panel off, if nothing is wrong up to this step. And again turn on and check that there is nothing wrong. Then a very faint noise can be heard after 8~10 seconds, because of function of the speaker silent circuit.

**(CAUTION)**

- 1) Use the amperemeter and the voltmeter of 0.5% tolerance.
- 2) Do not turn the seesaw switches on the back panel within 1 minute after turning on the power, or the power transistors might be damaged.

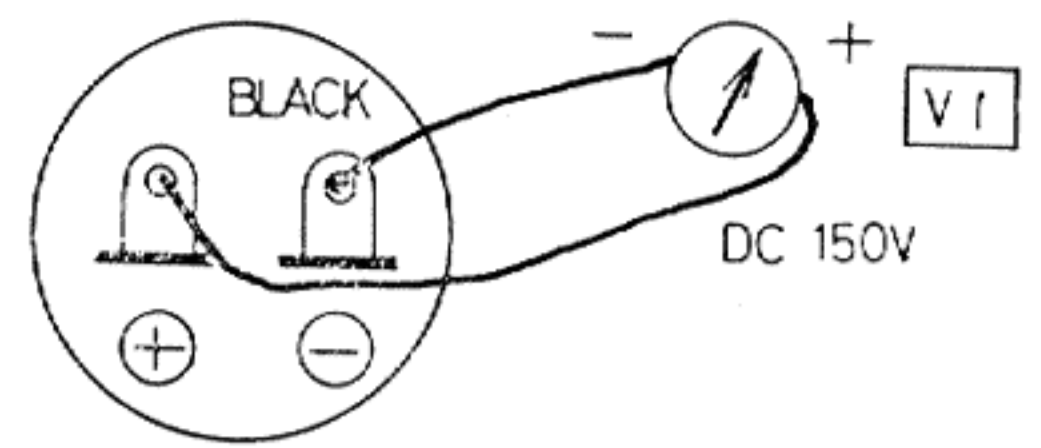
How to adjust the bias of power amplifier stage (semi-variable resistor 500 $\Omega$  ( $R_{127}$ ) on the circuit board TAD-10)

- Adjust at a normal room temperature with no signal input.
- Use speaker load.
- Switch on the power.
- Adjust semi-variable resistor ( $R_{127}$ ) of 500 $\Omega$  turning it clockwise for 20mA current through  $A_L$ ,  $A_R$ .
- Turn off the power and take off  $A_L$ ,  $A_R$ .

Then restore the wiring to the original condition.

How to adjust the bias of driver amplifier stage (Semi-variable resistor  $R_{127}$  50K $\Omega$  on the circuit board TAD-10).

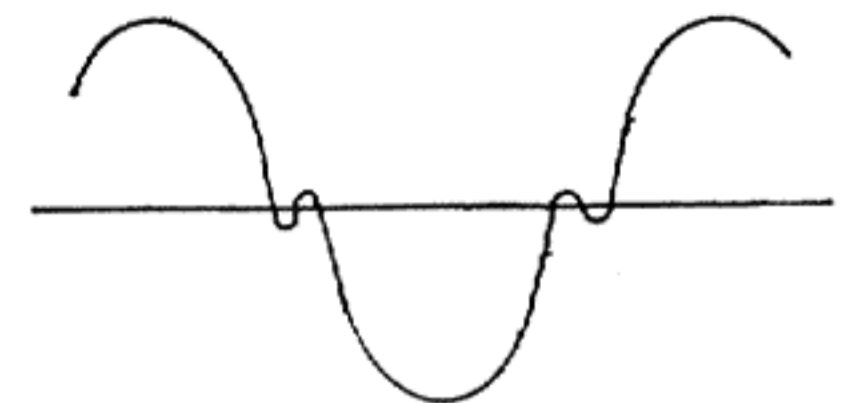
- Connect 100W, 8 $\Omega$  dummy resistors to output terminal of L. and R. channels respectively.
- Connect an oscilloscope and a V. T. V. M. to output terminals to observe the output wave form.
- Connect an audio oscillator to signal input terminal and apply 1 KHz.
- If the appliance operates normally, the output wave form will be clipped around 22V as the input increases. Adjust the semi-variable resistors 50K $\Omega$  ( $R_{121}$ ), so that the clips of wave becomes symmetrical at the same time.



