

SERVICE MANUAL

SA-5200 KU, KC, FV

NOTE:

MODEL SA-5200 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KU	120V only	UL approved (U.S.A.)
KC	120V only	CSA approved (Canada)
FV	5-position selector	General export model

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1. SPECIFICATIONS

SEMICONDUCTORS

Transistors 22

Diodes 7

POWER AMPLIFIER SECTION

Circuitry 1st Stage Differential Amplifier,
Direct Coupled Quasi-comple-
mentary.

Continuous Power Output

20Hz~20kHz

(Both channels driven) 10W+10W (8 Ω)

1kHz

(Both channels driven) 13W+13W (8 Ω), 15W+15W (4 Ω)

1kHz

(Each channel driven) 16W/16W (8 Ω), 20W/20W (4 Ω)

Harmonic Distortion

(Continuous Power

Output) Less than 0.8%

(1W+1W Power

Output) Less than 0.2%

Intermodulation Distortion

(Continuous Power

Output) Less than 0.8%

(1W+1W Power

Output) Less than 0.4%

Power Bandwidth (IHF,

Both channels driven) . . 10Hz~40kHz (H.D. 0.8%)

Output, Speaker A, B, A+B (4~16 Ω)

Headphones 4~16 Ω

Damping Factor

(1kHz, 8 Ω). More than 30

Residual Hum & Noise (8 Ω , Pre &

Power-amplifier) Less than 1mV (0.13 μ W)

PREAMPLIFIER SECTION

Circuitry

Equalizer-amplifier . . 2-stage Direct Coupled NFB type

Control-amplifier . . . CR type

Input Sensitivity/Impedance

PHONO 2.5mV/50k Ω

PHONO Overload Level

(rms/p-p) 100mV/280mV

TUNER 150mV/100k Ω

AUX 1 150mV/100k Ω

AUX 2 150mV/100k Ω

TAPE MONITOR 150mV/100k Ω

TAPE REC/PB

(DIN connector) 150mV/100k Ω

Output Level/Impedance

TAPE REC 150mV

TAPE REC/PB

(DIN connector) 30mV/80k Ω

Frequency Response

PHONO

(RIAA equalization) . . 30Hz~ 15kHz \pm 0.5dB

TUNER, AUX, TAPE

MON 15Hz~30kHz \pm 1dB

Tone Control

BASS +12dB, -10dB (100Hz)
TREBLE +9.5dB, -10.5dB (10kHz)

Loudness Contour (Volume control set

at -40dB position) . . . +10dB (100Hz), +6dB (10kHz)

Hum & Noise (IHF, Short-circuited, A Network)

PHONO More than 70dB
TUNER, AUX, TAPE
MON More than 90dB

MISCELLANEOUS

Power Requirements . . . AC 120V 60Hz or AC 110V, 120V,
130V, 220V and 240V 50/60Hz
(Switchable)

Power Consumption

(Max.) 85W

AC Outlets Switched 1, Unswitched 1

Dimensions (overall) . . . 415(W) x 132(H) x 328(D) mm
16-5/16 x 5-3/16 x 12-15/16 in.

Weight Without Package 7.2kg (15lb 13oz)

With Package . . 8.5kg (18lb 11oz)

FURNISHED PARTS

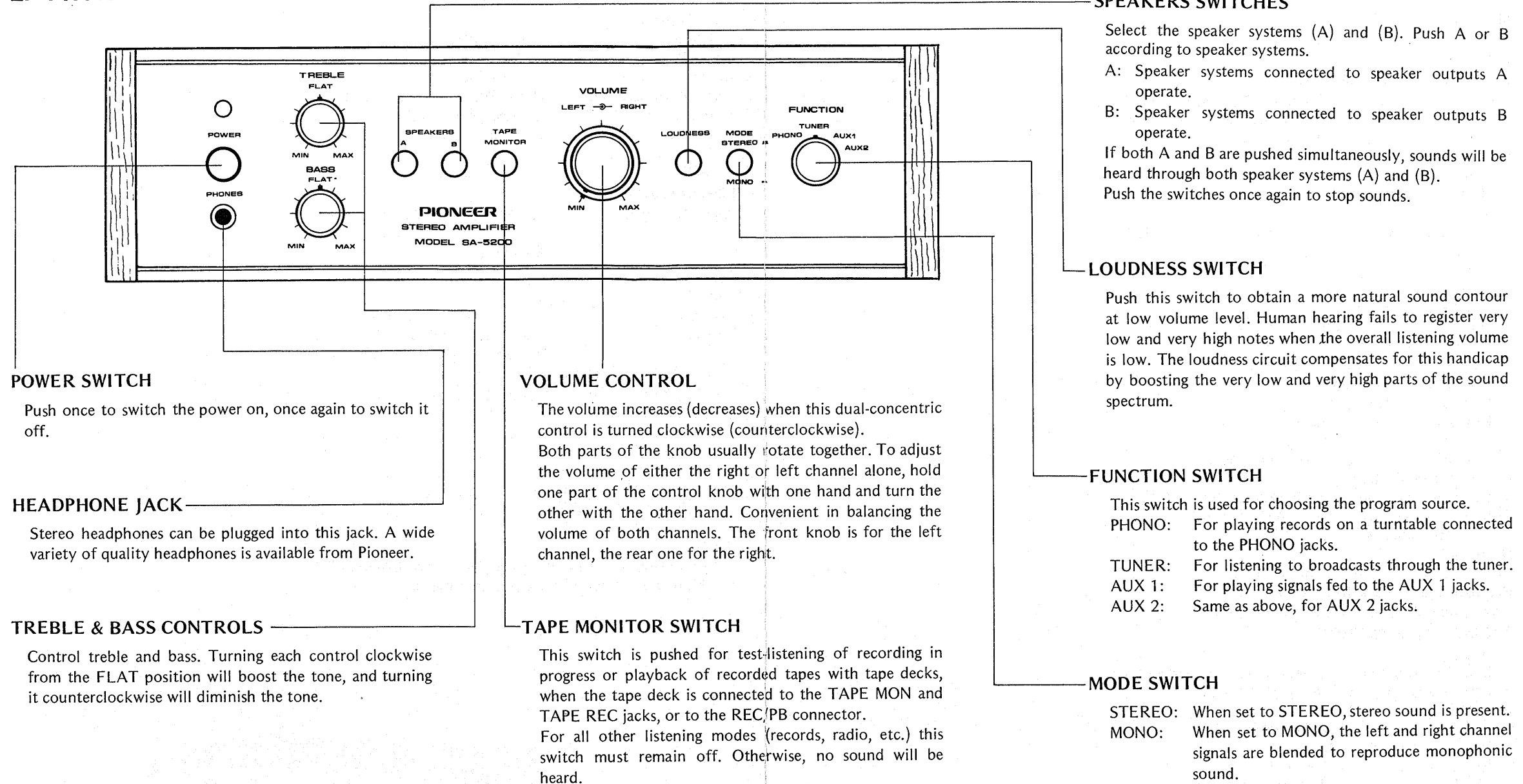
Connection Cord with Pin Plugs 1
Polishing Cloth 1
Operating Instructions 1
Fuse 0.5A (5-line voltage) 1
Fuses 1A (model only) 2

NOTE:

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



2. FRONT PANEL FACILITIES



POWER SWITCH

Push once to switch the power on, once again to switch it off.

HEADPHONE JACK

Stereo headphones can be plugged into this jack. A wide variety of quality headphones is available from Pioneer.

TREBLE & BASS CONTROLS

Control treble and bass. Turning each control clockwise from the FLAT position will boost the tone, and turning it counterclockwise will diminish the tone.

VOLUME CONTROL

The volume increases (decreases) when this dual-concentric control is turned clockwise (counterclockwise). Both parts of the knob usually rotate together. To adjust the volume of either the right or left channel alone, hold one part of the control knob with one hand and turn the other with the other hand. Convenient in balancing the volume of both channels. The front knob is for the left channel, the rear one for the right.

TAPE MONITOR SWITCH

This switch is pushed for test-listening of recording in progress or playback of recorded tapes with tape decks, when the tape deck is connected to the TAPE MON and TAPE REC jacks, or to the REC/PB connector. For all other listening modes (records, radio, etc.) this switch must remain off. Otherwise, no sound will be heard.

SPEAKERS SWITCHES

Select the speaker systems (A) and (B). Push A or B according to speaker systems.

A: Speaker systems connected to speaker outputs A operate.

B: Speaker systems connected to speaker outputs B operate.

If both A and B are pushed simultaneously, sounds will be heard through both speaker systems (A) and (B). Push the switches once again to stop sounds.

LOUDNESS SWITCH

Push this switch to obtain a more natural sound contour at low volume level. Human hearing fails to register very low and very high notes when the overall listening volume is low. The loudness circuit compensates for this handicap by boosting the very low and very high parts of the sound spectrum.

FUNCTION SWITCH

This switch is used for choosing the program source.

PHONO: For playing records on a turntable connected to the PHONO jacks.

TUNER: For listening to broadcasts through the tuner.

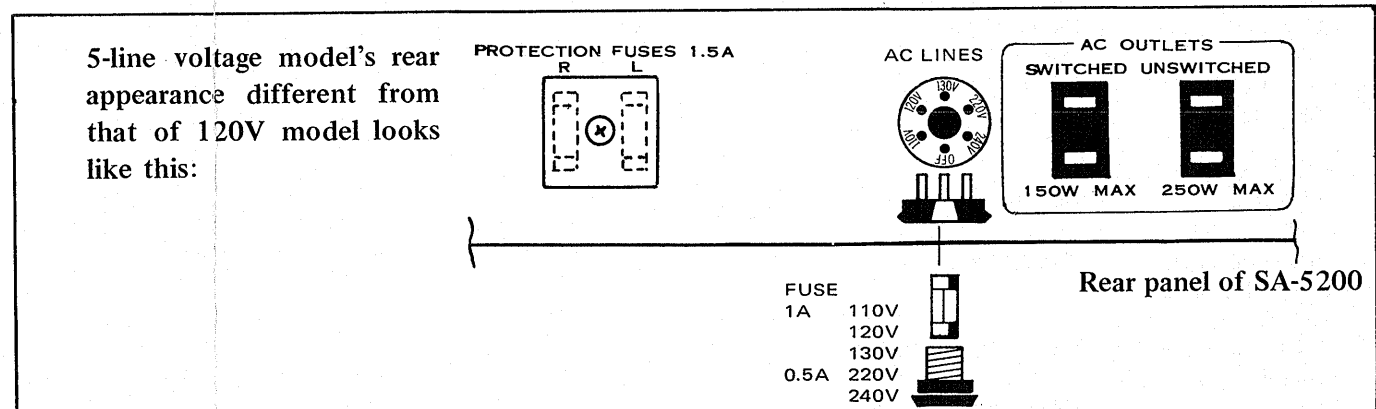
AUX 1: For playing signals fed to the AUX 1 jacks.

AUX 2: Same as above, for AUX 2 jacks.

