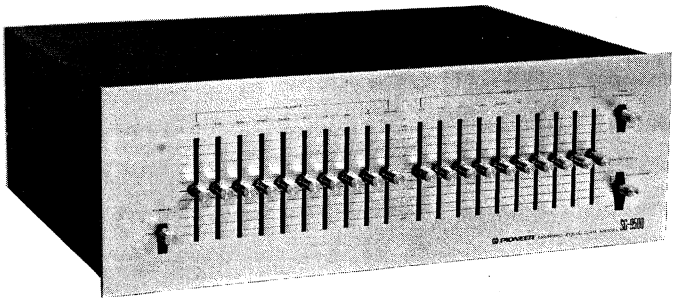
GRAPHIC EQUALIZER

SG-9500

KU

<ART-147-0>



PIONEER®

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1. SPECIFICATIONS

Semiconductors

ICs 14
FETs 2
Transistors 12
Diodes 15

Equalizer Section

Equalizer Range
(Individual channel adjust) ..... ±10dB,
32Hz, 64Hz, 125Hz, 250Hz, 500Hz,
1kHz, 2kHz, 4kHz, 8kHz, 16kHz

Total Harmonic Distortion
20Hz – 20kHz, All Control Flat Output 1V 0.04%
1kHz, All Control Max. Output 3V 0.04%
1kHz, All Control Flat Output 2V 0.03%
1kHz, All Control Min. Output 1V 0.05%
Insertion Loss ..... 0dB (Control Flat)
Max. Output Voltage
(1kHz, THD.: 0.05%, RL 47kΩ) 6V
Frequency Response ..... 5Hz – 70kHz ±1dB
Signal to Noise Ratio
(IHF, A Network, short circuited, 2V Output) 90dB
Input Impedance 100kΩ
Output Impedance 600Ω

Miscellaneous

Power Requirements 120V/60Hz
Power Consumption 16watts
Dimensions ..... 420(W) x 150(H) x 341(D)mm
16-1/2 x 5-7/8 x 13-7/16in
Weight 6.9kg, 15lb 3oz

Furnished Parts

Connection Cord with Pin Plugs 2
Operating Instructions 1

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

2. FRONT PANEL FACILITIES

LEFT AND RIGHT OCTAVE CONTROLS

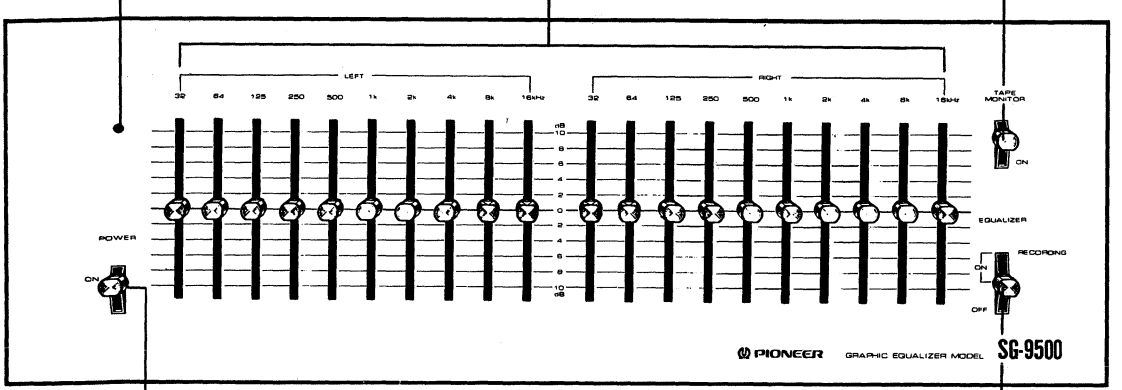
Each control provides continuous level variation of its indicated frequency from −10 dB to +10 dB. Each frequency segment becomes enhanced when its control is positioned above center (0) and attenuated when positioned below center. With all controls set to 0, the input signal is fed to the OUTPUT jacks unchanged.

PILOT LAMP

Lights when power is turned on.

TAPE MONITOR SWITCH

Set to ON to play tape or monitor recording conditions with a tape deck connected to the SG-9500. Normally set switch to OFF.



POWER SWITCH

Set to ON to energize the SG-9500. Sound will not be obtained immediately after switching on the power, due to the operation of the internal muting circuit. This does not signify a malfunction.

EQUALIZER SWITCH

OFF: Signal bypasses circuits and is not equalized.

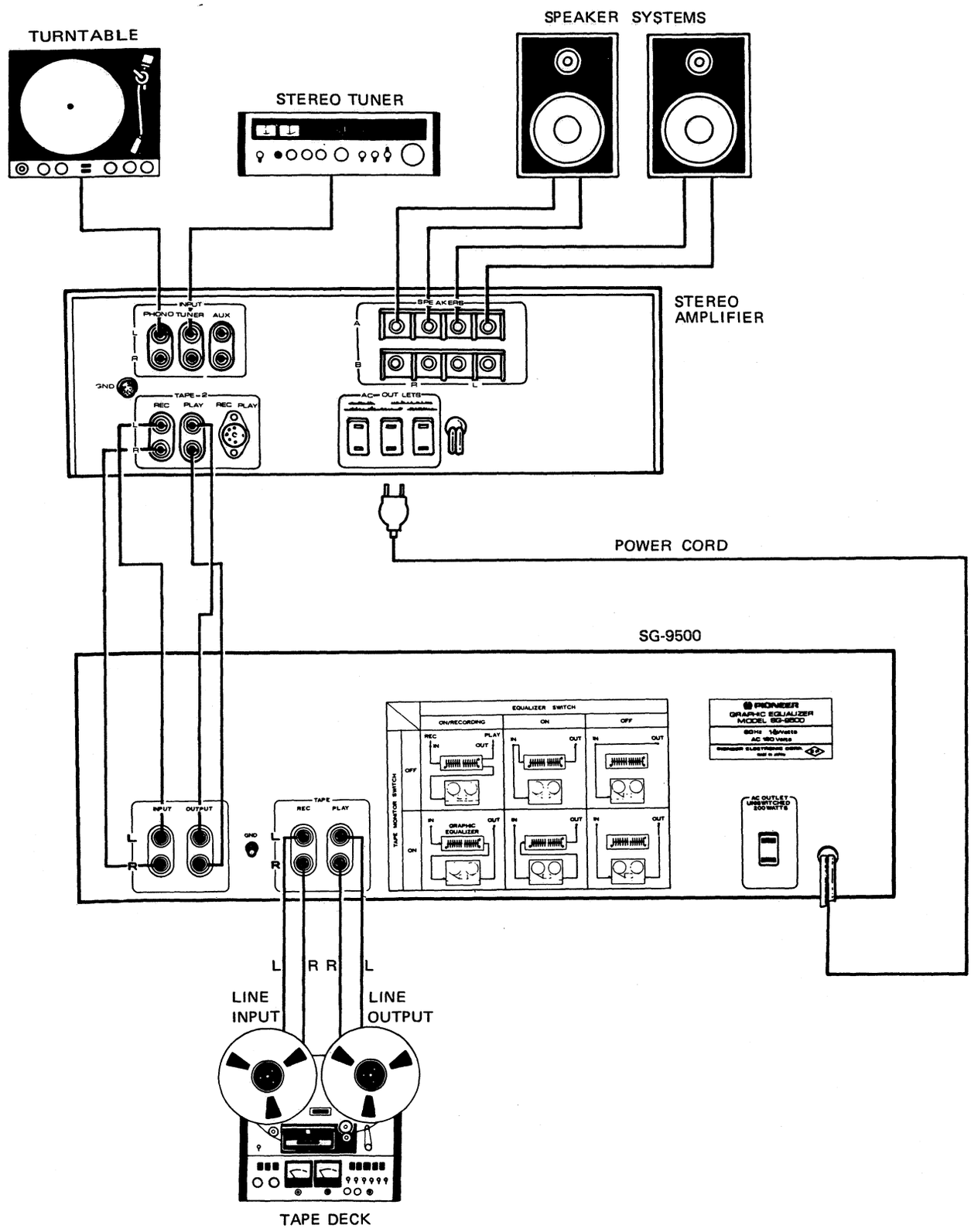
Note

In this condition the SG-9500 is not operational, and its POWER switch may be turned OFF if required.

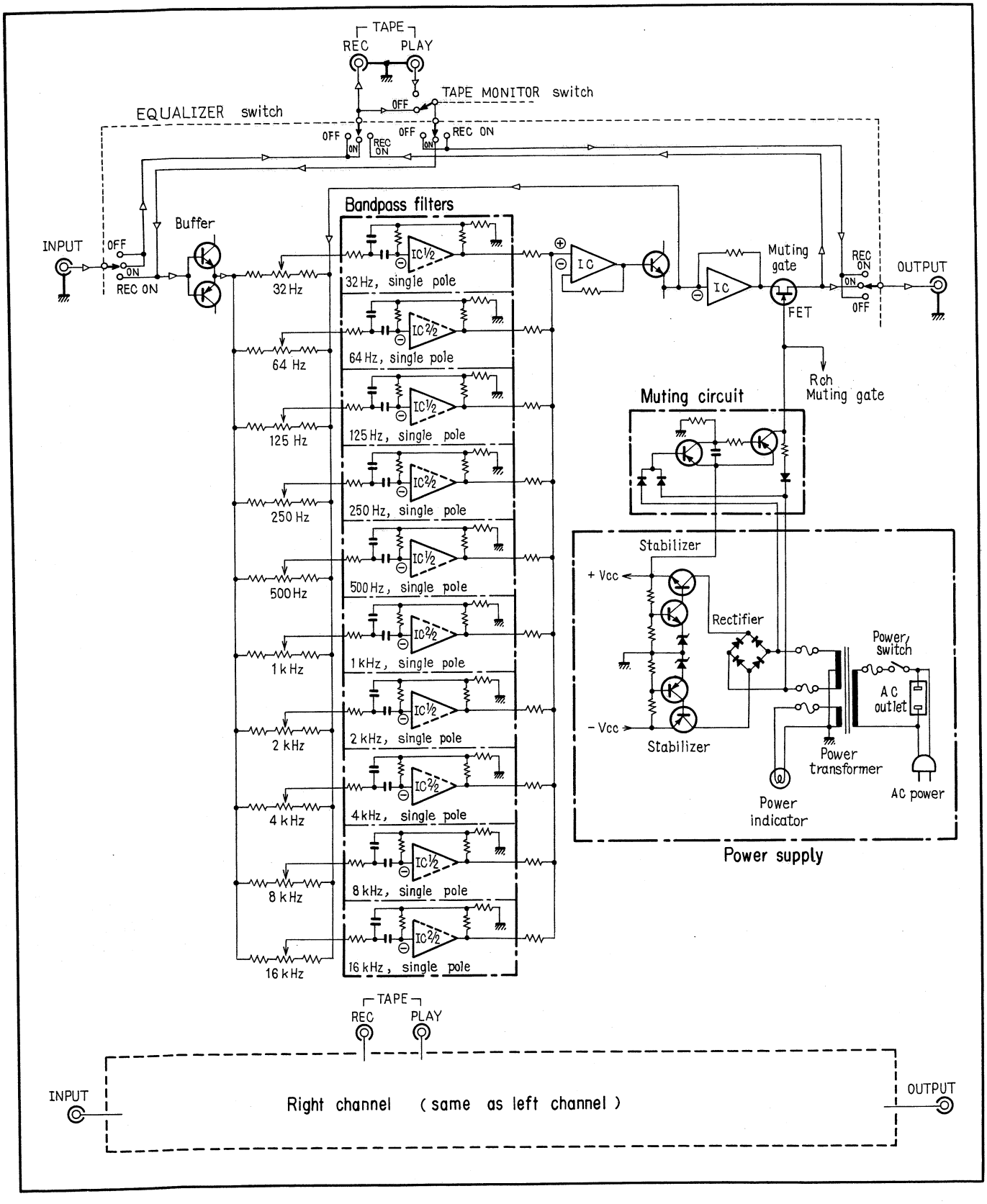
ON: For equalized playback of input signal.

ON/RECORDING: To record an equalized signal with a tape deck connected to SG-9500 TAPE jacks.

3. CONNECTION DIAGRAM



4. BLOCK DIAGRAM



5. CIRCUIT DESCRIPTIONS

5.1 EQ SECTION OPERATING DESCRIPTION

The basic construction of the EQ section is shown in Fig. 1, where BPF denotes a single pole bandpass active filter incorporating an operational amplifier*. The next stage also uses an operational amplifier to form a non-inverting voltage amplifier. Its output goes to an emitter-follower transistor which provides negative feedback to the BPF input.

In this type of feedback loop, by making the loop gain sufficiently large, the gain at a frequency equal to the BPF pole becomes essentially Rnf/Rin. Thus by adjusting the variable resistor (VR) the circuit gain (or attenuation) at the BPF pole frequency can be varied.

BPF equivalent impedance is applied in the same manner to both Rin and Rnf. Hence the more the input frequency deviates from the BPF pole frequency (BPF equivalent impedance increases), the smaller the effect of Rnf and Rin on the circuit gain is provided, the circuit gain is determined by the ratio of the BPF equivalent impedance applied between Rnf and Rin.

In case illustrated in Fig. 1, since the applied impedances are the same, the circuit gain is "1" and the frequency characteristic becomes flat without regard to the BPF. However at frequencies removed from the pole frequency of the BPF, the loop gain is significantly reduced and above conditions do not apply; in these cases the frequency response falls off.

A complementary symmetrical emitter-follower buffer stage is employed in the actual circuit. This is followed by bandpass filters for each octave (total 10 elements) arranged in parallel. A variable resistor for adjusting the feedback is provided at each element to allow a peak or a dip to be produced as desired in the frequency characteristic of each octave in the audio frequency band.

**Operational Amplifier (Op-Amp)*
This type of integrated circuit is often used in analogue computers and similar systems. It features large gain over a wide frequency band, low drift and stable response to the application of feedback. By varying the input or feedback circuit, division, addition, multiplication by coefficients, plus-minus conversions, and other functions can be performed.

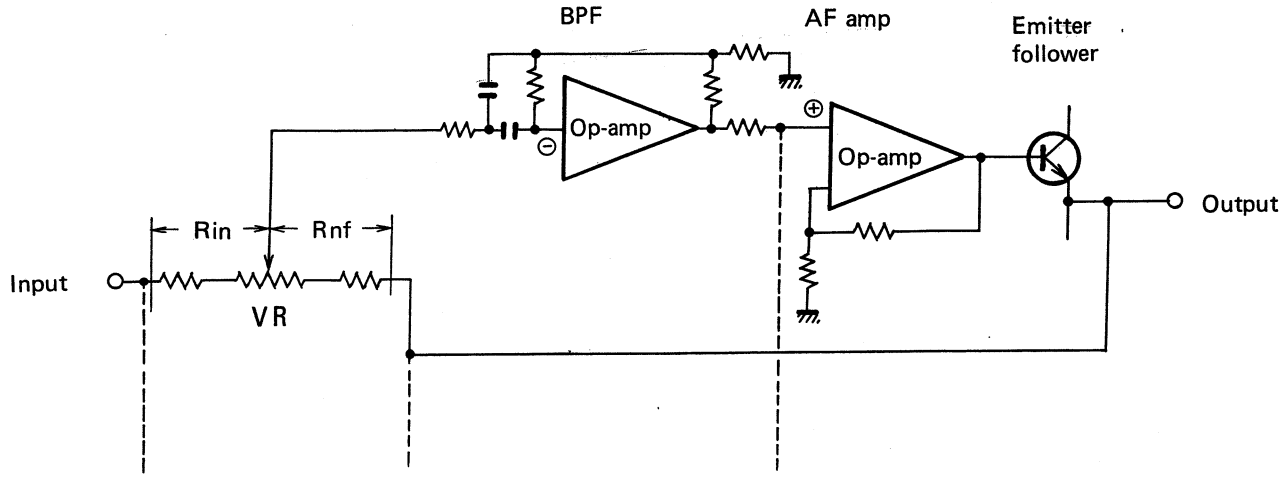


Fig. 1

5.2 MUTING CIRCUIT

A pure electronic muting circuit is provided in this unit to prevent bothersome noise when the power supply is switched ON-OFF. The muting function is performed by inserting an FET in series with the EQ section output circuit and applying a voltage to its gate. Q1 and Q2 in Fig. 2 are pnp transistors, while Q3 is a depletion type N channel junction FET which switches OFF when a negative voltage is applied to its gate.