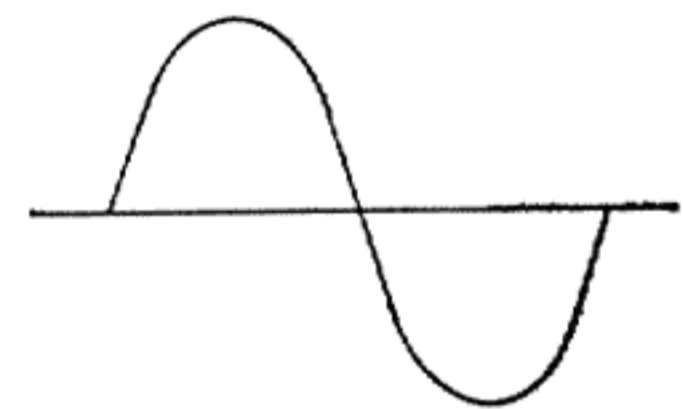
$C_3$  5000 $\mu$ F/125V

ELECTROLYTIC CAPACITOR

Fig. 18



ABNORMAL



NORMAL

UP : CROSSOVER DISTORTION  
CAUSED BY UNSUITED BIAS

Fig. 19

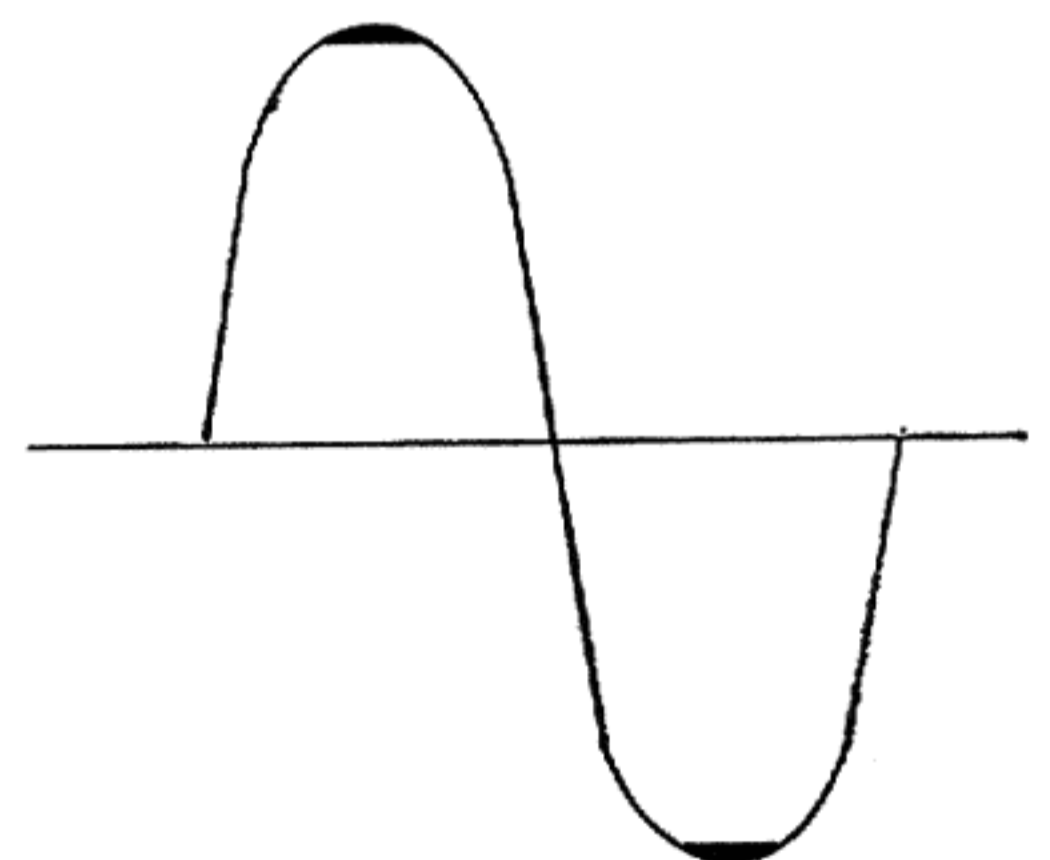


Fig. 20

- Switching the oscillator frequency, check that the non-clipped output exceeds 20V at 100Hz, 1KHz, 10KHz, and 100KHz.
  - Turn off the power and lock the shafts of R<sub>121,127</sub> lacquer paint.
5. Check of protecting circuit (safety circuit).
- Apply 1KHz signal at the input signal terminal to produce output of 3V at the output terminal, and confirm that the illumination of pilot lamp switches to "SAFETY-CAUTION, SPEAKER-SILENT", when the output terminal is short circuited.
  - Check both L. and R. channel.
6. How to adjust the interval of speaker silent.
- Adjust 330K $\Omega$  R<sub>307</sub> on the circuit board of TAC-23 after operating for 8~10 minuts.
  - Increase the resistance of R<sub>307</sub> when the interval is too short.
  - Decrease the resistance of R<sub>307</sub> when the interval is too low.