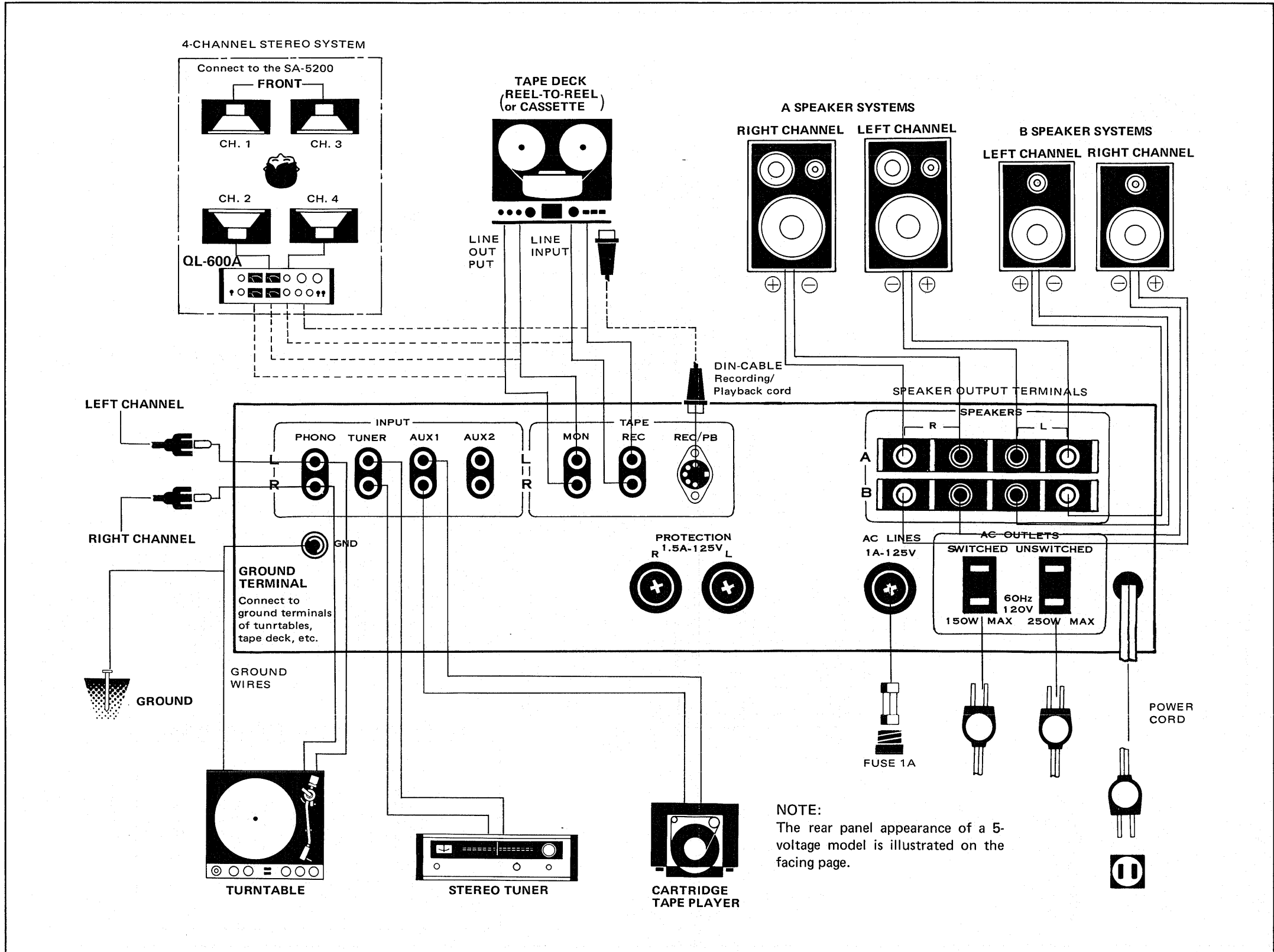
MODE SWITCH

STEREO: When set to STEREO, stereo sound is present.

MONO: When set to MONO, the left and right channel signals are blended to reproduce monophonic sound.



3. CONNECTION DIAGRAM



4. BLOCK DIAGRAM

RESISTORS
IN OHM, 1/4W, ±5% TOLERANCE
UNLESS OTHERWISE NOTED. K=kΩ. M=MΩ.

CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P=PF.

NOTES

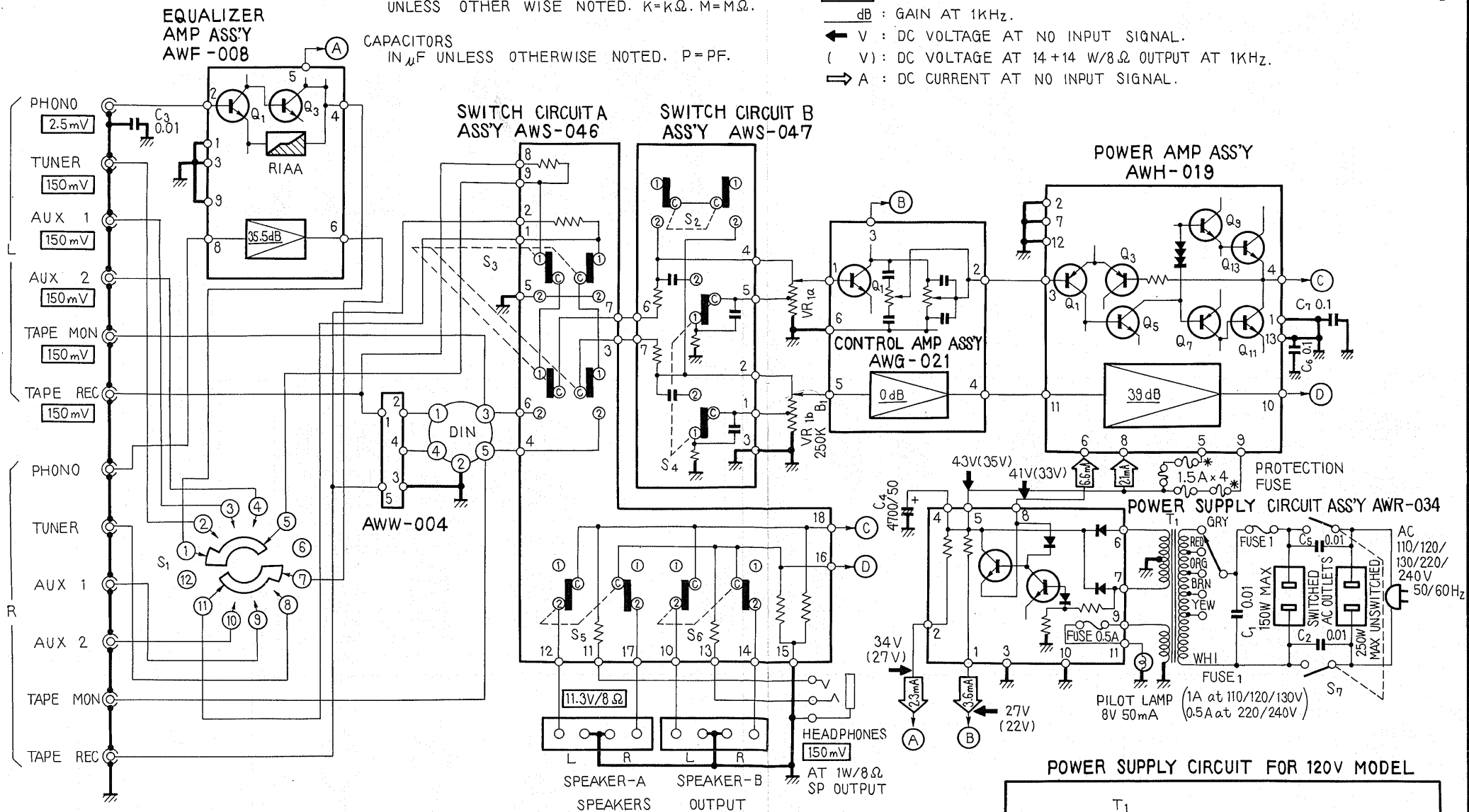
V : SIGNAL VOLTAGE NECESSARY FOR OBTAINING 16W/8Ω OUTPUT POWER (1KHz).

dB : GAIN AT 1KHz.

← V : DC VOLTAGE AT NO INPUT SIGNAL.

(V) : DC VOLTAGE AT 14+14 W/8Ω OUTPUT AT 1KHz.

⇒ A : DC CURRENT AT NO INPUT SIGNAL.



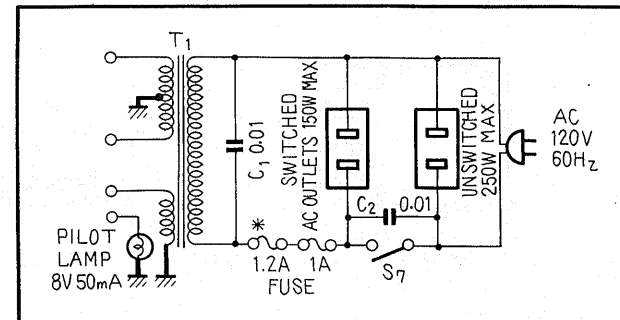
SWITCHES

- | | | | | |
|-----------------------------|----------|---------|---------|---------|
| S ₁ FUNCTION | ① PHONO | ② TUNER | ③ AUX 1 | ④ AUX 2 |
| S ₂ MODE | ① STEREO | ② MONO | | |
| S ₃ TAPE MONITOR | ① OFF | ② ON | | |
| S ₄ LOUDNESS | ① OFF | ② ON | | |
| S ₅ SPEAKER A | ① OFF | ② ON | | |
| S ₆ SPEAKER B | ① OFF | ② ON | | |
| S ₇ POWER | ① OFF | ② ON | | |

POTENTIOMETER
VR₁ MAIN VOLUME

* Asterisked fuses are attached only to CSA approved version.

POWER SUPPLY CIRCUIT FOR 120V MODEL



5. CIRCUIT DESCRIPTION

5.1 Equalizer Amp

The signal from the PHONO input terminal is fed to the input terminals of the equalizer amplifier stage, which employs a two-stage direct coupled circuit.

Since sufficient negative feedback from the second-stage collector is fed to the first-stage emitter, characteristics accurate to within ± 0.5 dB on the RIAA curve can be provided. Compared with previous two-stage direct coupled circuits, this system makes for greater stability in the bass range and provides a surplus dynamic margin.

The amplified signal from the second-stage collector is fed to switch circuit-A ass'y through the FUNCTION switch.

5.2 Control Amp

The signal selected by the FUNCTION switch is fed to the control amplifier through the TAPE MONITOR switch in switch circuit-A ass'y, the loudness compensator circuit in switch circuit-B ass'y, and a potentiometer. The TONE CONTROL circuit employs the nominal CR type configuration, and is connected after the one-stage amplifier. As in the BASS and TREBLE tone controls, click-stop volume controls are employed, which provide high accuracy for flat frequency characteristics at the middle point of control knobs. The output of the control amplifier is fed directly to the power amplifier.

5.3 Power Amp

The power amplifier stage consists of seven transistors for each channel. It is composed of the thruout direct coupled circuit with differential amplifier.

The signal from the control amplifier ass'y is fed to one base in the differential amplifier. The AC and DC negative feedback from the output junction is fed to another base in the differential amplifier so that overall stability is improved.

The differential amplifier output connects directly with the pre-driver base and amplifier. The signal from the pre-driver is amplified by the driver and the power output stage, and fed to the speaker terminals through the SPEAKER switch in switch circuit-A ass'y.

Temperature compensation in the power amp ass'y is accomplished by a three-element varistor and the idle current adjustment by a semi-fixed variable resistor connected in series to the varistor.

Power transistor protection is accomplished by the fuse installed in series at the B-power circuit.