Switching Power ON

The small charging time constant of C1 causes a positive voltage to be applied to Q1 base when the power source is switched ON, and Q1 remains in the OFF state. Since the charging time constant of C3 is also small, a negative voltage is immediately applied to Q2 collector through D3 and R3. Q2 remains OFF at this time due to the large charging time constant of C2 and insufficient bias between Q2 base and emitter. Consequently, the negative voltage at Q2 collector passes through D4 and is applied to Q3 gate. Q3 is therefore switched OFF and a muting function is obtained.

When C2 charges and sufficient bias is applied between Q2 base and emitter, Q2 switches ON. This causes Q2 collector potential to become essentially +Vcc, switching Q3 ON to release the muting.

Switching Power OFF

Since the discharge time constant of C1 is short, Q1 base potential becomes 0V almost instantaneously. During the time required for +Vcc to reach 0V, Q1 is temporarily biased between base and emitter, switching it ON. This causes C2 to discharge rapidly through Q1, switching Q2 OFF.

Since the discharge time of C3 is comparatively long, its negative charging voltage switches Q3 OFF to perform muting.

As a depletion type FET, Q3 switches ON after C3 has completely discharged. This does not present a problem since by this time Vcc has become sufficiently low and the equipment has ceased to function. Q2 collector voltage variation is shown in Fig. 3.

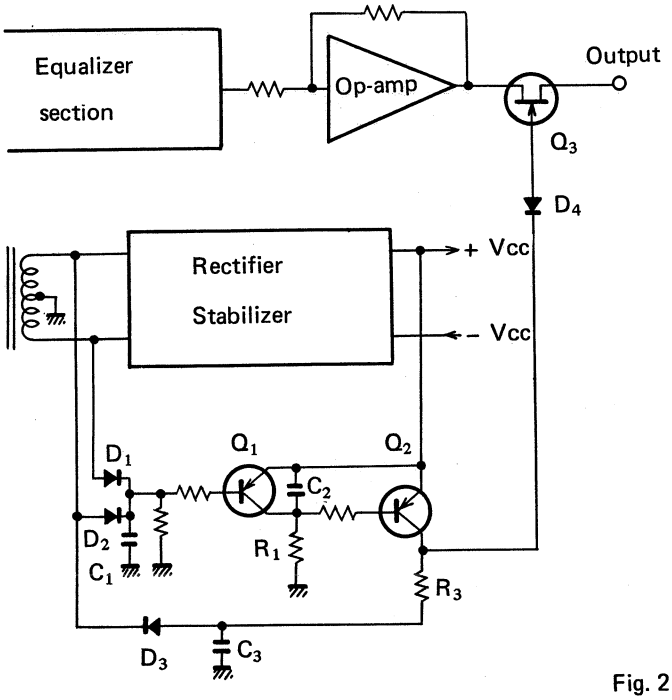


Fig. 2

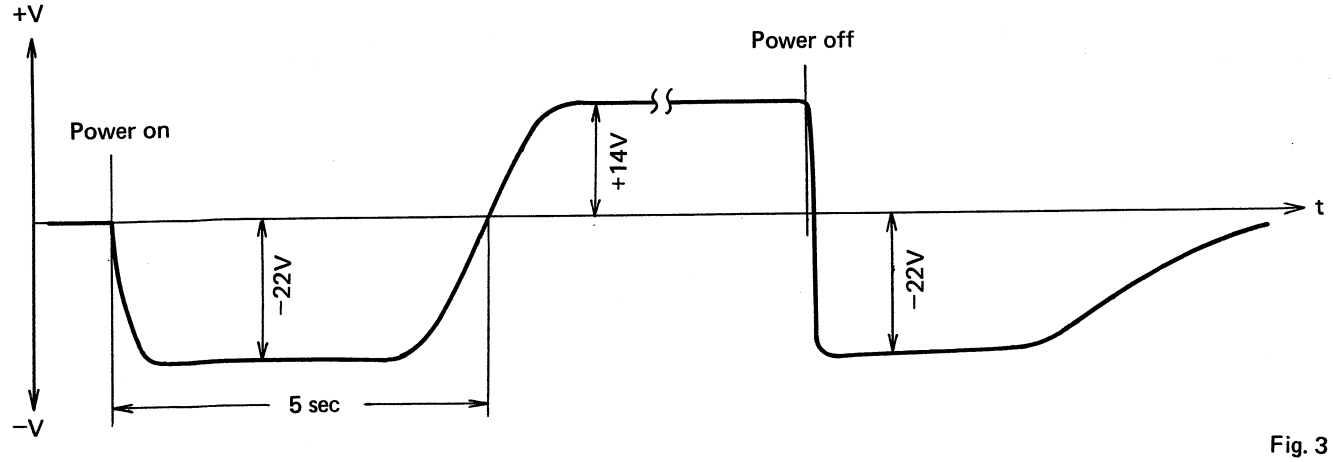


Fig. 3

5.3 TAPE MONITOR AND EQUALIZER SWITCHES

Input and output jack connections with respect to TAPE MONITOR and EQUALIZER switch operation are as shown in the following table.

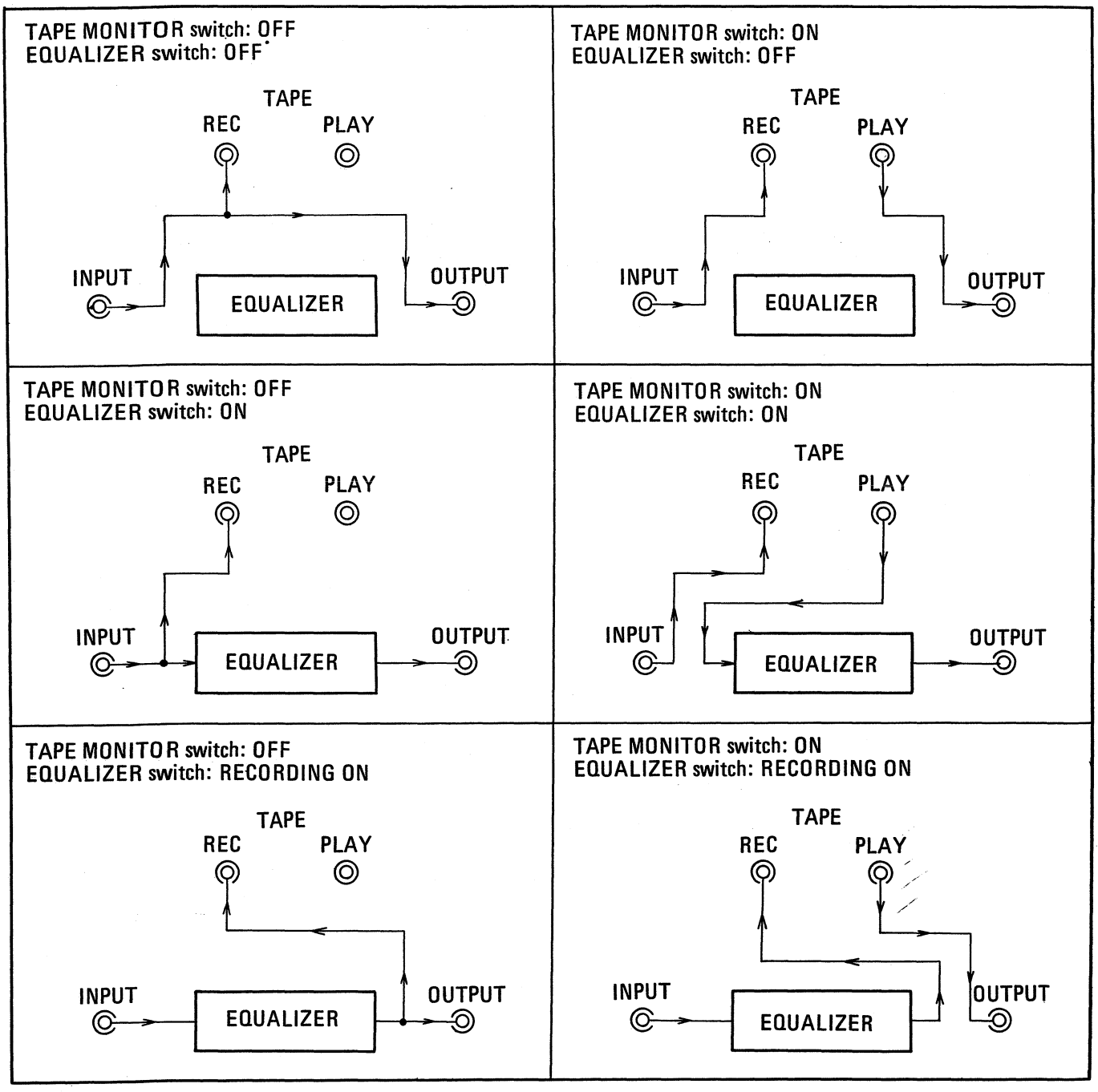
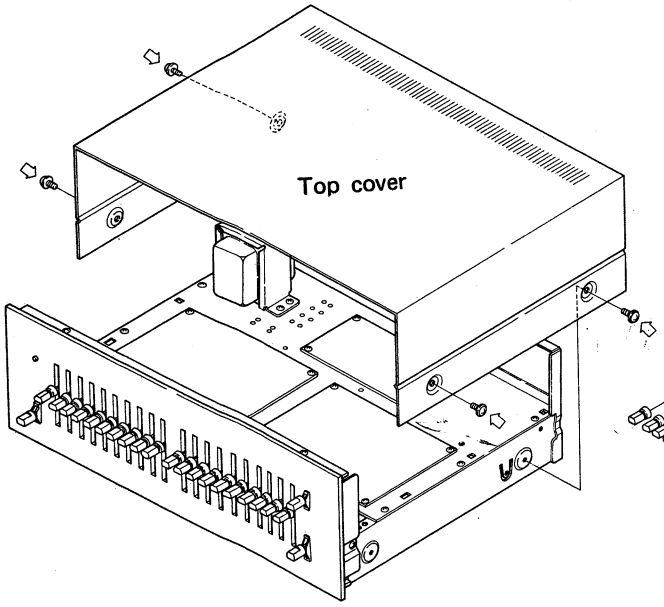


Fig. 4

6. DISASSEMBLY

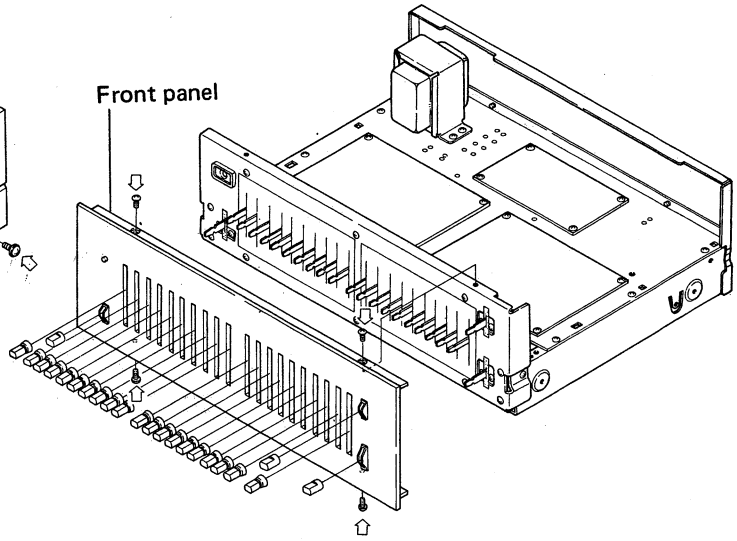
Top Cover

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



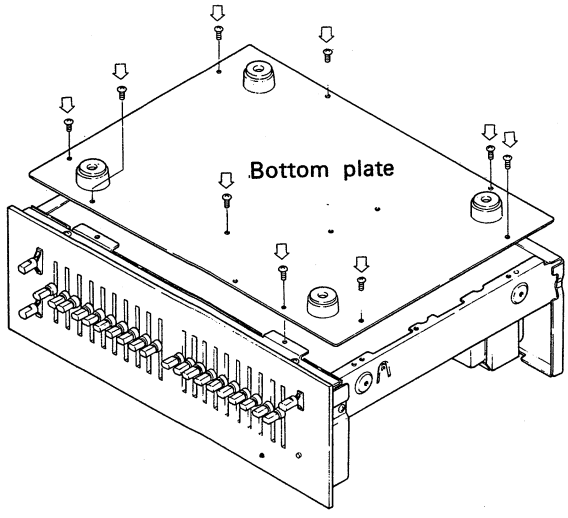
Front Panel

Remove all control knobs by pulling them out. Remove the two screws each from the top and bottom edges of the front panel.



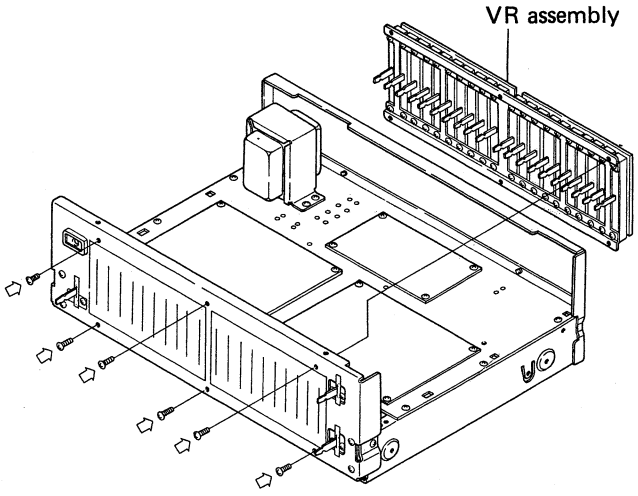
Bottom Plate

Remove the nine screws to detach the bottom plate.



VR Assembly

Remove the top cover and front panel. Remove the six screws which mount the VR assembly on the sub-panel.

