

STEREO AMPLIFIER

# SA-5500II

SERVICE MANUAL



 PIONEER

MODEL SA-5500 II COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	120V	UL (U.S.A.) approved.
KC	120V	CSA (Canada) approved.
HG	220V and 240V (Switchable)	SEMKO (Sweden), NEMKO (Norway), DEMKO (Denmark) and EI (Finland) approved.
S	110V, 120V, 220V and 240V (Switchable)	General export model.

*This Service Manual is applicable the Model SA-5500II/KU.*

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# 1. SPECIFICATIONS

## Semiconductors

ICs	2
Transistors	7
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## Amplifier Section

Circuitry . . . . . 2-stage differential amplifier  
direct-coupled OCL

Continuous Power Output from 20 Hertz to 20,000 Hertz  
(Both channels driven) . . . 15 watts per channel (8 ohms)

Total Harmonic Distortion at 20Hertz to 20,000Hertz from  
AUX

Continuous rated power output	0.5%
1 watt per channel power output, 8ohms	0.1%

### Intermodulation Distortion

Continuous rated power output	0.5%
1 watt per channel power output, 8ohms	0.1%

Speaker . . . . . A, B, A + B

Headphones . . . . . Low impedance

Damping Factor (20Hertz to 20,000Hertz, 8ohms) . . . 30

### Input (Sensitivity/Impedance)

PHONO	2.5mV/50kohms
TUNER	150mV/50kohms
AUX	150mV/50kohms
TAPE PLAY	150mV/50kohms

PHONO Overload Level (T.H.D.: 0.3%) . . . 130mV (1kHz)

### Output (Level/Impedance)

TAPE REC	150mV
----------	-------

### Frequency Response

PHONO (RIAA Equalization)	20Hz to 20,000Hz ±0.5dB
TUNER, AUX, TAPE PLAY	20Hz to 20,000Hz ±1dB

### Tone Control

BASS	±7dB (100Hz)
TREBLE	±7dB (10kHz)

### Loudness Contour

(Volume control set at -40dB position) . . +6dB (100Hz)

Hum and Noise (IHF, short-circuited, A network, rated  
power)

PHONO	71dB
TUNER, AUX, TAPE PLAY	87dB

## Miscellaneous

Power Requirements . . . . . 120V 60Hz only.

Power Consumption . . . . . 70W (UL)

100VA (CSA), 130W (Max.)

Dimensions . . . . . 380(W) x 124(H) x 269(D) mm

14-15/16 x 4-7/8 x 10-9/16 in

Weight . . . . . Without Package; 5.2kg (11lb 7 oz)

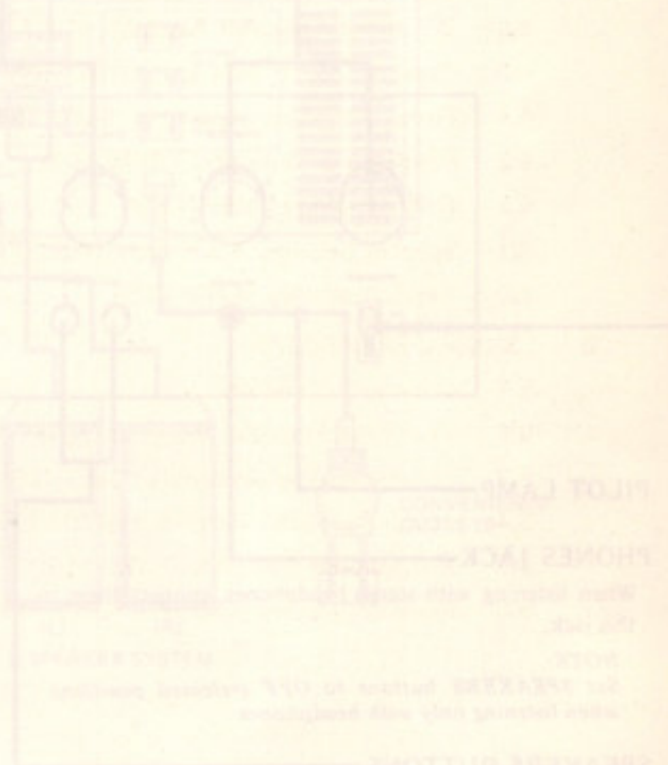
With Package; 5.9kg (13lb)

## Furnished Parts

Operating Instructions . . . . . 1

### NOTE:

*Specifications and the design subject to possible modification without notice due to improvements.*



## 2. FRONT PANEL FACILITIES

### POWER SWITCH

Set to ON position to energize SA-5500II. After setting to ON, there is a brief delay before sound is obtained. This is due to the operation of the muting circuit which prevents noise when the POWER is switched. This function does not indicate difficulty and normal operating condition is attained in a few seconds. The POWER switch also controls the rear panel SWITCHED convenience outlets.

### BASS AND TREBLE CONTROLS

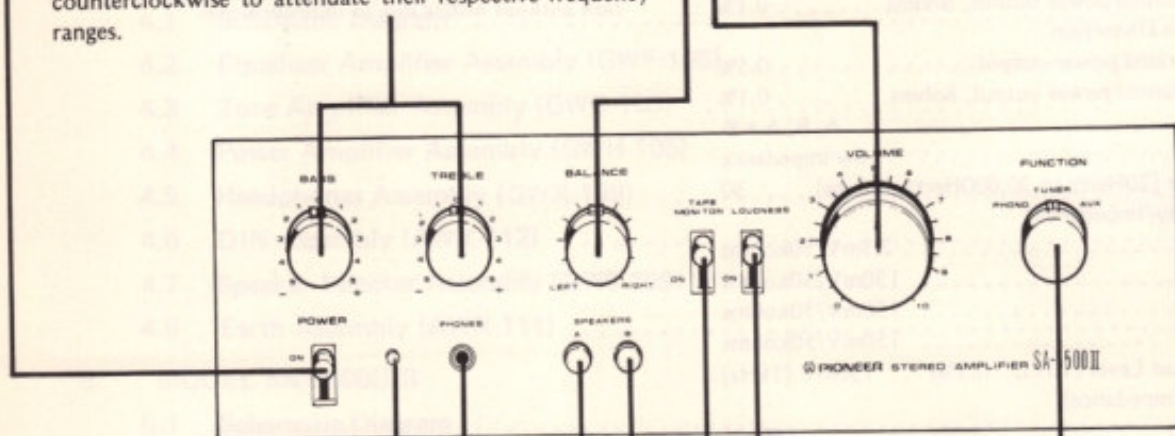
Controls for adjusting low and high frequency tone. Turn controls clockwise to enhance low or high frequencies and counterclockwise to attenuate their respective frequency ranges.

### BALANCE CONTROL

Adjusts relative left and right channel volume balance between speaker systems and headphones. If the right channel volume is insufficient, turn the control clockwise from center. Conversely, if the left channel volume is insufficient, turn the control counter-clockwise from center.

### VOLUME CONTROL

Adjusts volume from speakers and headphones. Clockwise rotation increases volume.



### PILOT LAMP

### PHONES JACK

When listening with stereo headphones, connect them to this jack.

#### NOTE:

Set **SPEAKERS** buttons to **OFF** (released position) when listening only with headphones.

### SPEAKERS BUTTONS

Switch for selecting speaker systems connected to the rear panel. Sound from corresponding speaker systems is obtained when button is depressed, while sound is not obtained in the released position.

A: Sound obtained from speakers connected to the A speakers terminals.

B: Sound obtained from speakers connected to the B speakers terminals.

If both buttons are depressed simultaneously, sound will be obtained from both sets of speaker systems.

When listening with headphones, set **SPEAKERS** buttons to released (**OFF**) positions.

### FUNCTION SWITCH

Selects desired playback program source.

**PHONO:** To play records on a turntable connected to the **PHONO** jacks.

**TUNER:** To listen to broadcasts with a tuner connected to the **TUNER** jacks.

**AUX:** To play a component connected to the **AUX** jacks.

### LOUDNESS SWITCH

When listening at low volume settings, set switch to **ON** to enhance low frequencies. The response of the human ear to sound differs according to loudness. This switch compensates for this effect at low volumes.

