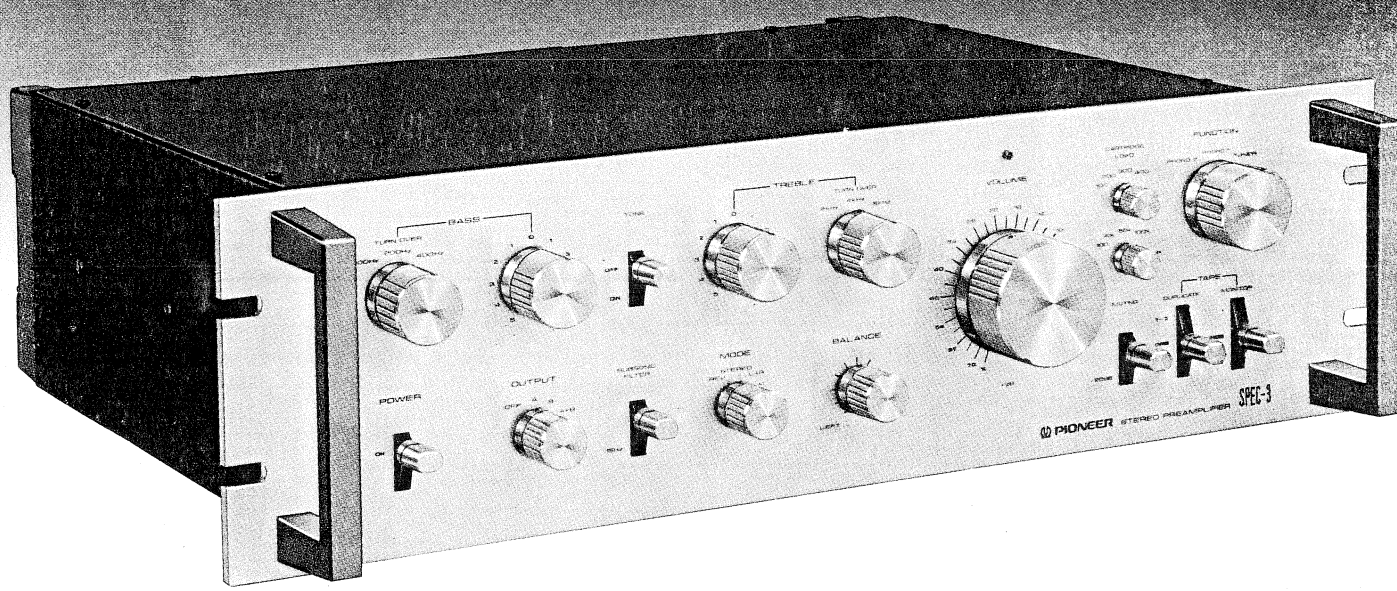
STEREO PREAMPLIFIER

SPEC-3

SERVICE MANUAL



PIONEER

CONTENTS

1. SPECIFICATIONS

SEMICONDUCTORS

Transistors 29
Diodes 10

PREAMPLIFIER

Equalizer amplifier . . . . . 3-stage direct-coupled class A SEPP with 1st-stage differential amplifier
Control amplifier . . . . . 3-stage direct-coupled with 1st-stage differential amplifier

Input (Sensitivity/Impedance)
- PHONO 1 . . . . . 2.5mV/100ohms, 10, 50, 100kilohms
- PHONO 2 . . . . . 2.5mV/100ohms, 10, 50, 100kilohms
- Cartridge Load PHONO 1, 2 . . . . . 100pF, 200pF, 300pF, 400pF
- TUNER 150mV/50kilohms
- AUX 1 . . . . . 150mV/50kilohms
- AUX 2 . . . . . 150mV/50kilohms
- TAPE PLAY 1 . . . . . 150mV/50kilohms
- TAPE PLAY 2 . . . . . 150mV/50kilohms
- TAPE PLAY 2 (DIN connector) 150mV/50kilohms

PHONO Overload Level (T.H.D.: 0.01%)
- PHONO 1 . . . . . 300mV (1,000Hz)
- PHONO 2 . . . . . 300mV (1,000Hz)

Output (Level/Impedance)
- TAPE REC 1 . . . . . 150mV
- TAPE REC 2 . . . . . 150mV
- TAPE REC 2 (DIN connector) 30mV/80kilohms
- OUTPUT 1, 2 (R_L: 50kilohms) . . . . . 2V/600ohms 8V/600ohms (max.)

Total Harmonic Distortion (20 to 20,000Hz)
- PHONO . . . . . No more than 0.01% (2V output)
- TUNER, AUX, TAPE PLAY . . . . . No more than 0.005% (2V output)

Frequency Response
- PHONO (RIAA Equalization) . . . . . 20Hz to 20,000Hz ±0.2dB
- TUNER, AUX, TAPE PLAY . . . . . 10Hz to 100,000Hz $^{+0}_{-0.5}$dB

Tone Control
- BASS . . . . . ±10dB (25Hz/50Hz/100Hz) Turnover frequency 100Hz/200Hz/400Hz
- TREBLE . . . . . ±10dB (8kHz/16kHz/32kHz) Turnover frequency 2kHz/4kHz/8kHz

Filter
- SUBSONIC 15Hz (6dB/oct)

Hum and Noise (IHF, short-circuited, A Network)
- PHONO 80dB
- TUNER, AUX, TAPE PLAY 100dB

Hum and Noise (DIN)
- PHONO 69dB
- TUNER, AUX, TAPE PLAY 86dB
- MUTING . . . . . –20dB

MISCELLANEOUS

Power Requirements . . . . . 220V/240V (switchable), 50/60Hz
Power Consumption . . . . . 15 watts
Dimensions . . . . . 480(W) x 142(H) x 390(D) mm 18-7/8(W) x 5-5/8(H) x 15-3/8(D) in
Weight (Without package) 7.7kg, 16lb 15oz

FURNISHED PARTS

Connection cord with pin plugs 1
Operating instructions 1
Hex. wrench 1

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

FOR USE UNITED KINGDOM OR AUSTRALIA

CAUTION 240V

Mains supply voltage is factory adjusted at 240 volts.

WARNING

THIS APPARATUS MUST BE EARTHED.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Green-and-Yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.

The AC Outlets of this apparatus have been removed from this apparatus in order to comply with U.K. Safety Regulation. Ensure that your equipment is connected correctly—if you are in doubt, consult a qualified electrician.

Do not unscrew the bottom plate and cabinet.

No user serviceable parts inside.

Always disconnect all the equipment from the mains supply when disconnecting the signal leads.

The Power cord should be connected last, make sure that the Power switch is OFF. Be sure the appliance connector is fully inserted into the AC inlet.

Unplug the set from the wall socket when it is not to be used for an extended period of time.

FOR YOUR SAFETY

1. Insert this plug only into effectively earthed three-pin plug-socket outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cords, if used, must be three-core correctly wired.

2. FRONT PANEL FACILITIES

BASS TURN OVER SWITCH

Selects the frequency below which the BASS control tone adjustments apply. Set switch to 100Hz, 200Hz or 400Hz according to listening room and speaker system characteristics or personal preference.

BASS AND TREBLE CONTROLS

Control for adjusting low and high frequency tones. With the TONE switch set to ON, turning the BASS control clockwise from center enhances the frequency band below the point selected by the BASS TURN OVER switch, while counter-clockwise rotation attenuates this band. In a similar manner, the TREBLE control adjusts the frequency range above the point selected by the TREBLE TURN OVER switch.

POWER SWITCH

Flip this switch to the ON position to supply power to the SPEC-3. There will be a short delay when it is set to ON, because the muting circuit has been actuated to suppress the unpleasant noise that is sometimes generated when the power is switched on and off.

OUTPUT SWITCH

Selects the OUTPUT jacks for signal output. Set this switch according to the jacks connected to the power amplifier.

- OFF: Sound not obtained from the OUTPUT jacks.
- A: When using the power amplifier connected to the OUTPUT A jacks.
- B: When using the power amplifier connected to the OUTPUT B jacks.
- A + B: When using the power amplifiers connected to both the OUTPUT A and B jacks.