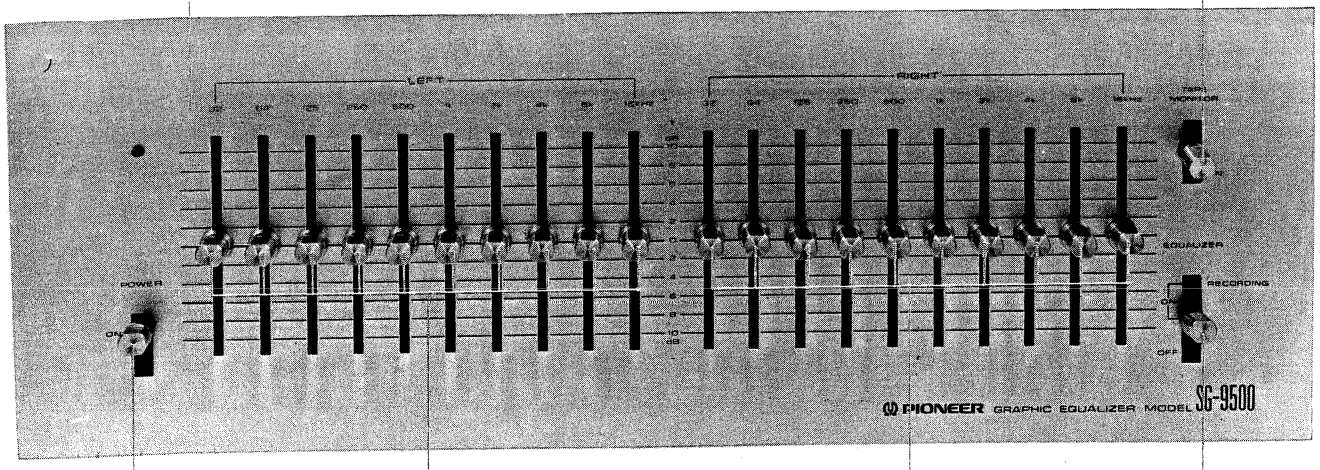


7. PARTS LOCATIONS

7.1 FRONT VIEW 1

Front panel assembly
ANB-367

Knob (TAPE MONITOR)
AAD-040



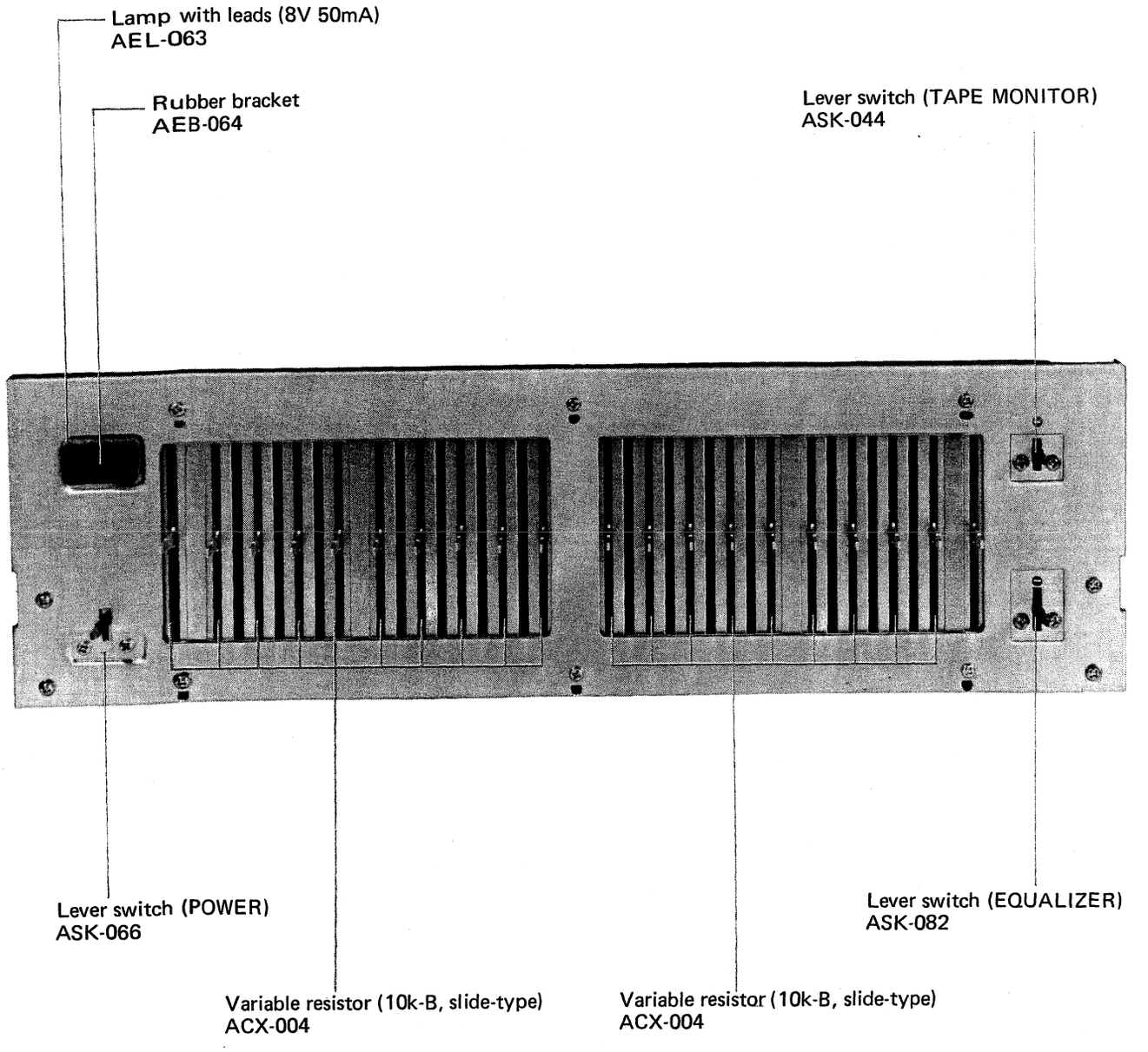
Knob (POWER)
AAD-040

Knob (LEFT octave control)
AAD-111

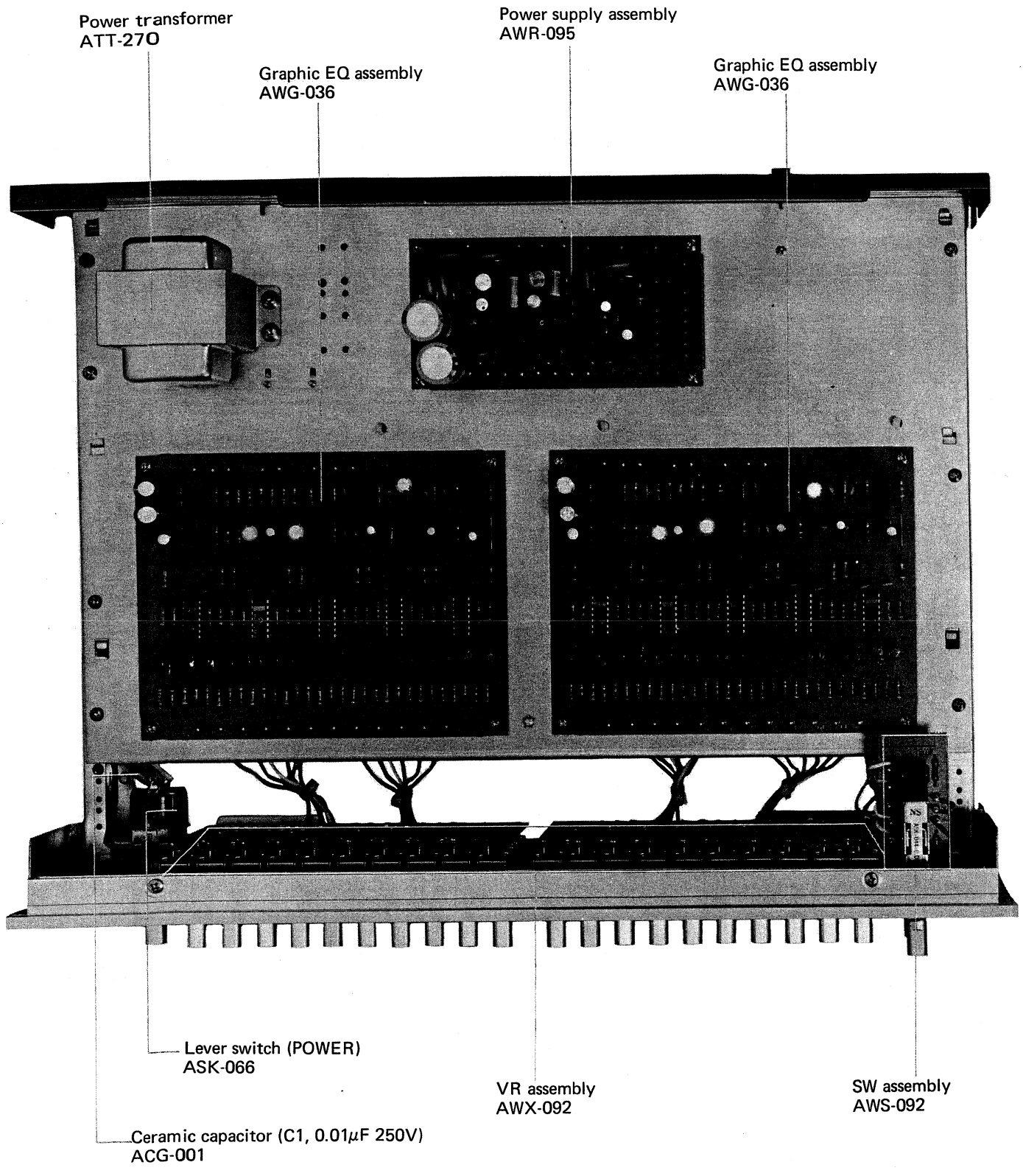
Knob (RIGHT octave control)
AAD-111

Knob (EQUALIZER)
AAD-040

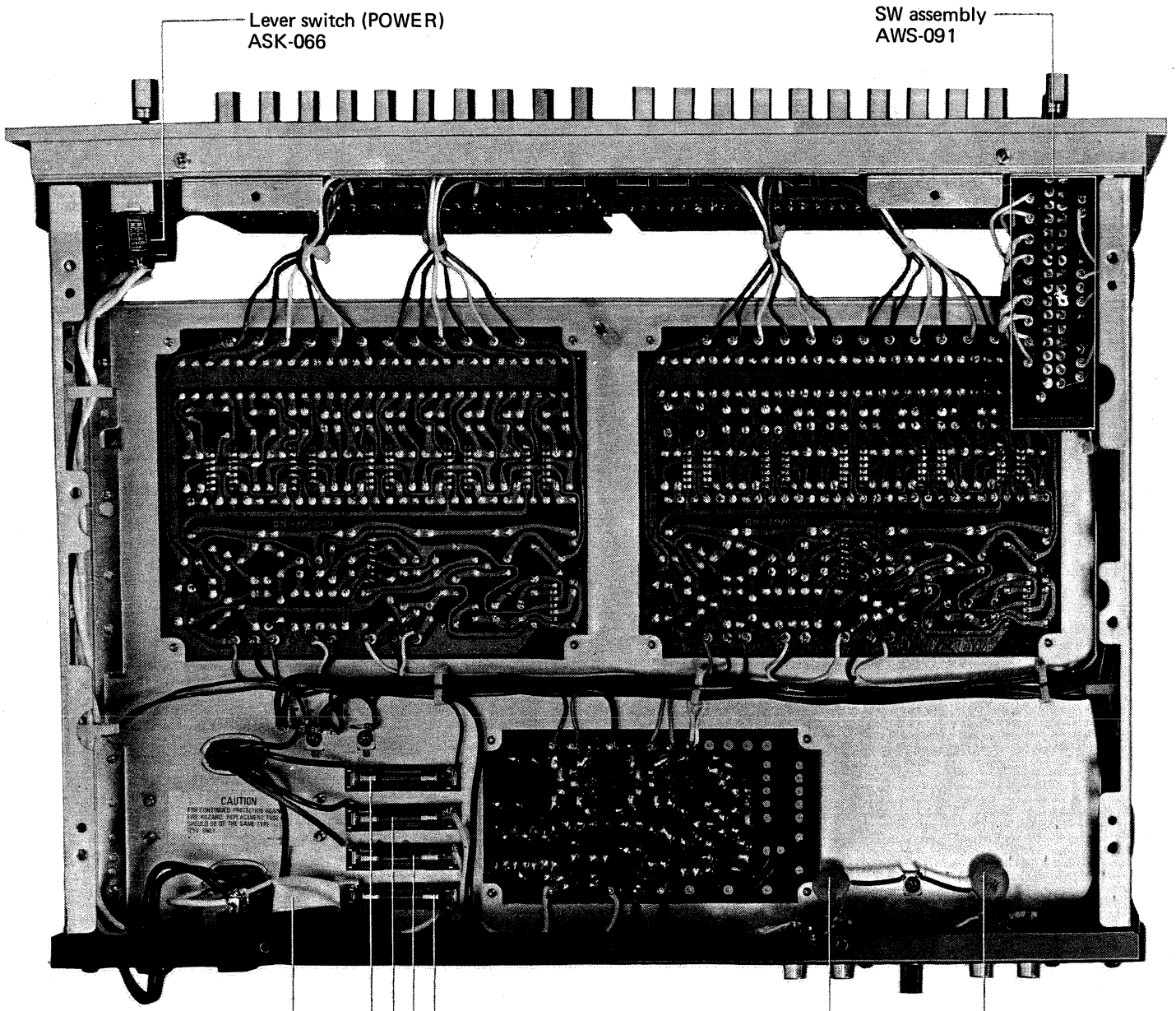
7.2 FRONT VIEW 2 (with Panel Removed)



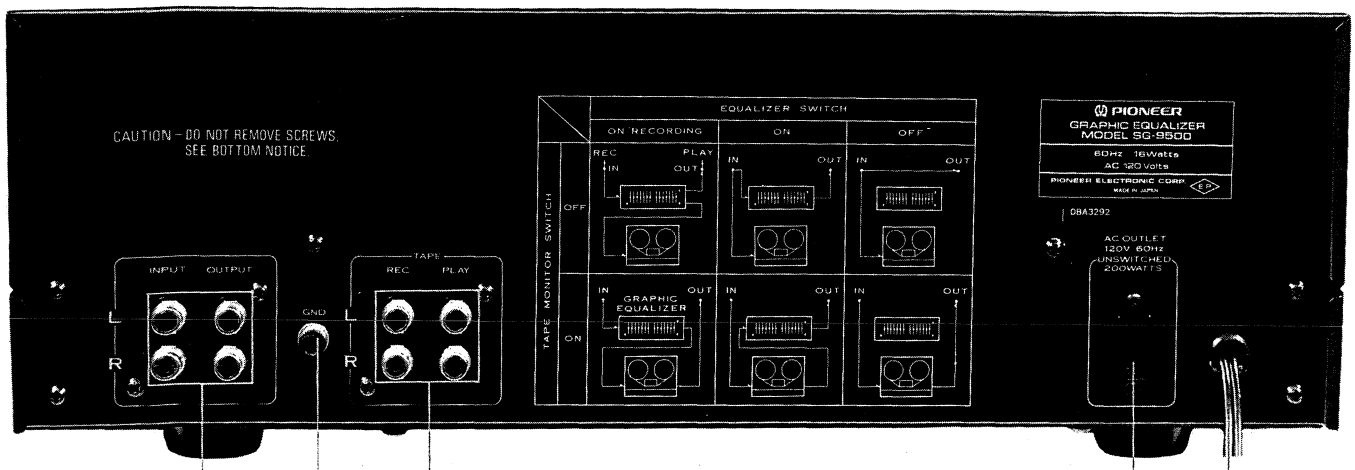
7.3 TOP VIEW


Power transformer
ATT-270
Graphic EQ assembly
AWG-036
Power supply assembly
AWR-095
Graphic EQ assembly
AWG-036
Lever switch (POWER)
ASK-066
Ceramic capacitor (C1, 0.01μF 250V)
ACG-001
VR assembly
AWX-092
SW assembly
AWS-092