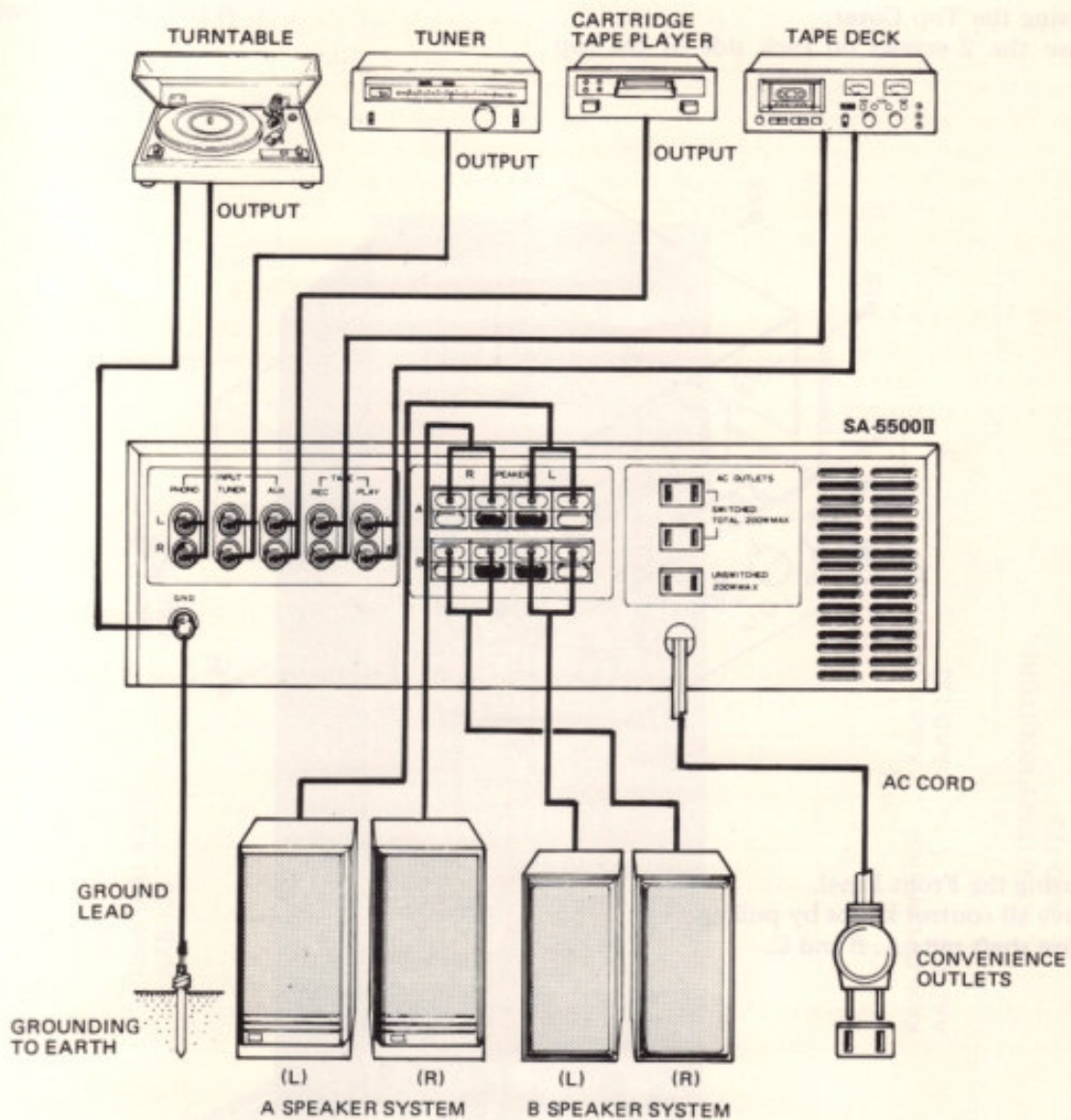
### TAPE MONITOR SWITCH

Set to **ON** to play on a tape deck connected to the **TAPE** jacks or to monitor recording conditions.

#### NOTE:

Be sure to set switch to upper (**OFF**) position when playing records or listening to broadcasts.

## 3. CONNECTION DIAGRAM



## Connection Notes

- Rear panel jacks are provided in pairs, the upper jack for the left (L) channel and lower jack for the right (R) channel. When connecting components, use care to connect the channels properly (L to L and R to R).
- Insert connecting plugs fully. Loose connections can cause absence of sound or noise problems.

## Convenience outlets (AC OUTLETS)

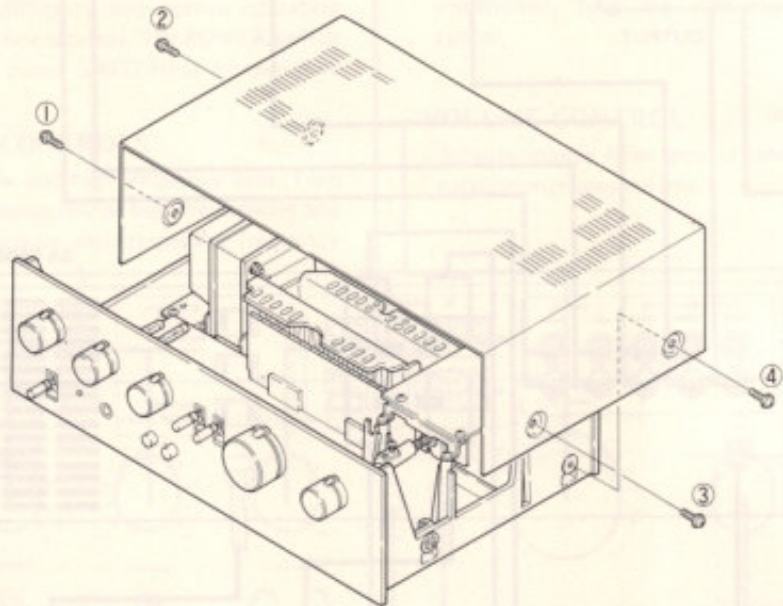
**SWITCHED:** Power to these outlets is coupled to the operation of the front panel POWER switch. By connecting the power cords of often used components (maximum total 200W) such as a tuner, the tuner power switch can be left in the on position. Power for the tuner will then be controlled by on-off operation of the SA-5500II POWER switch.

**UNSWITCHED:** Power is always supplied to this outlet (maximum total 200W) regardless of the front panel POWER switch position.

## 4. DISASSEMBLY

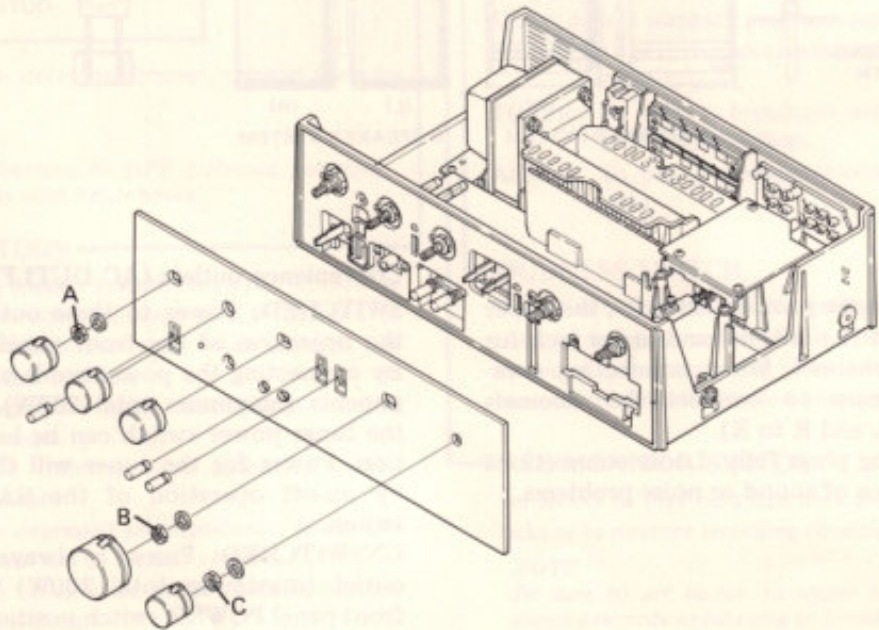
### 1. Removing the Top Cover.