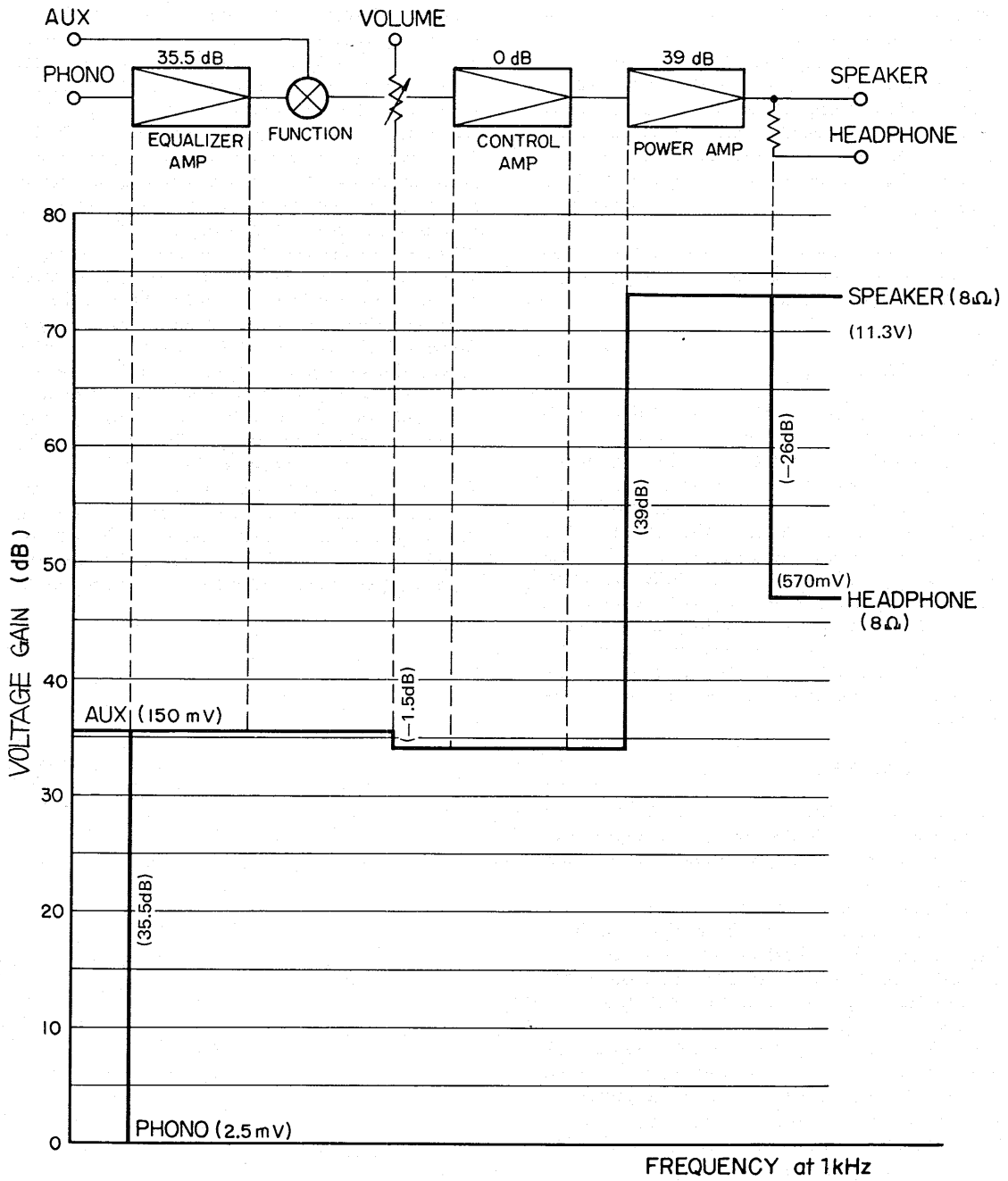
5.4 Power Supply

A full-wave rectifier circuits supply all DC power. The rectified DC, with the ripple component eliminated by means of a $4,700\mu\text{F}$ capacitor, is supplied for the output circuitry of the power amplifier circuit, and through CR filters for the other stages. The muting circuit eliminates the unpleasant noise usually heard when the power switch is turned ON or OFF. When the power switch is turned on, the first-stage transistor Q1 in the power supply circuit is cut off immediately by the reverse bias caused by a diode associated with the base.

When the power switch is turned off, the negative bias which has kept the first-stage transistor cut off is turned over to positive bias, and current entering the driver-stage in the power amplifier makes the second-stage transistor base connect to ground, the transistor cuts off the bias current entering the driver-stage in the power amplifier ass'y. Thus the amplifier stops working and unpleasant noise is eliminated.

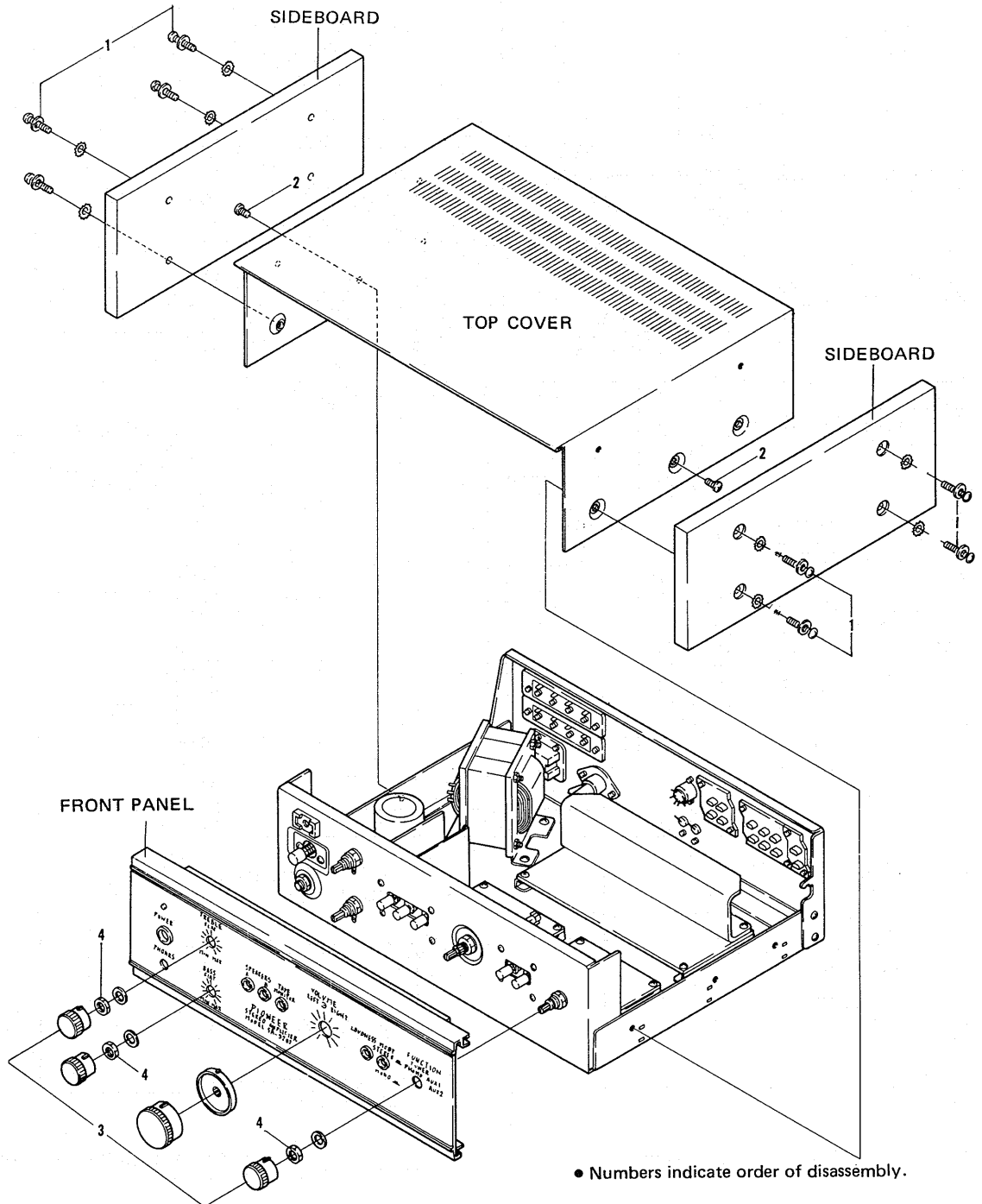
A diode connected between the base and the emitter of the second-stage transistor permits discharge of the current charge in the power amplifier ass'y when the second-stage transistor is cut off (when the power switch is turned off).

6. LEVEL DIAGRAM

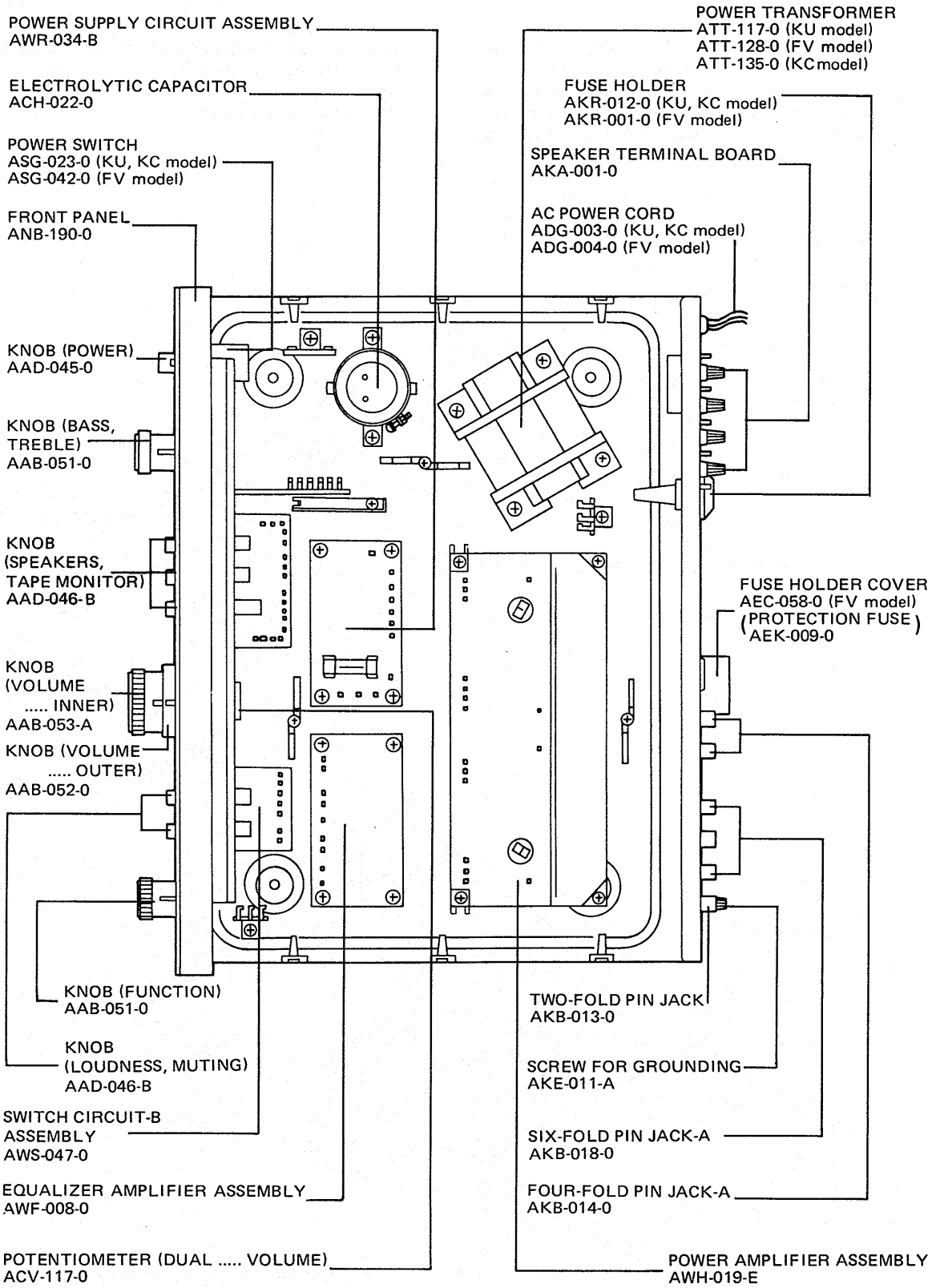


7. DISASSEMBLY

1. Unscrew the four screws which fasten the sideboards on both sides of the top cover.
2. Remove the top cover after unscrewing the two screws on each side of the top cover.
3. Remove all knobs except the push-button.
4. Unscrew the hexagonal nuts which fasten the shafts of FUNCTION, BASS, and TREBLE. Remove the front panel.



