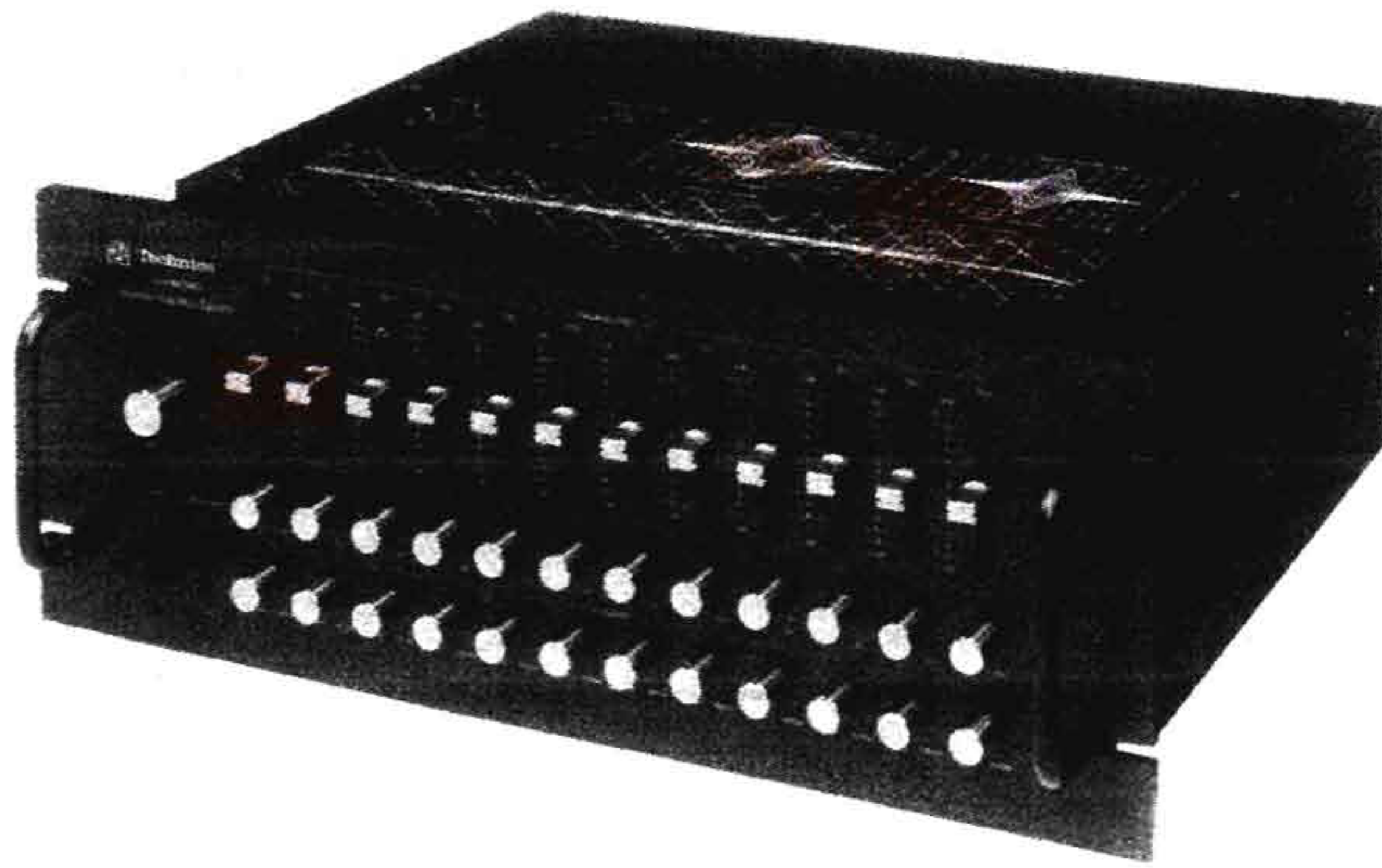


# Service Manual

HI-FI COMPONENTS

## SH-9090-(X)

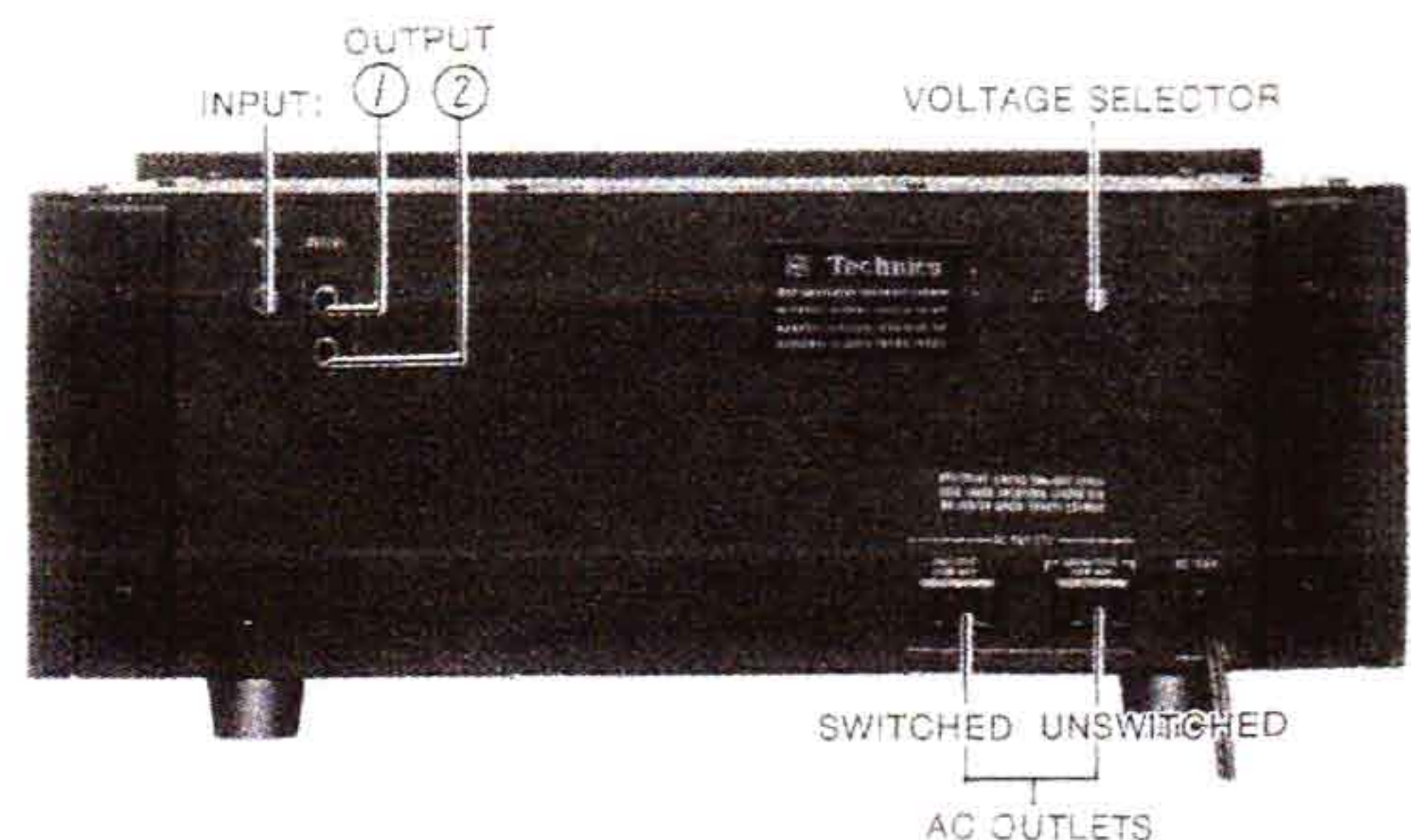
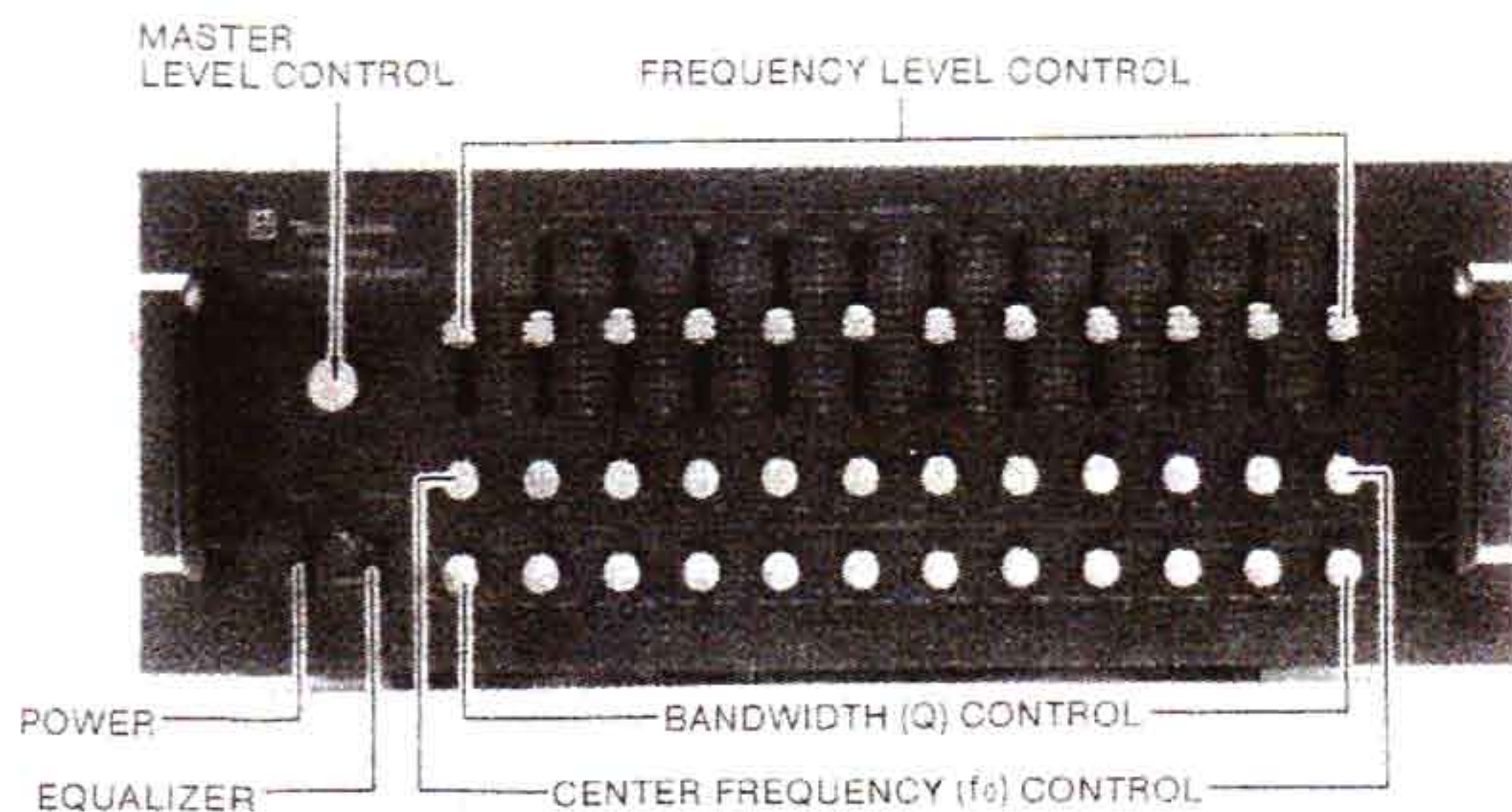


Universal Frequency Equalizer  
(monoral)