Remove the 2 screws on each side of the top cover.



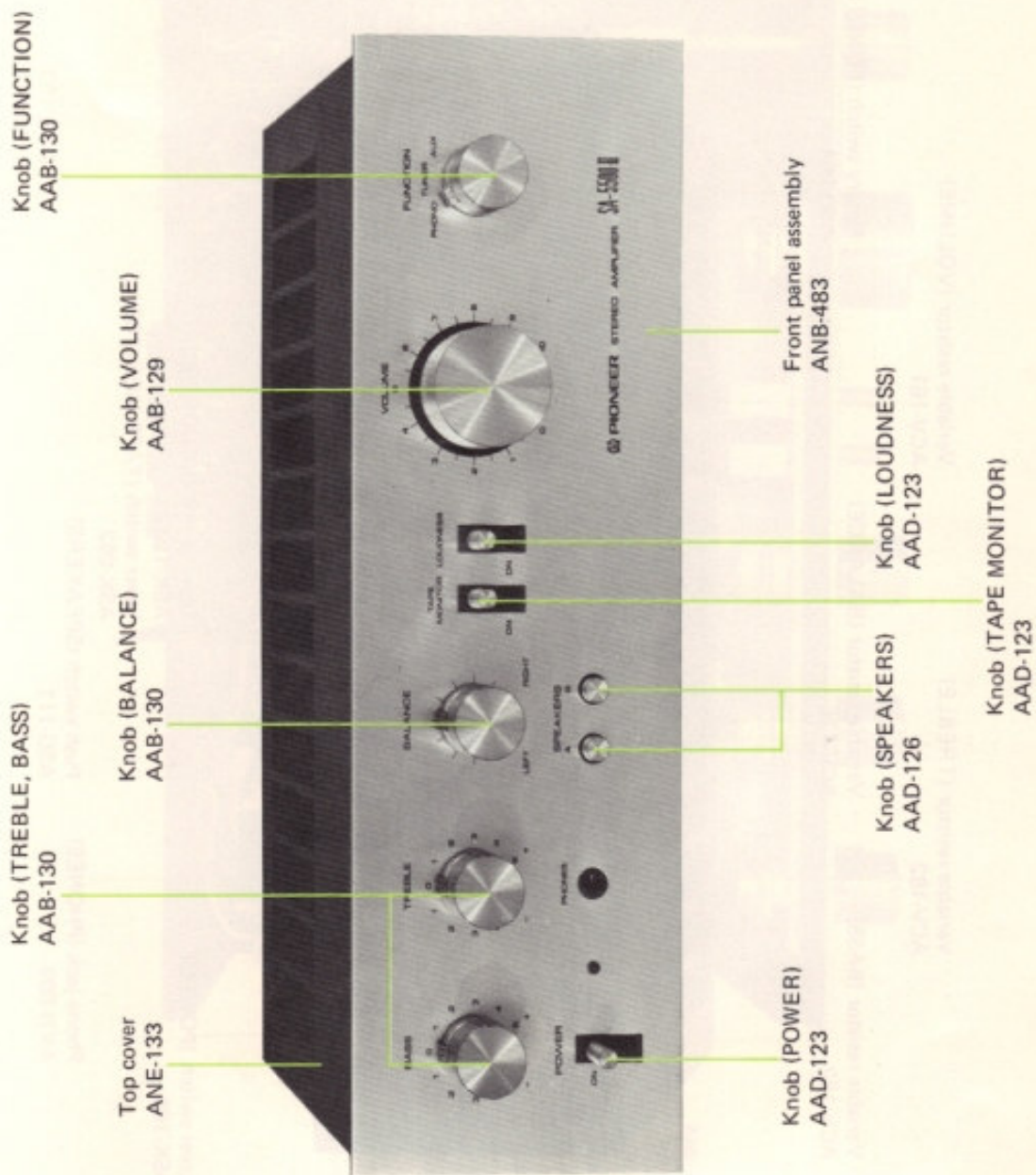
### 2. Removing the Front Panel.

- Remove all control knobs by pulling.
- Remove shaft nuts A, B and C.