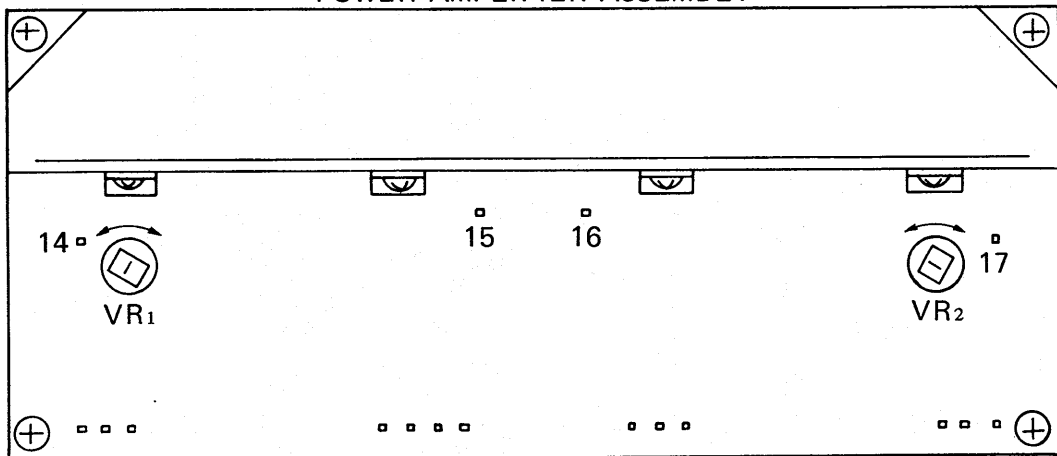
8. PARTS LOCATION



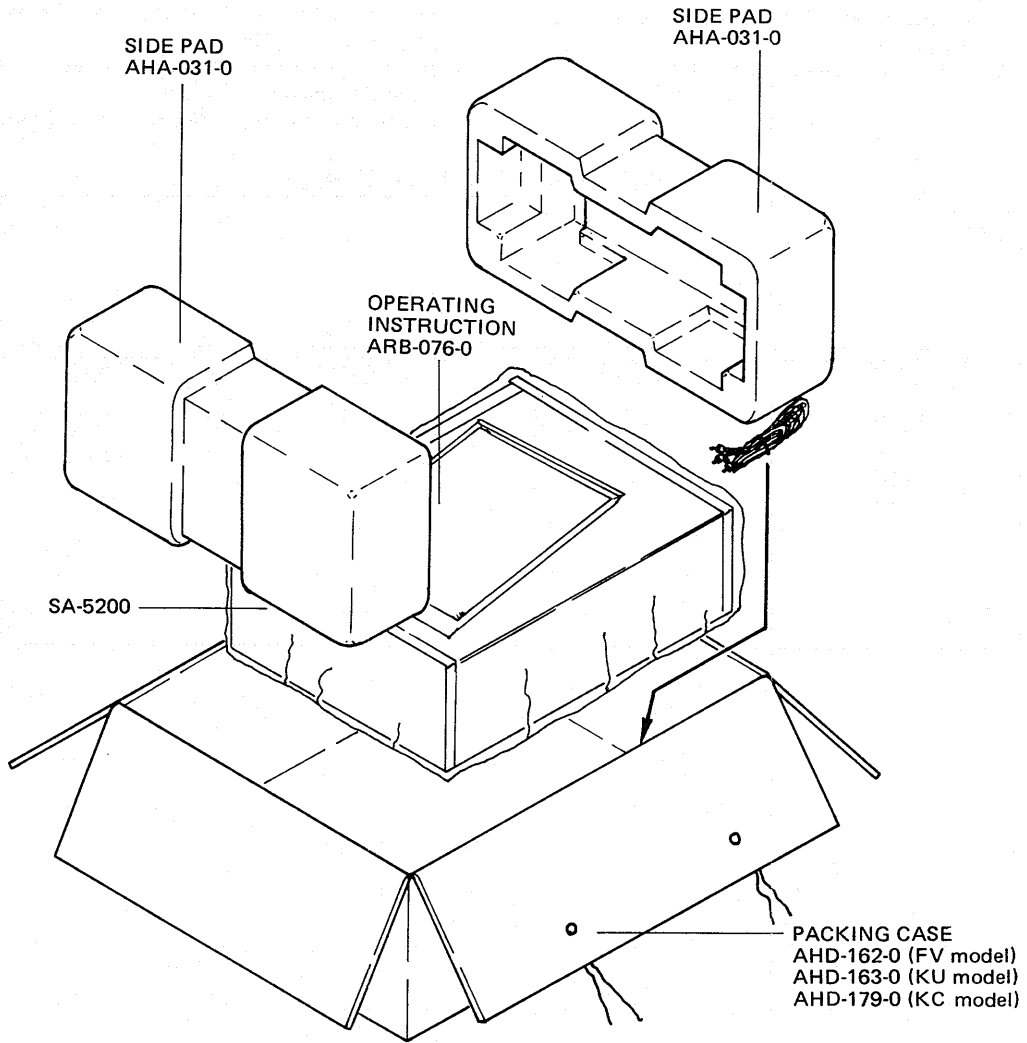
9. IDLE CURRENT ADJUSTMENT

1. Remove the top cover. (Refer to page 13.)
2. Connect 8Ω non-inductive resistor to the speaker terminals without connecting the input.
3. Turn on the power and check that the proper voltage is being fed to the individual circuit boards.
(For the voltage, refer to page 23)
4. Leave the power on for ten minutes, then connect the voltmeter between terminals 14 and 15 of the power amplifier ass'y. Adjust VR1 so that the voltmeter reads 30mV.
5. Adjust VR2 so that the voltmeter reads the voltage between 16 and 17 of the power amplifier ass'y 30mV.
6. After adjustment, disconnect 8Ω resistor from the speaker terminals.
Reassemble the top cover and the sideboards.

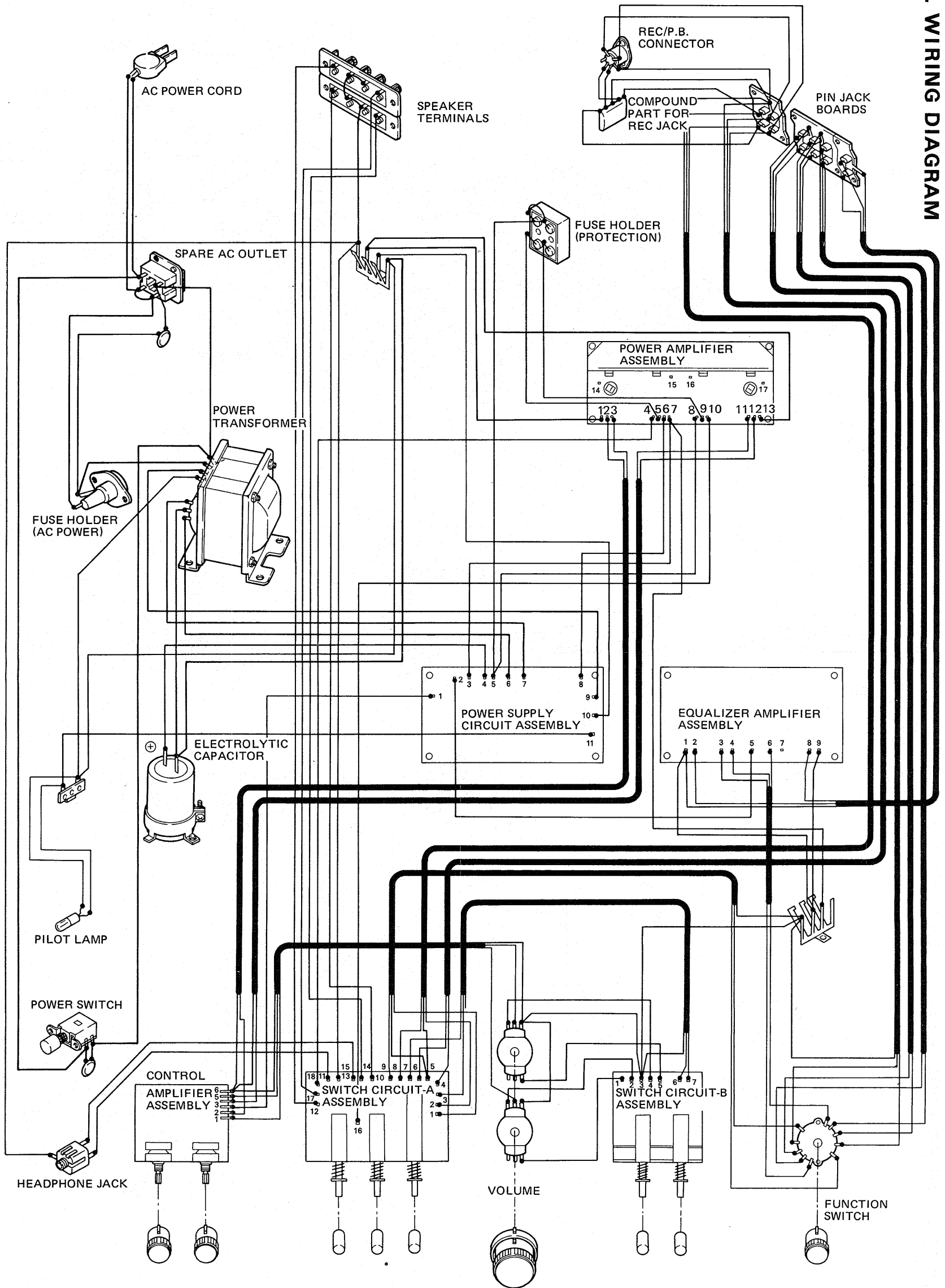
POWER AMPLIFIER ASSEMBLY



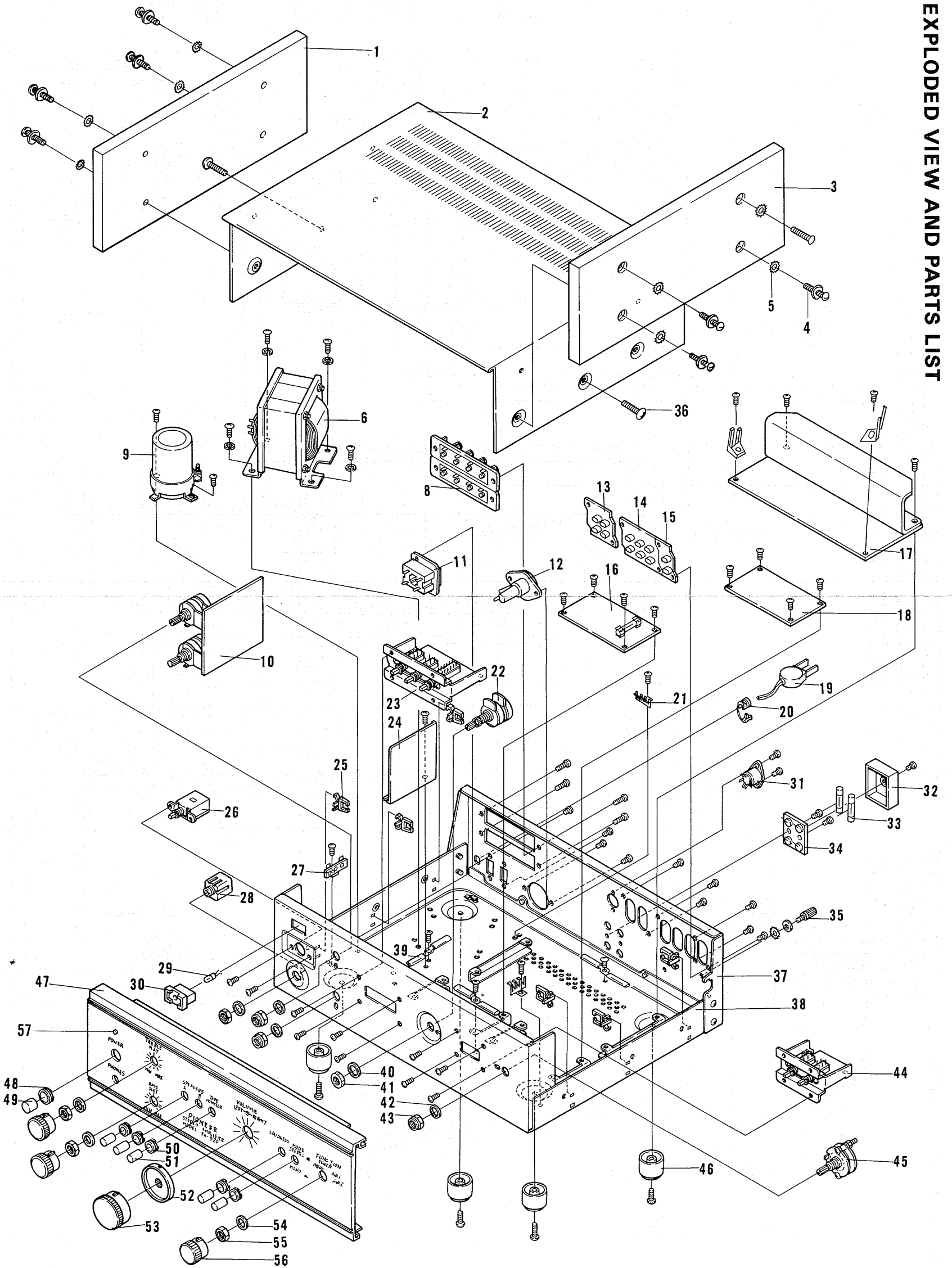
10. PACKING METHOD AND PART NUMBERS



11. WIRING DIAGRAM



12. EXPLODED VIEW AND PARTS LIST



NOTICE:

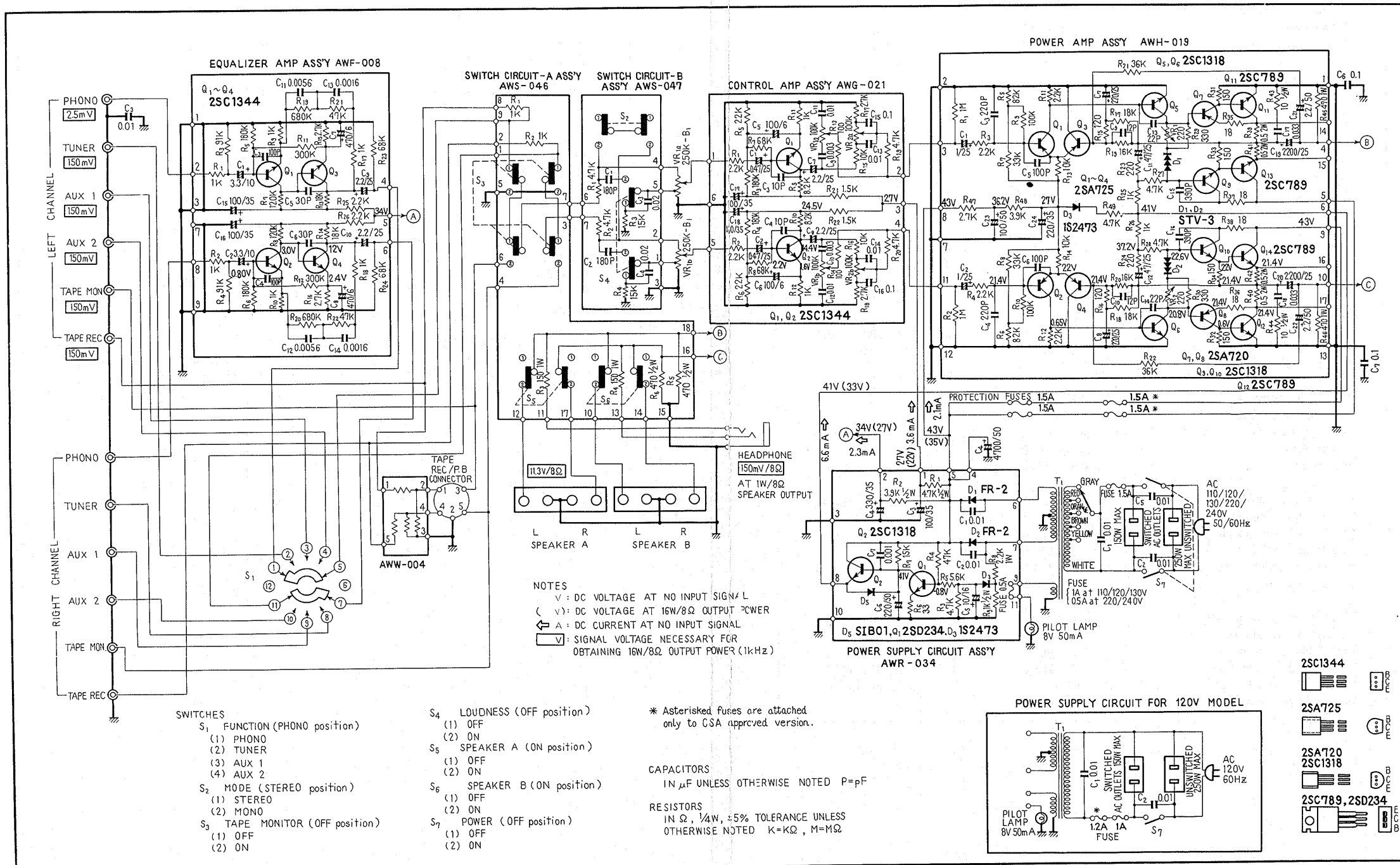
Any parts asterisked are subject to being not supplied.

Key No.	Description	Part No.	
1	Side board-L	AMS-003-A	
2	Metal cover	ANE-024-0	
3	Side board-R	AMS-004-A	
4	Sideboard fixing screw	ABA-013-0	
5	Washer	B21-011-0	
6	Power transformer	ATT-127-0	KU model
	Power transformer	ATT-128-0	FV model
	Power transformer	ATT-135-0	KC model
7			
8	Speaker terminal board	AKA-001-0	
9	Electrolytic capacitor 4,700 μ F 50V	ACH-022-0	
10	Control amplifier assembly	AWG-021-0	
11	Spare AC outlet	AKP-002-0	KU, KC model
	Spare AC outlet (Dual)	AKP-004-0	FV model
12	Fuse holder (AC power)	AKR-012-0	KU, KC model
	Fuse holder (AC power)	AKR-001-0	FV model
13	Four-fold pin jack-A	AKB-014-0	
14	Six-fold pin jack-A	AKB-018-0	
15	Two-fold pin jack	AKB-013-0	
16	Power supply circuit assembly	AWR-034-B	
17	Power amplifier assembly	AWH-019-E	
18	Equalizer amplifier assembly	AWF-008-0	
19	AC power cord	ADG-003-0	KU, KC model
	AC power cord	ADG-004-0	FV model
20	AC cord stopper	AEC-079-0	
21	4P strip lug terminal	K13-047-0	
22	Volume control (250k-B ₁)	ACV-117-0	
23	Switch circuit-A assembly	AWS-046-0	
24*	Shield plate	ANH-147-0	
25*	Wire clip-S	AEC-037-0	
26	Power switch (push-button type)	ASG-023-0	KU, KC model
	Power switch (push-button type)	ASG-042-0	FV model
27	1L2P strip lug terminal	AKC-015-0	
28	Headphone jack	K72-026-0	
29	Pilot lamp (power indicator)	AEL-007-0	
30	Grommet (rubber)	AEB-034-0	
31	5P connector socket (DIN-type)	K93-003-B	
32	Fuse holder (protection) cover	AEC-058-0	FV model
33	Fuse 1.5A (protection)	AEK-009-0	
34	Fuse holder (protection)	AKR-012-0	KU, KC model
	Fuse holder (protection)	AKR-011-0	FV model
35	Screw for grounding	AKE-011-A	

Key No.	Description	Part No.
36	Metal cover fixing screw	B11-034-0
37*	Rear panel	ANC-079-0
38*	Chassis	ANA-042-A
39*	Wire clammer	M46-027-0
40	Washer (11φ)	B22-009-0
41	Nut (11φ)	B71-005-0
42	Washer	B22-016-0
43	Special nut	ALA-006-A
44	Switch circuit-B assembly	AWS-047-0
45	Function switch (rotary type)	ASB-029-A
46	Foot	AEC-061-A
47	Front panel	ANB-191-0
48	Spacer (A)	AEC-095-0
49	Knob (POWER)	AAD-045-0
50	Spacer (B)	AEC-096-0
51	Knob (SPEAKERS, MODE, TAPE MON., LOUDNESS)	AAD-046-B
52	Knob (VOLUME outer)	AAB-052-0
53	Knob (VOLUME inner)	AAB-053-A
54	Washer	B22-016-0
55	Nut (9φ)	B71-004-0
56	Knob (FUNCTION, BASS, TREBLE)	AAB-051-0
57	Lens (power indicator)	AEC-097-A

13. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS

13.1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



Miscellaneous Parts List

- CAPACITORS: IN μ F UNLESS OTHERWISE NOTED p:pF
- RESISTORS: IN Ω , $\frac{1}{4}$ W UNLESS OTHERWISE NOTED k:k Ω M:M Ω

CAPACITORS

Symbol	Description	Part No.	
C1	Metallized mylar 0.01 800V	ACE-002-0	KU model
	Ceramic 0.01 150V	ACG-003-0	KC model
C2	Ceramic 0.01 DC 1.4kV	C43-003-0	FV model
	Ceramic 0.01 150V	ACG-002-0	KU, KC model
	Ceramic 0.01 DC 1.4kV	C43-003-0	FV model
C3	Ceramic 0.01 50V	CKDYF 103Z 50	
C4	Electrolytic 4,700 50V	ACH-022-0	
CF	Ceramic 0.01 DC1.4kV	C43-003-0	FV model
C6	Mylar 0.1 50V	CQMA 104K 50	
C7	Mylar 0.1 50V	CQMA 104K 50	

POTENTIOMETER

Symbol	Description	Part No.	
VR1	Volume control (250k-B1)	ACV-117-0	

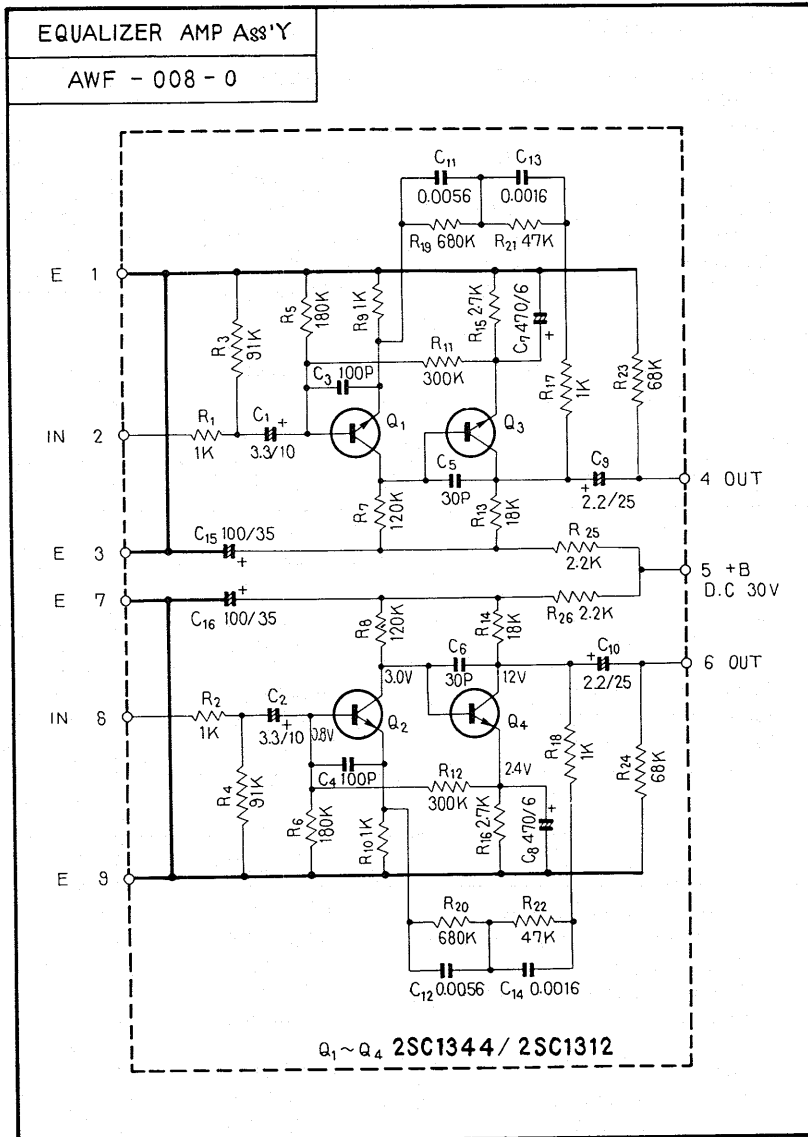
SWITCHES

Symbol	Description	Part No.	
S1	Function (Rotary type)	ASB-029-A	
S7	Power (Push-button type)	ASG-023-0	KU, KC model
	Power (Push-button type)	ASG-042-0	FV model