### TECHNICAL SPECIFICATIONS

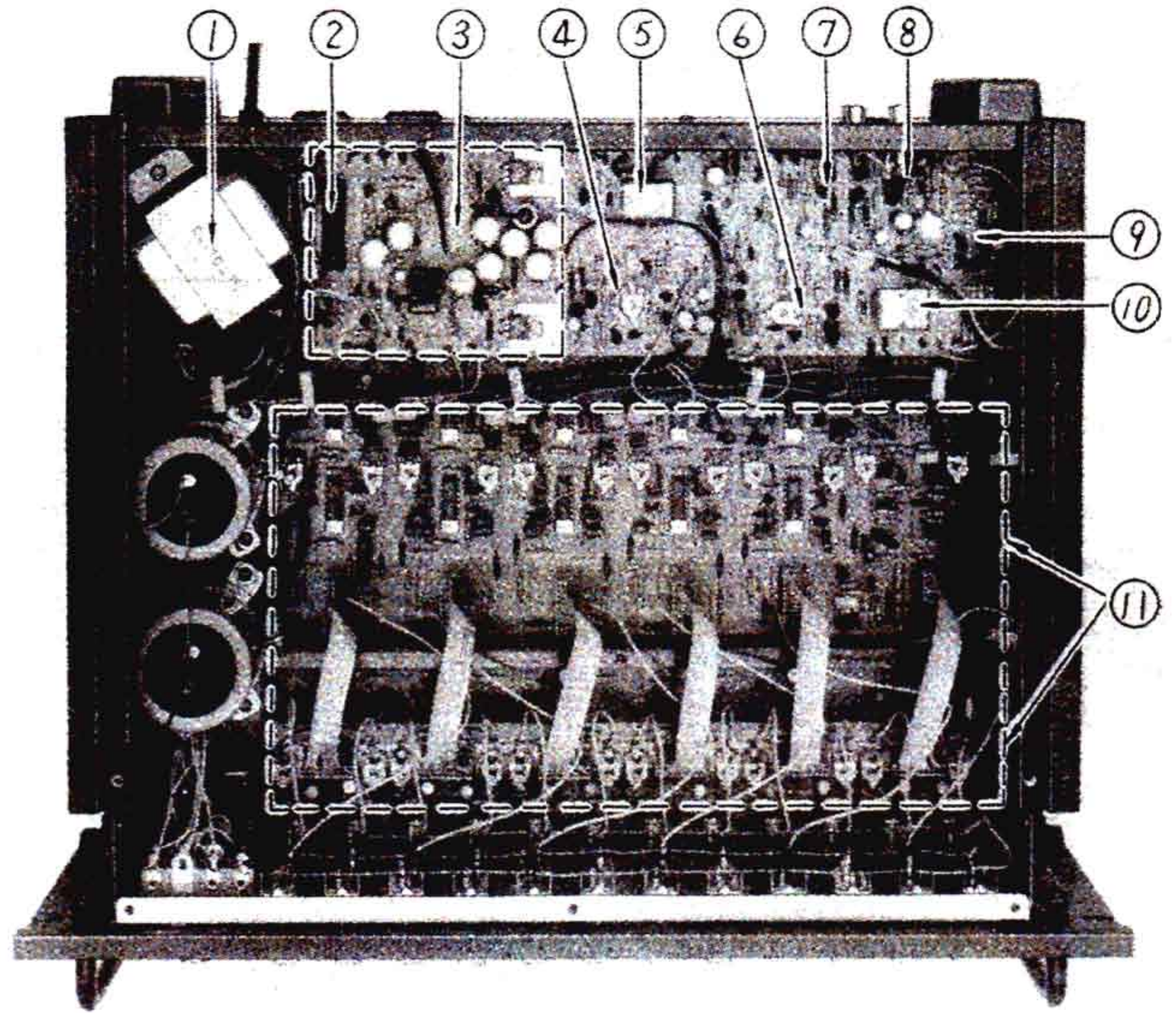
<b>Output voltage/output impedance</b>	
Rated	1V/500Ω
Maximum	7V/500Ω
<b>Total harmonic distortion</b>	0.05% (rated output)
<b>Input sensitivity/input impedance</b>	1V/50kΩ
<b>Frequency response</b>	10 Hz~30 kHz, +0 dB -0.5 dB 3 Hz~80 kHz, +0 dB -3 dB
<b>S/N (IHF, A) Signal = 1V</b>	90 dB
<b>Master level controls</b>	+6 dB~-6 dB
<b>Band-level controls</b>	+12 dB~-12 dB (12 divisions)

<b>Center-frequency controls</b>	From 1 octave above to 1 octave below the standard frequency (12 divisions)
<b>Bandwidth controls [Q]</b>	0.7~7 (12 divisions)
<b>Center frequency</b>	10 Hz, 30 Hz, 60 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8kHz, 16 kHz, 32 kHz
<b>Power supply</b>	110V, 120V, 220V, 240V
<b>Power consumption</b>	40W
<b>Dimensions (WxHxD)</b>	450x173x375 mm 17 <sup>33</sup> / <sub>8</sub> "x6 <sup>7</sup> / <sub>8</sub> "x14 <sup>3</sup> / <sub>8</sub> "
<b>Weight</b>	9.2 kg 20.3 lb

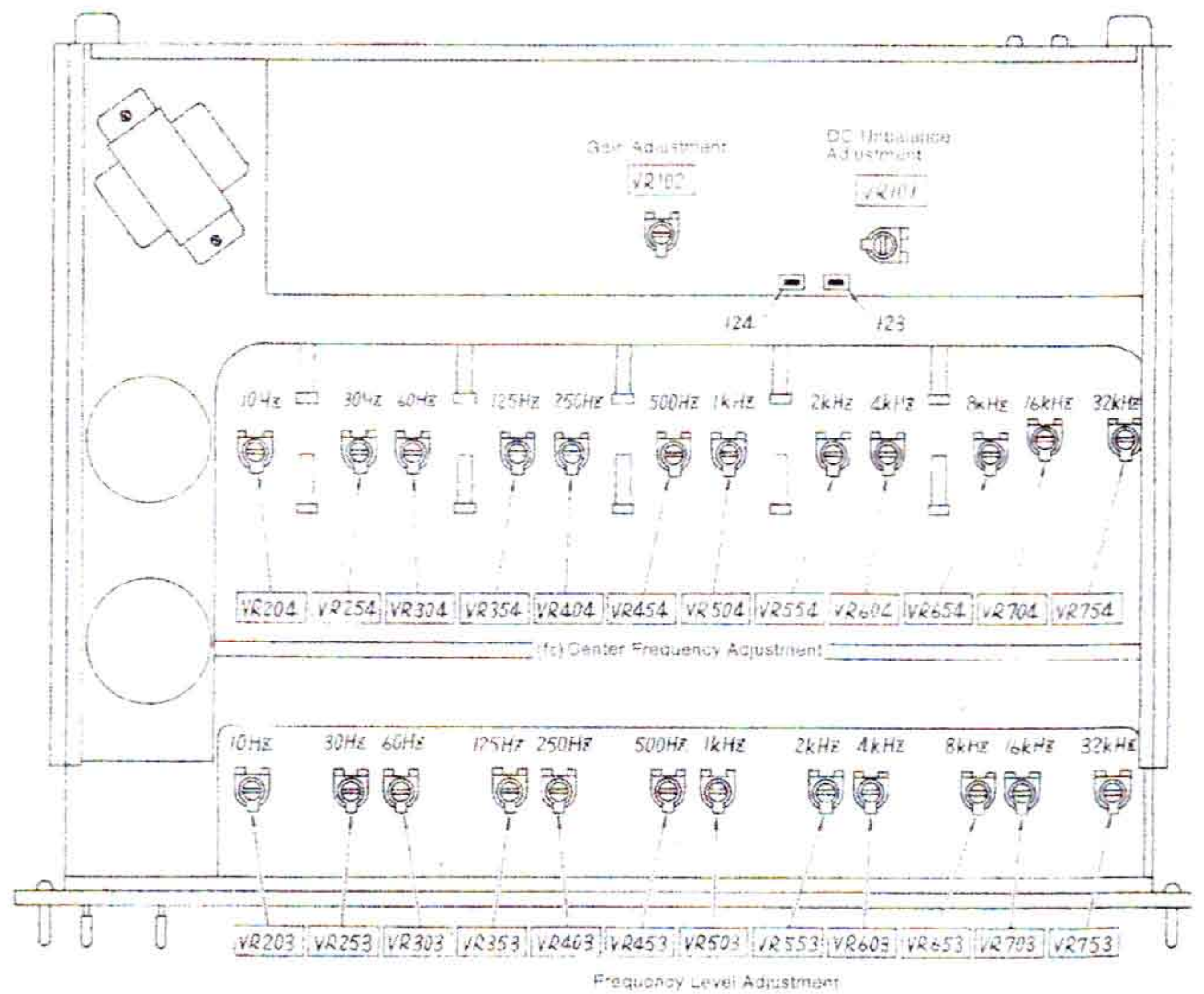


## ■ LOCATION OF CIRCUITS

1. POWER TRANSFORMER
2. FUSE
3. POWER SOURCE CIRCUIT
4. AUDIO FREQUENCY AMPLIFIER CIRCUIT
5. RELAY OF MUTING
6. SUBTRACTION AMPLIFIER CIRCUIT
7. ADDITION AMPLIFIER CIRCUIT
8. AUDIO FREQUENCY AMPLIFIER CIRCUIT
9. BUFFER AMPLIFIER
10. RELAY OF EQUALIZER SELECTOR
11. BAND PASS FILTER CIRCUIT