SUBSONIC FILTER SWITCH

Set to 15Hz position in the event that turntable rumble, recording cutting noise or other low frequency noise becomes objectionable. Attenuation in the frequency band below 15Hz is 6dB/octave.

TONE SWITCH

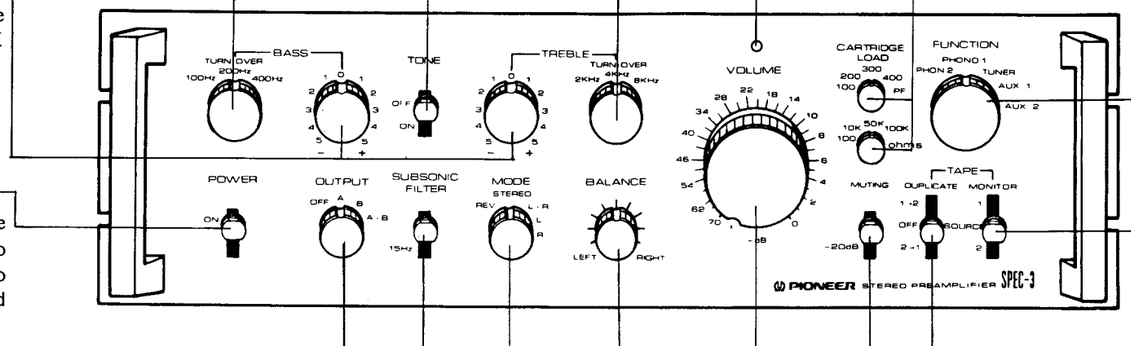
In the ON position, tone adjustments can be performed with the BASS and TREBLE controls. When set to the upper (OFF) position, the tone control circuits are disengaged and frequency response is flat. This function is convenient for checking phono cartridge and speaker tone quality and listening room acoustics.

MODE SWITCH

- REV: Reverses left and right channel stereo signals and reproduces them stereophonically.
- STEREO: Set to this position for normal stereo reproduction.
- L + R: Mixes left and right channel signals and reproduces them monophonically.
- L: Left channel signal is reproduced monophonically from both speakers.
- R: Right channel signal is reproduced monophonically from both speakers.

BALANCE CONTROL

Control for adjusting stereo balance between left and right speaker systems or headphones. Turn clockwise from center to increase right (R) channel volume and counter-clockwise from center to increase left (L) channel volume in order to obtain a balance.



POWER INDICATOR

Lights when the SPEC-3 is turned on.

MUTING SWITCH

Switch for reducing volume by 20dB from the VOLUME control setting. Convenient for temporarily reducing the volume when changing records or tapes, since it eliminates the need for continually readjusting the VOLUME control.

VOLUME CONTROL

Adjust speaker and headphone volume. Scale indicates attenuation in dB with maximum volume assigned an arbitrary value of 0dB. Control can also be used in combination with the MUTING switch to provide a finer and wider range of adjustment.

TREBLE TURN OVER SWITCH

Selects the frequency above which the TREBLE control tone adjustments apply. Set to 2kHz, 4kHz or 8kHz according to listening room and speaker system characteristics or personal preference.

CARTRIDGE LOAD SWITCHES

Select phono input circuit resistance and capacitance according to the specifications for the employed phono cartridge.

FUNCTION SWITCH

Selects desired playback program source.

- PHONO 2: To play records on a turntable connected to the PHONO 2 jacks.
- PHONO 1: To play records on a turntable connected to the PHONO 1 jacks.
- TUNER: To listen to broadcasts with a tuner connected to the TUNER jacks.
- AUX 1: To play a component connected to the AUX 1 jacks.
- AUX 2: To play a component connected to the AUX 2 jacks.

TAPE MONITOR SWITCH

Employ for tape playback or to monitor a recording in progress.

- 1: Playback or monitoring of a tape deck connected to the TAPE 1 jacks.
- SOURCE: Be sure to set to this position when not using the tape deck for playback.
- 2: Playback or monitoring of a tape deck connected to the TAPE 2 jacks.

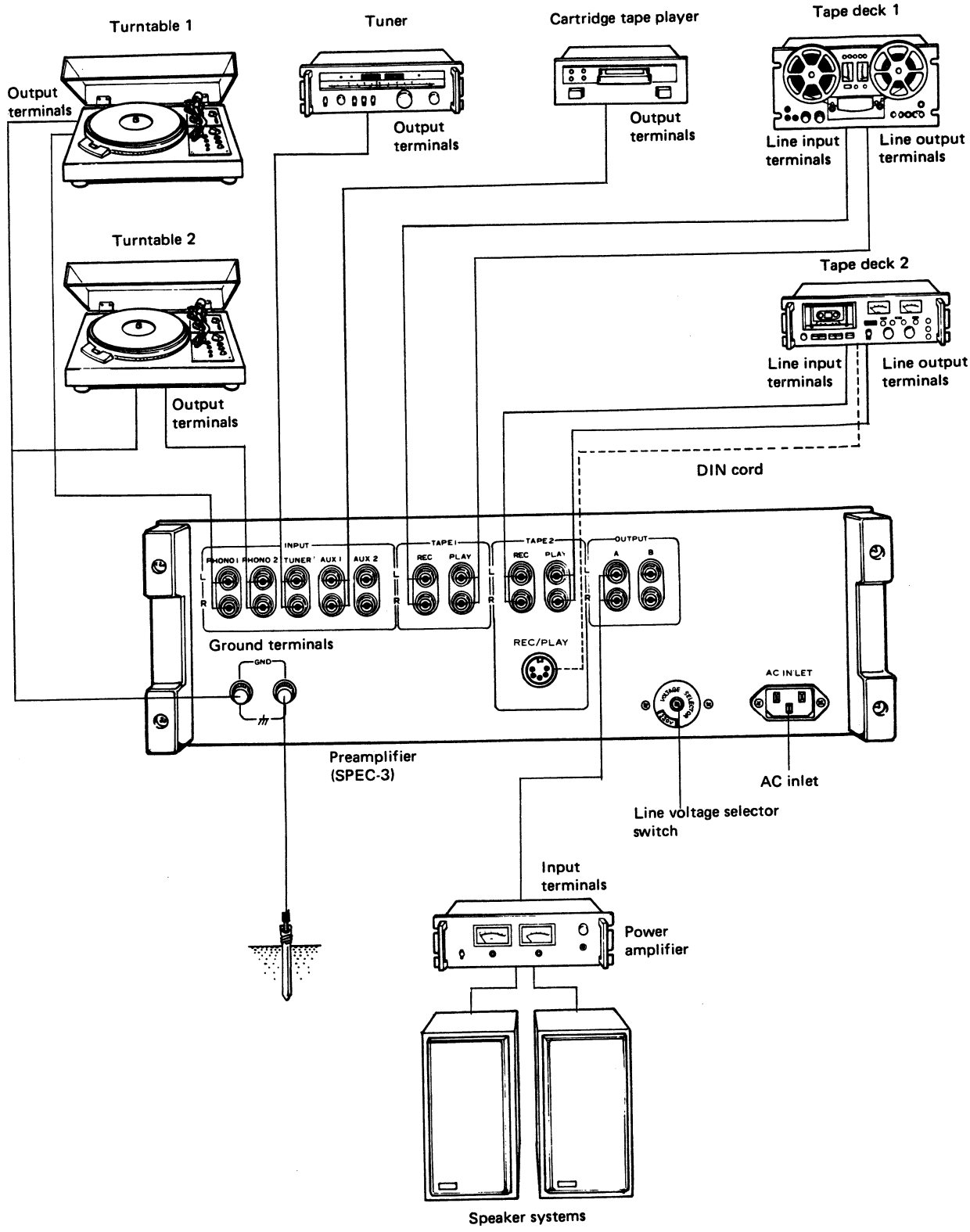
NOTE:
When listening to records or broadcasts, be sure to set this switch to SOURCE. Sound will not be obtained from speakers if it is set to 1 or 2.