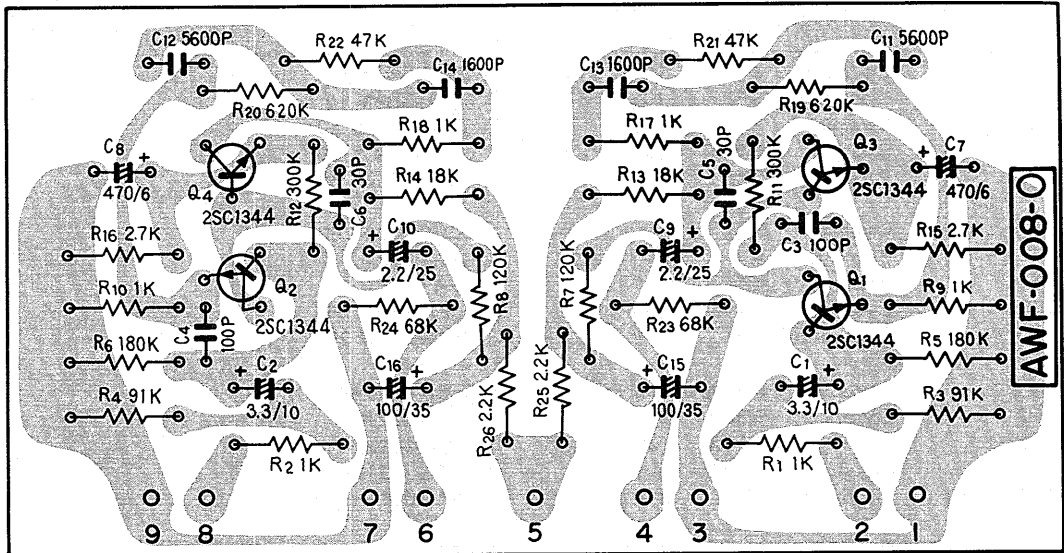
OTHERS

Symbol	Description	Part No.	
	Fuse 1A (AC power, protection)	E21-033-0	KU model
	Fuse 0.5A (AC power, protection)	AEK-016-0	FV model
	Fuse 0.5A (protection)	E21-028-0	KU model
	Compound part for REC jack	AWW-004-0	
	Operating instructions	ARB-076-0	
	Polyshing cloth	E33-009-B	
	Fuse 1A (AC power)	E21-034-A	FV model
	Cord with pin plug	ADE-005-0	
	Packingcase	AHD-163-0	KU model
	Packing case	AHD-162-0	FV model
	Packing case	AHD-179-0	KC model
	Side pad	AHA-031-0	
	Soft sheet-C	H12-113-0	
	Vinyl bag	AHG-009-0	

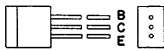
13.2 EQUALIZER AMPLIFIER ASSEMBLY (AWF-008-0)



FOIL SIDE



2SC1344



2SC1312



EQUALIZER AMPLIFIER ASSEMBLY

Parts List of Equalizer Amplifier Assembly (AWF-008-0)

CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 3.3 10V	CSZA 3R3M 10
C2	Electrolytic 3.3 10V	CSZA 3R3M 10
C3	Ceramic 100p 50V	CCDSL 101K 50
C4	Ceramic 100p 50V	CCDSL 101K 50
C5	Ceramic 30p 50V	CCDSL 300K 50
C6	Ceramic 30p 50V	CCDSL 300K 50
C7	Electrolytic 470 6V	CEA 471P 6
C8	Electrolytic 470 6V	CEA 471P 6
C9	Electrolytic 2.2 25V	CSZA 2R2M 25
C10	Electrolytic 2.2 25V	CSZA 2R2M 25
C11	Styrol 5,600p 50V	CQSA 562J 50
C12	Styrol 5,600p 50V	CQSA 562J 50
C13	Styrol 1,600p 50V	CQSA 162J 50
C14	Styrol 1,600p 50V	CQSA 162J 50
C15	Electrolytic 100 35V	CEA 101P 35
C16	Electrolytic 100 35V	CEA 101P 35

RESISTORS

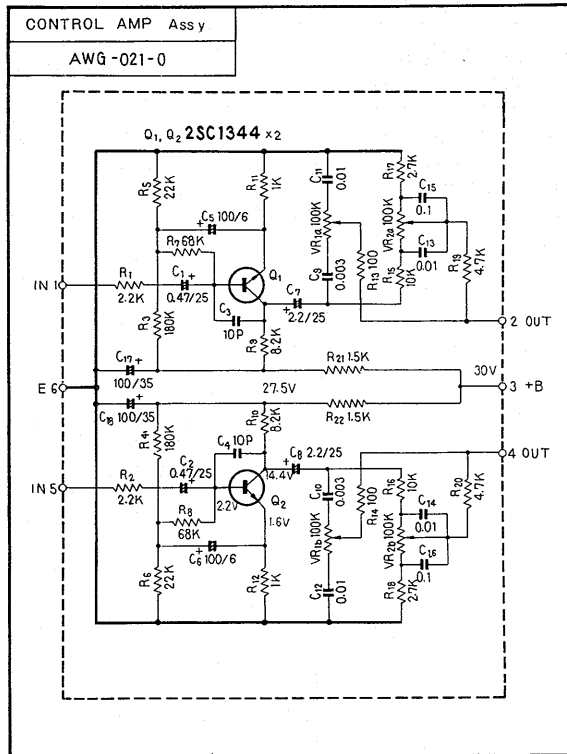
Symbol	Description	Part No.
R1	Carbon film 1k	RD¼PM 102J
R2	Carbon film 1k	RD¼PM 102J
R3	Carbon film 91k	RD¼PM 913J
R4	Carbon film 91k	RD¼PM 913J
R5	Carbon film 180k	RD¼PM 184J
R6	Carbon film 180k	RD¼PM 184J
R7	Carbon film 120k	RD¼PM 124J
R8	Carbon film 120k	RD¼PM 124J
R9	Carbon film 1k	RD¼PM 102J
R10	Carbon film 1k	RD¼PM 102J
R11	Carbon film 300k	RD¼PM 304J
R12	Carbon film 300k	RD¼PM 304J
R13	Carbon film 18k	RD¼PM 183J
R14	Carbon film 18k	RD¼PM 183J
R15	Carbon film 2.7k	RD¼PM 272J
R16	Carbon film 2.7k	RD¼PM 272J
R17	Carbon film 1k	RD¼PM 102J
R18	Carbon film 1k	RD¼PM 102J
R19	Carbon film 680k	RD¼PM 684J
R20	Carbon film 680k	RD¼PM 684J
R21	Carbon film 47k	RD¼PM 473J
R22	Carbon film 47k	RD¼PM 473J
R23	Carbon film 68k	RD¼PM 683J
R24	Carbon film 68k	RD¼PM 683J
R25	Carbon film 2.2k	RD¼PM 222J
R26	Carbon film 2.2k	RD¼PM 222J

EQUALIZER AMPLIFIER ASSEMBLY

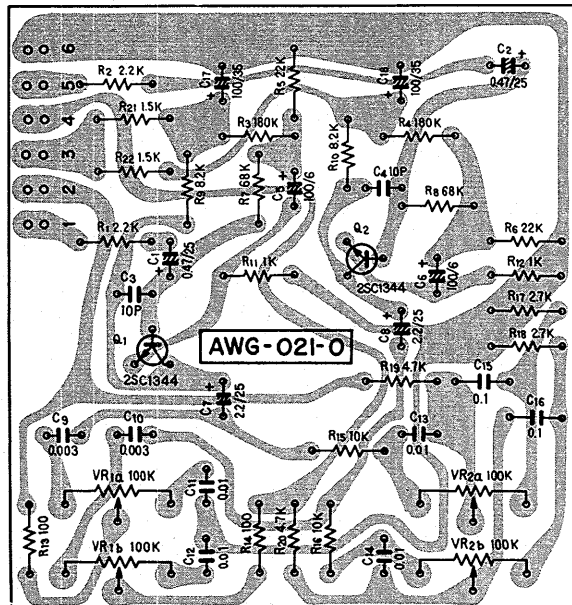
SEMICONDUCTORS

Symbol	Description	Part No.	
Q1	Transistor 2SC1344-E or F (or 2SC1312-G, F)		
Q2	Transistor 2SC1344-E or F (or 2SC1312-G, F)		
Q3	Transistor 2SC1344-E or F (or 2SC1312-G, F)		
Q4	Transistor 2SC1344-E or F (or 2SC1312-G, F)		

13.3 CONTROL AMPLIFIER ASSEMBLY (AWG-021-0)



FOIL SIDE



Parts List of Control Amplifier Assembly (AWG-021-0)

CAPACITORS

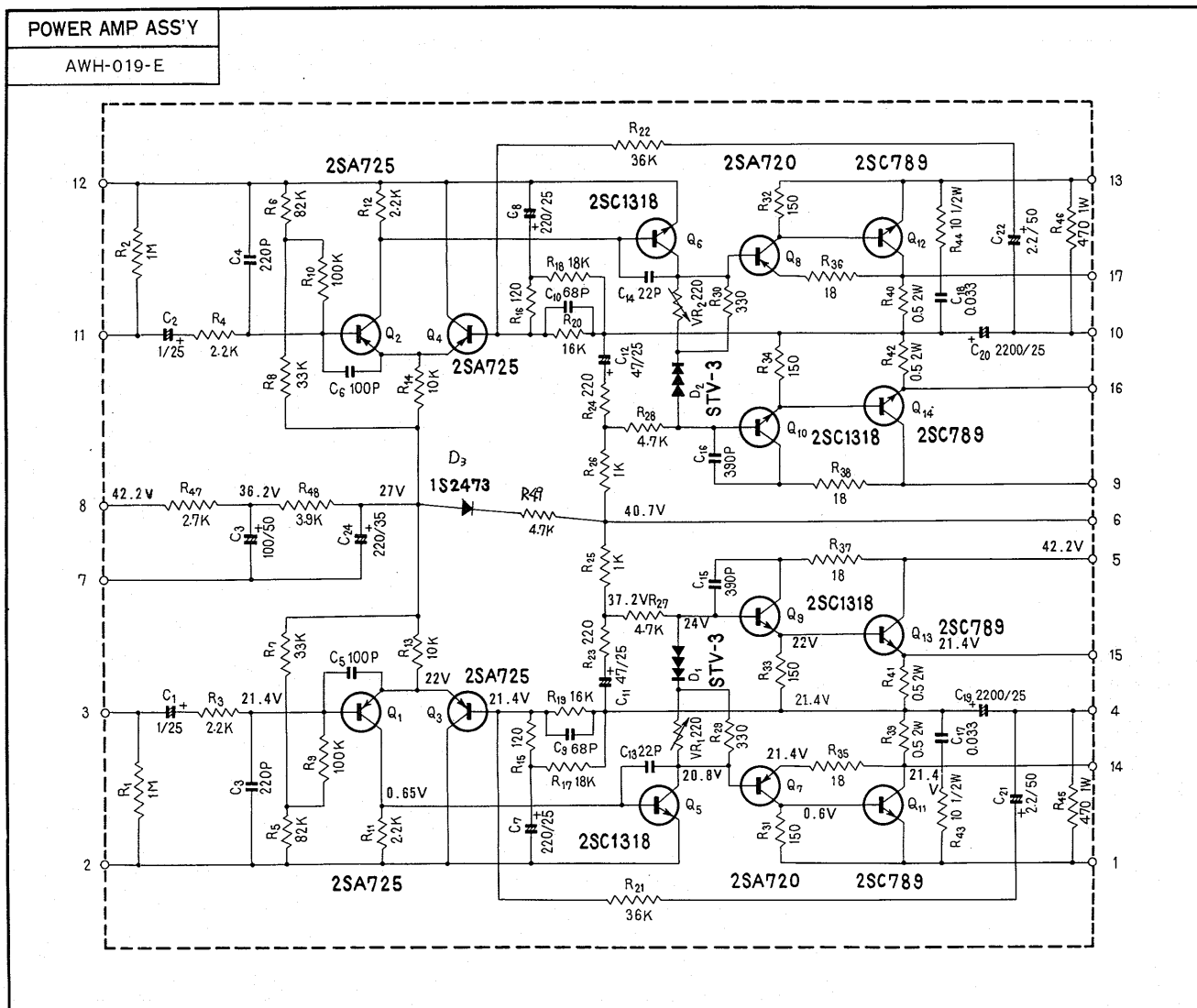
Symbol	Description	Part No.
C1	Electrolytic 0.47 25V	CSSA R47M 25
C2	Electrolytic 0.47 25V	CSSA R47M 25
C3	Ceramic 10p 50V	CCDSL 100K 50
C4	Ceramic 10p 50V	CCDSL 100K 50
C5	Electrolytic 100 6V	CEA 101P 6
C6	Electrolytic 100 6V	CEA 101P 6
C7	Electrolytic 2.2 25V	CSSA 2R2M 25
C8	Electrolytic 2.2 25V	CSSA 2R2M 25
C9	Mylar 0.003 50V	QOMA 302J 50
C10	Mylar 0.003 50V	QOMA 302J 50
C11	Mylar 0.01 50V	QOMA 103J 50
C12	Mylar 0.01 50V	QOMA 103J 50
C13	Mylar 0.01 50V	QOMA 103J 50
C14	Mylar 0.01 50V	QOMA 103J 50
C15	Mylar 0.1 50V	QOMA 104J 50
C16	Mylar 0.1 50V	QOMA 104J 50
C17	Electrolytic 100 35V	CEA 101P 35
C18	Electrolytic 100 35V	CEA 101P 35