7.4 BOTTOM VIEW



7.5 REAR VIEW



AC socket (AC OUTLET)
AKP-002

Terminal (TAPE REC-PLAY)
AKB-014

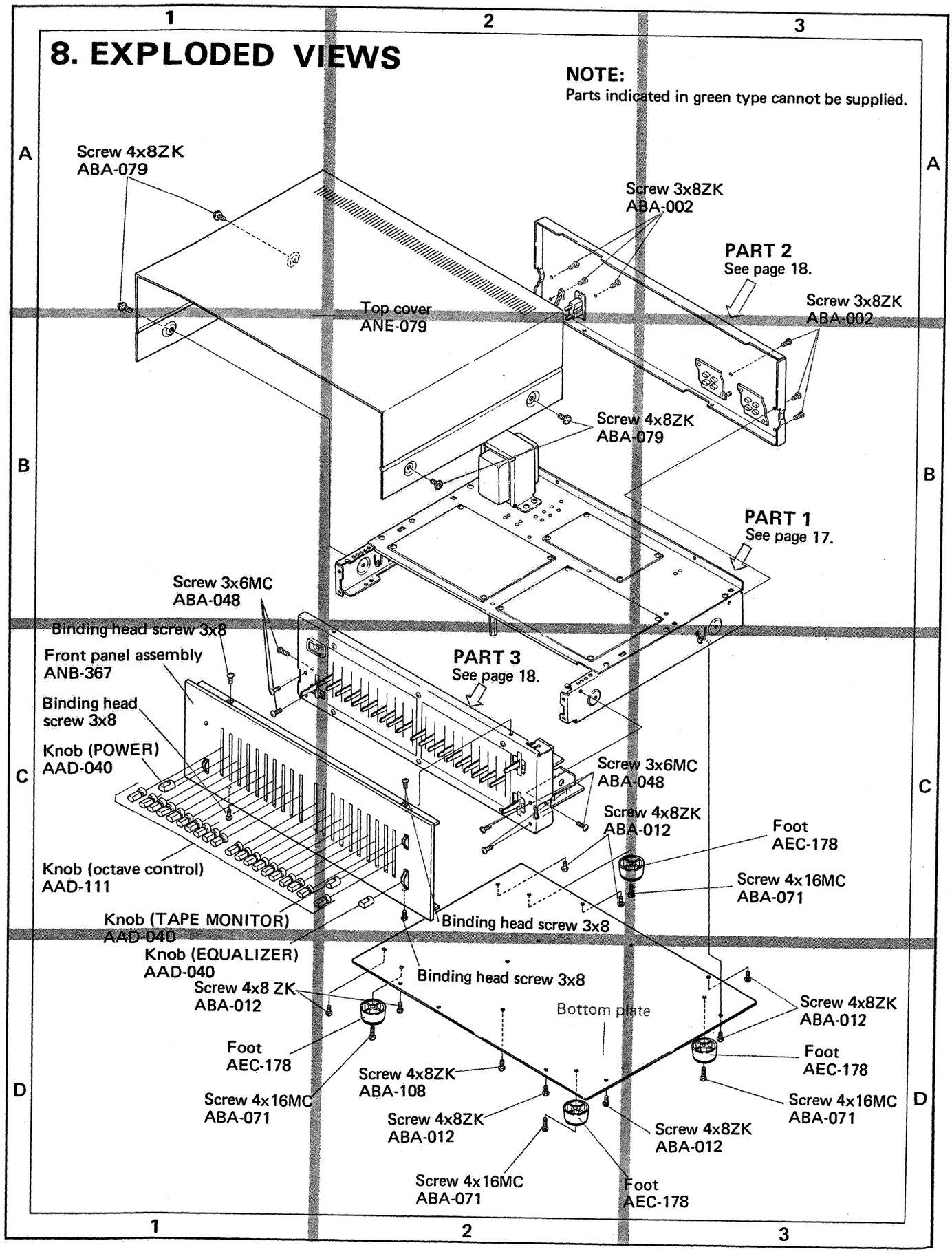
AC power cord
ADG-005

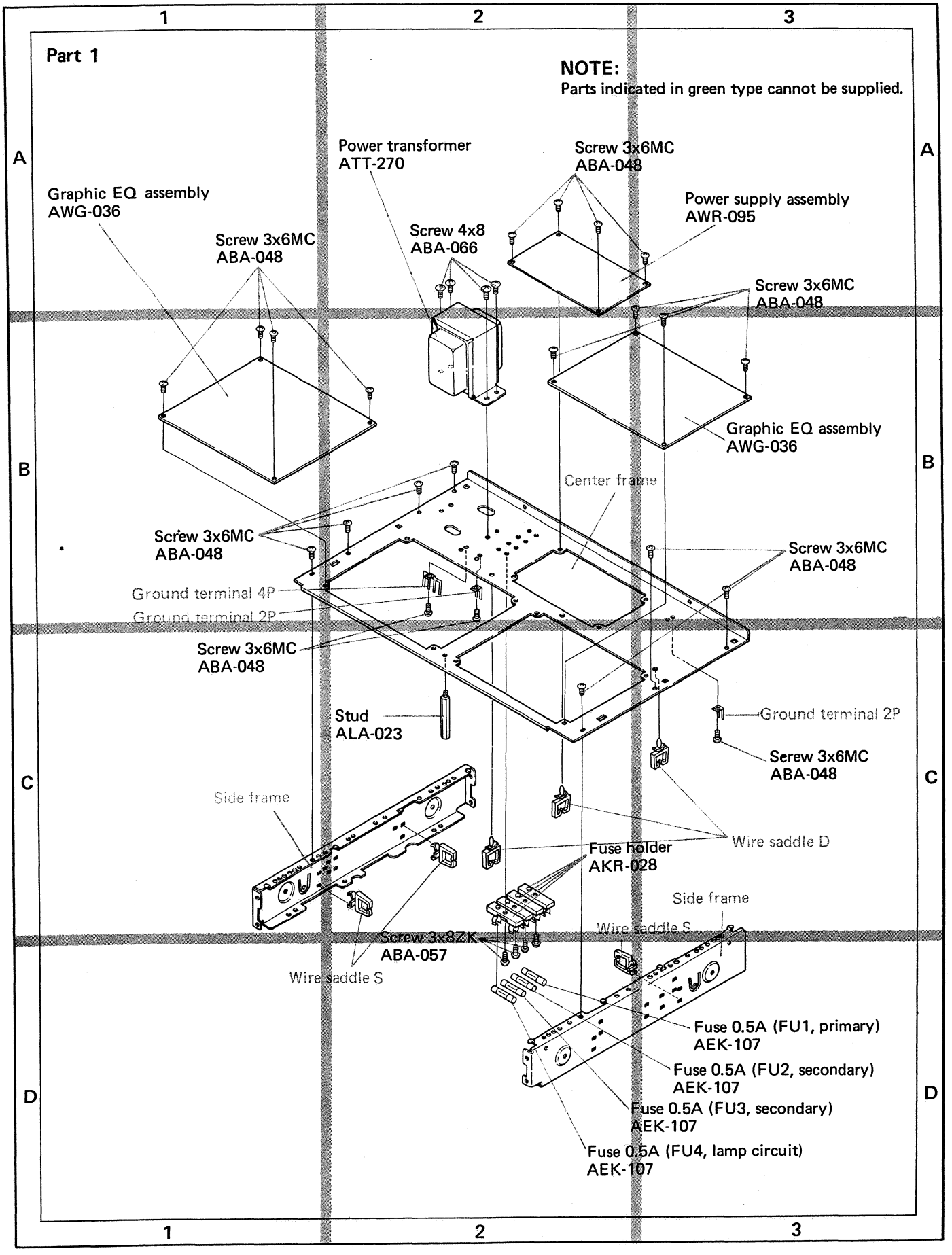
Screw for ground (GND)
AKE-017

Terminal (INPUT-OUTPUT)
AKB-014

8. EXPLODED VIEWS

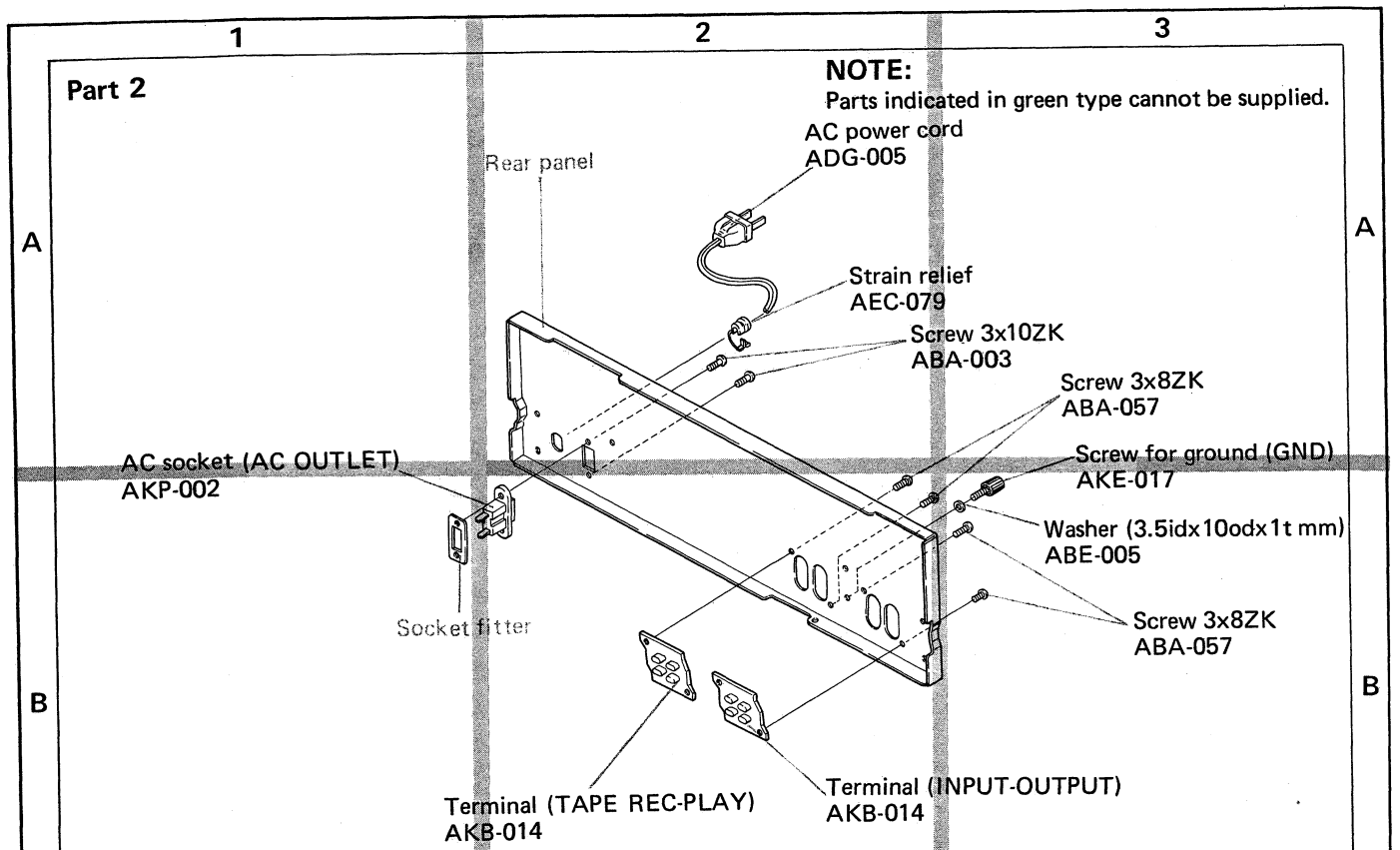
NOTE:
Parts indicated in green type cannot be supplied.



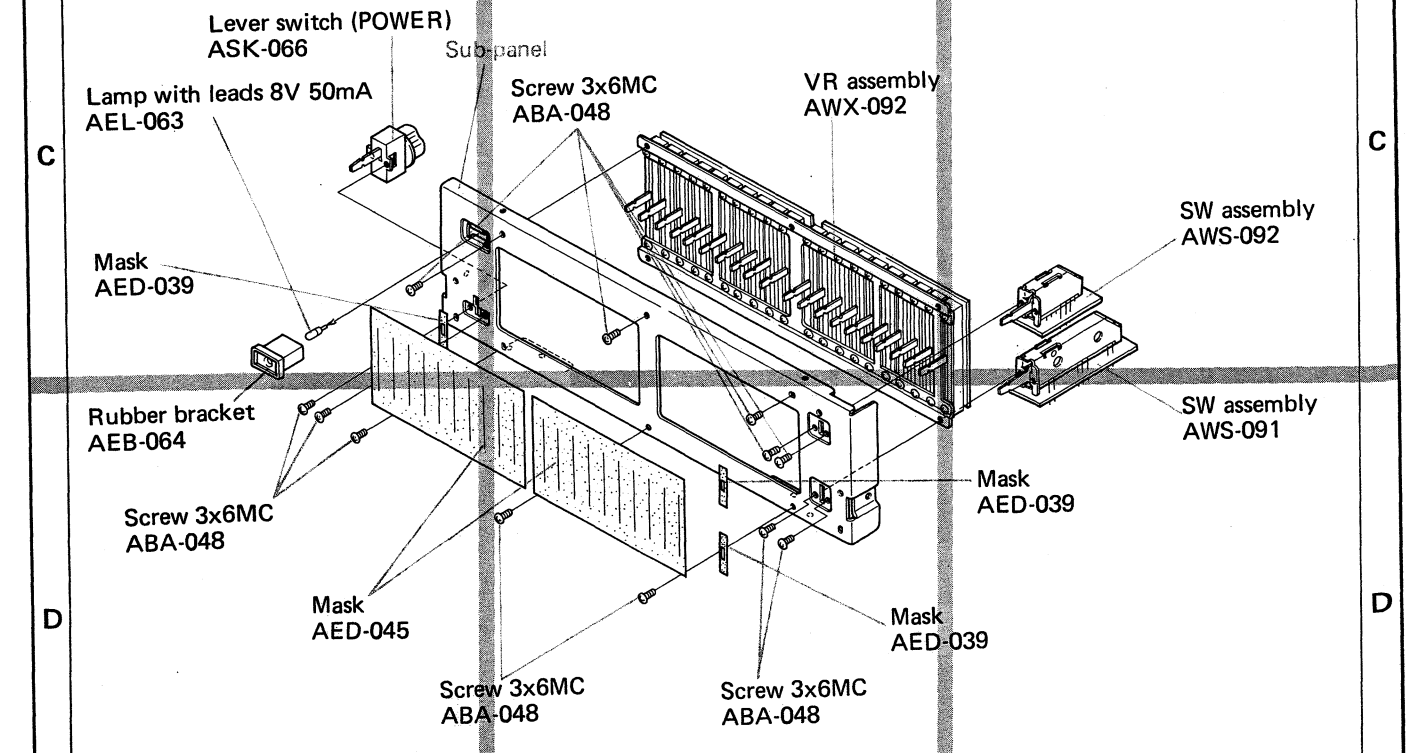

1
2
3
A
B
C
D
Part 1
NOTE:
Parts indicated in green type cannot be supplied.
Power transformer
ATT-270
Screw 3x6MC
ABA-048
Graphic EQ assembly
AWG-036
Power supply assembly
AWR-095
Screw 4x8
ABA-066
Screw 3x6MC
ABA-048
Screw 3x6MC
ABA-048
Graphic EQ assembly
AWG-036
Center frame
Screw 3x6MC
ABA-048
Screw 3x6MC
ABA-048
Ground terminal 4P
Ground terminal 2P
Screw 3x6MC
ABA-048
Stud
ALA-023
Ground terminal 2P
Screw 3x6MC
ABA-048
Side frame
Wire saddle D
Fuse holder
AKR-028
Side frame
Wire saddle S
Screw 3x8ZK
ABA-057
Wire saddle S
Fuse 0.5A (FU1, primary)
AEK-107
Fuse 0.5A (FU2, secondary)
AEK-107
Fuse 0.5A (FU3, secondary)
AEK-107
Fuse 0.5A (FU4, lamp circuit)
AEK-107

Part 2

NOTE:
Parts indicated in green type cannot be supplied.

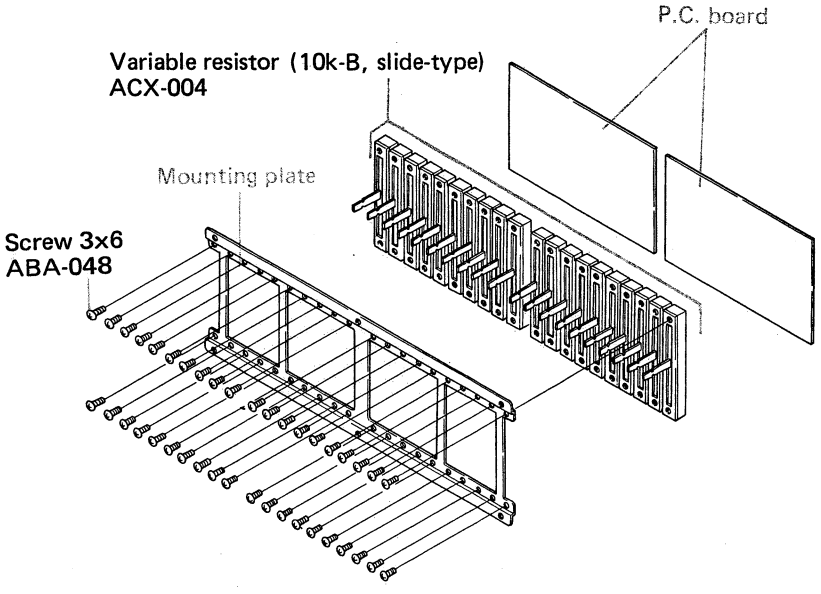


Part 3

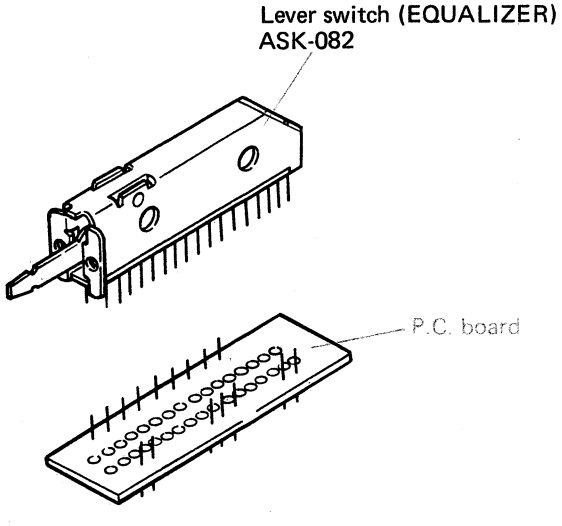


VR Assembly (AWX-092)

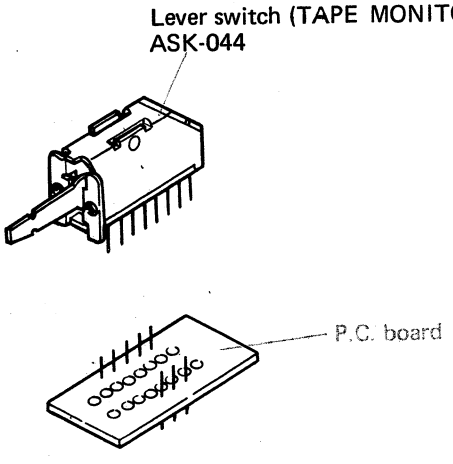
NOTE:
Parts indicated in green type cannot be supplied.