TAPE DUPLICATE SWITCH

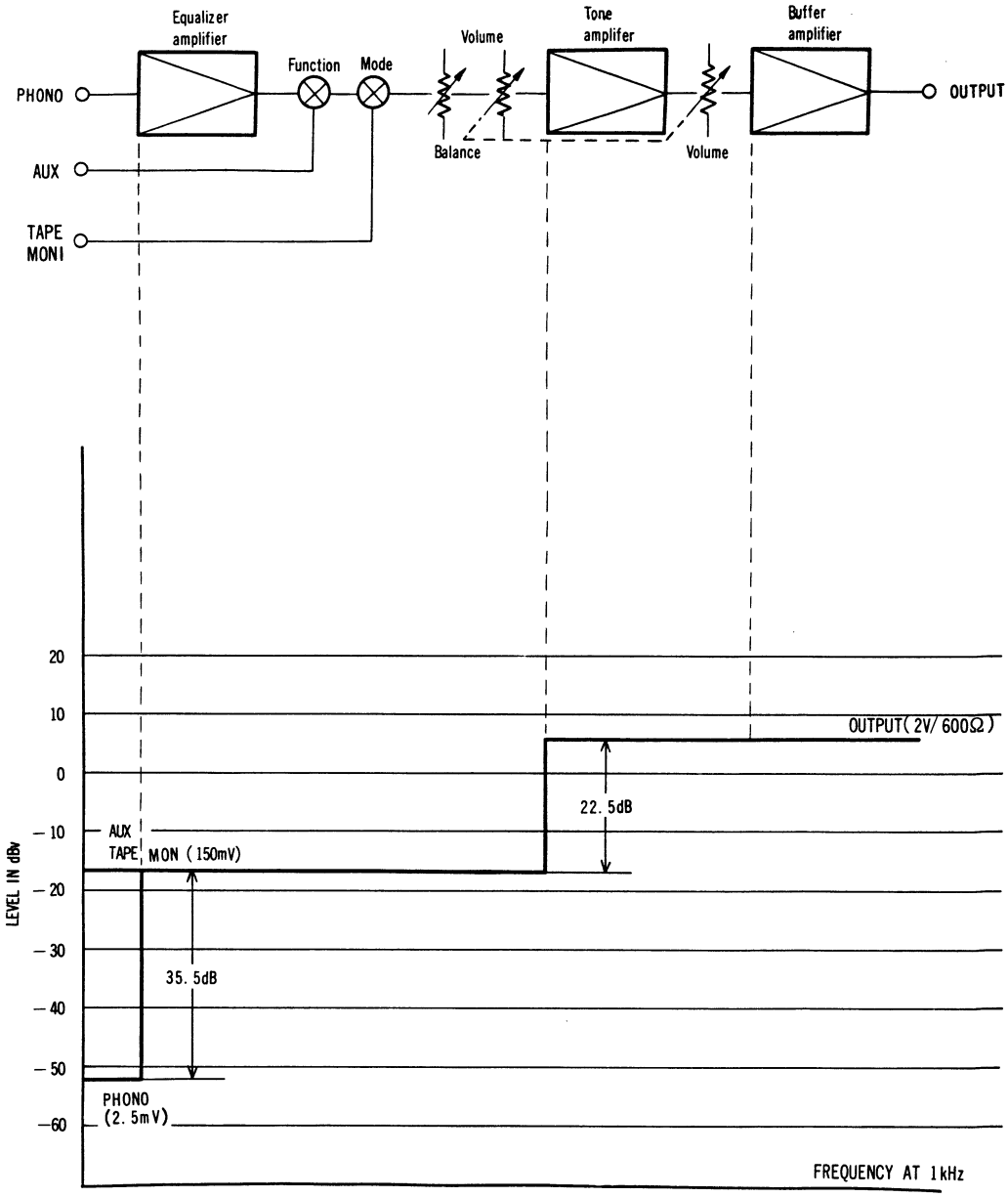
Employ when using two tape decks for duplication or editing. Be sure to set to the OFF position at other times.

- 1 → 2: Duplication of tape from TAPE 1 (playback mode) to TAPE 2 (recording mode).
- OFF: Set to this position when not using the duplication feature (this includes simultaneous recording with two tape decks and tape playback).
- 2 → 1: Duplication of tape from TAPE 2 (playback mode) to TAPE 1 (recording mode).

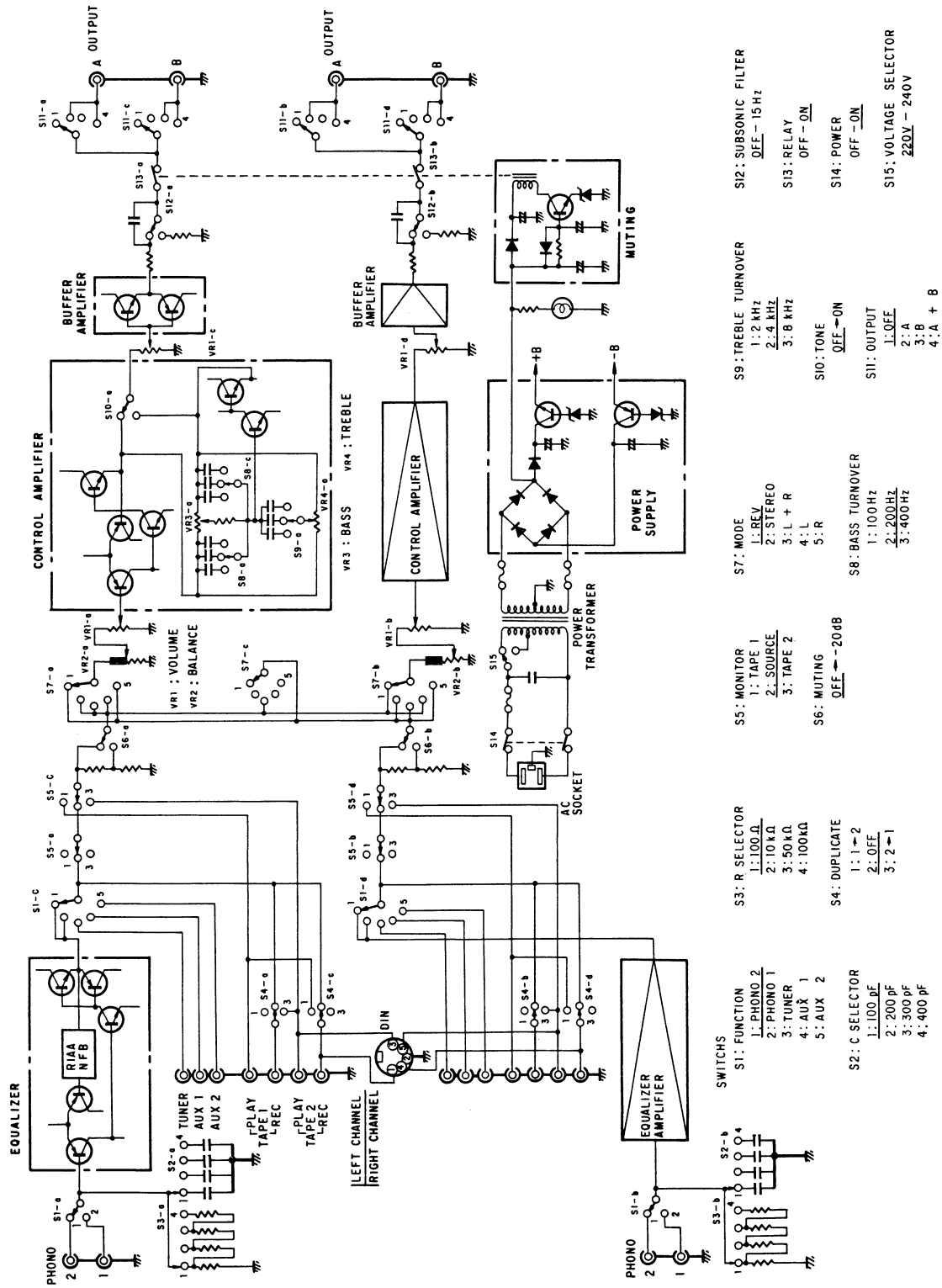
3. CONNECTION DIAGRAM



4. LEVEL DIAGRAM



5. BLOCK DIAGRAM



6. CIRCUIT DESCRIPTIONS

PHONO INPUT RESISTANCE/CAPACITANCE SELECTOR CIRCUIT

The phono input circuit includes a CR selector circuit (See Fig. 1) which permits the user to vary input resistance and input capacitance in order to obtain optimum load conditions for the cartridge being used.