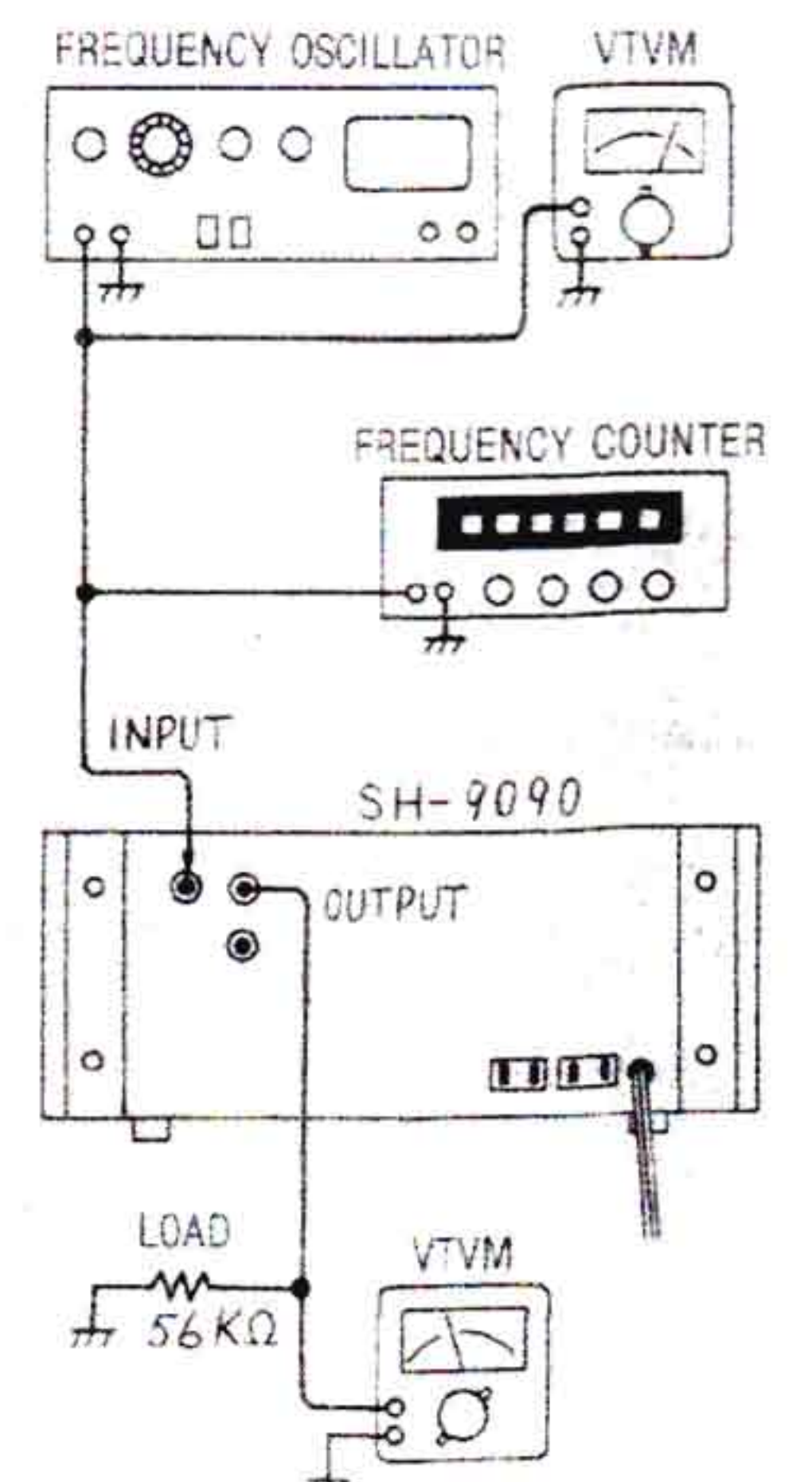


## ■ ALIGNMENT INSTRUCTIONS



Alignment Points  
(Fig. 1)

- This unit should be re-adjusted when capacitors or resistors (especially the volume) are replaced.
- A perfectly complete and very precise measuring instrument is required for adjustment of this unit. It is especially necessary to use a frequency oscillator which oscillates a stable signal for each individual frequency.
- For adjustment of this unit, turn the power switch on and the equalizer selector to the "IN" position.  
Note that about 12 seconds are required, after turning the power switch on, for the equalizer circuit to operate.
- Refer to figure 2 for information concerning connections of measuring instruments.
- Follow the steps described below before beginning adjustments.
  - \* Main level volume...0.
  - \* Individual frequency level volume...0 dB.
  - \* Frequency variable volume...middle position.
  - \* Band-width volume...narrow.
  - \* Standard input voltage (each frequency)...0 dB in the 1V range (0.775V)



CONNECTIONS OF MEASURING INSTRUMENT  
(Fig. 2)

**SH-9090**

## ■ ADJUSTMENT OF THE DC UNBALANCED VOLTAGE

1. Connect a DC voltmeter between terminal **123** and terminal **124** of the P base (with no input power applied)
2. Adjust VR101 to obtain 9 mV.

## ■ ADJUSTMENT OF TOTAL GAIN (AMPLIFIER GAIN)

- ① Adjust VR102 so as to standardize the output voltage at any position of the equalizer selector, applying 1 kHz standard input voltage (0.775V) and switching the equalizer selector to "in" and "out" alternately.

## ■ ADJUSTMENT OF INDIVIDUAL FREQUENCY GAIN

- Adjustment of 1 kHz gain.

Input frequency	Output voltage	Adjustment point	Adjustment summary
1 kHz	1V range 0dB	input level	(1) Vary input level to make output power 0dB (0.775V) in the 1V range at 1 kHz input.
	Maximum	VR504	(2) Set the 1 kHz level volume to +12dB and adjust VR504 to obtain maximum output.
	+12dB	VR503	(3) Adjust VR503 to +12dB of output at this time.

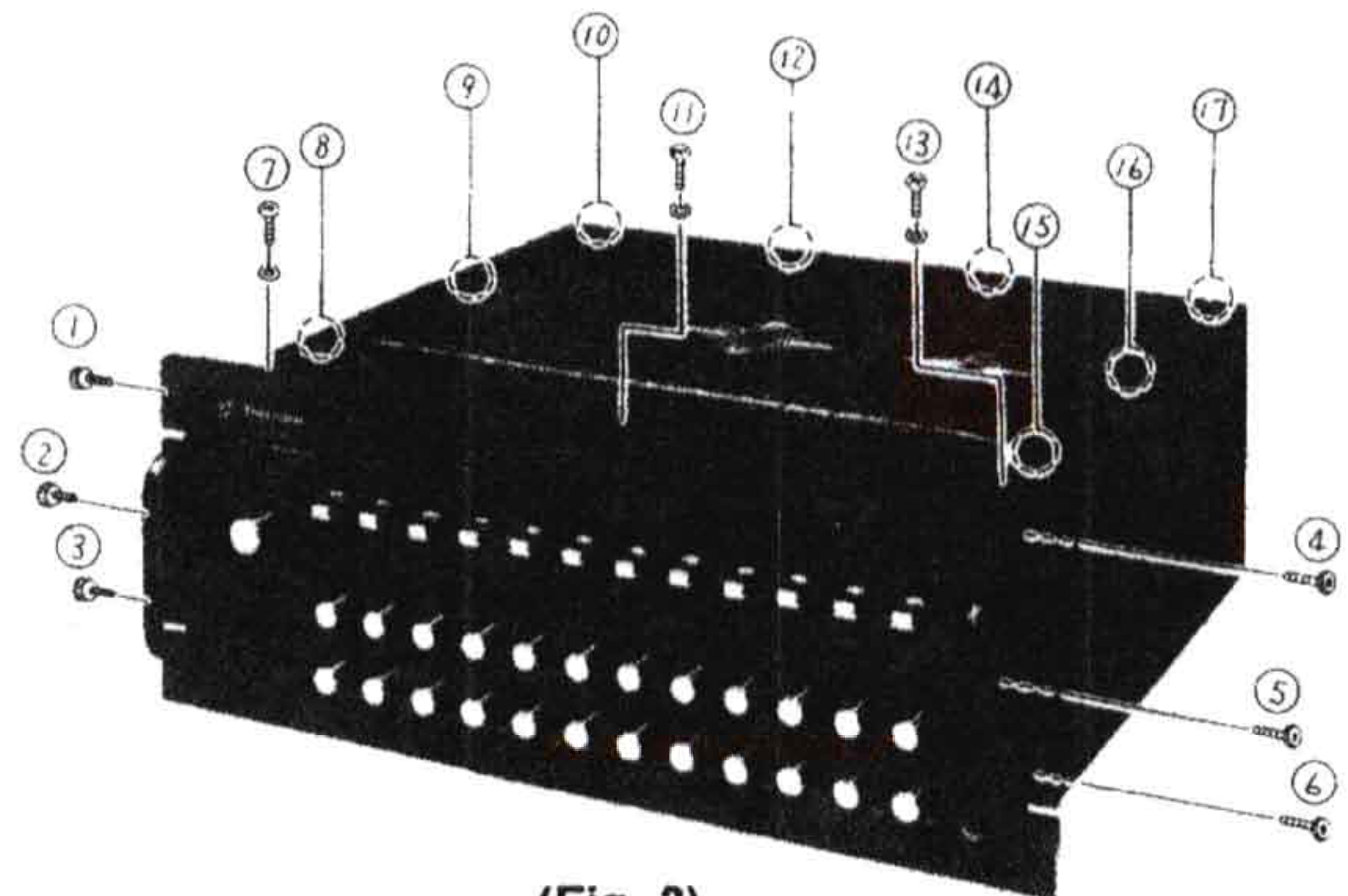
\* Concerning other frequencies, adjust them by using the same method as described in "Adjustment of 1 kHz gain."

Frequency	10Hz	30Hz	60Hz	125Hz	250Hz	500Hz	2kHz	4kHz	8kHz	16kHz	32kHz
Maximum output	VR204	VR254	VR304	VR354	VR404	VR454	VR554	VR604	VR654	VR704	VR754
Output (+12dB)	VR203	VR253	VR303	VR353	VR403	VR453	VR553	VR603	VR653	VR703	VR753

## ■ REMOVAL OF FRONT PANEL & TOP BOARD

1. Pull off each volume control knob.
2. Pull off the power switch and the equalizer selector.
3. Remove the 6 panel-installation bolts from the sides of the panel (M4 bolts ① ~ ⑥), using a hexagonal spanner with 3-mm outer contact surfaces (Ref. to Fig. 3).
4. Remove the panel by holding its handle and pulling the panel gently forward.
5. To remove the top board, remove the eleven screws (nos. ⑦ ~ ⑰ in Fig. 3).

(Note) Care should be taken not to scratch the panel nor deform the volume shafts when removing the knobs.

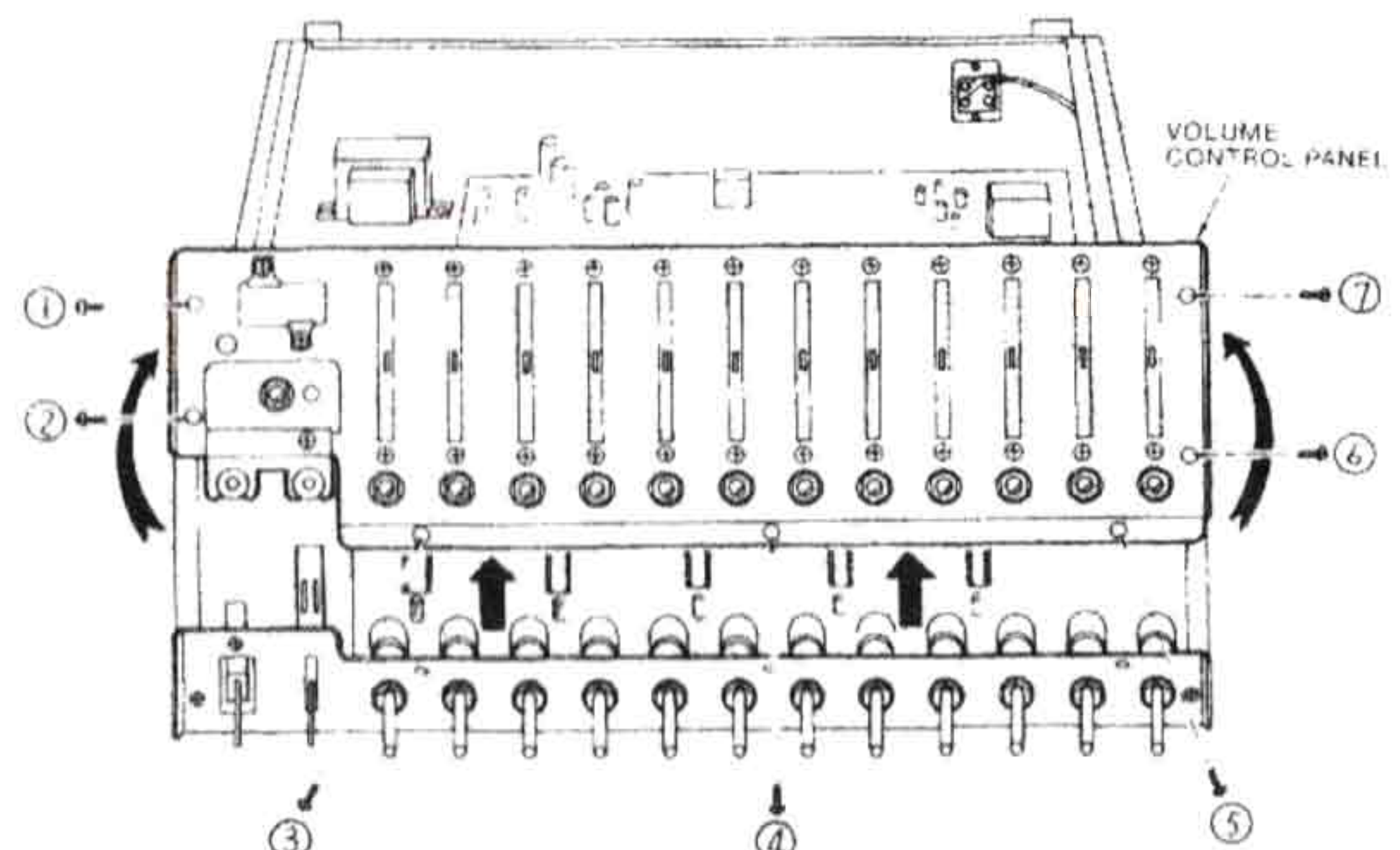


(Fig. 3)

## ■ HOW TO REMOVE THE VOLUME CONTROL PANEL

1. Remove the front panel.
2. Remove the seven installation screws (① ~ ⑦ in figure 4) for the volume control panel.
3. The volume control panel can then be removed in the direction of the arrow in figure 4.
4. When re-installing the panel, make sure that the 8-pin connector and the earth wire remain in their original condition. Note that, if those parts are not as they were, there is the possibility that incorrect operation or abnormal sounds may result.
5. When replacing the center-frequency variable volume controls with new ones, remove the nut for every volume control and remove the P base from the volume control panel. Then, replace the malfunctioning volume control (s).