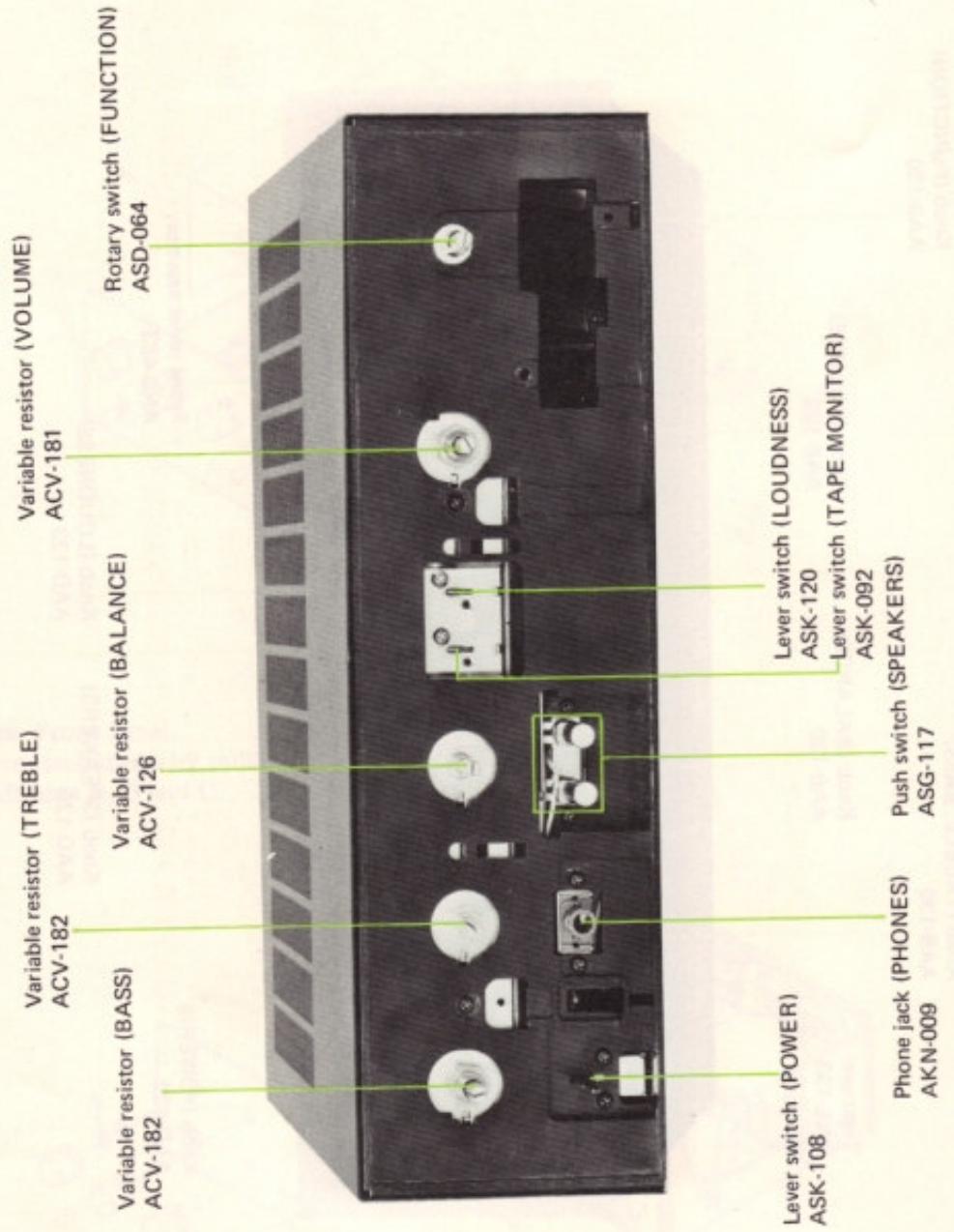
# 5. PARTS LOCATION

## 5.1 FRONT PANEL VIEW



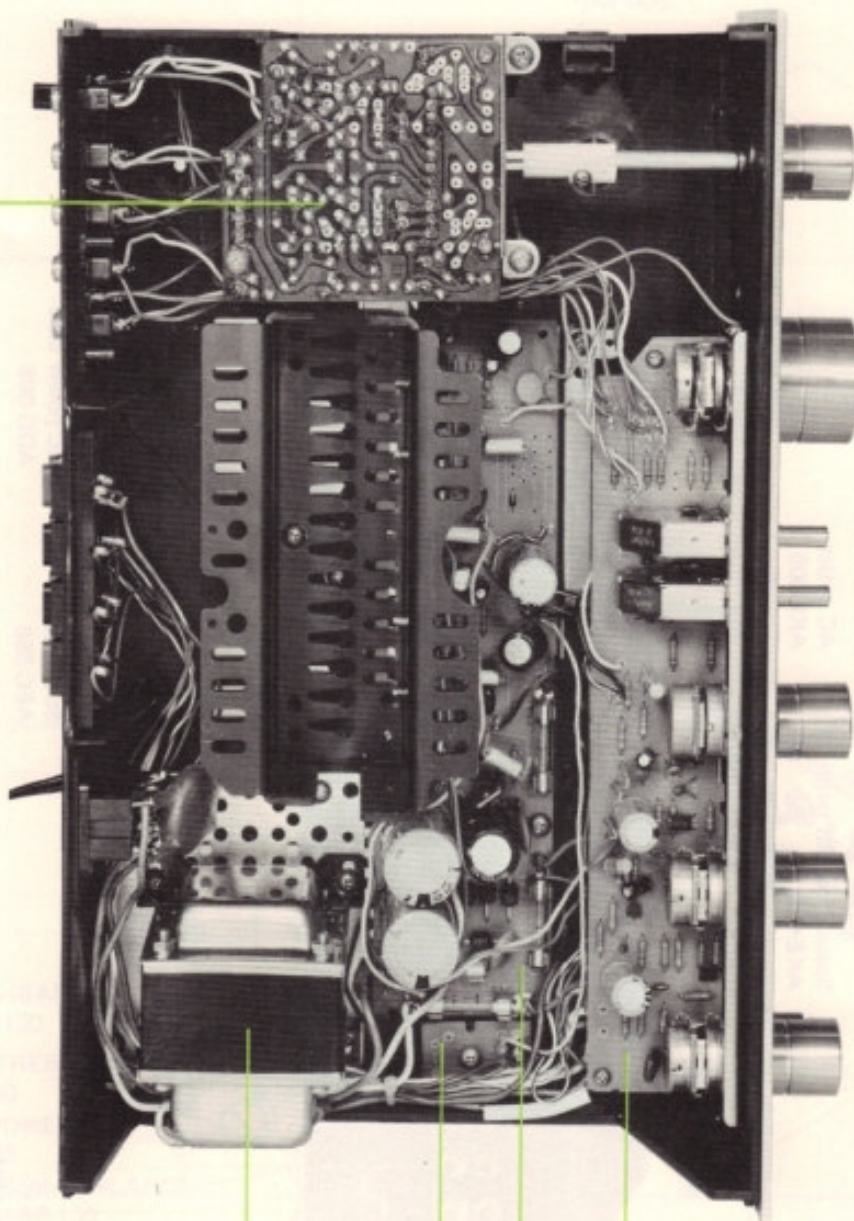


5.2 FRONT VIEW WITH PANEL REMOVED



5.3 TOP VIEW EXPLODED VIEWS

Equalizer amplifier assembly  
GWF-103



Power transformer  
ATT-356

Earth assembly  
AWX-110

Power amplifier assembly  
GWH-103

Tone amplifier assembly  
GWG-103

## 6. CIRCUIT DESCRIPTION

### EQUALIZER AMPLIFIER ASSEMBLY

The equalizer amplifier is a 2-stage direct-coupled amplifier comprised of a PNP and an NPN transistors.

A more effective use is made of the power supply voltage, since voltage loss at the 2nd stage is eliminated due to VCE of the 1st stage, an effect gained by employing transistors of different polarity. Maximum permissible input is 120mV (1kHz, 0.3% T.H.D.). And since the collector resistance of the 2nd stage also serves as the emitter resistance of the 1st stage, a 100% DC NFB is applied, producing very high DC stability. Equalizer deviation is less than  $\pm 0.5\text{dB}$  (20Hz - 20kHz).

The output of the equalizer amplifier, plus the TUNER and AUX input terminals are selected by the FUNCTION switch, thus connecting to the tone amplifier assembly.

### TONE AMPLIFIER ASSEMBLY

Signals from the equalizer amplifier assembly are applied to the TAPE REC terminals and the TAPE MONITOR switch.

The BALANCE CONTROL is a center click-stop no-loss type (HB type). The VOLUME CONTROL is also a click-stop control, with 41 click-stops.

The loudness feature compensates for bass only. The circuit is coupled to the center tap of the VOLUME CONTROL when LOUDNESS is switched ON.

The tone control circuit amplifies the signal to the necessary level by a single NPN transistor. The signal is then applied to a CR type control circuit.

### POWER AMPLIFIER ASSEMBLY

The power amplifier makes use of a recently developed monolithic IC (PA 3002). This IC contains protective circuits such as a thermal shut-down circuit and a current limiter circuit. Output is 17.5W (1kHz,  $8\Omega$ ) for a  $\pm 22\text{V}$  supply.

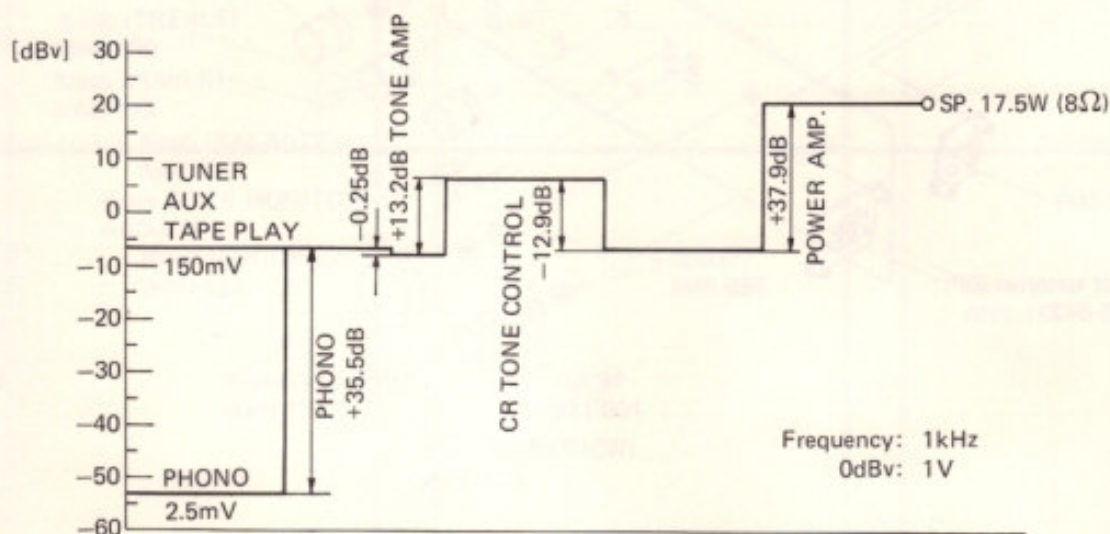
The two sets of speaker terminals (A, B) have separate ON/OFF speaker switches.