Without including the resistance of R, the design input resistance of the equalizer amplifier stage is 240kΩ. Since the selectable values of R are 100Ω, 11kΩ, 62kΩ, and 242kΩ, the input resistance may be varied form 100Ω, 10kΩ, 50kΩ, to 100kΩ.

Without including the capacitance of C, the design input capacitance (in respect to the phono input capacitance) is 100pF. By switching in the values of C (0, 100pF, 200pF, and 300pF), input capacitance may be varied from 100pF, 200pF, 300pF, to 400pF.

NOTE:
Input resistance and input capacitance values refer to the phono input terminals.

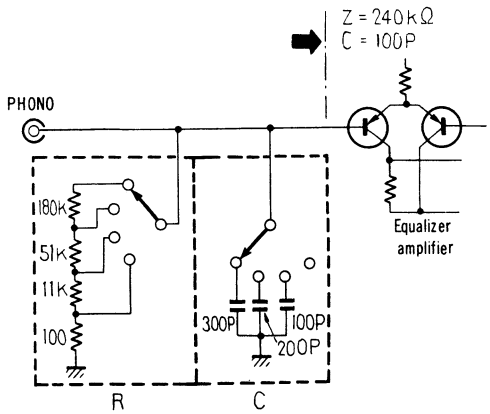


Fig. 1 CR Selector Circuit

EQUALIZER AMPLIFIER

The equalizer amplifier is a low-distortion positive/negative dual power supply direct-coupled amplifier employing a differential amplifier in the first stage, and a class A pure complementary SEPP circuit in the final stage.

Maximum input voltage at 1kHz is 300mV (0.01% THD), and frequency response (equalizer deviation) 20Hz to 20,000Hz ±0.2dB.

CONTROL AMPLIFIER (Fig. 2)

Q_1 to Q_7 constitute a 3-stage direct-coupled flat amplifier employing emitter-follower and differential amplifier stages, while Q_9 and Q_{11} form an emitter-follower type tone amplifier. The tone control is of the turnover frequency selector NFB type.

In the flat amplifier, the load of the voltage amplifier (Q_5) is applied to the emitter-follower (Q_7) and bootstrap circuit (R_{19}, R_{21}, and C_{13}), thereby obtaining a high open-loop gain. Consequently, with the application of sufficient NFB, the signal is applied to the following stage with low distortion and low impedance. In the tone amplifier too, the load of Q_9 is applied to the emitter-follower (Q_{11}) and bootstrap circuit (R_{61}, R_{63}, and C_{43}), thereby applying the signal to the output with low distortion and low impedance.

POWER SUPPLY CIRCUIT

A bridged rectifier circuit supplies ±42V DC voltage, with each of the amplifier circuits being supplied with ±31V via a constant voltage stage, and the power supply muting circuit and pilot lamps being supplied.

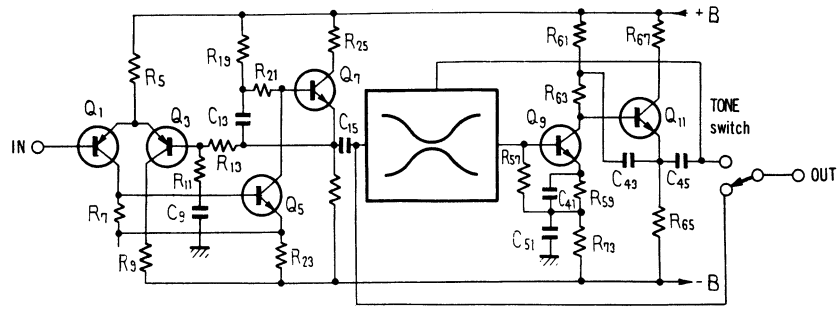


Fig. 2 Control Amplifier

POWER SUPPLY MUTING CIRCUIT (Fig. 4)

This circuit mutes out the residual noise and switching noise caused when the power supply switch is turned on and off.

Muting Operation When the Power Supply Switch is Turned On (Fig. 3)

When the power is turned on, the Q_5 base and emitter potentials increase in accordance to the R_{27}/C_{14} time constant (6 to 8 secs). Once the emitter potential exceeds the D_3 zener potential (A) of 17.7V, a current will flow through the base, thereby turning Q_5 on. This will activate the relay to close the signal path circuit.

Muting Operation When the Power Supply Switch is Turned Off

When the power is turned off, the charge on C_{14} discharges immediately via D_2-R_9-PL, thereby turning Q_5 off immediately. The relay will consequently be released, opening the signal path extremely rapidly.

The diodes D_1 and D_5 included in this circuit prevent any reverse flow of current, thereby eliminating any possible delay in muting response due to the discharge of loads on C_3 and C_{15} (smoothing capacitors).

BUFFER AMPLIFIER

This stage too employs positive/negative dual power supply class A pure complementary SEPP circuitry. Although the gain of this circuit is approximately 0dB, input impedance is high, and output impedance low. Besides preventing mutual interference between the first and final stages, this also keeps the output impedance of the output terminals low, thereby avoiding any possible changes in output voltage and other characteristics caused by the equipment connected to the output terminals. Note that the output impedance of the output terminals is 600Ω.