Note: After adjustments and/or repairs are finished, make sure that the wiring inside the chassis remains in the original condition. If the earth wire, for example, is not correctly arranged in the specific position it was initially, a malfunction may result.



(Fig. 4)

## ■ SERVICE AID

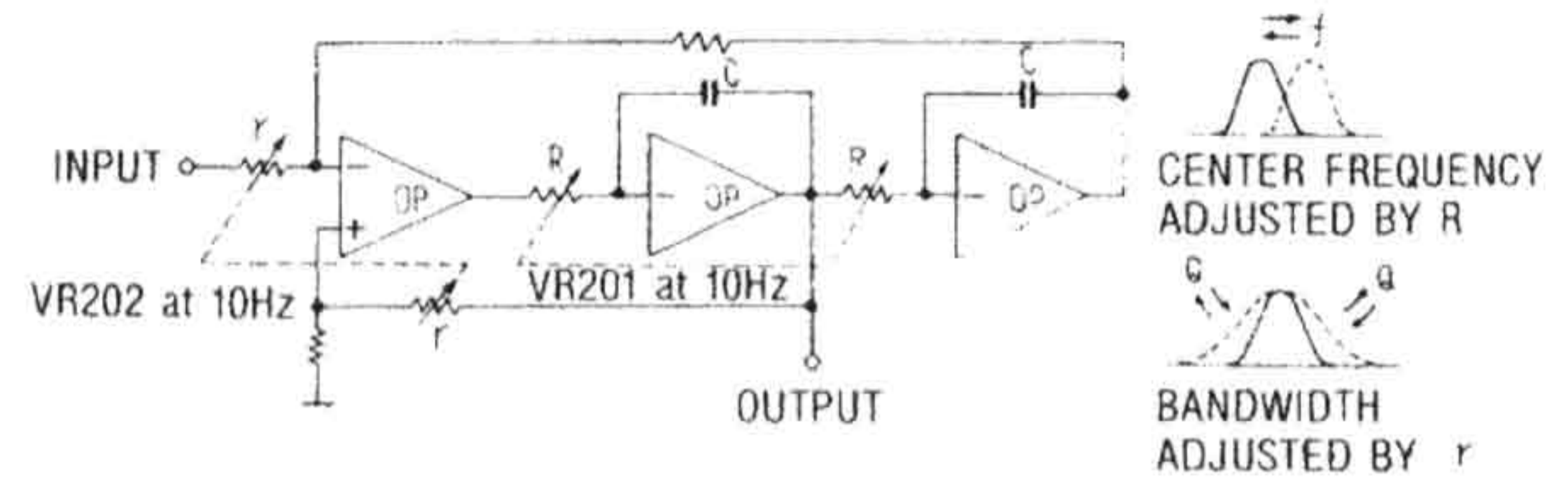
On this unit, the audio frequency band is divided into 12 bands, and all bands employ equalizers which consist of only capacitors and resistors. The center frequency of each band is continuously variable up to 1 octave above and below. In addition, the "Q" of the resonance peak is also continuously variable from 0.7 through 7, and, because the level variation characteristic of the peak and dip is the same as that when "Q" is approximately constant, minute corrections of the frequency response of the peak and dip are possible.

The equalizer section of this unit is mainly divided into two parts: the band-pass filter section and the operational section.

### 1. Band-Pass Filter Section

There are 12 band-pass filters, each filter consisting of three operational amplifiers (OP amplifier) (figure 5). The three operational amplifiers are: two integrators and one adder.

Because the center frequency of the band-pass filter is determined by the time constant relative to **R** and **C**, it is operated by a 2-gang volume control (VR201 at 10Hz in the circuit diagram). In addition, the "Q" of the resonance peak characteristic (bandwidth) of the band-pass filter is to be varied with the 2-gang volume "r" (VR202 at 10Hz in the circuit diagram).



(Fig. 5)

### 2. Operational Section

This "block" functions to form the peak and dip frequency response; figure 6 shows this circuit construction. When the level volume VR (VR1 at 10Hz in the circuit diagram) is located at the center position, the band-pass filter is disengaged from the circuit, so that the gain of both input and output is:

$$G = \frac{R_2}{R_1} \times \frac{R_4}{R_3}$$

When the sliding VR is located at position 1, the output becomes the total of the input from **R<sub>3</sub>** added to the output of the band-pass filter.

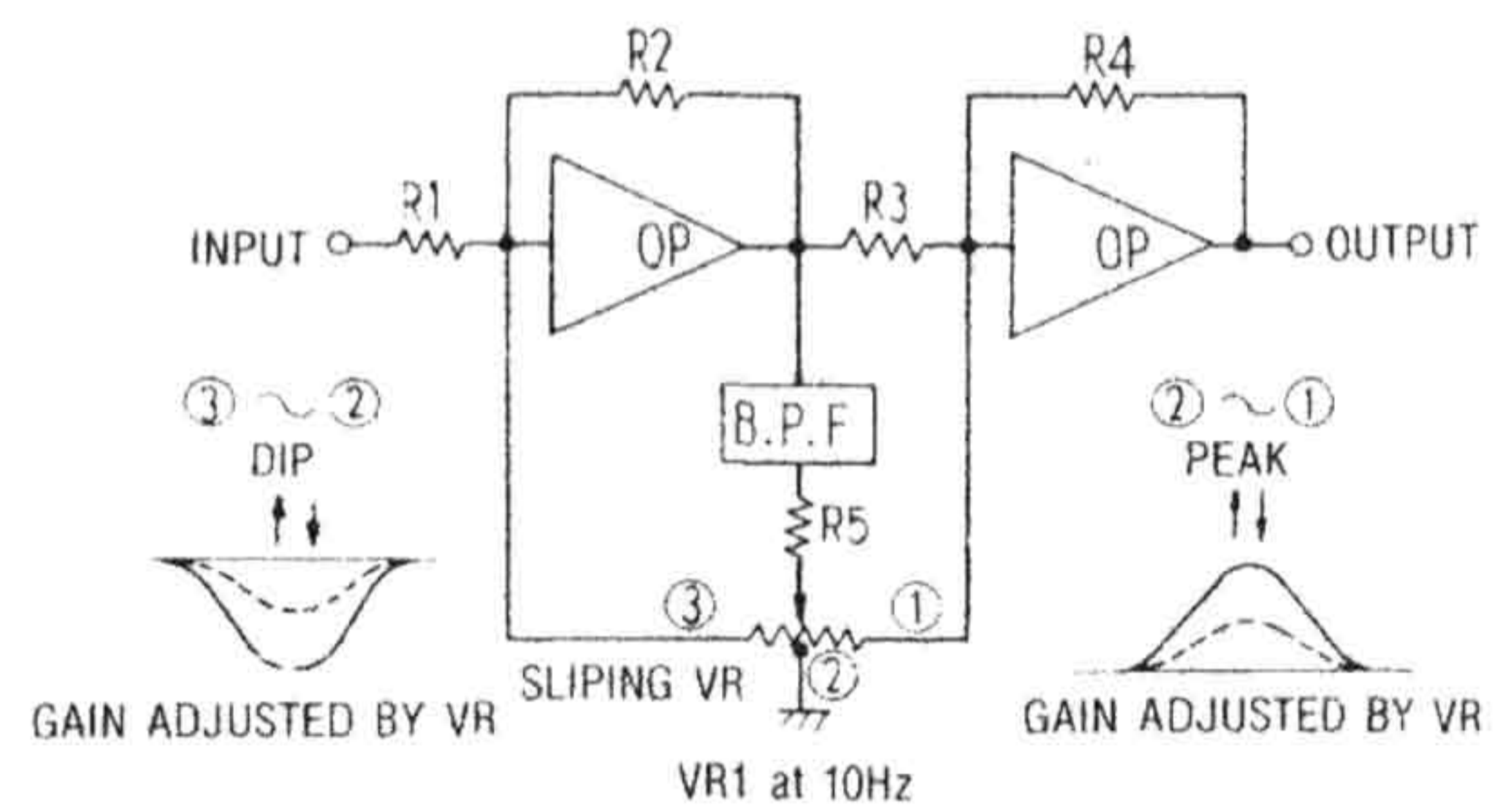
$$\text{That is, } G = \frac{R_2}{R_1} \times \left( \frac{R_4}{R_3} + \frac{R_4}{R_5} T_B \right)$$

$T_B$ : gain characteristic of the band-pass filter.

In this way, as the overall response, a frequency response which has a peak is produced.