### POWER SUPPLY

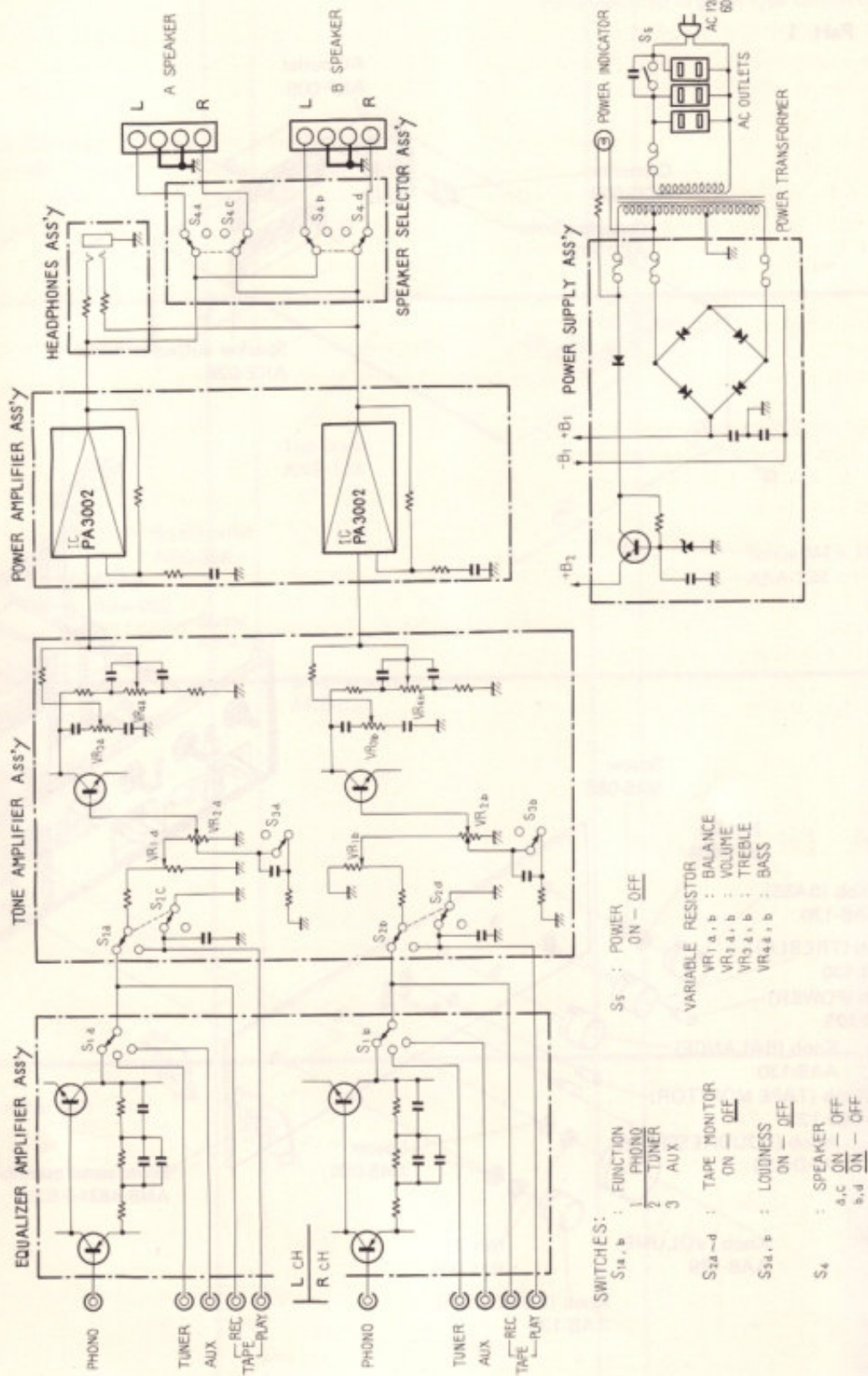
The power for IC power is supplied from the bridged rectifier and the two electrolytic capacitors ( $4,700\mu\text{F}$ ).

The +B2 for the tone amplifier and equalizer amplifier is supplied via a stabilizer circuit composed of transistor and zener diode.