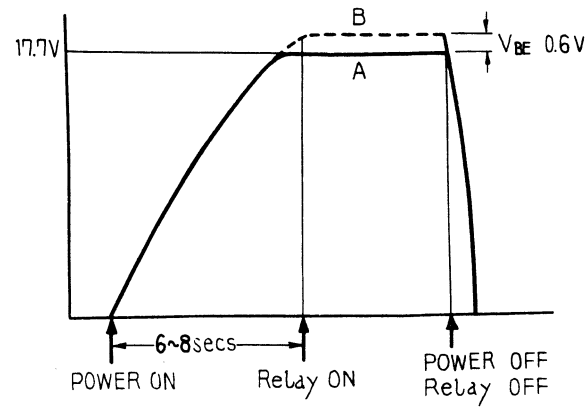


Fig. 3 Muting Action in Relation to Voltages A and B

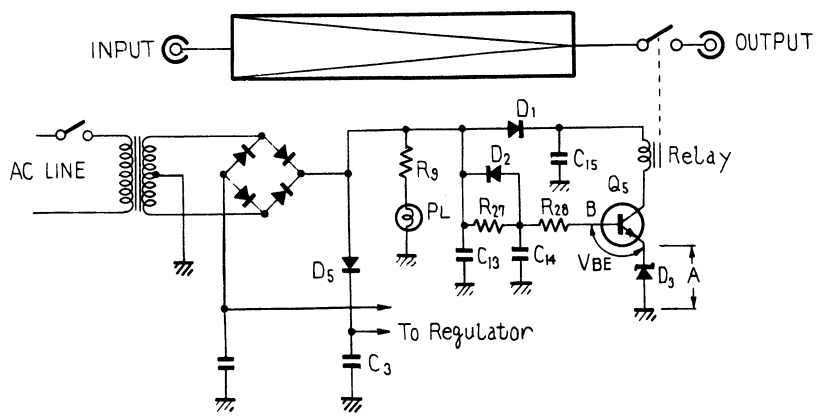
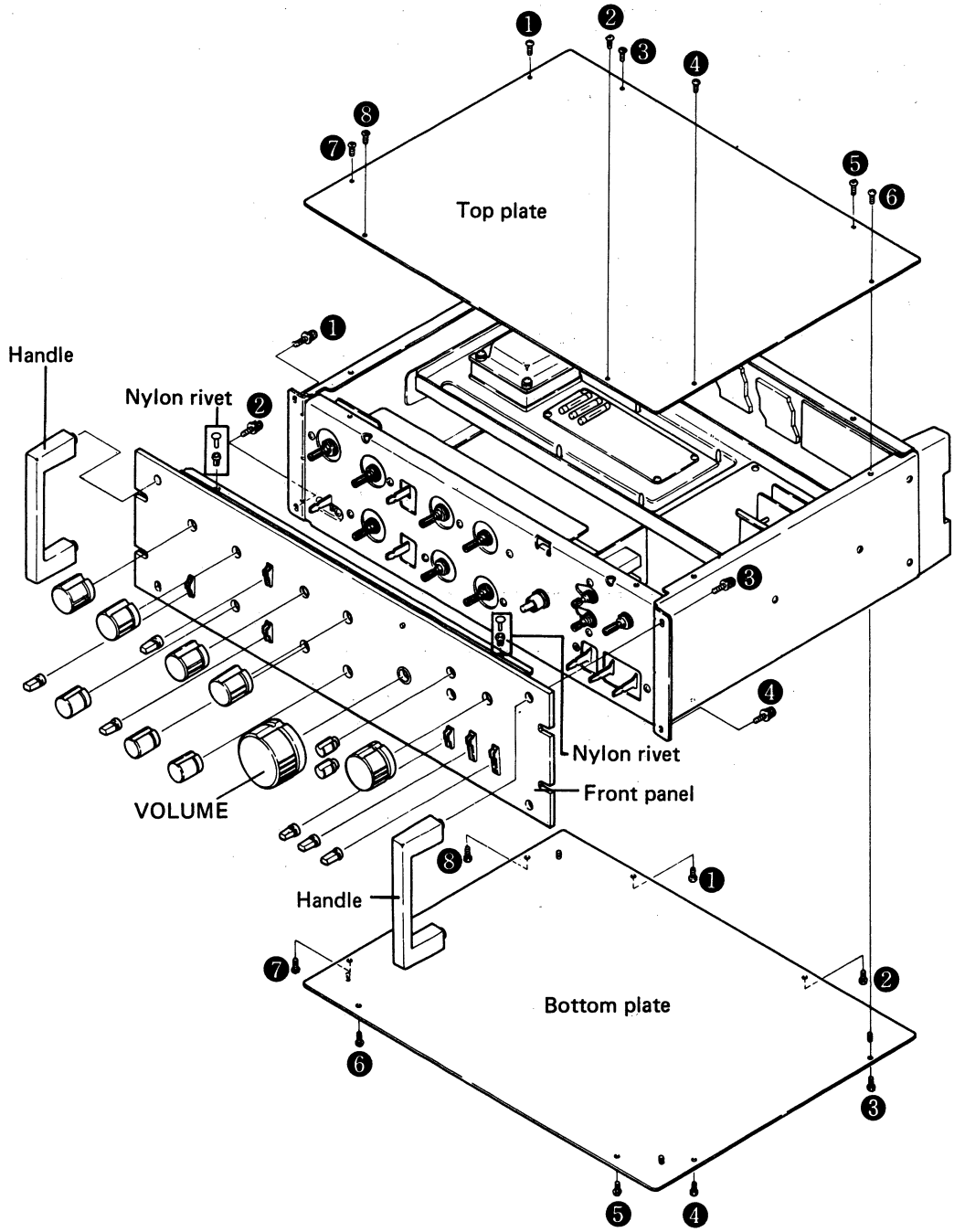


Fig. 4 Power Supply Muting Circuit

7. DISASSEMBLY

1. Undo the 8 screws to remove the top plate.
2. Undo another 8 screws to remove the bottom plate.
3. Loosen the screw securing the VOLUME control knob, and then pull off all the front panel knob. Next extract the 2 nylon rivets and the 4 screws securing the handle grips, whereupon the front panel may be lifted off.