SW Assembly (AWS-091)



SW Assembly (AWS-092)



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

9.1 MISCELLANEOUS PARTS

NOTE:
- *Capacitors: in μF unless otherwise noted p:pF*
- *Resistors: in Ω, ¼W unless otherwise noted k:kΩ, M:MΩ*

SWITCH

Symbol	Description	Part No.
S1	Lever switch (POWER)	ASK-066

TRANSFORMER

Symbol	Description	Part No.
T1	Power Transformer	ATT-270

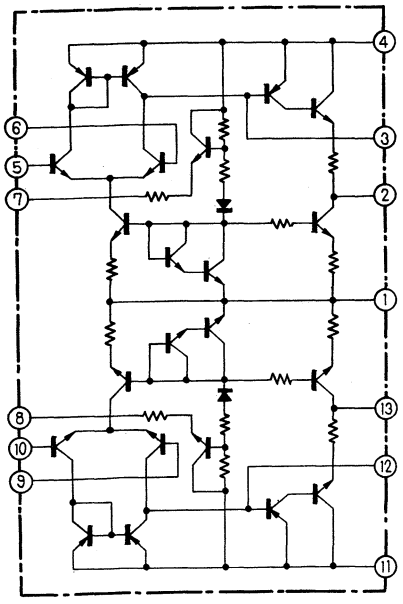
LAMP AND FUSES

Symbol	Description	Part No.
PL1	Lamp with lead 8V 50mA	AEL-063
FU1	Fuse 0.5A (primary)	AEK-107
FU2	Fuse 0.5A (secondary)	AEK-107
FU3	Fuse 0.5A (secondary)	AEK-107
FU4	Fuse 0.5A (lamp circuit)	AEK-107

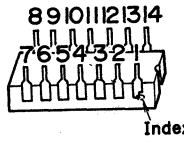
CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 0.01 250V	ACG-001
C2	Ceramic 0.01 150V (DC1.4kV)	ACG-003
C3	Ceramic 0.047 50V	CKDYF 473Z 50
C4	Ceramic 0.047 50V	CKDYF 473Z 50

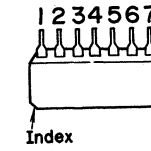
HA1452



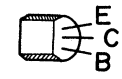
HA1452



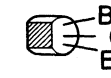
TA7136P1



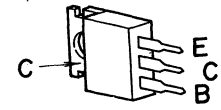
2SA725
2SC1312



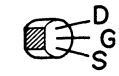
2SA733
2SC945



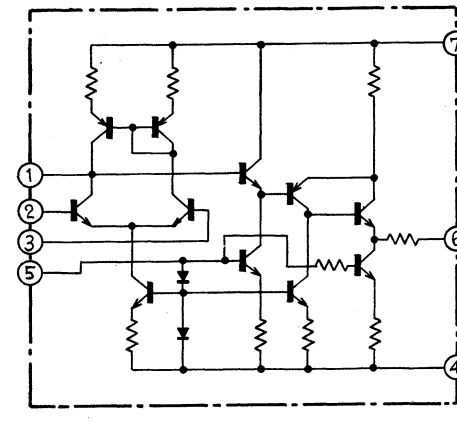
2SB507
2SD313



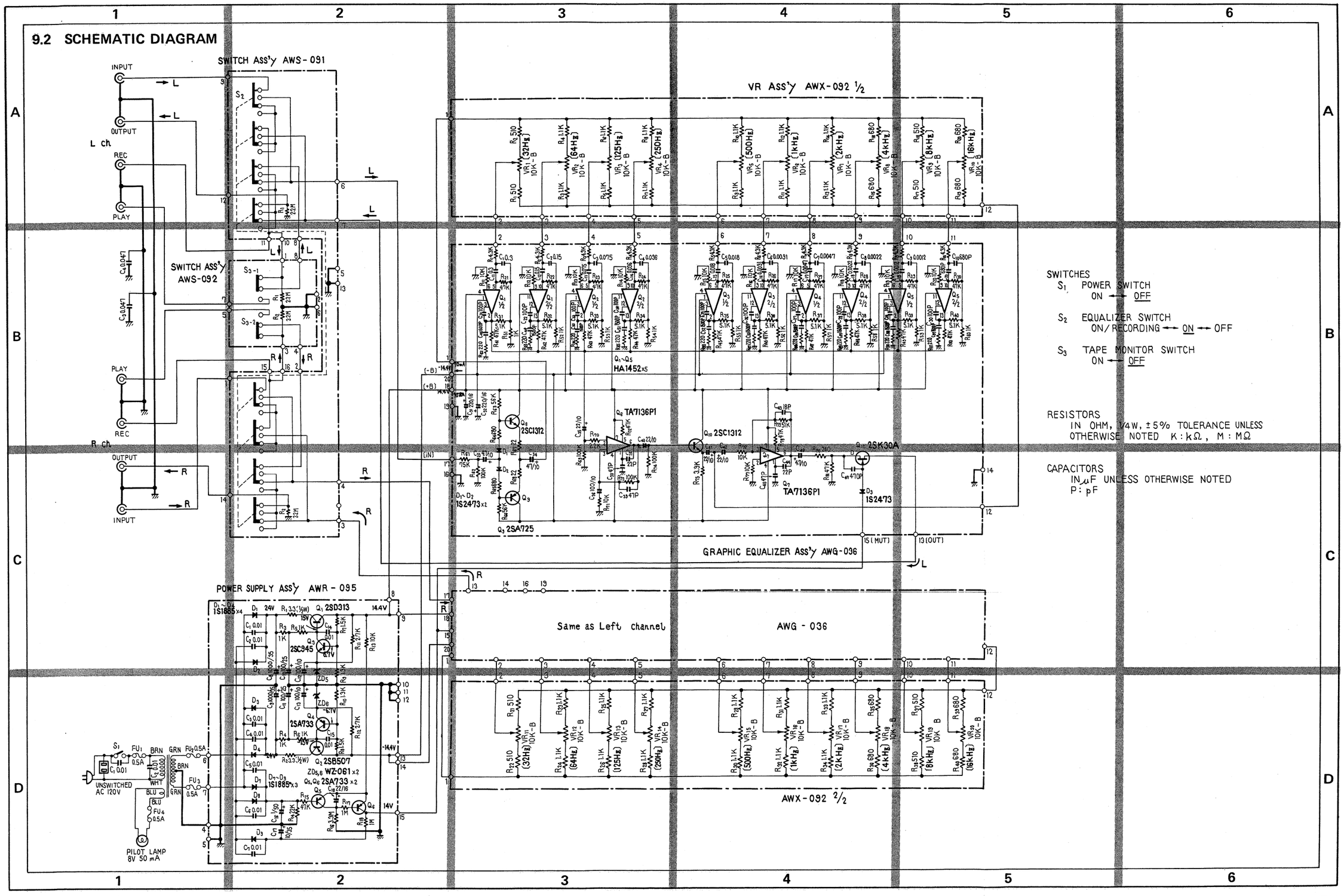
2SK30A



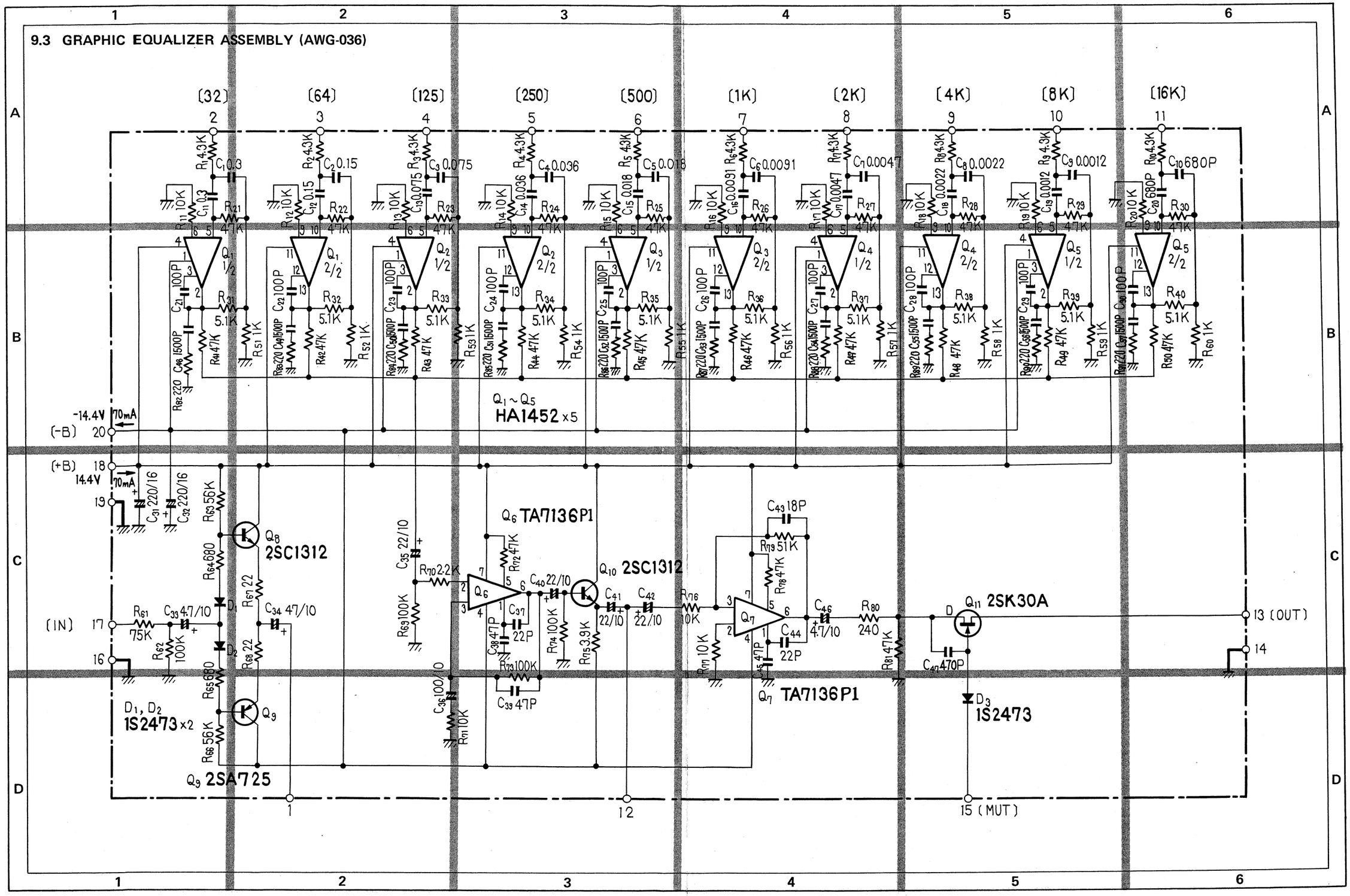
TA7136P1



9.2 SCHEMATIC DIAGRAM



9.3 GRAPHIC EQUALIZER ASSEMBLY (AWG-036)



AWX-092

Lch: 1/2

Rch: 2/2

12
11
10
9
8
7
6
5
4
3
2
1

Lch: AWS-091 No.7
Rch: AWS-091 No.3

AWR-095 No.15

Lch: AWS-091 No.6
Rch: AWS-091 No.4

Lch: AWR-095 No.8
Rch: AWR-095 No.9

Lch: AWR-095 No.13
Rch: AWR-095 No.14

Parts List of Graphic Equalizer Assembly (AWG-036)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	IC	HA1452
Q2	IC	HA1452
Q3	IC	HA1452
Q4	IC	HA1452
Q5	IC	HA1452
Q6	IC	TA7136P1
Q7	IC	TA7136P1
Q8	Transistor	2SC1312-G (2SC1313-G)
Q9	Transistor	2SA725-G (2SA726-G)
Q10	Transistor	2SC1312-G (2SC1313-G)
Q11	FET	2SK30A-Y
D1	Diode	1S2473 (1S1555)
D2	Diode	1S2473 (1S1555)
D3	Diode	1S2473 (1S1555)