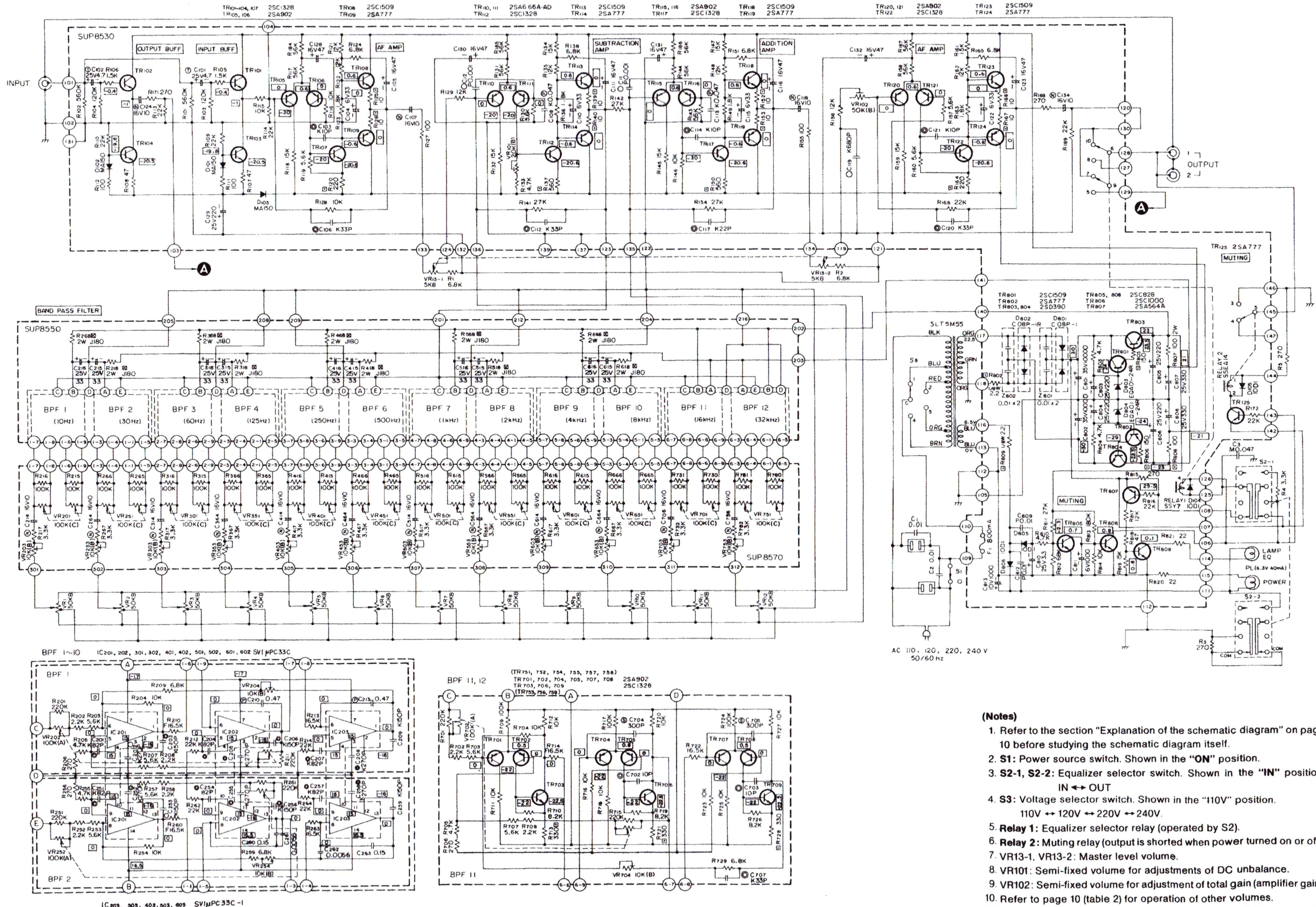
When the sliding VR is located at position 3, the band-pass filter enters the NF circuit of the first-stage amplifier so that negative feedback, which is the synthesis of a band-pass filter which has a peak and of **R<sub>2</sub>**, will be applied. The result is a frequency response which has a dip.

There are 12 band-pass filters and sliding volume controls in parallel, making it possible to form the desired frequency response for each frequency.



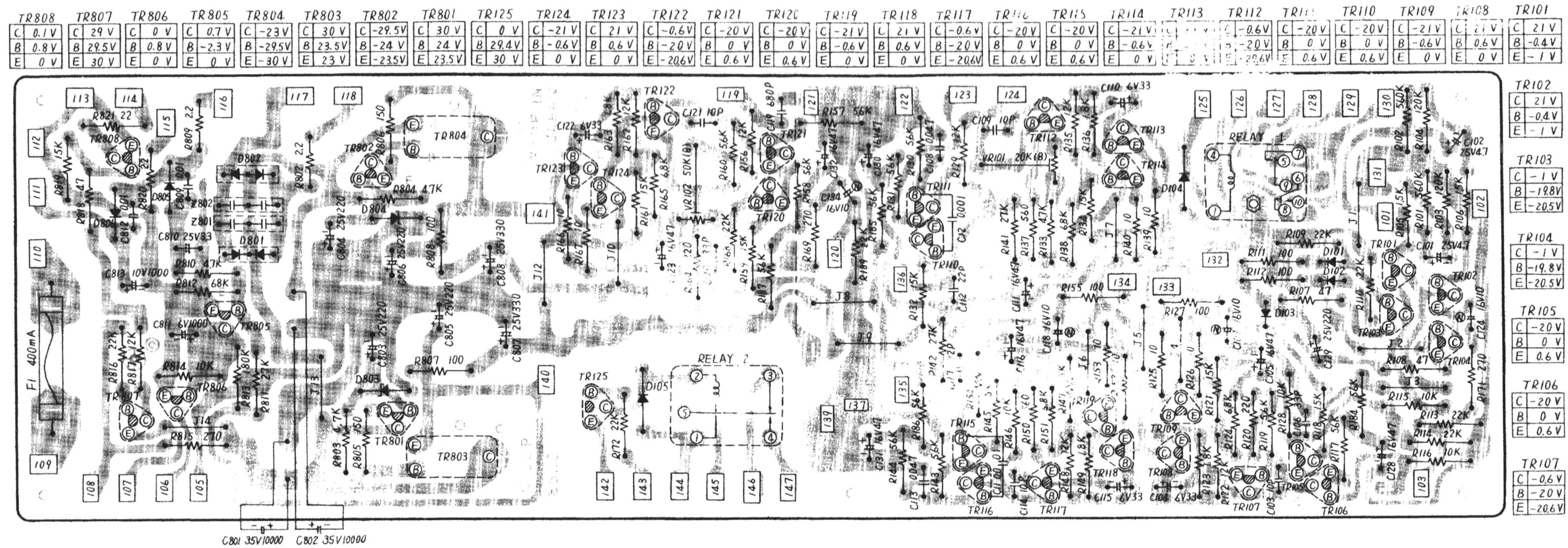
(Fig. 6)

# Schematic Diagram.....Model SH-9090 (This schematic diagram may be modified at any time with the development of new technology.)

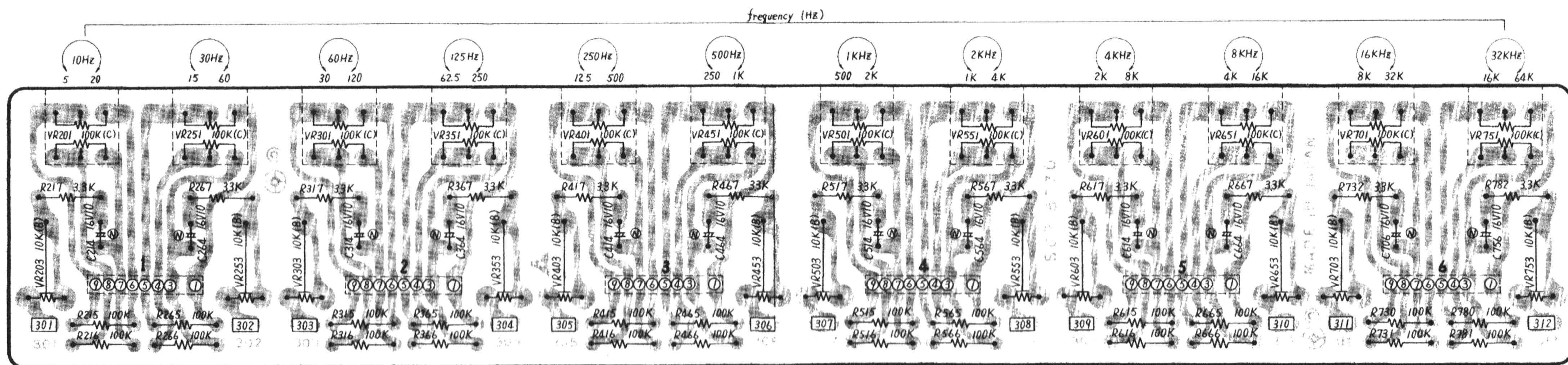


- (Notes)**
1. Refer to the section "Explanation of the schematic diagram" on page 10 before studying the schematic diagram itself.
  2. S1: Power source switch. Shown in the "ON" position.
  3. S2-1, S2-2: Equalizer selector switch. Shown in the "IN" position.  
IN ↔ OUT
  4. S3: Voltage selector switch. Shown in the "110V" position.  
110V ↔ 120V ↔ 220V ↔ 240V.
  5. Relay 1: Equalizer selector relay (operated by S2).
  6. Relay 2: Muting relay (output is shorted when power turned on or off).
  7. VR101, VR13-2: Master level volume.
  8. VR101: Semi-fixed volume for adjustments of DC unbalance.
  9. VR102: Semi-fixed volume for adjustment of total gain (amplifier gain).
  10. Refer to page 10 (table 2) for operation of other volumes.
  11. Values within □ are standard DC voltages of this unit measured by DC valve voltmeter with the chassis as standard reference.