RESISTORS

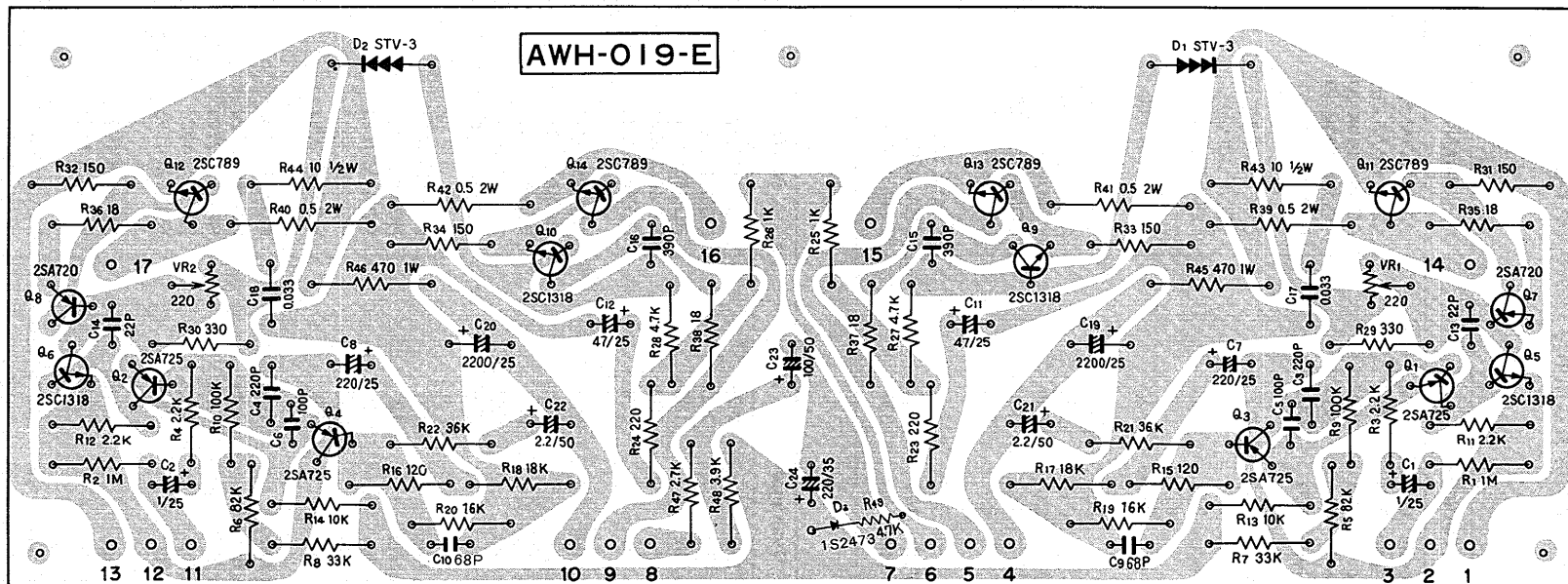
Symbol	Description	Part No.
R1	Carbon film 2.2k	RD½PM 222J
R2	Carbon film 2.2k	RD½PM 222J
R3	Carbon film 180k	RD½PM 184J
R4	Carbon film 180k	RD½PM 184J
R5	Carbon film 22k	RD½PM 223J
R6	Carbon film 22k	RD½PM 223J
R7	Carbon film 68k	RD½PM 683J
R8	Carbon film 68k	RD½PM 683J
R9	Carbon film 8.2k	RD½PM 822J
R10	Carbon film 8.2k	RD½PM 822J
R11	Carbon film 1k	RD½PM 102J
R12	Carbon film 1k	RD½PM 102J
R13	Carbon film 100	RD½PM 101J
R14	Carbon film 100	RD½PM 101J
R15	Carbon film 10k	RD½PM 103J
R16	Carbon film 10k	RD½PM 103J
R17	Carbon film 2.7k	RD½PM 272J
R18	Carbon film 2.7k	RD½PM 272J
R19	Carbon film 4.7k	RD½PM 472J
R20	Carbon film 4.7k	RD½PM 472J
R21	Carbon film 1.5k	RD½PM 152J
R22	Carbon film 1.5k	RD½PM 152J
VR1	Potentiometer, dual (100k-A2)	ACV-118-0
VR2	Potentiometer, dual (100k-A2)	ACV-118-0

SEMICONDUCTORS

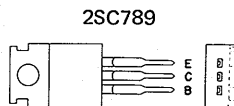
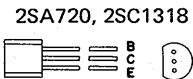
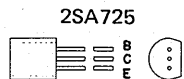
Symbol	Description	Part No.	
Q1	Transistor 2SC1344-F or E (or 2SC1312-F, G)		
Q2	Transistor 2SC1344-F or E (or 2SC1312-F, G)		



FOIL SIDE



POWER AMPLIFIER ASSEMBLY



Parts List of Power Amplifier Assembly (AWH-019-E)

CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 1 25V	CSSA 010X 25
C2	Electrolytic 1 25V	CSSA 010X 25
C3	Ceramic 220p 50V	CCDSL 221K 50
C4	Ceramic 220p 50V	CCDSL 221K 50
C5	Ceramic 100p 50V	CCDSL 101K 50
C6	Ceramic 100p 50V	CCDSL 101K 50
C7	Electrolytic 220 25V	CEA 221P 25
C8	Electrolytic 220 25V	CEA 221P 25
C9	Ceramic 12p 50V	CCDSL 120K 50
C10	Ceramic 12p 50V	CCDSL 120K 50
C11	Electrolytic 47 25V	CEA 470P 25
C12	Electrolytic 47 25V	CEA 470P 25
C13	Ceramic 22p 50V	CCDSL 220K 50
C14	Ceramic 22p 50V	CCDSL 220K 50
C15	Ceramic 390p 50V	CKDYB 391K 50
C16	Ceramic 390p 50V	CKDYB 391K 50
C17	Mylar 0.033 50V	QOMA 333K 50
C18	Mylar 0.033 50V	QOMA 333K 50
C19	Electrolytic 2,200 25V	CEA 222P 25
C20	Electrolytic 2,200 25V	CEA 222P 25
C21	Electrolytic 2.2 50V	CEA 2R2P 50
C22	Electrolytic 2.2 50V	CEA 2R2P 50
C23	Electrolytic 100 50V	CEA 101P 50
C24	Electrolytic 220 35V	CEA 221P 35

SEMICONDUCTORS

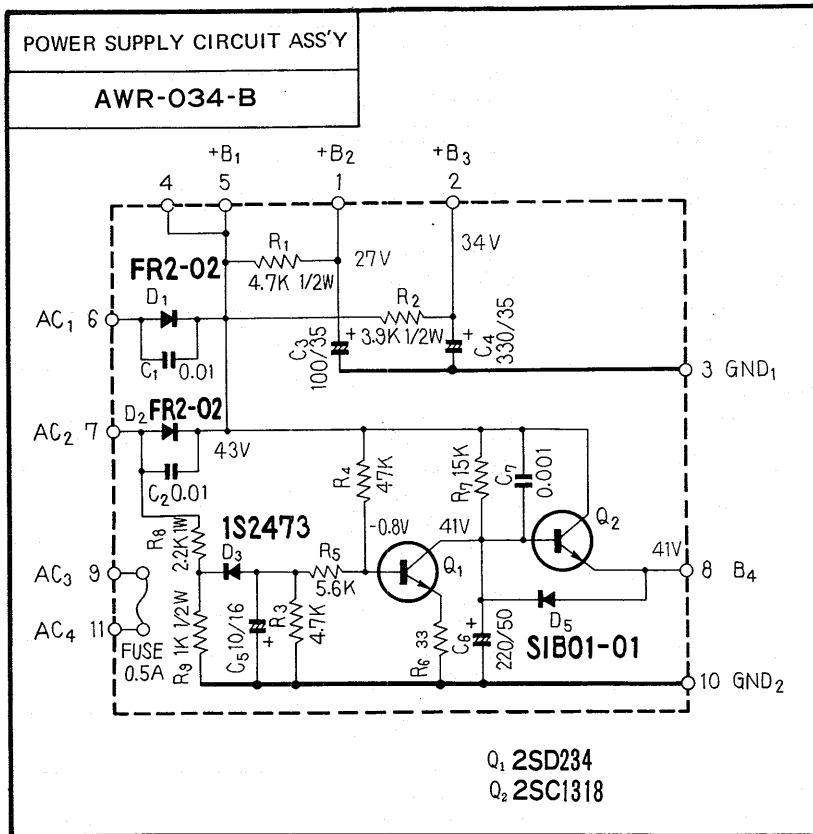
Symbol	Description	Part No.
Q1	Transistor 2SA725-FW or F, G	
Q2	Transistor 2SA725-FW or F, G	
Q3	Transistor 2SA725-FW or F, G	
Q4	Transistor 2SA725-FW or F, G	
Q5	Transistor 2SC1318-R or Q	
Q6	Transistor 2SC1318-R or Q	
Q7	Transistor 2SA720-R or Q	
Q8	Transistor 2SA720-R or Q	
Q9	Transistor 2SC1318-R or Q	
Q10	Transistor 2SC1318-R or Q	
Q11	Transistor 2SC789-R or O	
Q12	Transistor 2SC789-R or O	
Q13	Transistor 2SC789-R or O	
Q14	Transistor 2SC789-R or O	
D1	Varistor STV-3-G	
D2	Varistor STV-3-G	
D3	Diode 1S2473	