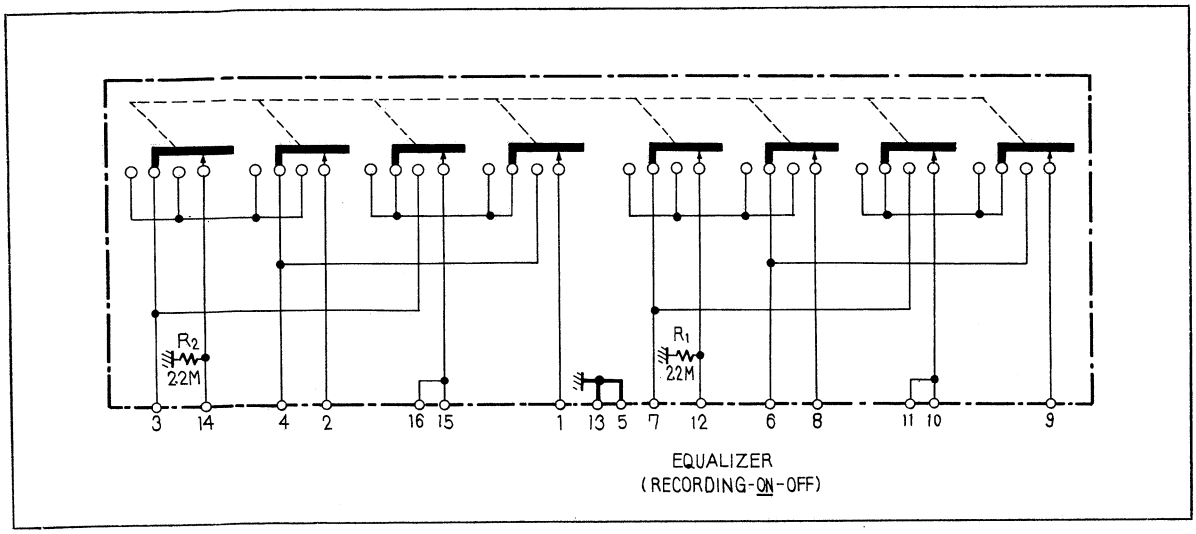
RESISTORS

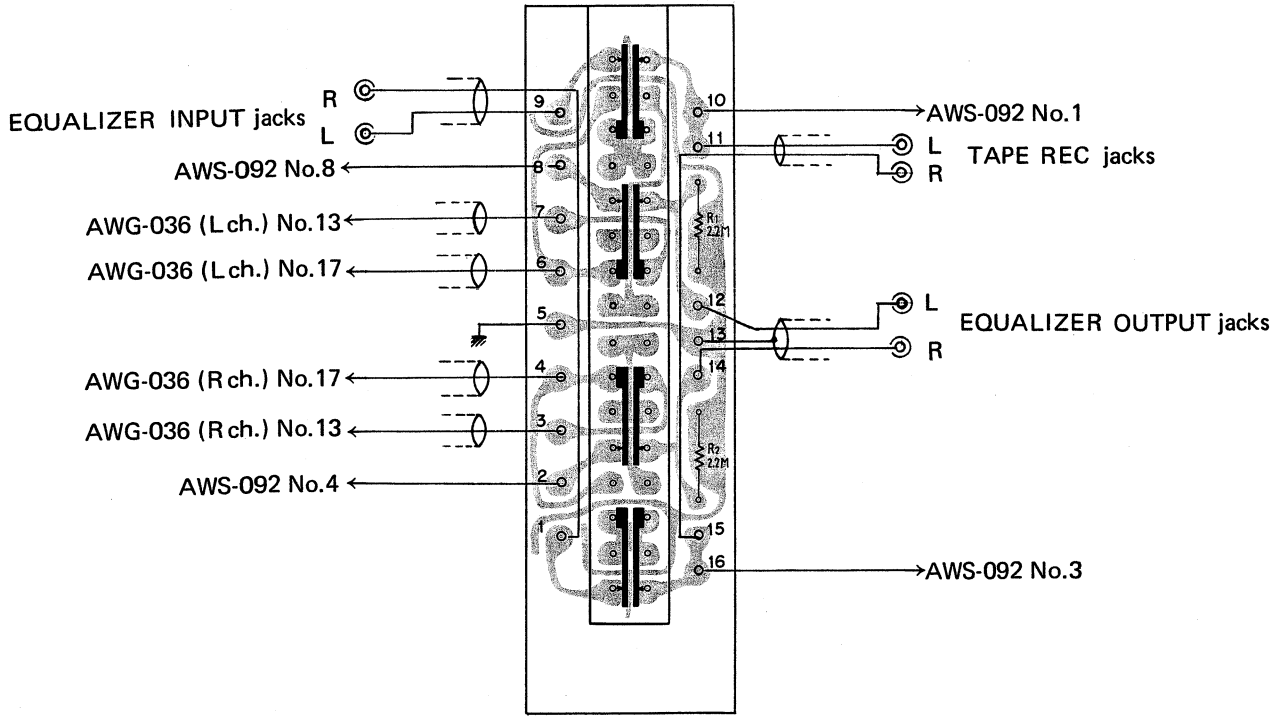
Symbol	Description		Part No.
R1	Carbon film	4.3k	RD¼PS 432J
R2	Carbon film	4.3k	RD¼PS 432J
R3	Carbon film	4.3k	RD¼PS 432J
R4	Carbon film	4.3k	RD¼PS 432J
R5	Carbon film	4.3k	RD¼PS 432J
R6	Carbon film	4.3k	RD¼PS 432J
R7	Carbon film	4.3k	RD¼PS 432J
R8	Carbon film	4.3k	RD¼PS 432J
R9	Carbon film	4.3k	RD¼PS 432J
R10	Carbon film	4.3k	RD¼PS 432J
R11	Carbon film	10k	RD¼PS 103J
R12	Carbon film	10k	RD¼PS 103J
R13	Carbon film	10k	RD¼PS 103J
R14	Carbon film	10k	RD¼PS 103J
R15	Carbon film	10k	RD¼PS 103J
R16	Carbon film	10k	RD¼PS 103J
R17	Carbon film	10k	RD¼PS 103J
R18	Carbon film	10k	RD¼PS 103J
R19	Carbon film	10k	RD¼PS 103J
R20	Carbon film	10k	RD¼PS 103J
R21	Carbon film	47k	RD¼PS 473J
R22	Carbon film	47k	RD¼PS 473J
R23	Carbon film	47k	RD¼PS 473J
R24	Carbon film	47k	RD¼PS 473J
R25	Carbon film	47k	RD¼PS 473J
R26	Carbon film	47k	RD¼PS 473J
R27	Carbon film	47k	RD¼PS 473J
R28	Carbon film	47k	RD¼PS 473J
R29	Carbon film	47k	RD¼PS 473J
R30	Carbon film	47k	RD¼PS 473J
R31	Carbon film	5.1k	RD¼PS 512J
R32	Carbon film	5.1k	RD¼PS 512J
R33	Carbon film	5.1k	RD¼PS 512J
R34	Carbon film	5.1k	RD¼PS 512J
R35	Carbon film	5.1k	RD¼PS 512J
R36	Carbon film	5.1k	RD¼PS 512J
R37	Carbon film	5.1k	RD¼PS 512J
R38	Carbon film	5.1k	RD¼PS 512J
R39	Carbon film	5.1k	RD¼PS 512J
R40	Carbon film	5.1k	RD¼PS 512J
R41	Carbon film	47k	RD¼PS 473J
R42	Carbon film	47k	RD¼PS 473J
R43	Carbon film	47k	RD¼PS 473J
R44	Carbon film	47k	RD¼PS 473J
R45	Carbon film	47k	RD¼PS 473J
R46	Carbon film	47k	RD¼PS 473J
R47	Carbon film	47k	RD¼PS 473J
R48	Carbon film	47k	RD¼PS 473J
R49	Carbon film	47k	RD¼PS 473J
R50	Carbon film	47k	RD¼PS 473J
R51	Carbon film	1k	RD¼PS 102J
R52	Carbon film	1k	RD¼PS 102J
R53	Carbon film	1k	RD¼PS 102J
R54	Carbon film	1k	RD¼PS 102J
R55	Carbon film	1k	RD¼PS 102J
R56	Carbon film	1k	RD¼PS 102J
R57	Carbon film	1k	RD¼PS 102J
R58	Carbon film	1k	RD¼PS 102J
R59	Carbon film	1k	RD¼PS 102J
R60	Carbon film	1k	RD¼PS 102J
R61	Carbon film	75k	RD¼PS 753J
R62	Carbon film	100k	RD¼PS 104J
R63	Carbon film	56k	RD¼PS 563J
R64	Carbon film	680	RD¼PS 681J
R65	Carbon film	680	RD¼PS 681J
R66	Carbon film	56k	RD¼PS 563J
R67	Carbon film	22	RD¼PS 220J
R68	Carbon film	22	RD¼PS 220J
R69	Carbon film	100k	RD¼PS 104J
R70	Carbon film	2.2k	RD¼PS 222J
R71	Carbon film	10k	RD¼PS 103J
R72	Carbon film	47k	RD¼PS 473J
R73	Carbon film	100k	RD¼PS 104J
R74	Carbon film	100k	RD¼PS 104J
R75	Carbon film	3.9k	RD¼PS 392J
R76	Carbon film	10k	RD¼PS 103J
R77	Carbon film	10k	RD¼PS 103J
R78	Carbon film	47k	RD¼PS 473J
R79	Carbon film	51k	RD¼PS 513J
R80	Carbon film	240	RD¼PS 241J
R81	Carbon film	47k	RD¼PS 473J
R82	Carbon film	220	RD¼PS 221J
R83	Carbon film	220	RD¼PS 221J
R84	Carbon film	220	RD¼PS 221J
R85	Carbon film	220	RD¼PS 221J
R86	Carbon film	220	RD¼PS 221J
R87	Carbon film	220	RD¼PS 221J
R88	Carbon film	220	RD¼PS 221J
R89	Carbon film	220	RD¼PS 221J
R90	Carbon film	220	RD¼PS 221J
R91	Carbon film	220	RD¼PS 221J

CAPACITORS

Symbol	Description			Part No.
C1	Mylar	0.3	50V	CQMA 304J 50
C2	Mylar	0.15	50V	CQMA 154J 50
C3	Mylar	0.075	50V	CQMA 753J 50
C4	Mylar	0.036	50V	CQMA 363J 50
C5	Mylar	0.018	50V	CQMA 183J 50
C6	Mylar	0.0091	50V	CQMA 912J 50
C7	Mylar	0.0047	50V	CQMA 472J 50
C8	Mylar	0.0022	50V	CQMA 222J 50
C9	Mylar	0.0012	50V	CQMA 122J 50
C10	Styrol	680p	50V	CQSA 681J 50
C11	Mylar	0.3	50V	CQMA 304J 50
C12	Mylar	0.15	50V	CQMA 154J 50
C13	Mylar	0.075	50V	CQMA 753J 50
C14	Mylar	0.036	50V	CQMA 363J 50
C15	Mylar	0.018	50V	CQMA 183J 50
C16	Mylar	0.0091	50V	CQMA 912J 50
C17	Mylar	0.0047	50V	CQMA 472J 50
C18	Mylar	0.0022	50V	CQMA 222J 50
C19	Mylar	0.012	50V	CQMA 122J 50
C20	Styrol	680p	50V	CQSA 681J 50
C21	Ceramic	100p	50V	CCDSL 101K 50
C22	Ceramic	100p	50V	CCDSL 101K 50
C23	Ceramic	100p	50V	CCDSL 101K 50
C24	Ceramic	100p	50V	CCDSL 101K 50
C25	Ceramic	100p	50V	CCDSL 101K 50
C26	Ceramic	100p	50V	CCDSL 101K 50
C27	Ceramic	100p	50V	CCDSL 101K 50
C28	Ceramic	100p	50V	CCDSL 101K 50
C29	Ceramic	100p	50V	CCDSL 101K 50
C30	Ceramic	100p	50V	CCDSL 101K 50
C31	Electrolytic	220	16V	CEA 221P 16
C32	Electrolytic	220	16V	CEA 221P 16
C33	Electrolytic	4.7	10V	CSSA 4R7M 10
C34	Electrolytic	47	10V	CEA 470P 10
C35	Electrolytic	22	10V	CEA 220P 10
C36	Electrolytic	100	10V	CEA 101P 10
C37	Ceramic	22p	50V	CCDSL 220K 50
C38	Ceramic	47p	50V	CCDSL 470K 50
C39	Ceramic	47p	50V	CCDSL 470K 50
C40	Electrolytic	22	10V	CEA 220P 10
C41	Electrolytic	22	10V	CEA 220P 10
C42	Electrolytic	22	10V	CEA 220P 10
C43	Ceramic	18p	50V	CCDSL 180K 50
C44	Ceramic	22p	50V	CCDSL 220K 50
C45	Ceramic	47p	50V	CCDSL 470K 50
C46	Electrolytic	4.7	10V	CSSA 4R7M 10
C47	Ceramic	470p	50V	CKDYB 471K 50
C48	Ceramic	1500p		CKDYB 152K 50
C49	Ceramic	1500p		CKDYB 152K 50
C50	Ceramic	1500p		CKDYB 152K 50
C51	Ceramic	1500p		CKDYB 152K 50
C52	Ceramic	1500p		CKDYB 152K 50
C53	Ceramic	1500p		CKDYB 152K 50
C54	Ceramic	1500p		CKDYB 152K 50
C55	Ceramic	1500p		CKDYB 152K 50
C56	Ceramic	1500p		CKDYB 152K 50
C57	Ceramic	1500p		CKDYB 152K 50

9.4 SW ASSEMBLY (AWS-091)





Parts List of SW Assembly (AWS-091)

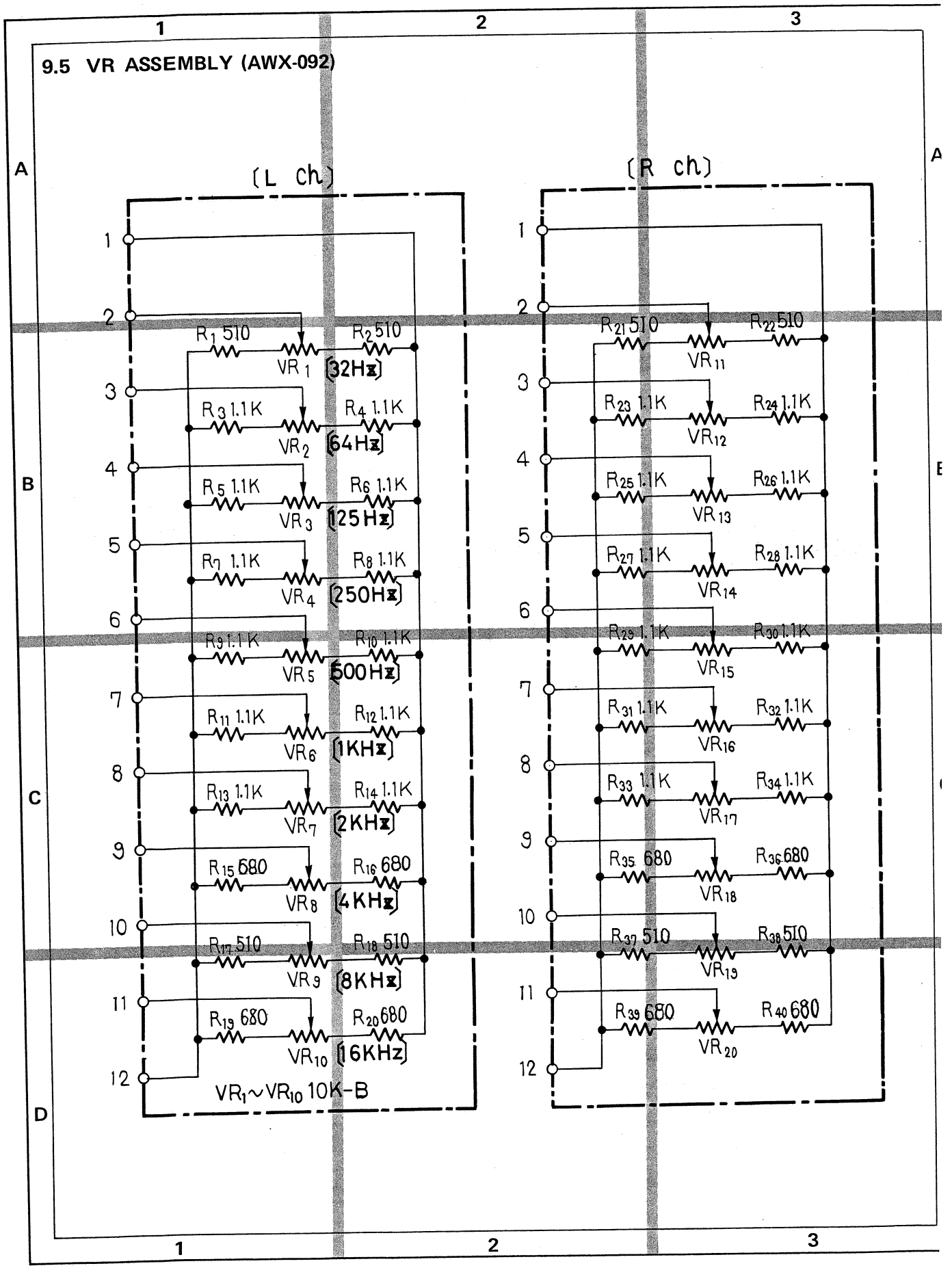
SWITCH

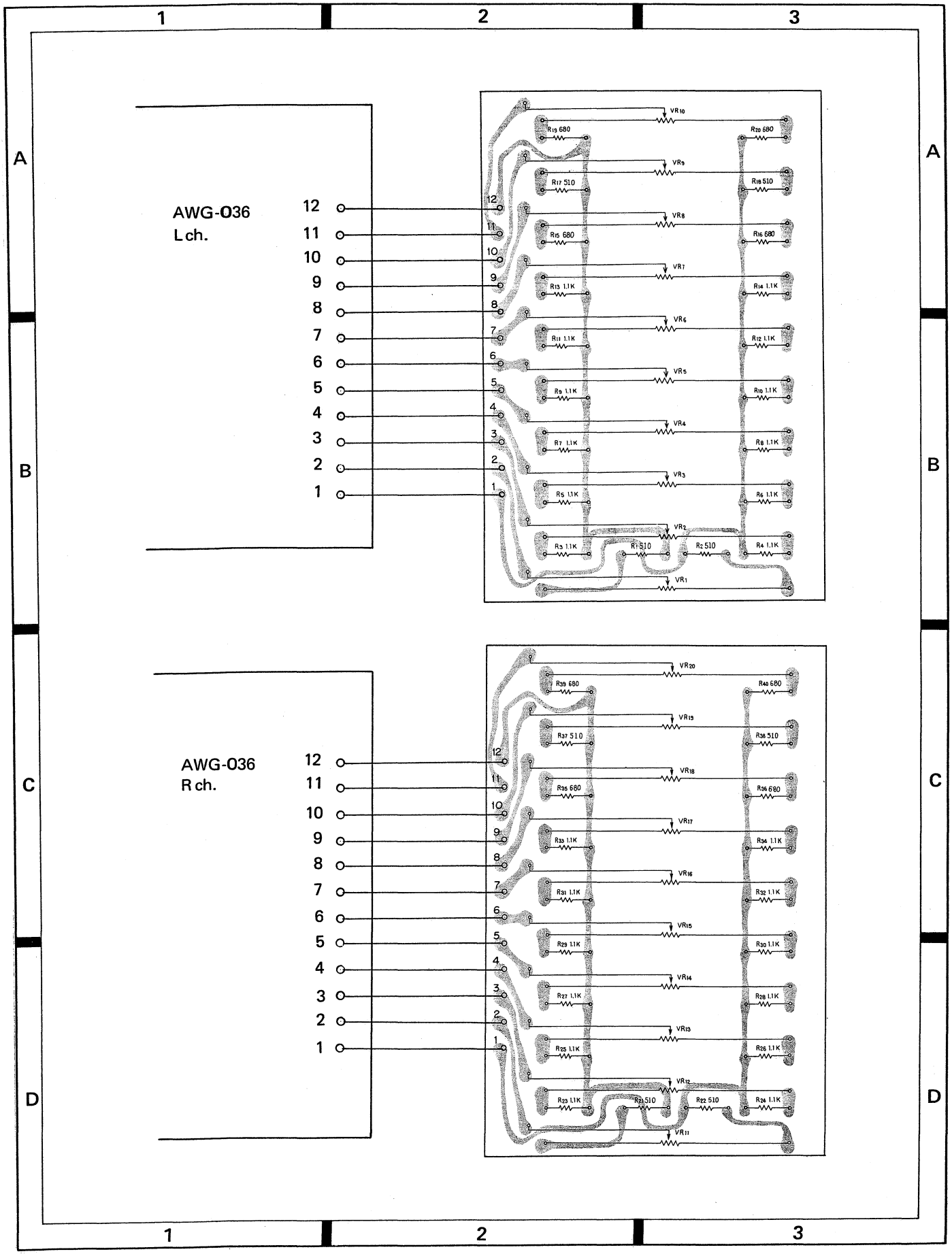
Symbol	Description	Part No.
	Lever switch (EQUALIZER)	ASK-082

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 2.2M	RD¼PS 225J
R2	Carbon film 2.2M	RD¼PS 225J