8. PARTS LOCATION

8.1 FRONT PANEL VIEW

Knob (TREBLE)
AAB-141

Lever knob assembly (TONE)
AAD-125

Knob (TREBLE)
AAB-141

Knob (BASS)
AAB-141

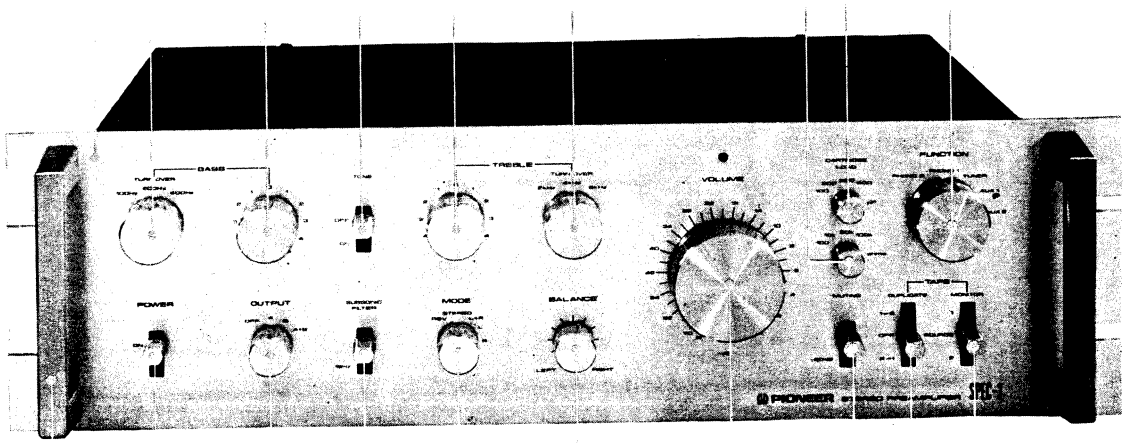
Knob
AAB-143

Knob (BASS)
AAB-141

Knob
AAB-143

Front panel assembly
ANB-575

Knob (FUNCTION)
AAB-140



Lever knob assembly
(TAPE MONITOR)
AAD-125

Handle
ANK-111

Lever knob assembly
(TAPE DUPLICATE)
AAD-125

Lever knob assembly (POWER)
AAD-125

Lever knob assembly (MUTING)
AAD-125

Knob (OUTPUT)
AAB-142

Knob (VOLUME)
AAB-139

Lever knob assembly (SUBSONIC FILTER)
AAD-125

Knob (MODE)
AAB-142

Knob (BALANCE)
AAB-142

8.2 FRONT VIEW WITH PANEL REMOVED

Rotary switch (TREBLE)
ASD-056

Variable resistor (TREBLE)
ACV-136

Lever switch
(TONE)
ASK-122

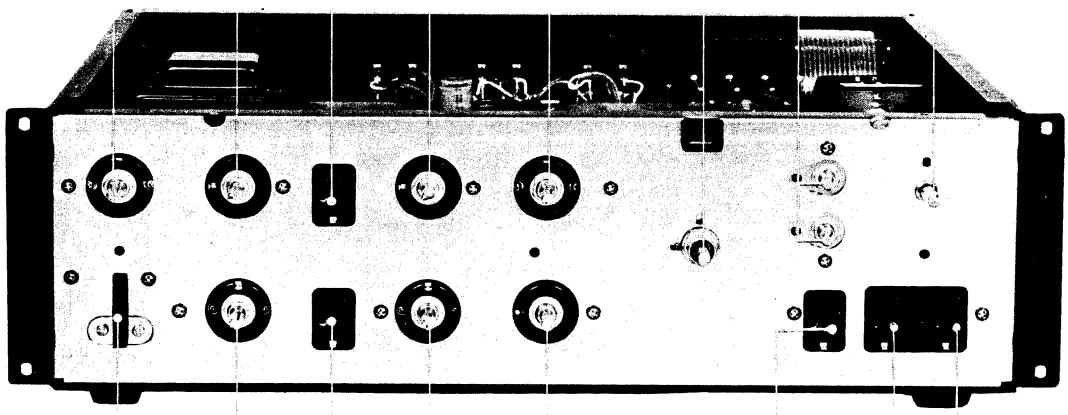
Variable resistor (VOLUME)
ACV-317

Variable resistor
(BASS)
ACV-136

Rotary switch
ASD-005

Rotary switch (BASS)
ASD-057

Rotary switch (FUNCTION)
ASD-068



Lever switch (POWER)
ASK-125

Lever switch (TAPE MONITOR)
ASK-118

Rotary switch (OUTPUT)
ASD-066

Lever switch (TAPE DUPLICATE)
ASK-118

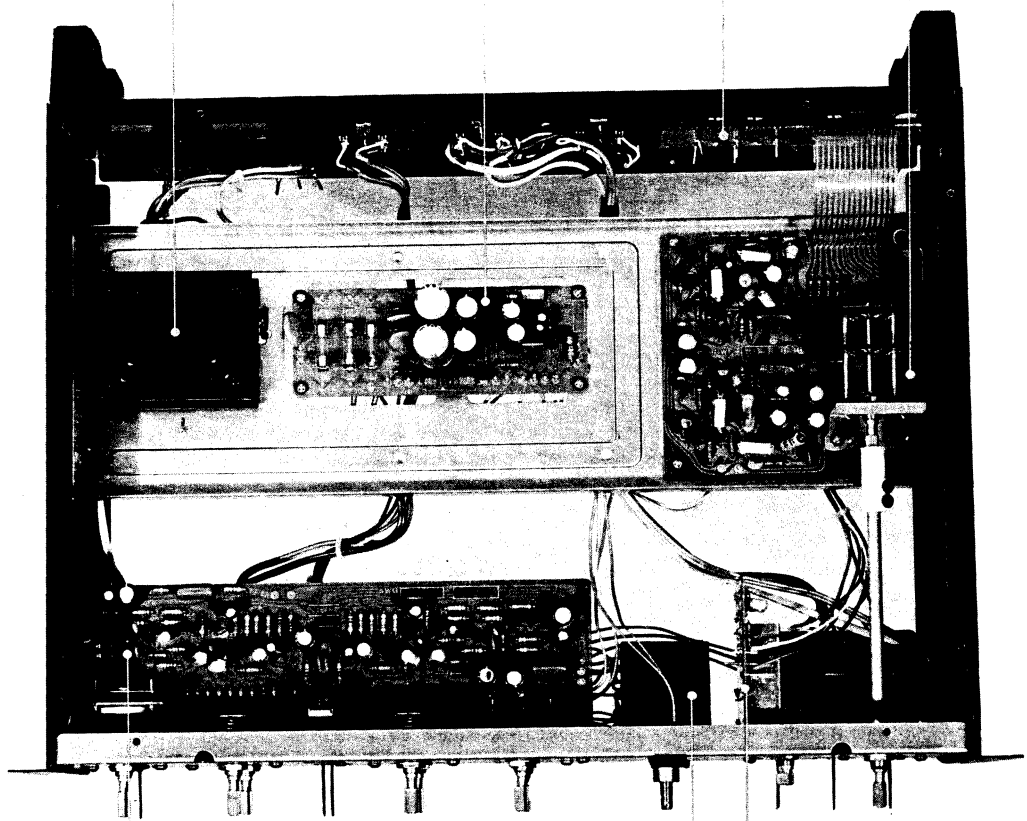
Lever switch (SUBSONIC FILTER)
ASK-122

Lever switch (MUTING)
ASK-122

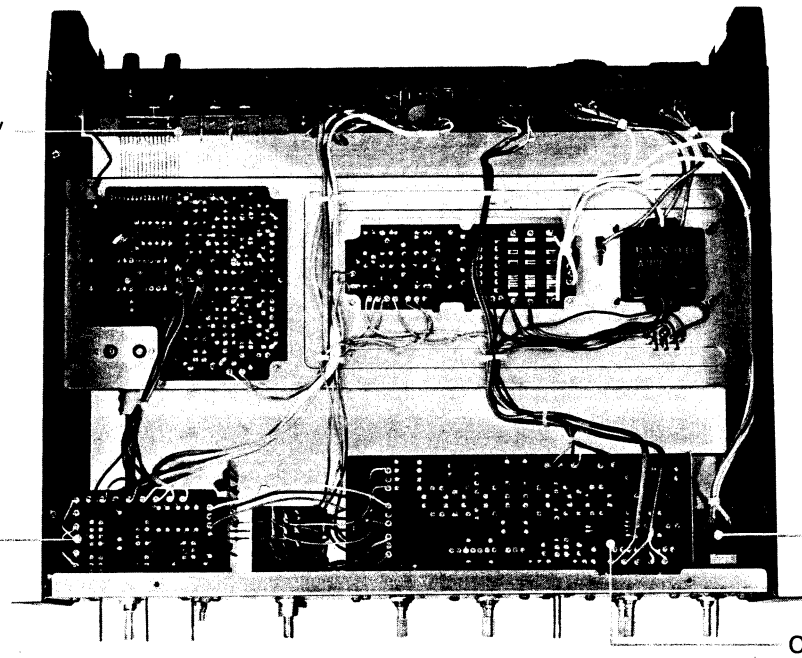
Rotary switch (MODE)
ASD-067

Variable resistor (BALANCE)
ACV-135

8.3 TOP VIEW


Power supply assembly
AWR-166
Input terminal assembly
GWX-106
Power transformer
ATT-467
Equalizer amplifier assembly
GWF-102
CR Selector assembly
AWM-106
Tone amplifier assembly
AWG-050
Variable resistor (VOLUME)
ACV-317