# POWER SOURCE, MUTING, BUFFER AMP, AF AMP, ADDITION & SUBTRACTION AMP CIRCUIT BOARD



# CENTER FREQUENCY & FREQUENCY GAIN CONTROL CIRCUIT BOARD



# BAND PASS FILTER CIRCUIT BOARD (BPF 1 ~ BPF 12)

IC201~203 301~303, 401~403, 501~503 601~603

1	0 V	5	0 V	9	0 V	13	0 V
2	-16 V	6	0 V	10	+15 V	14	+16.5 V
3	+15 V	7	-17 V	11	+15 V		
4	+15 V	8	0 V	12	-16 V		

TR701, 704, 707  
751, 754, 757

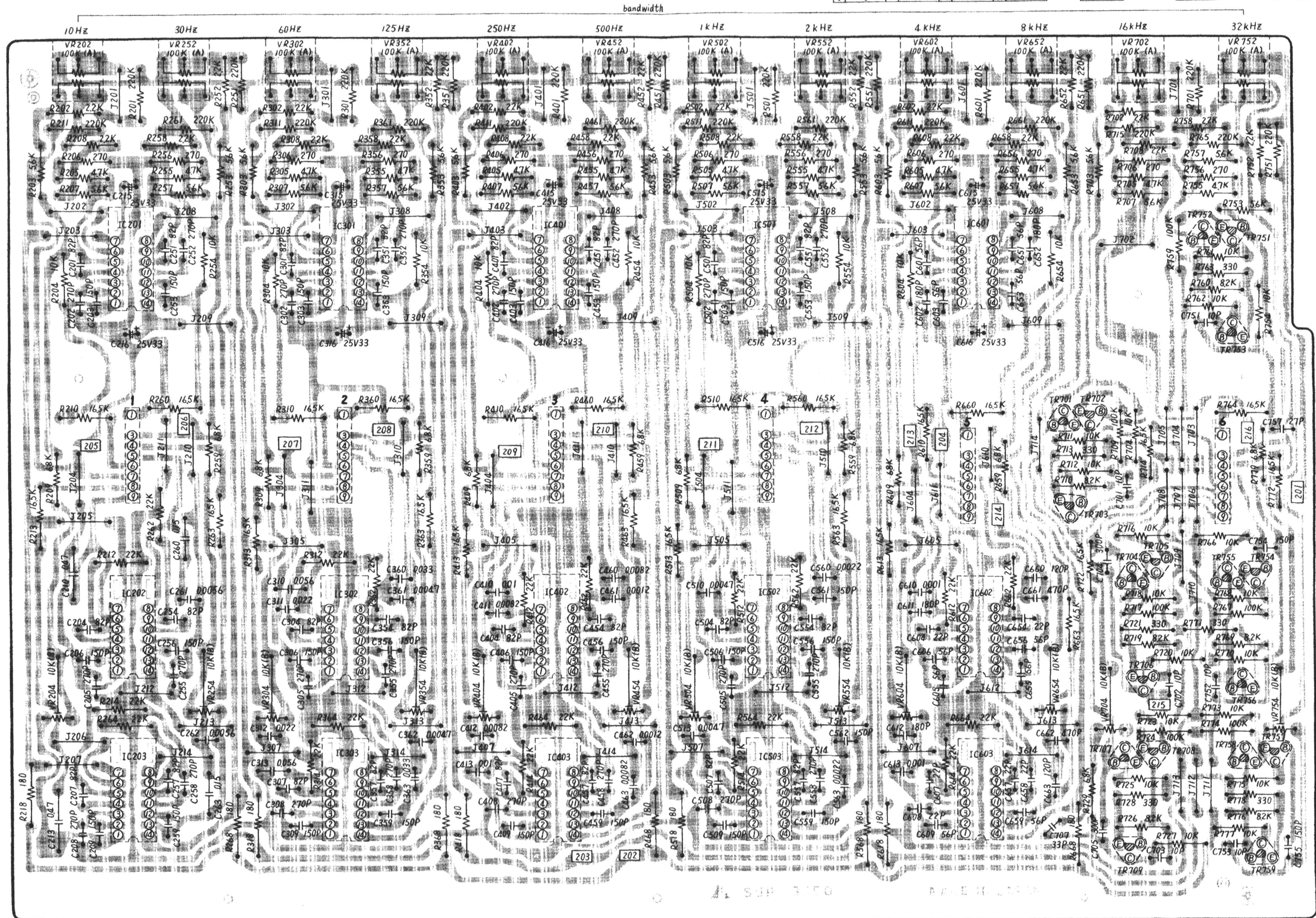
C	-22 V
B	0 V
E	+0.5 V

TR702, 705, 708  
752, 755, 758

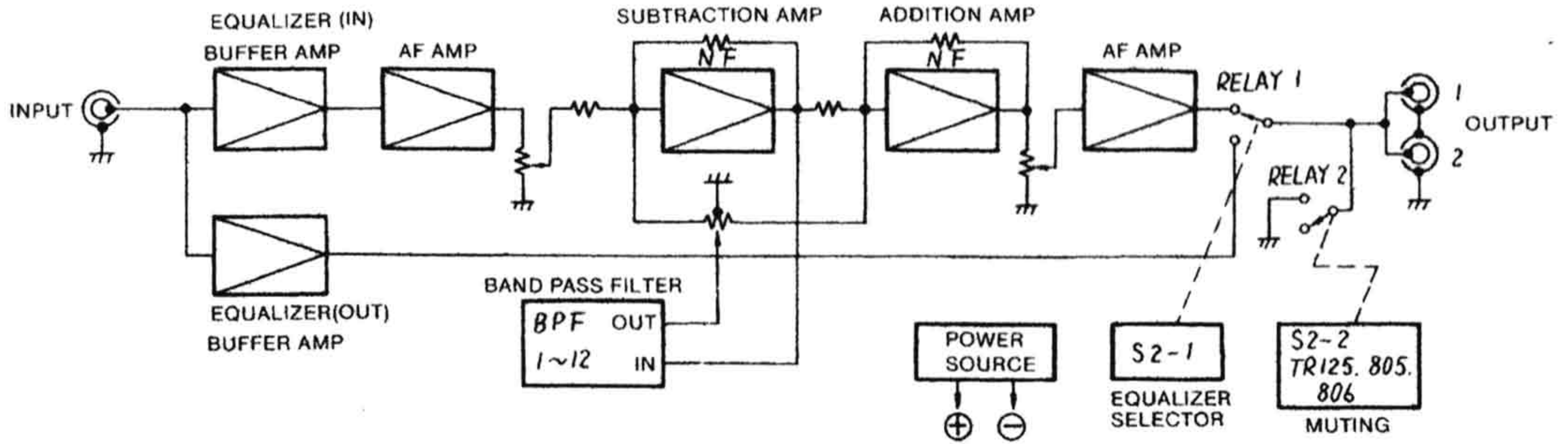
C	-22 V
B	0 V
E	+0.5 V

TR703, 706, 709  
753, 756, 759

C	0 V
B	-22 V
E	-22.5 V



## ■ BLOCK DIAGRAM



## ■ EXPLANATION OF THE SCHEMATIC DIAGRAM

- This schematic diagram includes only band-pass filters BPF 1, BPF 2 and BPF 11. Other band-pass filters are omitted because band-pass filters BPF 3, 5, 7 and 9 are very similar to BPF 1; BPF 4, 6, 8 and 10 are very similar to BPF 2; and BPF 12 is very similar to BPF 11. Note, however, that the numbers of capacitors and resistors are different at the P base, and that the constant of some of the capacitors and resistors is different. These differences are shown, therefore, in the table at the right.

\* BPF 1 is numbered from 201, and BPF 2 from 251.  
\* C310 of BPF 3 corresponds to C210 of BPF 1.

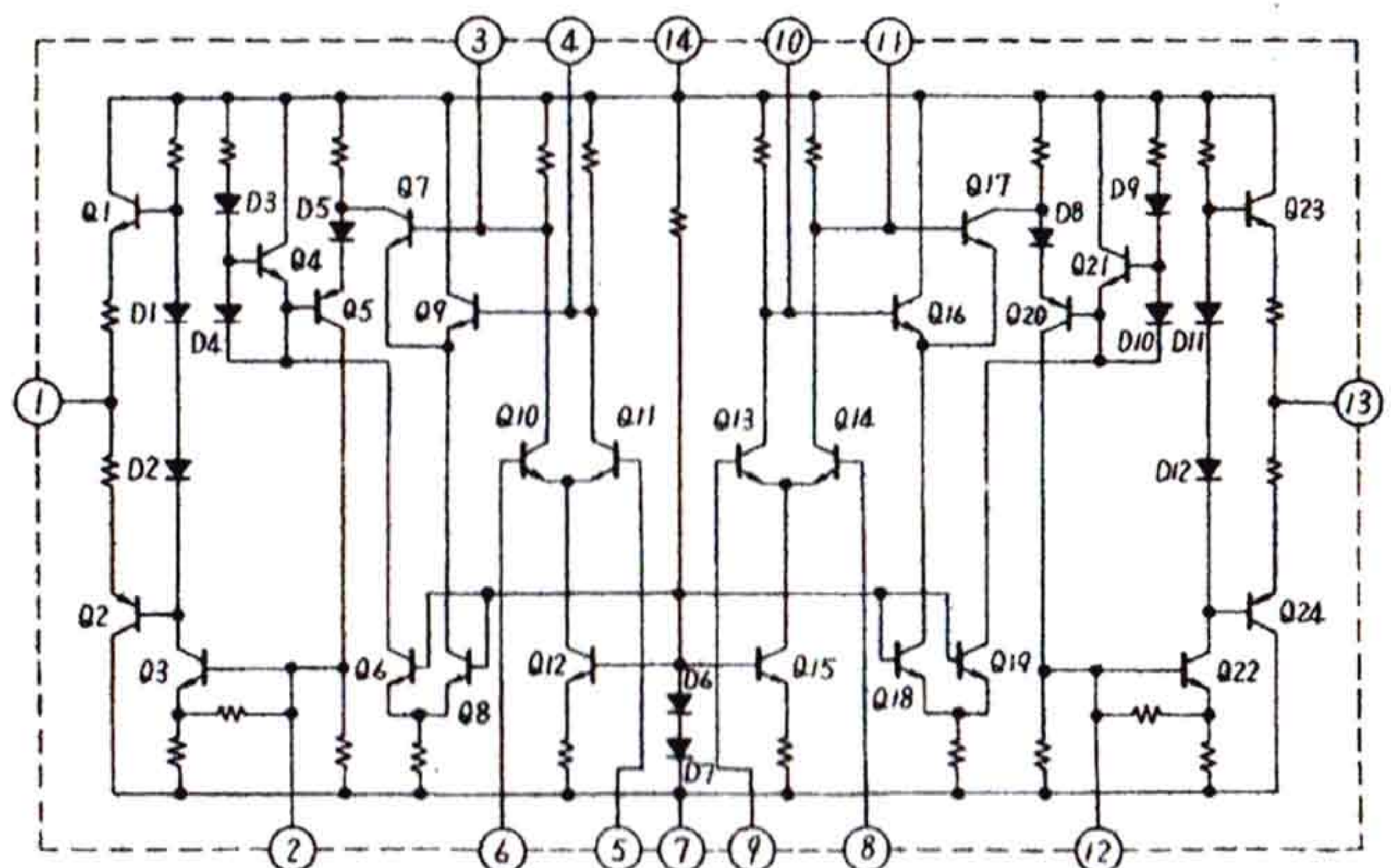
	C R No.	CENTER FREQUENCY	REMARKS
BPF 1	C201~ R201~	10Hz	C210, 213 0.47 $\mu$ F ⊕ J
BPF 2	C251~ R251~	30Hz	C260, 263 0.15 ⊕ J C261, 262 0.0056 ⊕ J
BPF 3	C301~ R301~	60Hz	C310, 313 0.056 ⊕ J C311, 312 0.022 ⊕ J
BPF 4	C351~ R351~	125Hz	C360, 363 0.033 ⊕ J C361, 362 0.0047 ⊕ J
BPF 5	C401~ R401~	250Hz	C410, 413 0.01 ⊕ J C411, 412 0.0082 ⊕ J
BPF 6	C451~ R451~	500Hz	C460, 463 0.0082 ⊕ J C461, 462 0.0012 ⊕ J
BPF 7	C501~ R501~	1 kHz	C510, 513 0.0047 ⊕ J
BPF 8	C551~ R551~	2 kHz	C560, 563 0.0022 ⊕ J C561, 562 150P ⊕ J
BPF 9	C601~ R601~	4 kHz	C610, 613 0.001 ⊕ J C611, 612 180P ⊕ J C603, 605 56P ⊕ K 606, 609
BPF 10	C651~ R651~	8 kHz	C660, 663 120P ⊕ J C661, 662 470P ⊕ J C653, 655 56P ⊕ K 656, 659
BPF 11	C701~ R701~	16 kHz	C704, 705 330P ⊕ J C707 33P K
BPF 12	C751~	32 kHz	C754, 755 150P ⊕ J C757 27P ⊕ K

[TABLE 1] →

[TABLE 2]

- Each frequency and its adjustment volume is shown in the table 2.