9.5 VR ASSEMBLY (AWX-092)




1
2
3
A
B
C
D
AWG-036
L ch.
12
11
10
9
8
7
6
5
4
3
2
1
VR10
R19 680
R20 680
VR9
R17 510
R18 510
VR8
R15 680
R16 680
VR7
R13 1.1K
R14 1.1K
VR6
R11 1.1K
R12 1.1K
VR5
R9 1.1K
R10 1.1K
VR4
R7 1.1K
R8 1.1K
VR3
R5 1.1K
R6 1.1K
VR2
R3 1.1K
R1 510
R2 510
R4 1.1K
VR1
AWG-036
R ch.
12
11
10
9
8
7
6
5
4
3
2
1
VR20
R39 680
R40 680
VR19
R37 510
R38 510
VR18
R35 680
R36 680
VR17
R33 1.1K
R34 1.1K
VR16
R31 1.1K
R32 1.1K
VR15
R29 1.1K
R30 1.1K
VR14
R27 1.1K
R28 1.1K
VR13
R25 1.1K
R26 1.1K
VR12
R23 1.1K
R21 510
R22 510
R24 1.1K
VR11

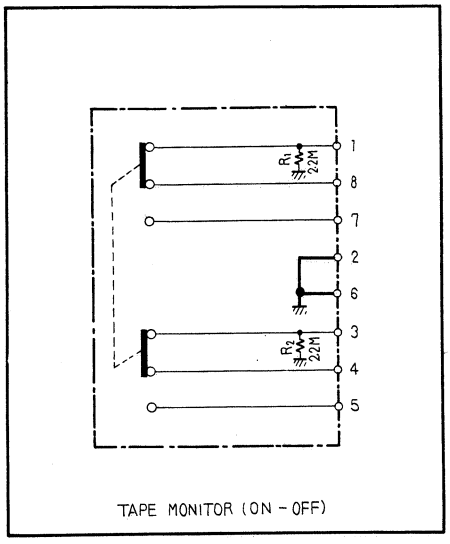
Parts List of VR Assembly (AWX-092)

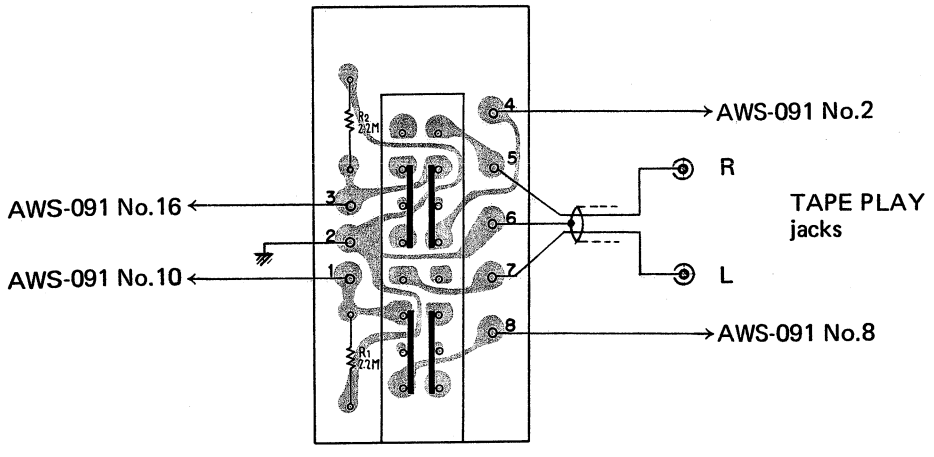
RESISTORS

Symbol	Description	Part No.
R1	Carbon film 510	RD¼PS 511J
R2	Carbon film 510	RD¼PS 511J
R3	Carbon film 1.1k	RD¼PS 112J
R4	Carbon film 1.1k	RD¼PS 112J
R5	Carbon film 1.1k	RD¼PS 112J
R6	Carbon film 1.1k	RD¼PS 112J
R7	Carbon film 1.1k	RD¼PS 112J
R8	Carbon film 1.1k	RD¼PS 112J
R9	Carbon film 1.1k	RD¼PS 112J
R10	Carbon film 1.1k	RD¼PS 112J
R11	Carbon film 1.1k	RD¼PS 112J
R12	Carbon film 1.1k	RD¼PS 112J
R13	Carbon film 1.1k	RD¼PS 112J
R14	Carbon film 1.1k	RD¼PS 112J
R15	Carbon film 680	RD¼PS 681J
R16	Carbon film 680	RD¼PS 681J
R17	Carbon film 510	RD¼PS 511J
R18	Carbon film 510	RD¼PS 511J
R19	Carbon film 680	RD¼PS 681J
R20	Carbon film 680	RD¼PS 681J
R21	Carbon film 510	RD¼PS 511J
R22	Carbon film 510	RD¼PS 511J
R23	Carbon film 1.1k	RD¼PS 112J
R24	Carbon film 1.1k	RD¼PS 112J
R25	Carbon film 1.1k	RD¼PS 112J
R26	Carbon film 1.1k	RD¼PS 112J
R27	Carbon film 1.1k	RD¼PS 112J
R28	Carbon film 1.1k	RD¼PS 112J
R29	Carbon film 1.1k	RD¼PS 112J
R30	Carbon film 1.1k	RD¼PS 112J
R31	Carbon film 1.1k	RD¼PS 112J
R32	Carbon film 1.1k	RD¼PS 112J
R33	Carbon film 1.1k	RD¼PS 112J
R34	Carbon film 1.1k	RD¼PS 112J
R35	Carbon film 680	RD¼PS 681J
R36	Carbon film 680	RD¼PS 681J
R37	Carbon film 510	RD¼PS 511J
R38	Carbon film 510	RD¼PS 511J
R39	Carbon film 680	RD¼PS 681J
R40	Carbon film 680	RD¼PS 681J
VR1	Variable 10k-B (slide-type)	ACX-004
VR2	Variable 10k-B (slide-type)	ACX-004
VR3	Variable 10k-B (slide-type)	ACX-004
VR4	Variable 10k-B (slide-type)	ACX-004
VR5	Variable 10k-B (slide-type)	ACX-004
VR6	Variable 10k-B (slide-type)	ACX-004
VR7	Variable 10k-B (slide-type)	ACX-004
VR8	Variable 10k-B (slide-type)	ACX-004

Symbol	Description	Part No.
VR9	Variable 10k-B (slide-type)	ACX-004
VR10	Variable 10k-B (slide-type)	ACX-004
VR11	Variable 10k-B (slide-type)	ACX-004
VR12	Variable 10k-B (slide-type)	ACX-004
VR13	Variable 10k-B (slide-type)	ACX-004
VR14	Variable 10k-B (slide-type)	ACX-004
VR15	Variable 10k-B (slide-type)	ACX-004
VR16	Variable 10k-B (slide-type)	ACX-004
VR17	Variable 10k-B (slide-type)	ACX-004
VR18	Variable 10k-B (slide-type)	ACX-004
VR19	Variable 10k-B (slide-type)	ACX-004
VR20	Variable 10k-B (slide-type)	ACX-004

9.6 SW ASSEMBLY (AWS-092)





Parts List of SW Assembly (AWS-092)

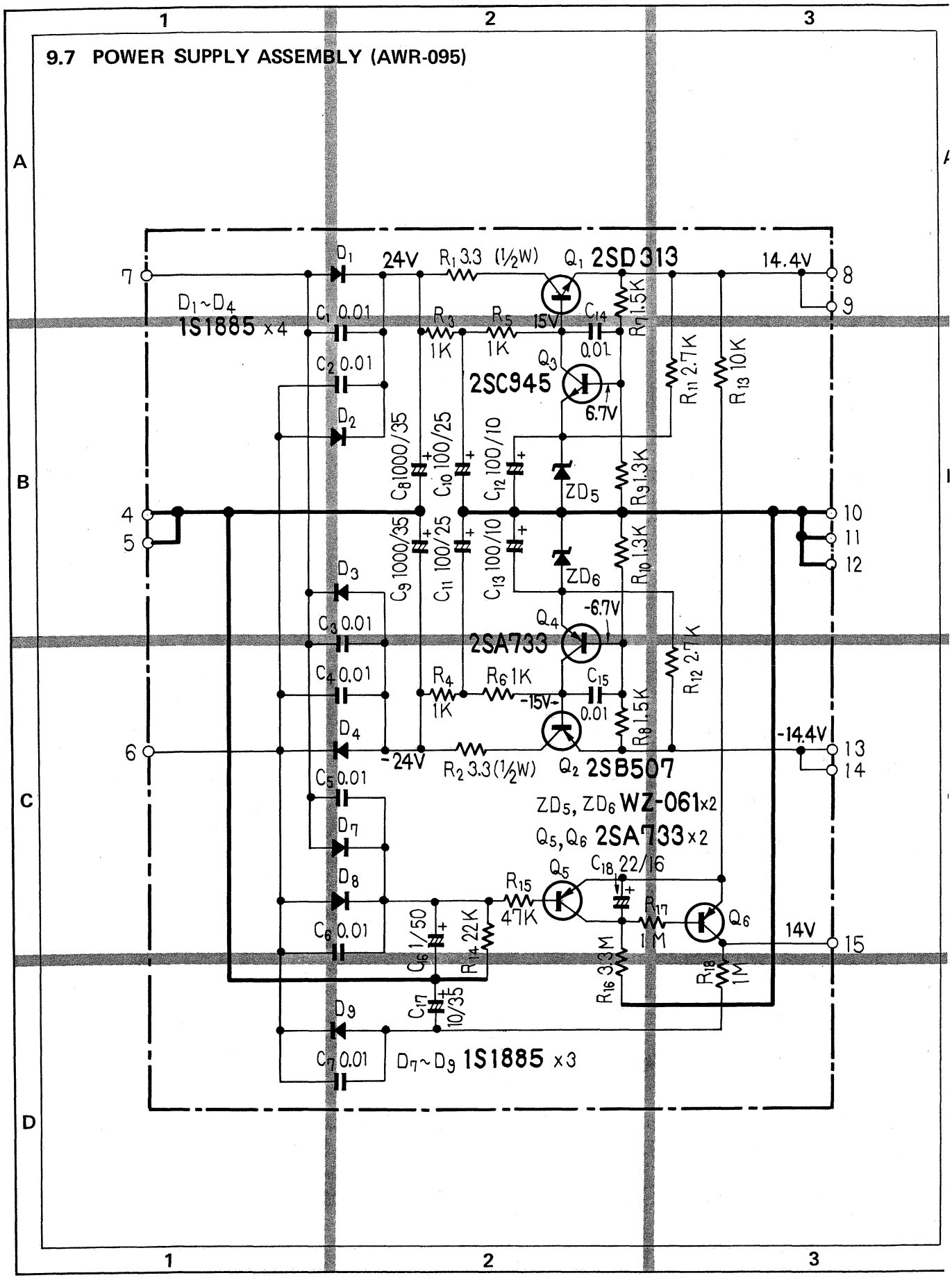
SWITCH

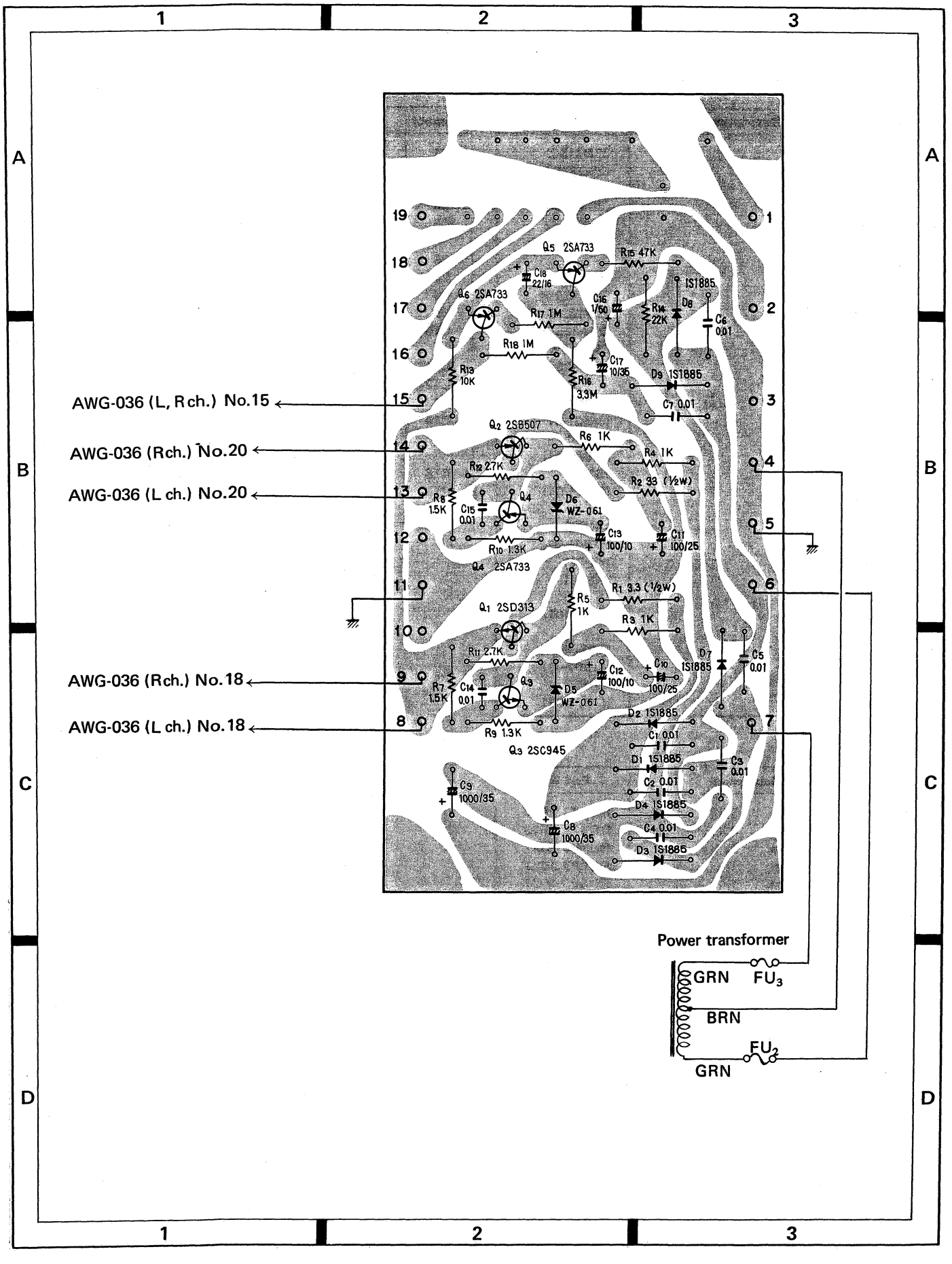
Symbol	Description	Part No.
	Lever switch (TAPE MONITOR)	ASK-044

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 2.2M	RD¼PS 225J
R2	Carbon film 2.2M	RD¼PS 225J

9.7 POWER SUPPLY ASSEMBLY (AWR-095)




1
2
3
A
B
C
D
AWG-036 (L, Rch.) No.15
AWG-036 (Rch.) No.20
AWG-036 (L ch.) No.20
AWG-036 (Rch.) No.18
AWG-036 (L ch.) No.18
Q5 2SA733
R15 47K
C18 22/16
Q6 2SA733
C16 1/50
R14 22K
D8 1S1885
C6 0.01
R17 1M
R18 1M
C17 10/35
R13 10K
R16 3.3M
D9 1S1885
C7 0.01
Q2 2SB507
R6 1K
R4 1K
R12 2.7K
R2 33 (1/2W)
R8 1.5K
C15 0.01
Q4
D6 WZ-061
C13 100/10
C11 100/25
R10 1.3K
Q4 2SA733
R5 1K
R1 3.3 (1/2W)
Q1 2SD313
R3 1K
R11 2.7K
C12 100/10
C10 100/25
D7 1S1885
C5 0.01
R7 1.5K
C14 0.01
Q3
D5 WZ-061
D2 1S1885
R9 1.3K
C1 0.01
Q3 2SC945
D1 1S1885
C3 0.01
C9 1000/35
C2 0.01
D4 1S1885
C8 1000/35
C4 0.01
D3 1S1885
Power transformer
GRN
FU3
BRN
FU2
GRN

Parts List of Power Supply Circuit Assembly (AWR-095)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SD313-D (2SD526-O)
Q2	Transistor	2SB507-D (2SB596-O)
Q3	Transistor	2SC945-Q (2SC1647-P)
Q4	Transistor	2SA733-Q (2SA823-P)
Q5	Transistor	2SA733-Q (2SA823-P)
Q6	Transistor	2SA733-Q (2SA823-P)
D1	Diode	1S1885 (SIB01-01)
D2	Diode	1S1885 (SIB01-01)
D3	Diode	1S1885 (SIB01-01)
D4	Diode	1S1885 (SIB01-01)
D5	Zener diode	WZ-061
D6	Zener diode	WZ-061
D7	Diode	1S1885 (SIB01-01)
D8	Diode	1S1885 (SIB01-01)
D9	Diode	1S1885 (SIB01-01)