RESISTORS

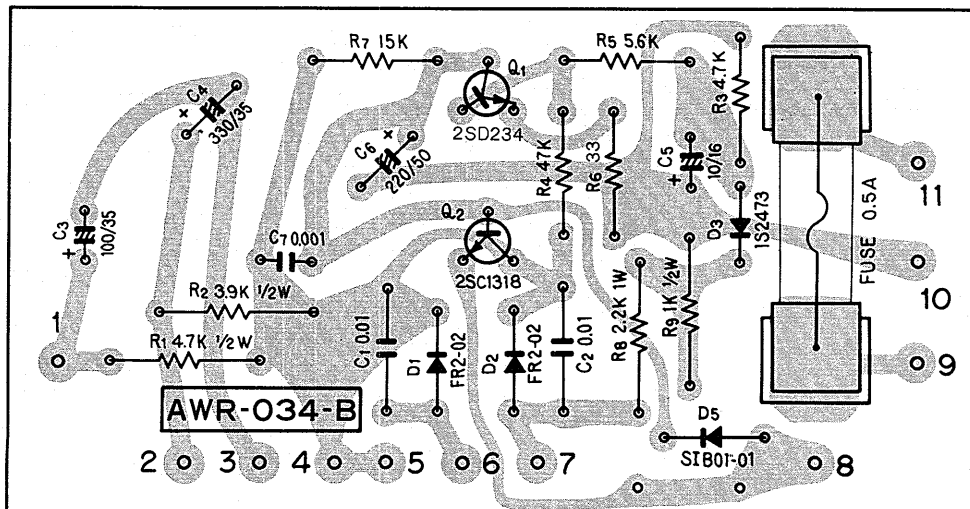
Symbol	Description	Part No.
R1	Carbon film 1M	RD¼PS 105J
R2	Carbon film 1M	RD¼PS 105J
R3	Carbon film 2.2k	RD¼PS 222J
R4	Carbon film 2.2k	RD¼PS 222J
R5	Carbon film 82k	RD¼PS 823J
R6	Carbon film 82k	RD¼PS 823J
R7	Carbon film 33k	RD¼PS 333J
R8	Carbon film 33k	RD¼PS 333J
R9	Carbon film 100k	RD¼PS 104J
R10	Carbon film 100k	RD¼PS 104J
R11	Carbon film 2.2k	RD¼PS 222J
R12	Carbon film 2.2k	RD¼PS 222J
R13	Carbon film 10k	RD¼PS 103J
R14	Carbon film 10k	RD¼PS 103J
R15	Carbon film 120	RD¼PS 121J
R16	Carbon film 120	RD¼PS 121J
R17	Carbon film 18k	RD¼PS 183J
R18	Carbon film 18k	RD¼PS 183J
R19	Carbon film 16k	RD¼PS 163J
R20	Carbon film 16k	RD¼PS 163J
R21	Carbon film 36k	RD¼PS 363J
R22	Carbon film 36k	RD¼PS 363J
R23	Carbon film 220	RD¼PS 221J
R24	Carbon film 220	RD¼PS 221J
R25	Carbon film 1k	RD¼PS 102J
R26	Carbon film 1k	RD¼PS 102J
R27	Carbon film 4.7k	RD¼PS 472J
R28	Carbon film 4.7k	RD¼PS 472J
R29	Carbon film 330	RD¼PS 331J
R30	Carbon film 330	RD¼PS 331J
R31	Carbon film 150	RD¼PS 151J
R32	Carbon film 150	RD¼PS 151J
R33	Carbon film 150	RD¼PS 151J
R34	Carbon film 150	RD¼PS 151J
R35	Carbon film 18	RD¼PS 180J
R36	Carbon film 18	RD¼PS 180J
R37	Carbon film 18	RD¼PS 180J
R38	Carbon film 18	RD¼PS 180J
R39	Metal film 0.5 2W	RN2H 0R5K
R40	Metal film 0.5 2W	RN2H 0R5K
R41	Metal film 0.5 2W	RN2H 0R5K
R42	Metal film 0.5 2W	RN2H 0R5K
R43	Carbon film 10 ¼W	RD¼PS 100J
R44	Carbon film 10 ¼W	RD¼PS 100J
R45	Metal oxide 470 1W	RS1P 471K
R46	Metal oxide 470 1W	RS1P 471K
R47	Carbon film 2.7k	RD¼PS 272J
R48	Carbon film 3.9k	RD¼PS 392J
R49	Carbon film 4.7k	RD¼PS 472J
VR1	Semi-fixed (220-B)	C92-060-0
VR2	Semi-fixed (220-B)	C92-060-0

CONTROL APPLICATOR ASSEMBLY

13.5 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-034-B)



FOIL SIDE



Parts List of Power Supply Circuit Assembly (AWR-034-B)

CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 0.01 150V	ACG-004-0
C2	Ceramic 0.01 150V	ACG-004-0
C3	Ceramic 100 35V	CEA 101P 35
C4	Ceramic 330 35V	CEA 331P 35
C5	Ceramic 10 16V	CEA 100P 16
C6	Electrolytic 220 50V	CEA 221P 50
C7	Mylar 0.001 50V	CQMA 102M 50

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 4.7k 1/4W	RD1/4PS 472J
R2	Carbon film 3.9k 1/4W	RD1/4PS 392J
R3	Carbon film 4.7k	RD1/4PS 472J
R4	Carbon film 47k	RD1/4PS 473J
R5	Carbon film 5.6k	RD1/4PS 562J
R6	Carbon film 33	RD1/4PS 330J
R7	Carbon film 15k	RD1/4PS 153J
R8	Metal oxide 2.2k 1W	RS1P 222J
R9	Carbon film 1k 1/4W	RS1/2PS 102J

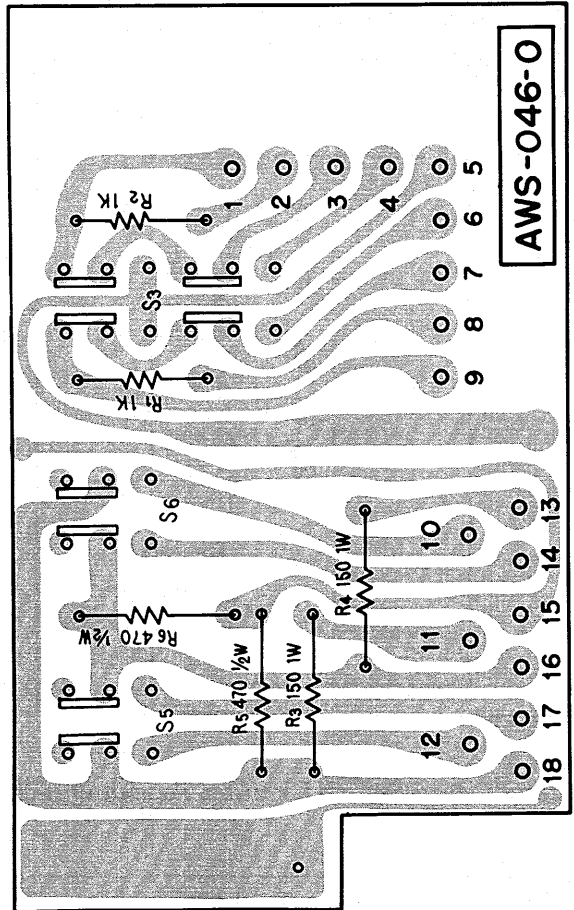
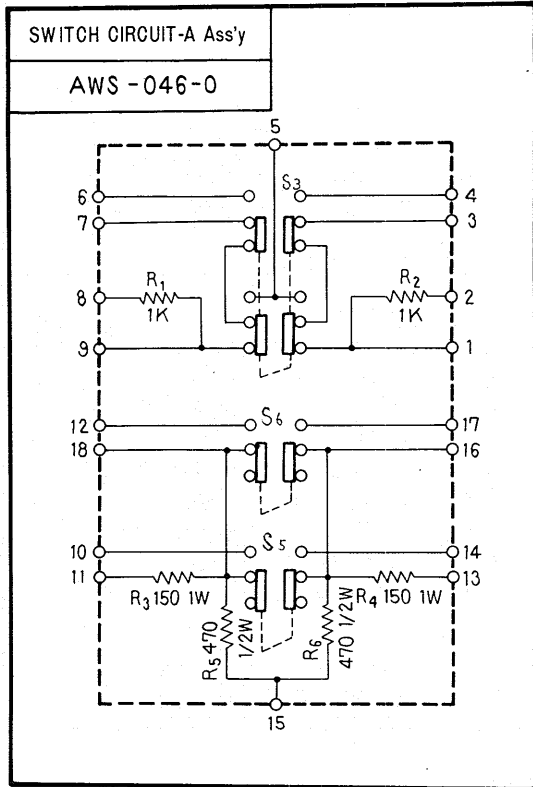
SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor 2SD234 or 2SC1061	
Q2	Transistor 2SC1318-R or Q	
D1	Diode FR2-02	
D2	Diode FR2-02	
D3	Diode 1S2473	
D5	Diode SIB01-01	

OTHER

Symbol	Description	Part No.
	Protection fuse holder	K91-006-0

13.6 SWITCH CIRCUIT-A ASSEMBLY (AWS-046-0)



Parts List of Switch Circuit-A Assembly (AWS-046-0)

RESISTORS

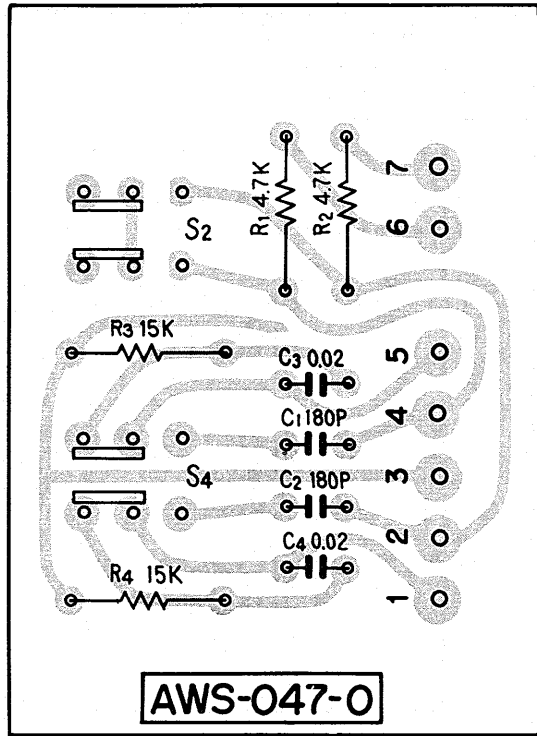
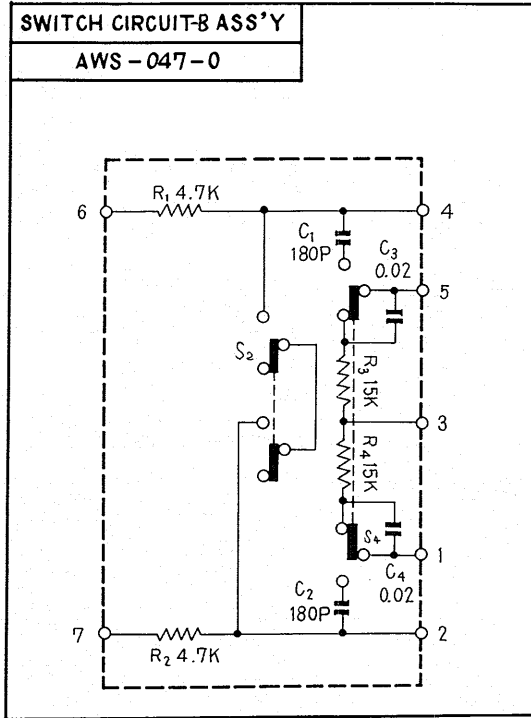
Symbol	Description	Part No.
R1	Carbon film 1k	RD½PS 102J
R2	Carbon film 1k	RD½PS 102J
R3	Metal oxide 150 1W	RS1P 151J
R4	Metal oxide 150 1W	RS1P 151J
R5	Carbon film 470 ½W	RD½PS 471J
R6	Carbon film 470 ½W	RD½PS 471J

SWITCH

Symbol	Description	Part No.
	Push switch	ASG-041-0

13.7 SWITCH CIRCUIT-B ASSEMBLY (AWS-047-0)

FOIL SIDE



Parts List of Switch Circuit-B Assembly (AWS-047-0)

CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 180p 50V	CCDSL 181K 50
C2	Ceramic 180p 50V	CCDSL 181K 50
C3	Mylar 0.02 50V	COMA 203K 50
C4	Mylar 0.02 50V	COMA 203K 50

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 4.7k	RD½PS 472J
R2	Carbon film 4.7k	RD½PS 472J
R3	Carbon film 15k	RD½PS 153J
R4	Carbon film 15k	RD½PS 153J

SWITCH

Symbol	Description	Part No.
	Push switch	ASG-032-0

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