	10 Hz	30 Hz	60 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	32 kHz
LEVEL	VR1	VR2	VR3	VR4	VR5	VR6	VR7	VR8	VR9	VR10	VR11	VR12
FREQUENCY	VR201	VR251	VR301	VR351	VR401	VR451	VR501	VR551	VR601	VR651	VR701	VR751
BANDWIDTH	VR202	VR252	VR302	VR352	VR402	VR452	VR502	VR552	VR602	VR652	VR702	VR752
GAIN ADJUST	VR203	VR253	VR303	VR353	VR403	VR453	VR503	VR553	VR603	VR653	VR703	VR753
FREQ ADJUST	VR204	VR254	VR304	VR354	VR404	VR454	VR504	VR554	VR604	VR654	VR704	VR754



[Equivalent circuit of SV1 $\mu$  PC 33C] →



# REPLACEMENT PARTS LIST

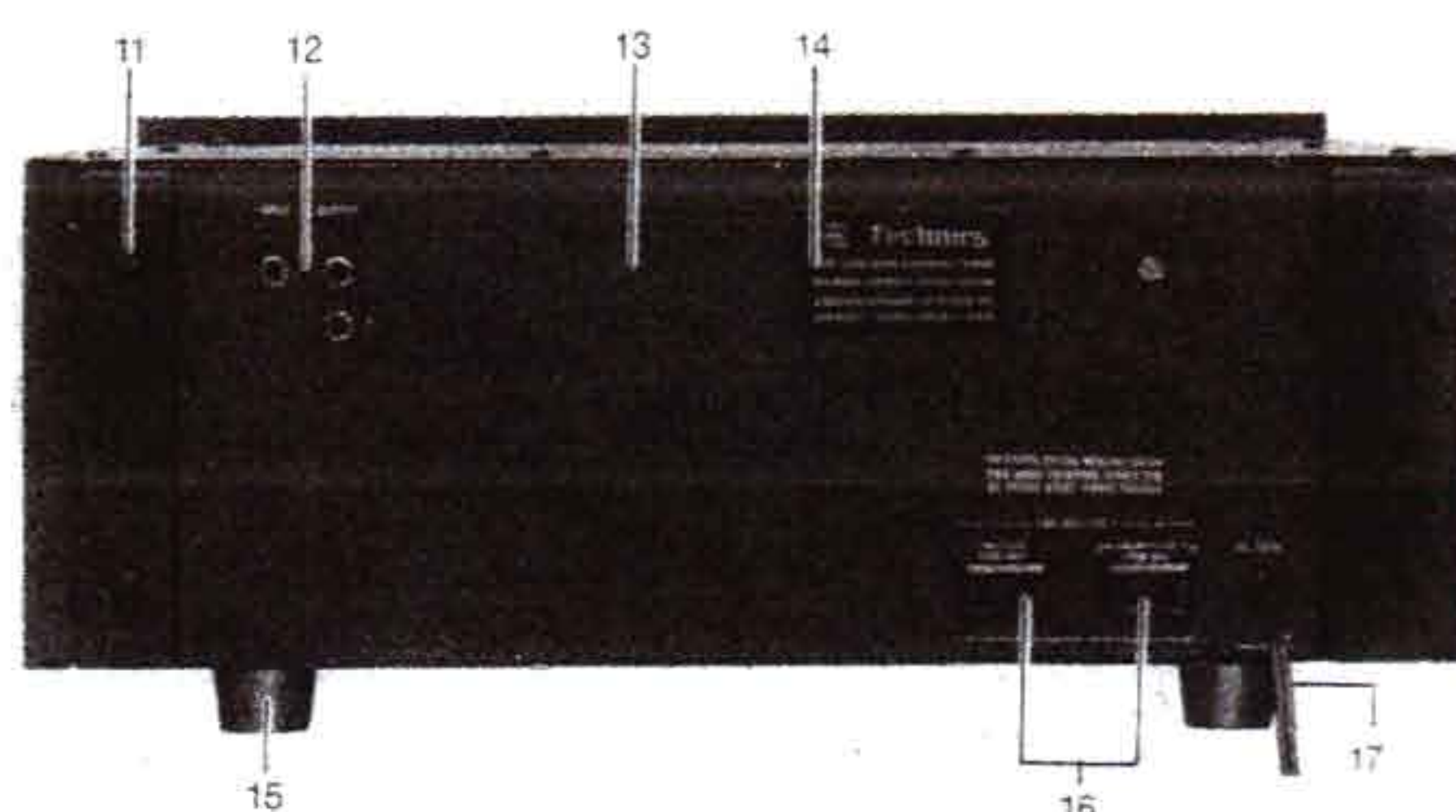
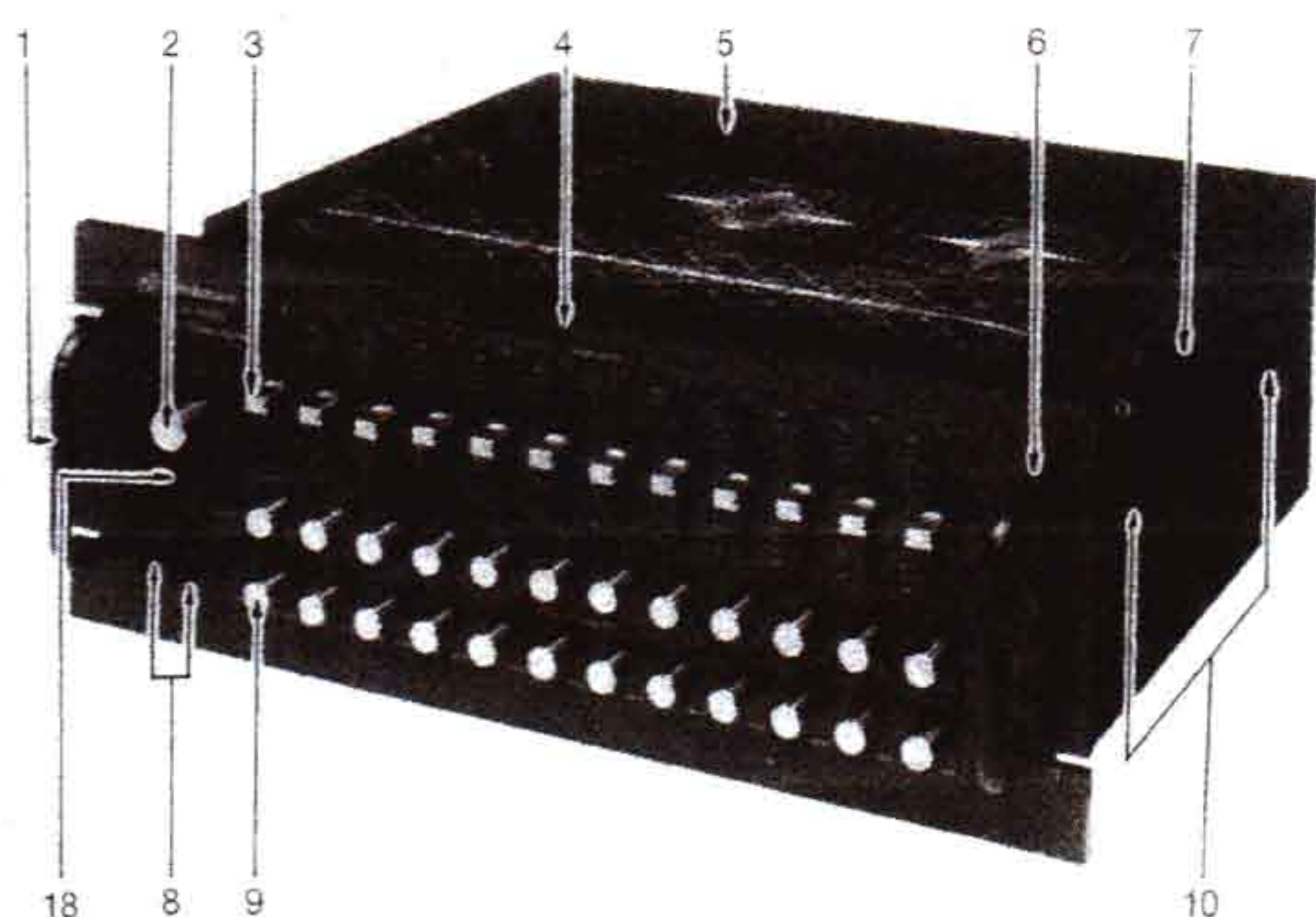
**NOTES**  
 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.  
 2. **SAFETY** Indicates that only parts specified by the manufacturer be used for replacement in critical circuits.

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
<b>INTEGRATED CIRCUIT</b>									
IC201,202, 301,302, 401,402, 501,502, 601,602	SVIAUPC33C	Band Pass Filter	10		R133,205,255, 305,355,405, 455,505,555, 605,655,705, 755,803,804, 810	ERD14TJ472	4.7kΩ, 1/4W, ±5%, Carbon	16	
IC203,303, 403,503, 603	SVIAUPC33C-1	Band Pass Filter	5		R119,130,143, 157,160,203, 207,253,257, 303,307,353, 357,403,407, 453,457,503, 507,553,557, 603,607,653, 657,703,707, 753,757	ERD14TJ562	5.6kΩ, 1/4W, ±5%, Carbon	29	
<b>TRANSISTORS</b>									
TR101~104, 107,112, 117,122, 703,706, 709, 753, 756,759	2SC1328-T	Equalizer Buffer Amp., AF Amp. & Band Pass Filter	14		R1,2,124 138,151,165, 209,259,309, 359,409,459, 509,559,609, 659,729,779	ERD14TJ682	6.8kΩ, 1/4W, ±5%, Carbon	18	
TR105,106, 115,116, 120,121, 701,702, 704,705, 707,708, 751,752, 754,755, 757,758	2SA902-F	Differential Amplifier [Use in Rank Pairs] There are 2 ranks (F and G)	18		R710,719,726 760,769,776	ERD14TJ822	8.2kΩ, 1/4W, ±5%, Carbon	6	
TR108,113 118,123, 801	2SC1509-Q	AF Amplifier	5	Use in Pairs	R115,116,128, 146,204,254, 304,354,404, 454,504,554, 604,654,704, 711,712,716, 718,720,723, 725,727,754, 761,762,766, 768,770,773, 775,777,814	ERD14TJ103	10kΩ, 1/4W, ±5%, Carbon	33	
TR109,114, 119,124, 125,802	2SA777-Q	AF Amp & Relay Driver	6		R122,129,135, 148,156,162, 817	ERD14TJ123	12kΩ, 1/4W, ±5%, Carbon	7	
TR110,111,	2SA666A-AD1~ ~2SA666A-AD5	Differential Amplifier [ There are 5 ranks. Use in pairs ]	2		R118,121,132, 134,145,147, 159,161,819	ERD14TJ153	15kΩ, 1/4W, ±5%, Carbon	9	
TR803,804	2SD390-Q	DC Voltage Control	2		R109,110,114, 168,172,189, 212,214,262, 264,312,314, 362,364,412, 414,462,464, 512,514,562, 564,612,614, 662,664,816,	ERD14TJ223	22kΩ, 1/4W, ±5%, Carbon	27	
TR805,808	2SC828-R	Muting Switching	2		R141,142,154, 811	ERD14TJ273	27kΩ, 1/4W, ±5%, Carbon	4	
TR806	2SC1000-BL	Muting Relay Switching	1		R168	ERD14TJ333	33kΩ, 1/4W, ±5%, Carbon	1	
TR807	2SA564A-R	Equalizer Indicator Switching	1		R113,117,131, 144,158,184, 185,186,187	ERD14TJ563	56kΩ, 1/4W, ±5%, Carbon	9	
<b>DIODES</b>									
D101,102,103	MA150	Thermo Compensation & Noise Silencer	3		R812	ERD14TJ683	68kΩ, 1/4W, ±5%, Carbon	1	
D801	SVDAC08P-1	Rectifier	1		R215,216,265, 266,315,316, 365,366,415, 416,465,466, 515,516,565, 566,615,616, 665,666,709, 717,724,730, 731,759,767, 774,780,781	ERD14TJ104	100kΩ, 1/4W, ±5%, Carbon	30	
D802	SVDAC08P-1R	Rectifier	1						
D803,804	SVDEQA0124R	Voltage Regulator, 24V Zener	2						
D104,105,805, 806	SVDA10D1M	Transistor Protection & Rectifier	4						
<b>TRANSFORMER</b>									
	SLT5M55	Power Transformer	1	SAFETY					
<b>RESISTORS</b>									
R820,821	ERD14TJ220	22Ω, 1/4W, ±5%, Carbon	2		R103,104	ERD14TJ124	120kΩ, 1/4W, ±5%, Carbon	2	
R107,108,818	ERD14TJ470	47Ω, 1/4W, ±5%, Carbon	3		R813	ERD14TJ184	180kΩ, 1/4W, ±5%, Carbon	1	
R111,112,127, 155	ERD14TJ101	100Ω, 1/4W, ±5%, Carbon	4		R201,211,251, 261,301,311, 351,361,401, 411,451,461, 501,511,551, 561,601,611, 651,661,701, 715,751,765	ERD14TJ224	220kΩ, 1/4W, ±5%, Carbon	24	
R5,169,271, 206,256,306, 356,406,456, 506,556,606, 656,706,756, 815	ERD14TJ271	270Ω, 1/4W, ±5%, Carbon	16		R101,102	ERD14TJ564	560kΩ, 1/4W, ±5%, Carbon	2	
R105,106	ERD14TJ152	1.5kΩ, 1/4W, ±5%, Carbon	2		R125,126,139, 140,152,153 166,167	ERD14FJ100	10Ω, 1/4W, ±5%, Carbon	8	SAFETY
R123,136,149, 163	ERD14TJ182	1.8kΩ, 1/4W, ±5%, Carbon	4		R808	ERD14FJ101	100Ω, 1/4W, ±5%, Carbon	1	SAFETY
R171,202,208, 252,258,302, 352,358,402, 408,452,458, 502,508,552, 558,602,608, 652,658,702, 708,752,758	ERD14TJ222	2.2kΩ, 1/4W, ±5%, Carbon	24		R805,806	ERD14FJ151	150Ω, 1/4W, ±5%, Carbon	2	SAFETY
R4,217,267, 317,367,417, 467,517,567, 617,667,732, 782	ERD14TJ332	3.3kΩ, 1/4W, ±5%, Carbon	13		R120,164	ERD14FJ221	220Ω, 1/4W, ±5%, Carbon	2	SAFETY
					R713,721,728, 763,771,778	ERD14FJ331	330Ω, 1/4W, ±5%, Carbon	6	SAFETY
					R137,150	ERD14FJ561	560Ω, 1/4W, ±5%, Carbon	2	SAFETY
					R802,809	ERD18FJ2R2	2.2Ω, 1/8W, ±5%, Carbon	2	SAFETY
					R210,213,260, 263,310,313, 360,363,410, 413,460,463 510,513,560,	ERO14CKF1652	16.5kΩ, 1/4W, ±1%, Metallic	15	