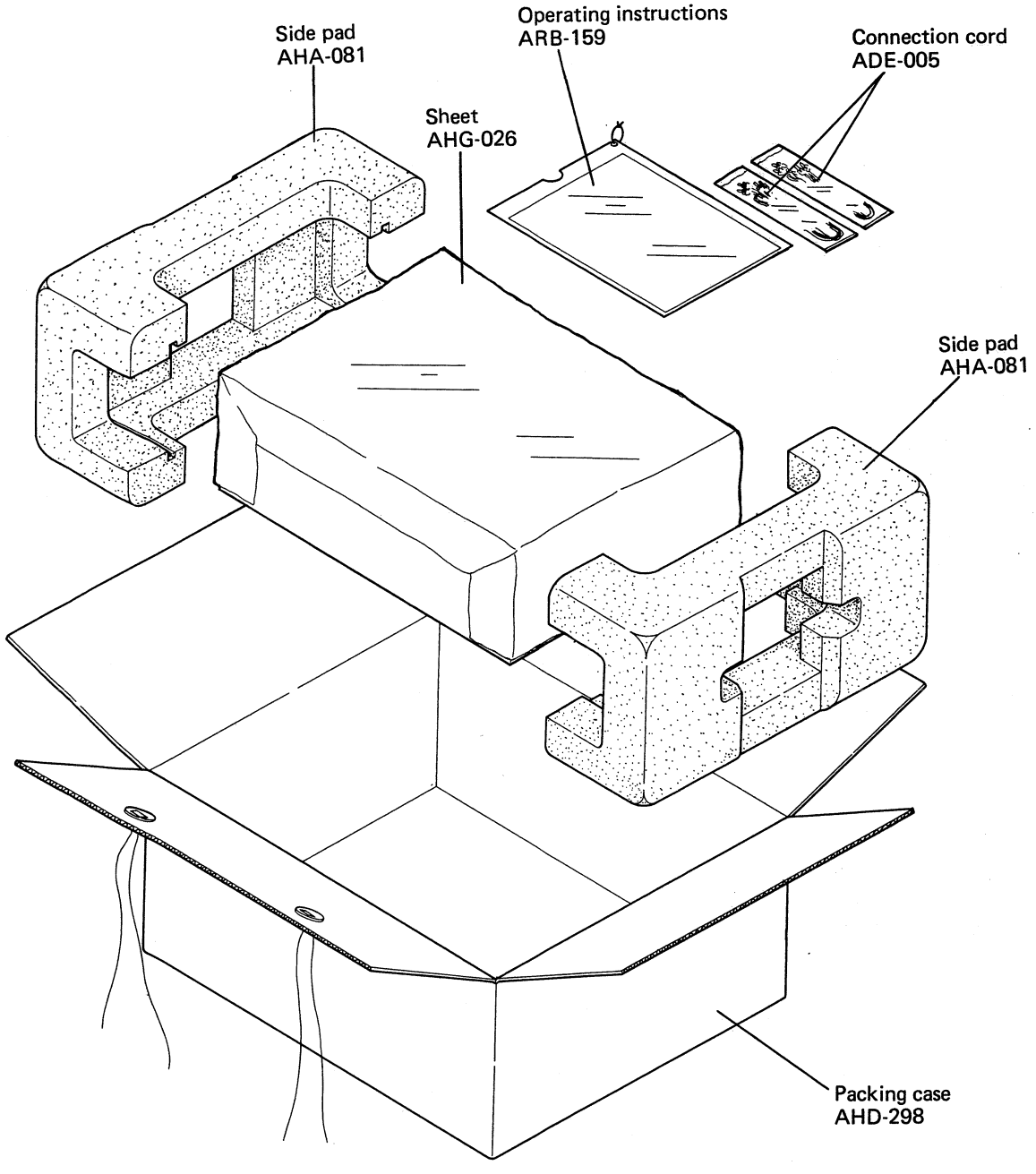
CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	150V	ACG-004
C2	Ceramic	0.01	150V	ACG-004
C3	Ceramic	0.01	150V	ACG-004
C4	Ceramic	0.01	150V	ACG-004
C5	Ceramic	0.01	150V	ACG-004
C6	Ceramic	0.01	150V	ACG-004
C7	Ceramic	0.01	150V	ACG-004
C8	Electrolytic	1,000	35V	CEA 102P 35
C9	Electrolytic	1,000	35V	CEA 102P 35
C10	Electrolytic	100	25V	CEA 101P 25
C11	Electrolytic	100	25V	CEA 101P 25
C12	Electrolytic	100	10V	CEA 101P 10
C13	Electrolytic	100	10V	CEA 101P 10
C14	Ceramic	0.01	50V	CKDYF 103Z 50
C15	Ceramic	0.01	50V	CKDYF 103Z 50
C16	Electrolytic	1	50V	CEA 010P 50
C17	Electrolytic	10	35V	CEA 100P 35
C18	Electrolytic	22	16V	CEA 220P 16

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	3.3	½W	RD½PS 3R3J
R2	Carbon film	3.3	½W	RD½PS 3R3J
R3	Carbon film	1k		RD¼PS 102J
R4	Carbon film	1k		RD¼PS 102J
R5	Carbon film	1k		RD¼PS 102J
R6	Carbon film	1k		RD¼PS 102J
R7	Carbon film	1.5k		RD¼PS 152J
R8	Carbon film	1.5k		RD¼PS 152J
R9	Carbon film	1.3k		RD¼PS 132J
R10	Carbon film	1.3k		RD¼PS 132J
R11	Carbon film	2.7k		RD¼PS 272J
R12	Carbon film	2.7k		RD¼PS 272J
R13	Carbon film	10k		RD¼PS 103J
R14	Carbon film	22k		RD¼PS 223J
R15	Carbon film	47k		RD¼PS 473J
R16	Carbon film	3.3M		RD¼PS 335J
R17	Carbon film	1M		RD¼PS 105J
R18	Carbon film	1M		RD¼PS 105J

10. PACKING

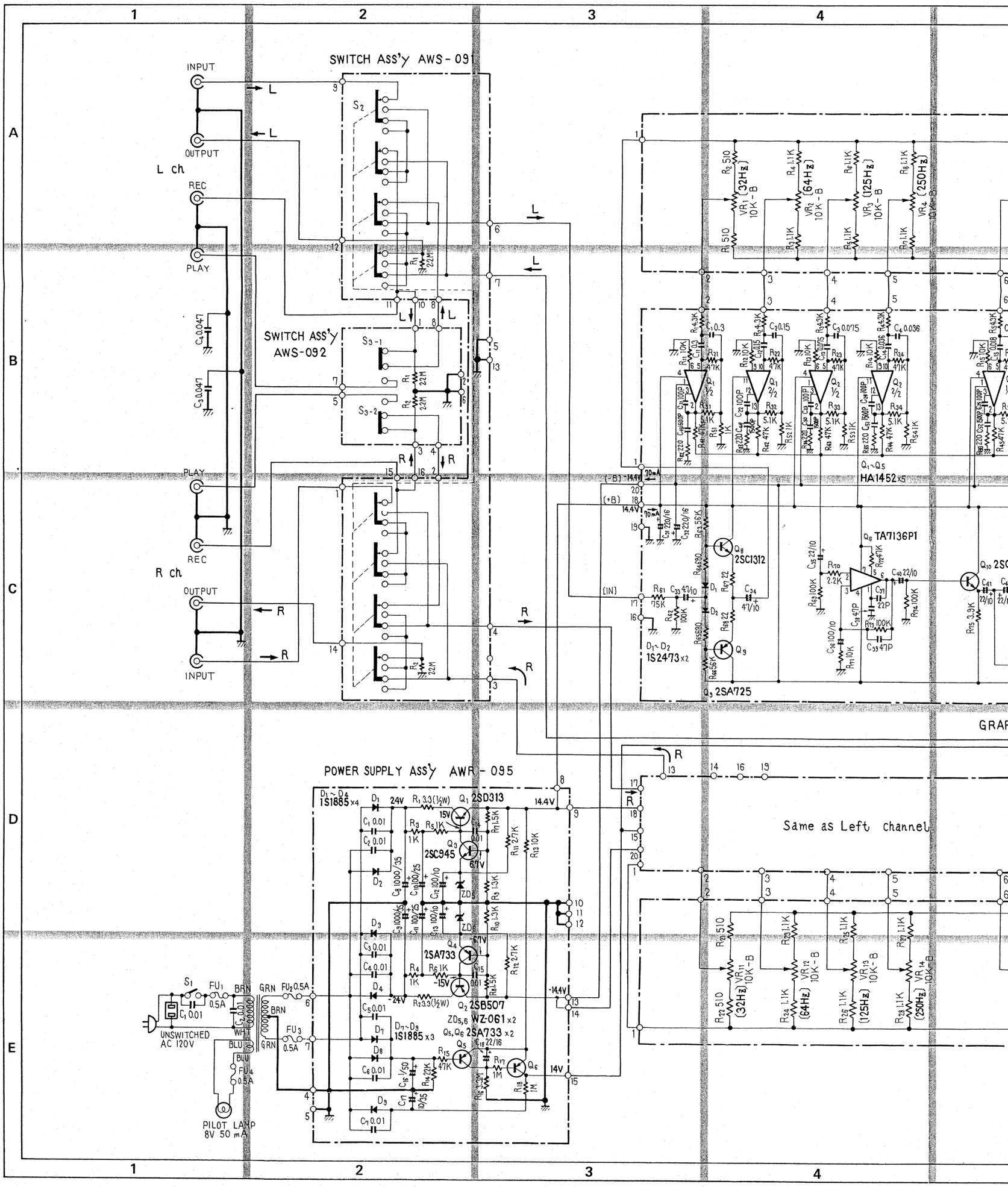

Side pad
AHA-081
Operating instructions
ARB-159
Connection cord
ADE-005
Sheet
AHG-026
Side pad
AHA-081
Packing case
AHD-298

11. PARTS LIST OF EXPLODED VIEWS

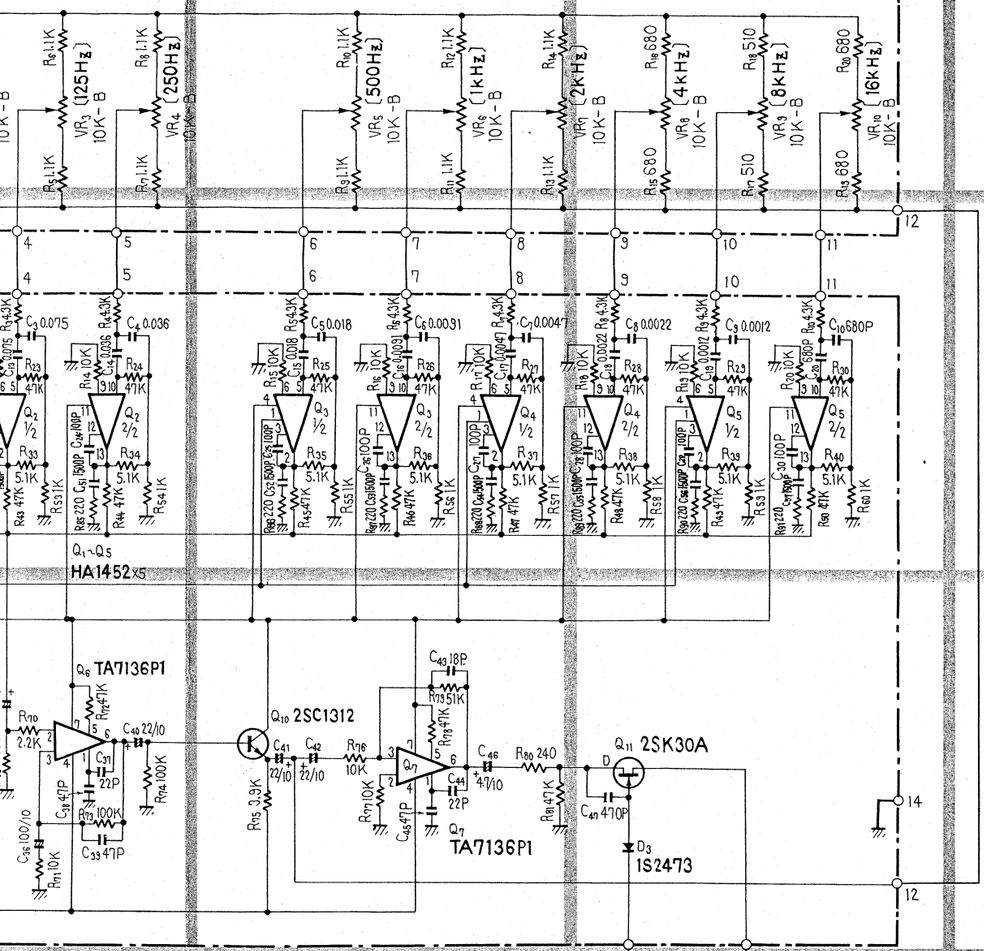
Parts No.	Parts Name
AAD-040	Knob
AAD-111	Knob
ABA-002	Screw 3x8ZK
ABA-003	Screw 3x10ZK
ABA-012	Screw 4x8ZK
ABA-048	Screw 3x6MC
ABA-057	Screw 3x8ZK
ABA-066	Screw 4x8
ABA-071	Screw 4x16MC
ABA-079	Screw 4x8ZK
ABA-108	Screw 4x8ZK
ABE-005	Washer
ACG-001	Ceramic Capacitor
ACG-003	Ceramic Capacitor
ACX-004	Variable Resistor
ADE-005	Connection Cord
ADG-005	AC Power Cord
AEB-064	Rubber Bracket
AEC-079	Strain Relief
AEC-178	Foot
AED-039	Mask
AED-045	Mask
AEK-107	Fuse 0.5A
AEL-063	Lamp with Leads (8V 50mA)
AHA-081	Side Pad
AHD-298	Packing Case
AHG-026	Sheet
AKB-014	Terminal
AKE-017	Screw for Ground
AKP-002	AC Socket
AKR-028	Fuse Holder
ALA-023	Stud
ANB-367	Front Panel Ass.
ANE-079	Top Cover
ARB-159	Operating Instructions
ASK-044	Lever Switch
ASK-066	Lever Switch
ASK-082	Lever Switch
ATT-270	Power Transformer
AWG-036	Graphic EQ Ass.
AWR-095	Power Supply Ass.
AWS-091	SW Ass.
AWS-092	SW Ass.
AWX-092	VR Ass.

GRAPHIC EQUALIZER

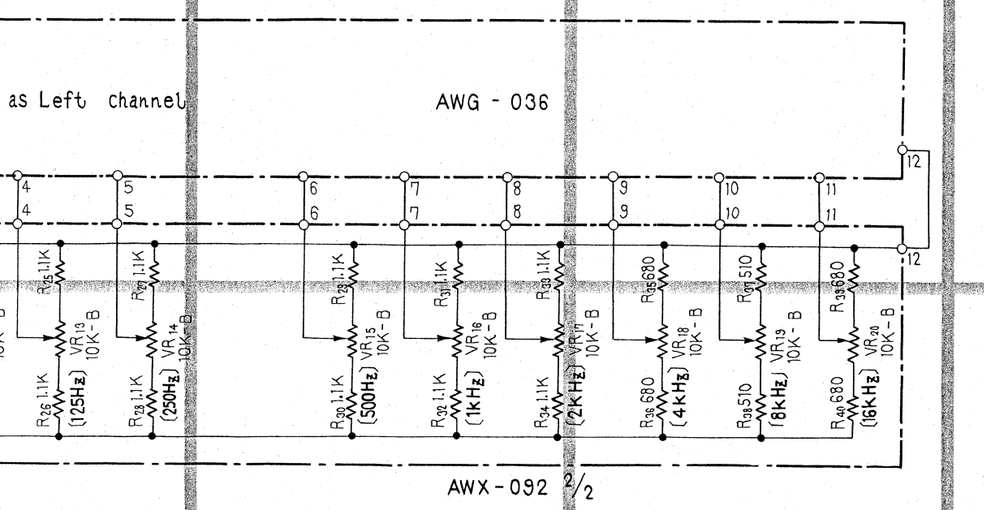
SG-9500 KU



VR ASS'y AWX-092 1/2



GRAPHIC EQUALIZER ASS'y AWG-036



AWX-092 2/2

SWITCHES

S_1 POWER SWITCH
ON ⟷ OFF

S_2 EQUALIZER SWITCH
ON/RECORDING ⟷ ON ⟷ OFF

S_3 TAPE MONITOR SWITCH
ON ⟷ OFF

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

CAPACITORS
IN μF UNLESS OTHERWISE NOTED
P: pF