8.4 BOTTOM VIEW



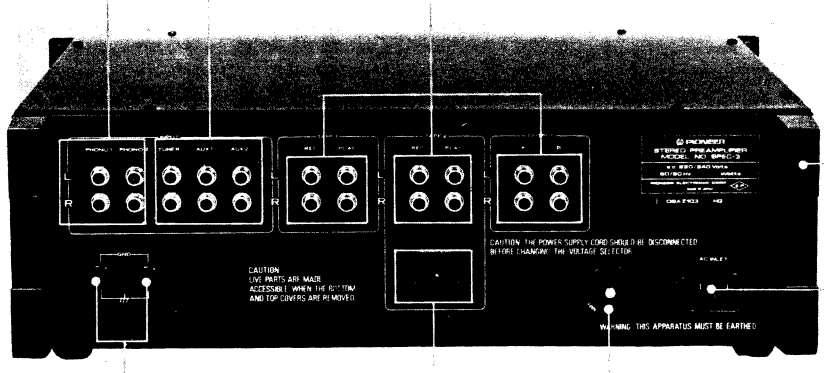
Input terminal assembly
GWX-106

Switch assembly
AWS-107

Lever switch (POWER)
ASK-125

Output amplifier assembly
AWK-073

8.5 REAR VIEW



6-P Input terminal
AKB-024

4-P Input terminal
AKB-023

4-P terminal
AKB-035

Spacer
AEC-350

AC socket
AKP-008

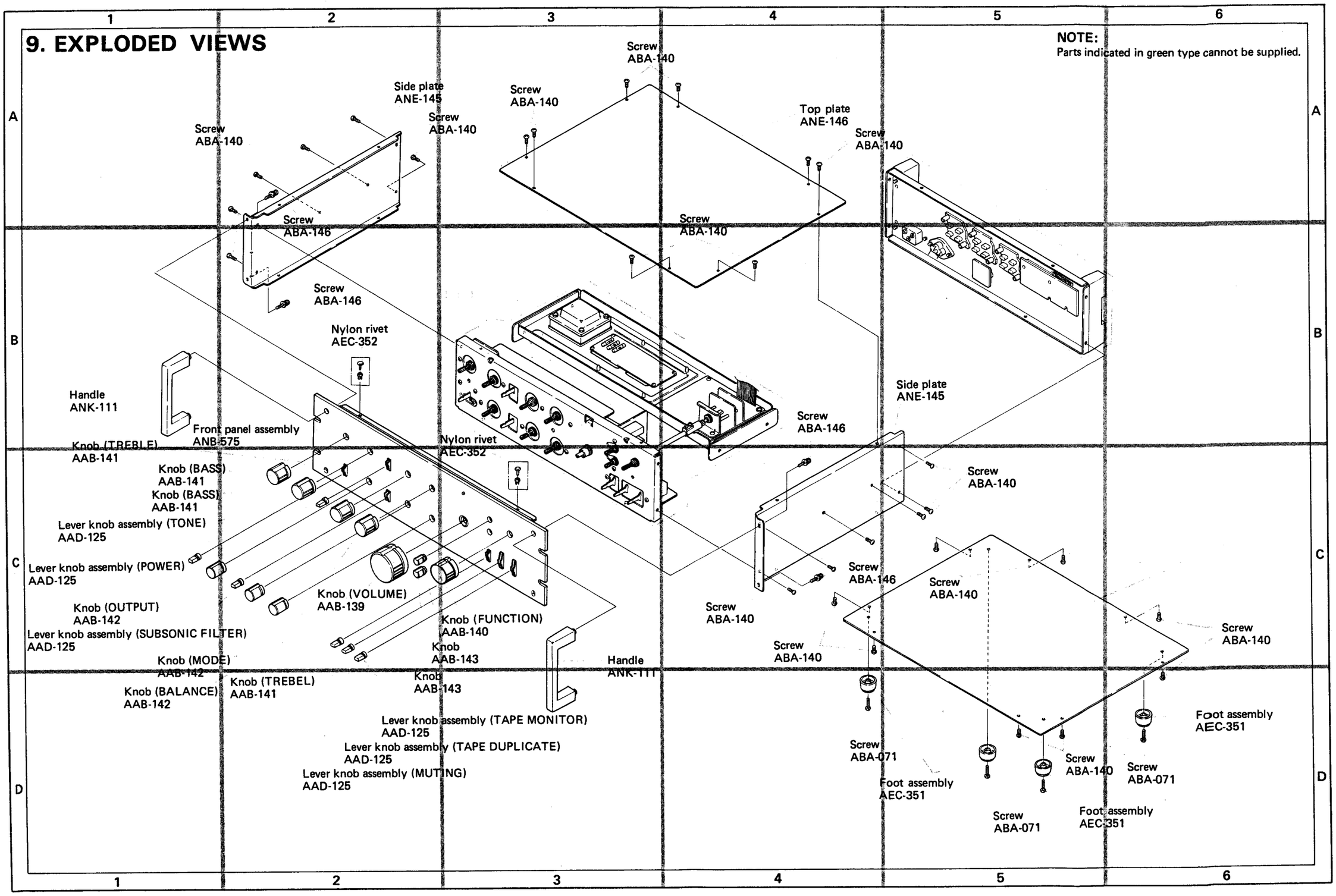
Terminal (GND)
AKE-030

Plug in selector (Line voltage selector)
AKX-037

DIN connector
AWX-062

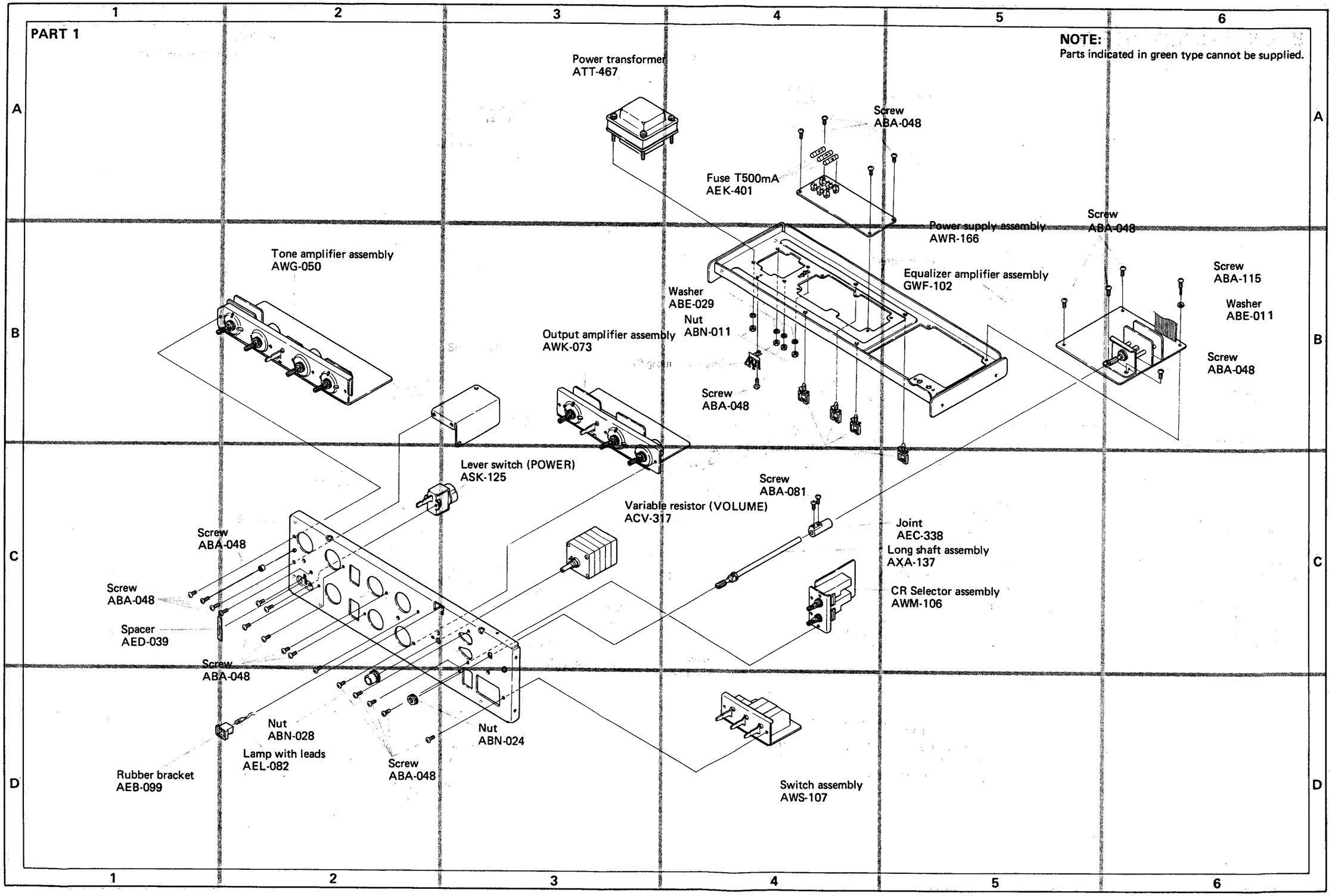
9. EXPLODED VIEWS

NOTE:
Parts indicated in green type cannot be supplied.



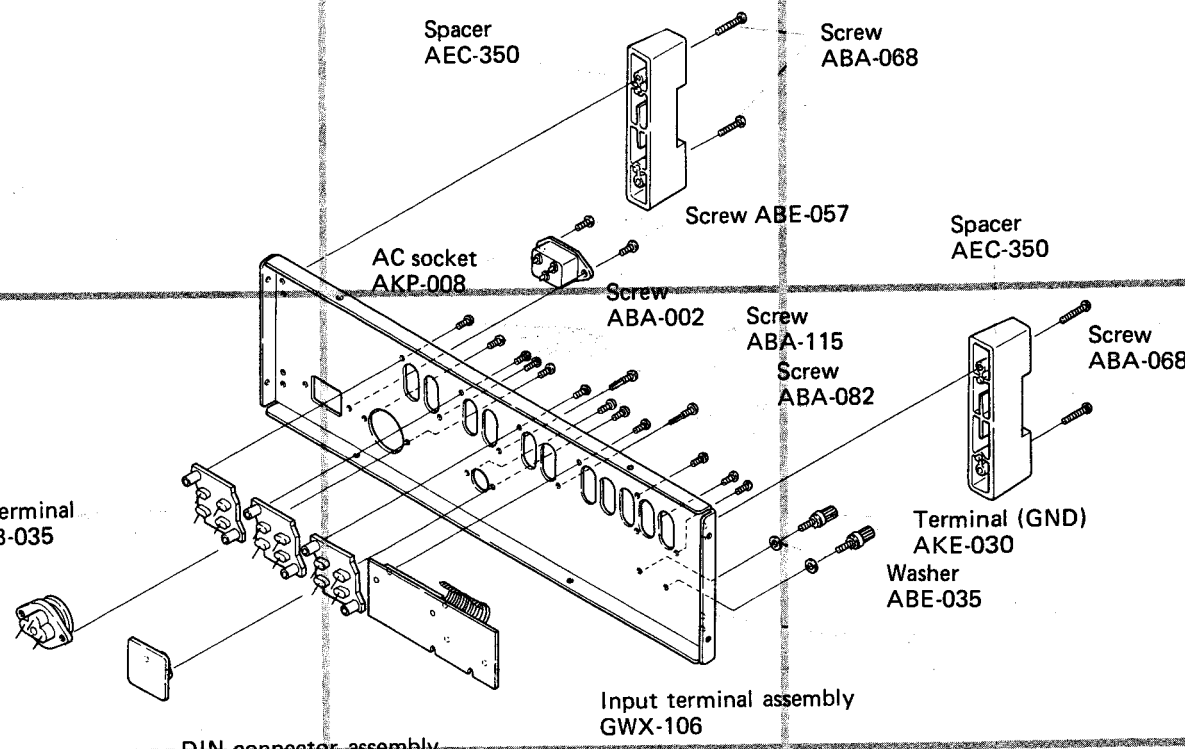
PART 1

NOTE:
Parts indicated in green type cannot be supplied.