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
R563,610,613, 660,663,714, 722,764,772	ERO14CKF1652	16.5kΩ, 1/4W, ±1%, Metallic	9	○	C361,362,510, 513	ECQM05472JZ	0.0047μF, 50WV, ± 5%, Polyester	4	
R807	ERG2ANJ101	100Ω, 2W, ±5%, Metallic	1		C261,262	ECQM05562JZ	0.0056μF, 50WV, ± 5%, Polyester	2	
R218,268,318, 368,418,468, 518,568,618, 668	ERG2ANJ181	180Ω, 2W, ±5%, Metallic	10		C411,412,460, 463	ECQM05822JZ	0.0082μF, 50WV, ± 5%, Polyester	4	
<b>VARIABLE RESISTORS</b>					C410,413	ECQM05103JZ	0.01μF, 50WV, ± 5%, Polyester	2	
VR1~12	EVAR15D20B54	50kΩ(B), Frequency Level Control	12	○	C311,312	ECQM05223JZ	0.022μF, 50WV, ± 5%, Polyester	2	
VR13	EWf8PA027B53	5kΩ(B), Master Level Control	1	○	C360,363	ECQM05333JZ	0.033μF, 50WV, ± 5%, Polyester	2	
VR101	EVLS3AA00B24	20kΩ(B), DC Unbalance Adjustment	1		C108,113	ECQM05473KZ	0.047μF, 50WV, ±10%, Polyester	2	
VR102	EVLS3AA00B54	50kΩ(B), Amplifier Gain Adjustment	1		C3	ECQM1473M	0.047μF, 125WV, ±20%, Polyester	1	
VR203,204, 253,254, 303,304, 353,354, 403,404, 453,454, 503,504, 553,554, 603,604, 653,654, 703,704, 753,754	EVLS3AA00B14	10kΩ(B), Each Frequency Gain Adj.	24		C310,313	ECQM05563JZ	0.056μF, 50WV, ± 5%, Polyester	2	
VR201,251, 301,351, 401,451, 501,551, 601,651, 701,751	EVK5QA025C15	100kΩ(C), Center Frequency Control	12	○	C260,263	ECQM05154JZ	0.15μF, 50WV, ± 5%, Polyester	2	
VR202,252, 302,352, 402,452, 502,552, 602,652, 702,752	EVK6QA025A15	100kΩ(A), Band width Control	12	○	C210,213	ECQM05474JZ	0.47μF, 50WV, ± 5%, Polyester	2	
					C660,663	ECQS1121JZ	120pF, 125WV, ± 5%, Styrol	2	
					C561,562,754, 755	ECQS1151JZ	150pF, 125WV, ± 5%, Styrol	4	
					C611,612	ECQS1181JZ	180pF, 125WV, ± 5%, Styrol	2	
					C704,705	ECQS1301JZ	300pF, 125WV, ± 5%, Styrol	2	
					C661,662	ECQS1471JZ	470pF, 125WV, ± 5%, Styrol	2	
					C104,110, 115,122	ECEA6V33L	33μF, 6.3WV, Electrolytic	4	
					C811	ECEA6V1000L	1000μF, 6.3WV, Electrolytic	1	○
					C813	ECEA10V1000	1000μF, 10WV, Electrolytic	1	
					C105,111,116, 123,128,130, 131,132	ECEA16V47L	47μF, 16WV, Electrolytic	8	
					C107,118,124, 134,214,264, 314,364,414, 464,514,564, 614,664,706, 756	ECEA16N10	10μF, 16WV, Non-Polar Electrolytic	16	<b>SAFETY</b>
					C810	ECEA25V3R3L	3.3μF, 25WV, Electrolytic	1	
					C101,102	ECSZ25EF4R7	4.7μF, 25WV, Electrolytic	2	
					C215,216,315, 316,415,416, 515,516,615, 616	ECEA25V33L	33μF, 25WV, Electrolytic	10	
					C803,804	ECEA25V220L	220μF, 25WV, Electrolytic	2	
					C805,806	ECEA25V220V	220μF, 25WV, Electrolytic	2	
					C807,808	ECEA25V330L	330μF, 25WV, Electrolytic	2	○
					C801,802	ECEM35R103Y	10000μF, 35WV, Electrolytic	2	○
<b>COMPONENT COMBINATIONS</b>					Z801,802	RXAF103P22HD	0.01μF(x2), Ceramic, Hum Cancel	2	<b>SAFETY</b>
<b>SWITCHES</b>					S1	SSLA34S	Power Source Switch	1	<b>SAFETY</b>
					S2	SSLA35S	Equalizer Selector Switch	1	
					S3	SSRA8	Voltage Selector Switch	1	<b>SAFETY</b>
<b>RELAYS</b>					RELAY1	SSY7	Equalizer Selector Relay	1	○
					RELAY2	SSEA14	Muting Relay	1	
<b>LAMPS and FUSES</b>					F1	XAMR38S150A	Power & Equalizer Indicator Lamp. (6.3V 40 mA)	2	<b>SAFETY</b>
						XBA2K08NS5	800 mA Fuse	1	<b>SAFETY</b>
<b>CABINET and CHASSIS PARTS</b>					1	SKYA4	Handle, Front Panel	2	
					2	SBNA129	Knob, Master Level Control	1	○
					3	SBD1	Knob, Frequency Level Control	12	○
					4	SGW6411	Front Panel	1	○
					5	SKPA7-1	Top Board, Chassis	1	○
					6	SGXA64	Bracket, Hande	4	
					7	SKSA2	Side Cover, Chassis	2	
					8	SBLA4-1	Knob, Power & Equalizer Switch	2	
					9	SBNA130	Knob, Bandwidth & Center Frequency Control	24	
					10	XVE4B8K	Bolt, Front Panel & Side Cover M'tg.	10	
					11	SHGA302-1	Rubber Cushion, Rear Panel	2	
					12	SJF3305	Terminal, Input & Output	1	○
C103,114,121, 701,702,703, 751,752,753	ECCD1H100KC	10pF, 50WV, ±10%, Ceramic	9						
C117,604,607, 608,654,657, 658	ECCD1H220KC	22pF, 50WV, ±10%, Ceramic	7						
C757	ECCD1H270K	27pF, 50WV, ±10%, Ceramic	1						
C707	ECCD1H330K	33pF, 50WV, ±10%, Ceramic	1						
C106,112,120	ECCD1H330KC	33pF, 50WV, ±10%, Ceramic	3						
C601,603,605, 606,609,651, 653,655,656, 659	ECCD1H560K	56pF, 50WV, ±10%, Ceramic	10						
C201,204,207, 251,254,257, 301,304,307, 351,354,357, 401,404,407, 451,454,457, 501,504,507, 551,554,557	ECCD1H820K	82pF, 50WV, ±10%, Ceramic	24						
C203,206,209, 253,256,259, 303,306,309, 353,356,359, 403,406,409, 453,456,459, 503,506,509, 553,556,559	ECCD1H151K	150pF, 50WV, ±10%, Ceramic	24						
C602,652	ECCD1H181K	180pF, 50WV, ±10%, Ceramic	2						
C202,205,208, 252,255,258, 302,305,308, 352,355,358, 402,405,408, 452,455,458, 502,505,508, 552,555,558,	ECCD1H271K	270pF, 50WV, ±10%, Ceramic	24						
C119	EXKD1H681KB	680pF, 50WV, ±10%, Ceramic	1						
C11,12	ECKD1H102PF	0.001μF, 50WV, ±100%, Ceramic	2						
C809,812	ECKD1H103PF	0.01μF, 50WV, ±100%, Ceramic	2						
C1,2	ECQE2A103MD	0.01μF, 250VAC, ±20%, Polyester	2	<b>SAFETY</b>					
C610,613	ECQM05102JZ	0.001μF, 50WV, ± 5%, Polyester	2						
C461,462	ECQM05122JZ	0.0012μF, 50WV, ± 5%, Polyester	2						
C560,563	ECQM05222JZ	0.0022μF, 50WV, ± 5%, Polyester	2						

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
13	SGP30-1AX	Rear Panel, with Name Plate	1	○	<b>ACCESSORIES</b>				
14	SGT11670	Name Plate	1	○		SJP2101	Connection Card	2	○
	SHR567	Cover Paper, (AC 60Hz 120V) Indicate	1	○		RJP16AS	AC Plug	1	•
15	SHGA303-1	Leg Set Bottom Board	4			RJP17AS	AC Plug	1	
	SKUA370	Bottom Board	1		<b>PACKING PARTS</b>				
16	SJSA66-1	Socket, AC Outlet	2	<b>SAFETY</b>	P1	SPPA27	Soft Cover	1	
17	<b>RJA5C</b>	AC Cord	1	<b>SAFETY</b>		SPEA3	Cover, AC Plug	1	
	RHR111	Bushing, AC Cord	1		P2	SPHA6008	Polyethylene Sheet	1	
	SJSA150 1A	Connector Lead Wire (with 6 pin)	6	○	P3	SPSA94	Pad, Upper	1	
	SJT341	6 pin Connection Terminal	12	○	P4	SPSA135	Pad, Lower	1	
	SHRA2	Spacer, Printed Circuit Board M'tg.	6		P5	SPG563	Carton Box, Outer	1	○
	XTV3+8CR	Red Screw, Bottom Board M'tg.	10		P6	SQF1121	Printed Matter, Complete	1	○
	XTB3+8BK	Black Screw Top Board M'tg.	11		P7	SPN5117	Carton Box, Inner	1	○
	SMP235	Lamp M'tg.	1	○	P8	SPSA30	Pad Board, Carton Box	1	○
18	SHGA204	Rubber Bracket, Lamp	2						
	SGLA9	Orange Filter, Panel Light	2						

## ■ CABINET PARTS



## ■ PACKINGS