## 7. LEVEL DIAGRAM

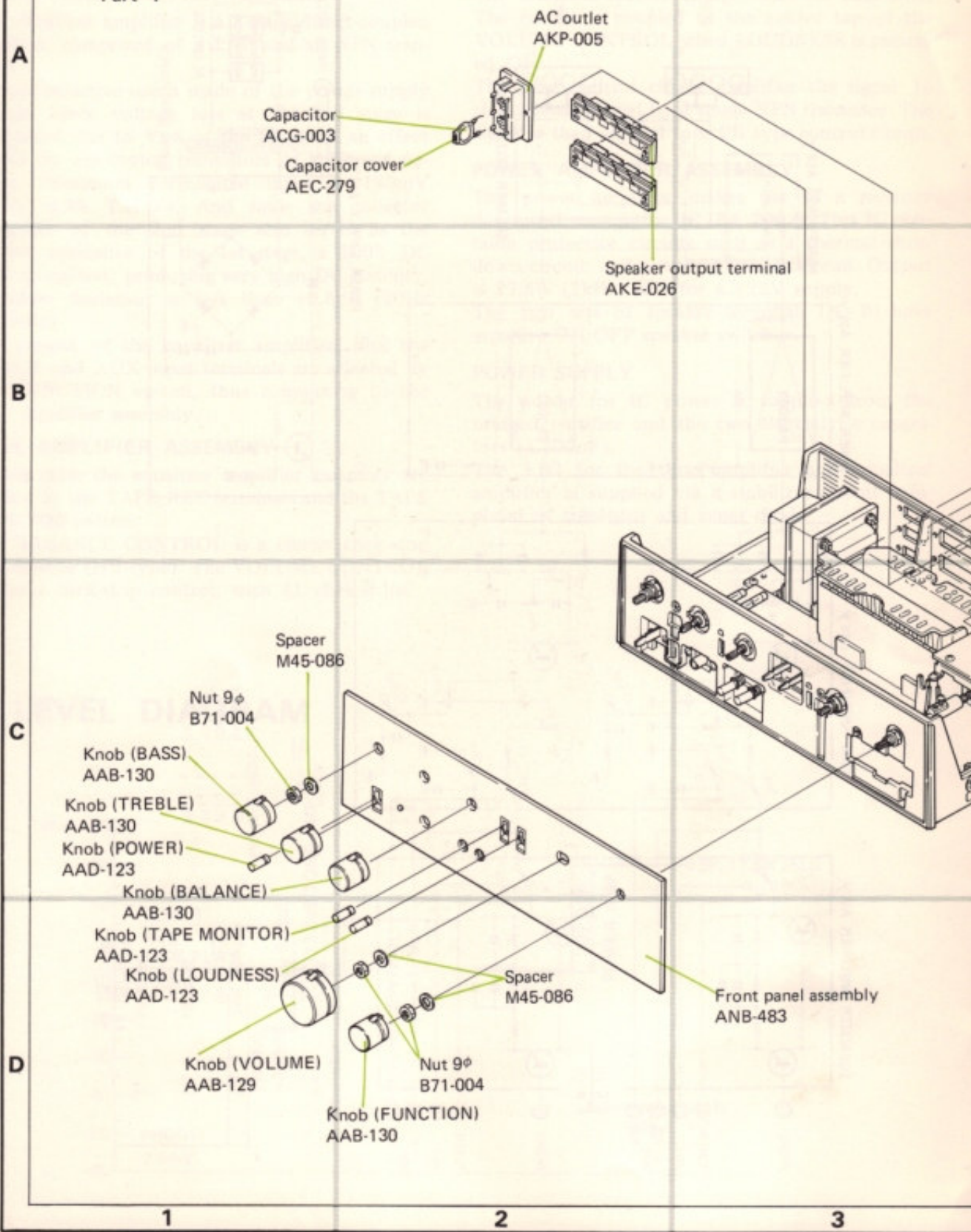


# 8. BLOCK DIAGRAM

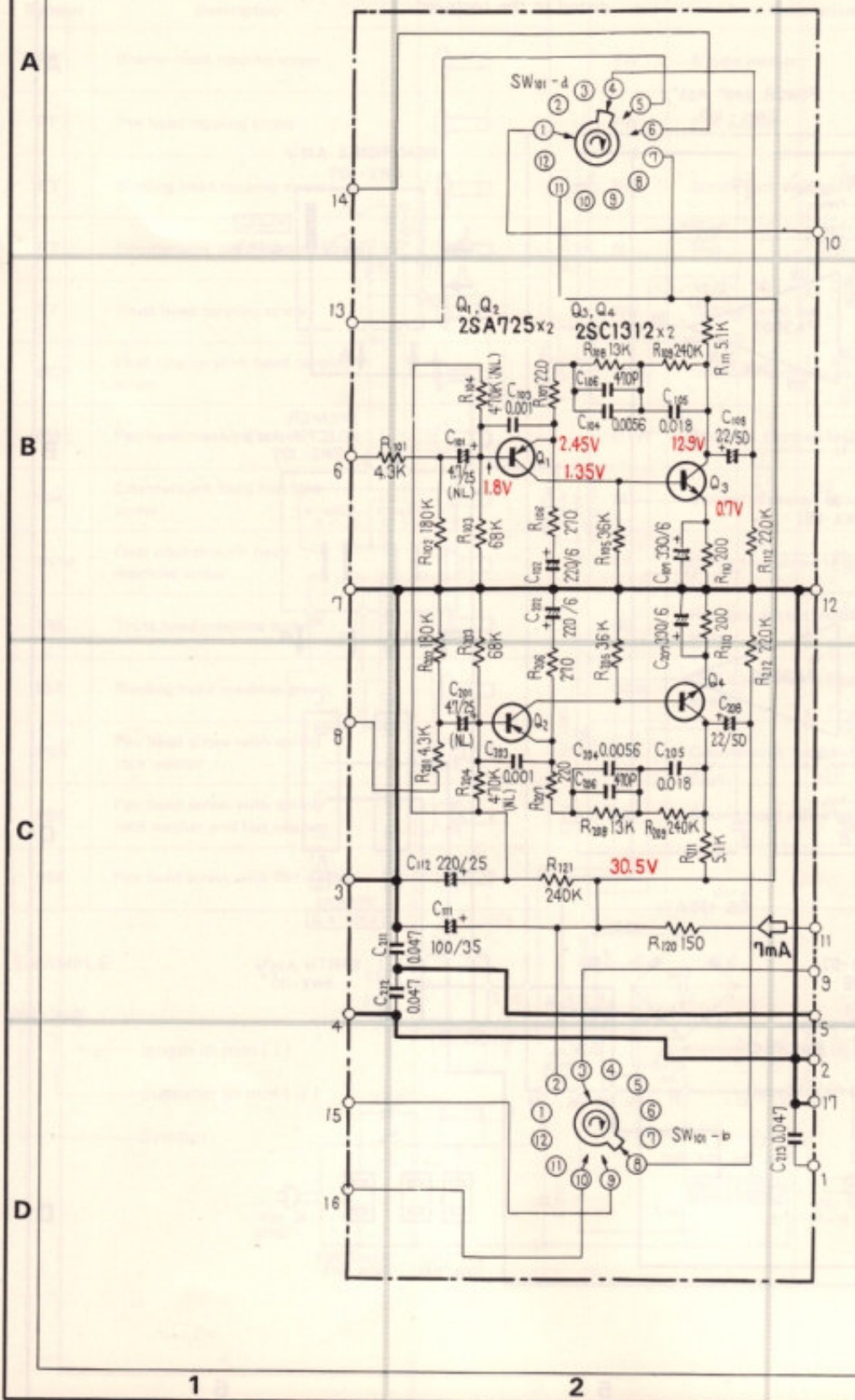


# 9. EXPLODED VIEWS

## Part 1



10.2 EQUALIZER AMPLIFIER ASSEMBLY (GWF-103)



Schematic Diagram

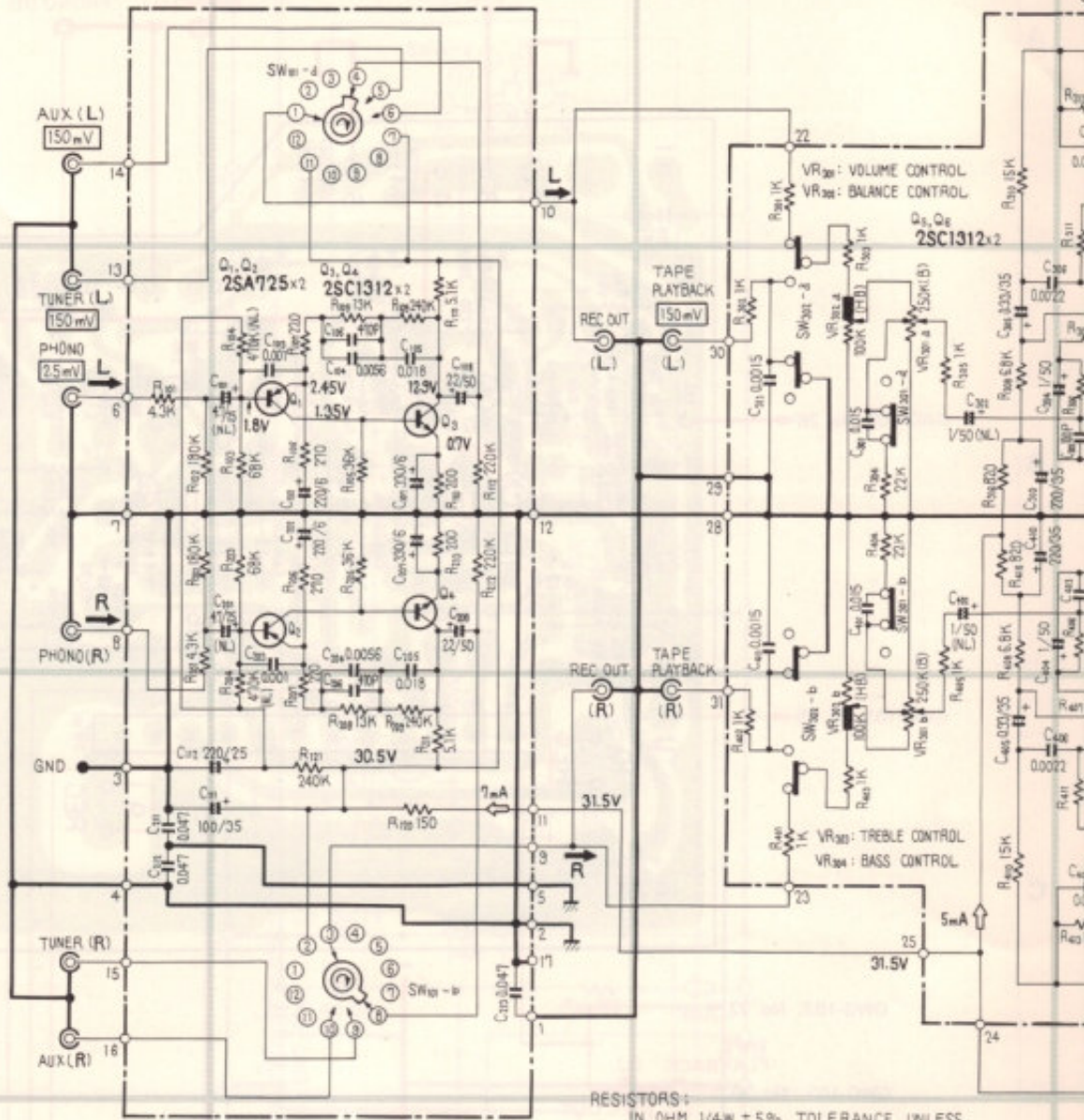
EQUALIZER AMP Ass'y  
GWF - 103

A

B

C

D



RESISTORS:  
IN OHM 1/4W ±5% TOLERANCE UNLESS  
OTHERWISE NOTED K:KΩ M:MΩ

CAPACITORS:  
IN μF UNLESS OTHERWISE NOTED P:pF

- SWITCHES:
- S<sub>1</sub>: POWER  
ON — OFF
  - SW<sub>301</sub>: FUNCTION  
1 PHONO  
2 TUNER  
3 AUX
  - SW<sub>302</sub>: TAPE MONITOR  
ON — OFF
  - SW<sub>303</sub>: SPEAKER  
a. ON — OFF  
b. ON — OFF
  - SW<sub>30</sub>: LOUDNESS  
ON — OFF

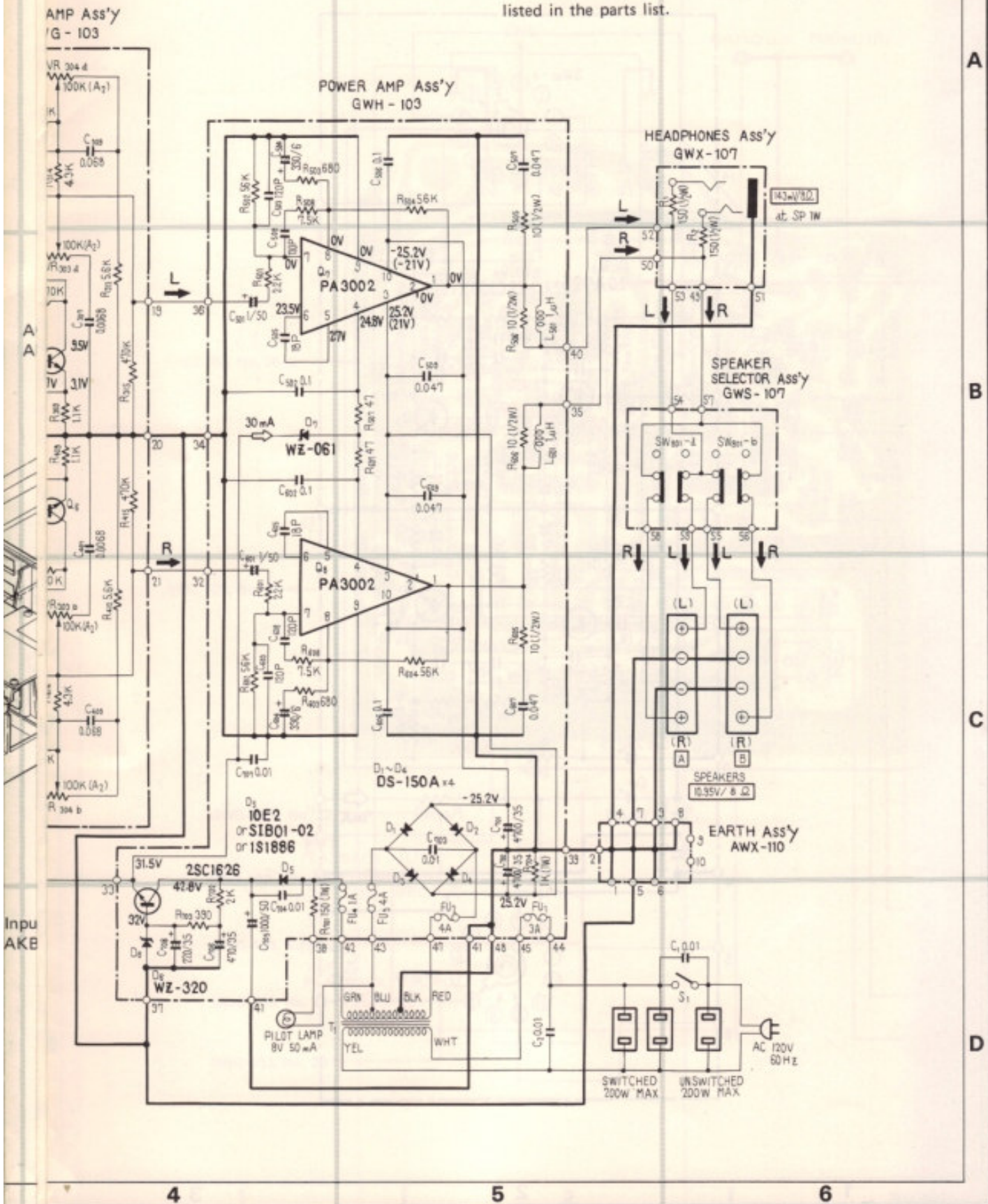
- NOTES
- mV : SIGNAL VOLTAGE AT 15W x 2 8Ω OUTPUT
  - V : DC VOLTAGE AT NO INPUT SIGNAL
  - V : DC VOLTAGE AT MAX POWER OUTPUT
  - mA : DC CURRENT AT NO INPUT SIGNAL

4

5

6

NOTE:  
The indicated semiconductors are representative ones only.  
Other alternative semiconductors may be used and are listed in the parts list.



A  
B  
C  
D

4

5

6





## Equalizer Amplifier Assembly (GWF-103)

## SWITCH AND OTHERS

Symbol	Description	Part No.
SW101	Rotary switch (FUNCTION) Switch-held metal Nut 9φ	ASD-064 ANF-487 B71-004

## CAPACITORS

Symbol	Description	Part No.
C101	Electrolytic 4.7 25V	CEANL 4R7P 25
C102	Electrolytic 220 6V	CEA 221P 6
C103	Ceramic 1000p 50V	CKDYB 102K 50
C104	Mylar 5600p 50V	CQMA 562J 50
C105	Mylar 0.018 50V	CQMA 183J 50
C106	Ceramic 470p 50V	CKDYB 471K 50
C107	Electrolytic 330 6V	CEA 331P 6
C108	Electrolytic 2.2 50V	CEA 2R2P 50
C111	Electrolytic 100 35V	CEA 101P 35
C112	Electrolytic 220 25V	CEA 221P 25
C201	Electrolytic 4.7 25V	CEANL 4R7P 25
C202	Electrolytic 220 6V	CEA 221P 6
C203	Ceramic 1000p 50V	CKDYB 102K 50
C204	Mylar 5600p 50V	CQMA 562J 50
C205	Mylar 0.018 50V	CQMA 183J 50
C206	Ceramic 470p 50V	CKDYB 471K 50
C207	Electrolytic 330 6V	CEA 331P 6
C208	Electrolytic 2.2 50V	CEA 2R2P 50
C211	Ceramic 0.047 50V	CKDYF 473Z 50
C212	Ceramic 0.047 50V	CKDYF 473Z 50
C213	Ceramic 0.047 50V	CKDYF 473Z 50

## RESISTORS

Symbol	Description	Part No.
R101	Carbon film 4.3k	RD%PS 432J
R102	Carbon film 180k	RD%PS 184J
R103	Carbon film 68k	RD%PS 683J
R104	Carbon film 470k	RD%PS 474J NL
R105	Carbon film 36k	RD%PS 363J
R106	Carbon film 270	RD%PS 271J
R107	Carbon film 220	RD%PS 221J
R108	Carbon film 13k	RD%PS 133J
R109	Carbon film 240k	RD%PS 244J
R110	Carbon film 200	RD%PS 201J
R111	Carbon film 5.1k	RD%PS 512J
R112	Carbon film 220k	RD%PS 224J
R120	Carbon film 150	RD%PS 151J
R121	Carbon film 240k	RD%PS 244J
R201	Carbon film 4.3k	RD%PS 432J

Symbol	Description	Part No.
R202	Carbon film 180k	RD%PS 184J
R203	Carbon film 68k	RD%VS 683J
R204	Carbon film 470k	RD%PS 474J NL
R205	Carbon film 36k	RD%PS 363J
R206	Carbon film 270	RD%PS 271J
R207	Carbon film 220	RD%PS 221J
R208	Carbon film 13k	RD%PS 133J
R209	Carbon film 240k	RD%PS 244J
R210	Carbon film 200	RD%PS 201J
R211	Carbon film 5.1k	RD%PS 512J
R212	Carbon film 220k	RD%PS 224J

## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SA725-F or G
Q2	Transistor	2SA725-F or G
Q3	Transistor	2SC1312-F or G
Q4	Transistor	2SC1312-F or G





## Tone Amplifier Assembly (GWG-103)

### SWITCHES AND OTHERS

Symbol	Description	Part No.
SW301	Lever switch (LOUDNESS)	ASK-120
SW302	Lever switch (TAPE MONITOR)	ASK-092
	Variable resistor-held metal	ANF-488
	Boss	ABN-021
	Nut 9φ	B71-004
	Shield board	ANH-331

### CAPACITORS

Symbol	Description	Part No.
C301	Mylar 0.015 50V	CQMA 153J 50
C302	Electrolytic 1 50V	CEANL 010P 50
C303	Ceramic 100p 50V	CCDSL 101K 50
C304	Electrolytic 1 50V	CEA 010P 50
C305	Electrolytic 0.33 35V	CSZA R33M 35
C306	Mylar 2200p 50V	CQMA 222J 50
C307	Mylar 6800p 50V	CQMA 682J 50
C308	Mylar 0.018 50V	CQMA 183J 50
C309	Mylar 0.068 50V	CQMA 683J 50
C310	Electrolytic 220 35V	CEA 221P 35
C311	Ceramic 1500p 50V	CKDYB 152K 50
C401	Mylar 0.015 50V	CQMA 153J 50
C402	Electrolytic 1 50V	CEANL 010P 50
C403	Ceramic 100p 50V	CCDSL 101K 50
C404	Electrolytic 1 50V	CEA 010P 50
C405	Electrolytic 0.33 35V	CSZA R33M 35
C406	Mylar 2200p 50V	CQMA 222J 50
C407	Mylar 6800p 50V	CQMA 682J 50
C408	Mylar 0.018 50V	CQMA 183J 50
C409	Mylar 0.068 50V	CQMA 683J 50
C410	Electrolytic 220 35V	CEA 221P 35
C411	Ceramic 1500p 50V	CKDYB 152K 50

### RESISTORS

Symbol	Description	Part No.
VR301	Variable resistor (VOLUME) 250k	ACV-181
VR302	Variable resistor (BALANCE) 100k	ACV-126
VR303	Variable resistor (TREBLE) 100k	ACV-182
VR304	Variable resistor (BASS) 100k	ACV-182
R301	Carbon film 1k	RD%PS 102J
R302	Carbon film 1k	RD%PS 102J
R303	Carbon film 1k	RD%PS 102J
R304	Carbon film 22k	RD%PS 223J
R305	Carbon film 1k	RD%VS 102J
R306	Carbon film 430k	RD%PS 434J NL
R307	Carbon film 470k	RD%PS 474J
R308	Carbon film 6.8k	RD%PS 682J
R309	Carbon film 1.1k	RD%PS 112J
R310	Carbon film 15k	RD%PS 153J

Symbol	Description	Part No.
R311	Carbon film 150k	RD%PS 153J
R312	Carbon film 5.6k	RD%PS 562J
R313	Carbon film 150k	RD%PS 153J
R314	Carbon film 4.3k	RD%PS 432J
R315	Carbon film 470k	RD%PS 473J
R316	Carbon film 820	RD%PS 822J
R401	Carbon film 1k	RD%PS 102J
R402	Carbon film 1k	RD%PS 102J
R403	Carbon film 1k	RD%PS 102J
R404	Carbon film 22k	RD%PS 223J
R405	Carbon film 1k	RD%PS 102J
R406	Carbon film 430k	RD%PS 434J NL
R407	Carbon film 470k	RD%PS 474J
R408	Carbon film 6.8k	RD%PS 682J
R409	Carbon film 1.1k	RD%PS 112J
R410	Carbon film 15k	RD%PS 153J
R411	Carbon film 150k	RD%PS 153J
R412	Carbon film 5.6k	RD%PS 562J
R413	Carbon film 150k	RD%PS 153J
R414	Carbon film 4.3k	RD%PS 432J
R415	Carbon film 470k	RD%PS 473J
R416	Carbon film 820	RD%VS 822J

### SEMICONDUCTORS

Symbol	Description	Part No.
Q5	Transistor	2SC1312
Q6	Transistor	2SC1312

## 10.4 POWER AMPLIFIER ASSEMBLY (GWH-103)

## COILS AND OTHERS

Symbol	Description	Part No.
L501	AF choke coil 1 $\mu$ H	ATH-011
L601	AF choke coil 1 $\mu$ H	ATH-011
	Heat sink	ANH-332
	Spacer	AEC-339
	Fuse clip (large)	AKR-013
	Fuse clip	AKR-030
	Screw 3 x 12 (MC)	ABA-143

## CAPACITORS

Symbol	Description	Part No.
C501	Electrolytic 1 50V	CEA 010P 50
C502	Mylar 0.1 50V	CQMA 104J 50
C503	Ceramic 120p 50V	CCDSL 121K 50
C504	Electrolytic 330 6V	CEA 331P 6
C505	Ceramic 18p 50V	CCDSL 180J 50
C506	Mylar 0.1 50V	CQMA 104J 50
C507	Mylar 0.047 50V	CQMA 473J 50
C508	Ceramic 120p 50V	CCDSL 121K 50
C509	Ceramic 0.047 150V	ACG-009
C601	Electrolytic 1 50V	CEA 010P 50
C602	Mylar 0.1 50V	CQMA 104J 50
C603	Ceramic 120p 50V	CCDSL 121K 50
C604	Electrolytic 330 6V	CEA 331P 6
C605	Ceramic 18p 50V	CCDSL 180J 50
C606	Mylar 0.1 50V	CQMA 104J 50
C607	Mylar 0.047 50V	CQMA 473J 50
C608	Ceramic 120p 50V	CCDSL 121K 50
C609	Ceramic 0.047 150V	ACG-009
C701	Electrolytic 4700 35V	ACH-043
C702	Electrolytic 4700 35V	ACH-043
C703	Ceramic 0.01 150V	ACG-004
C704	Ceramic 0.01 150V	ACG-004
C705	Electrolytic 1000 50V	CEA 102P 50
C706	Electrolytic 470 35V	CEA 471P 35
C707	Ceramic 0.01 50V	CKDYB 103K 50
C708	Electrolytic 220 35V	CEA 221P 35

## RESISTORS

Symbol	Description	Part No.
R501	Carbon film 2.2k	RD%PS 222J
R502	Carbon film 56k	RD%PS 563J
R503	Carbon film 680	RD%PS 681J
R504	Carbon film 56k	RD%PS 563J
R505	Carbon film 10 $\frac{1}{2}$ W	RD%PS 100J

Symbol	Description	Part No.
R506	Carbon film 10 $\frac{1}{2}$ W	RD%PS 100J
R507	Carbon film 47	RD%PS 470J
R508	Carbon film 7.5k	RD%PM 752J
R601	Carbon film 2.2k	RD%PS 222J
R602	Carbon film 56k	RD%PS 563J
R603	Carbon film 680	RD%PS 681J
R604	Carbon film 56k	RD%PS 563J
R605	Carbon film 10 $\frac{1}{2}$ W	RD%PS 100J
R606	Carbon film 10 $\frac{1}{2}$ W	RD%PS 100J
R607	Carbon film 47	RD%PS 470J
R608	Carbon film 7.5k	RD%PM 752J
R701	Metal oxide 150 1W	RS1P 151J
R702	Carbon film 2k	RD%PS 202J
R703	Carbon film 39	RD%PS 390J
R704	Metal oxide 1k 1W	RS1P 102J

## SEMICONDUCTORS

Symbol	Description	Part No.
Q7	IC	PA3002-A
Q8	IC	PA3002-A
Q9	Transistor	2SC1626-O or Y
D1	Diode	DS-150A
D2	Diode	DS-150A
D3	Diode	DS-150A
D4	Diode	DS-150A
D5	Diode	10E2 (1S1886 or S1B01-02)
D6	Zener diode	WZ-320
D7	Zener diode	WZ-061

Power Amplifier Assembly (GWH-103)