PART 2

NOTE:
Parts indicated in green type cannot be supplied.



10. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LIST

10.1 MISCELLANEA PARTS LIST

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

List of changed parts information will be furnished whenever necessary and you are requested to amend parts number in this parts list.

LAMP AND FUSES

Symbol	Part No.	Description
PL1	AEL-082	Lamp with leads
FU1	AEK-401	Fuse T500mA
FU2	AEK-401	Fuse T500mA
FU3	AEK-401	Fuse T500mA

TRANSFORMER

Symbol	Part No.	Description
T1	ATT-467	Power transformer

POTENTIOMETER

Symbol	Part No.	Description
VR1	ACV-317	Variable resistor (VOLUME)

CAPACITORS

Symbol	Part No.	Description		
C1	CKDYF 473Z 50	Ceramic	0.047	50V
C2	CKDYF 473Z 50	Ceramic	0.047	50V

SWITCHES

Symbol	Part No.	Description
S14	ASK-125	Lever switch (POWER)
S15	AKX-037	Line voltage selector

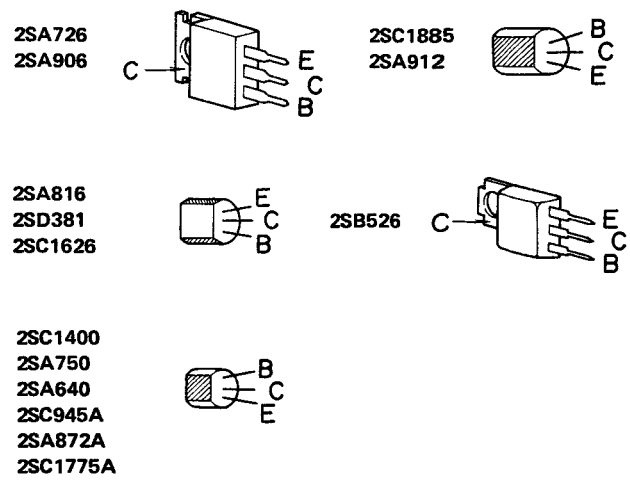
ASSEMBLIES

Symbol	Part No.	Description
	AWR-166	Power supply assembly
	AWS-107	Switch assembly
	AWM-106	CR Selector assembly
	GWF-102	Equalizer amplifier assembly
	GWX-106	Input terminal assembly
	AWG-050	Tone amplifier assembly
	AWK-073	Output amplifier assembly
	AWX-062	DIN connector assembly

List of Changed Parts for Factory Modification

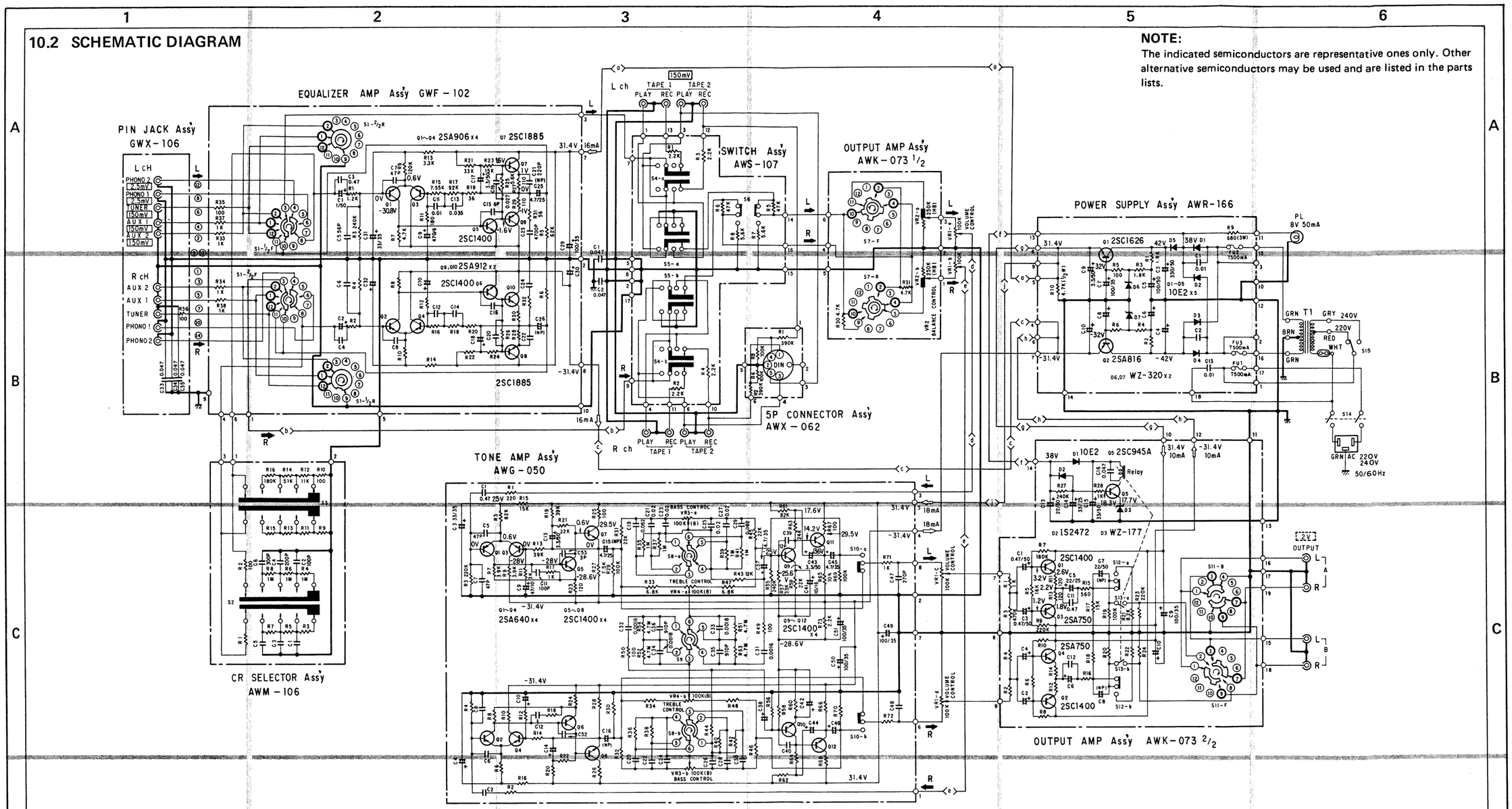
Symbol	Part No.	Description

External Appearance of Transistors.



10.2 SCHEMATIC DIAGRAM

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



SWITCHES;

S1 FUNCTION
1 PHONO 2
2 PHONO 1
3 TUNER
4 AUX 1
5 AUX 2

S2 SELECTOR (CAPACITOR)
1 100 pF
2 200 pF
3 300 pF
4 400 pF

S3 SELECTOR (RESISTOR)
1 0.1 KΩ
2 10 KΩ
3 50 KΩ
4 100 KΩ

S4 DUPLICATE
1 1 → 2
2 OFF
3 2 → 1

S5 TAPE MONITOR
1 TAPE 1
2 SOURCE
3 TAPE 2

S6 MUTING
OFF – -20 dB

S7 MODE
1 REV
2 STEREO
3 L + R
4 L
5 R

S8 TURN OVER (LOW)
1 100 Hz
2 200 Hz
3 400 Hz

S9 TURN OVER (HIGH)
1 2 KHz
2 4 KHz
3 8 KHz

S10 TONE
OFF – ON

S11 OUTPUT SELECTOR
1 OFF
2 A
3 B
4 A + R

S12 LOW FILTER
OFF – ON

S13 RELAY
OFF – ON

S14 POWER
OFF – ON

S15 LINE VOLTAGE SELECTOR
220V – 240V

CAPACITORS;
IN μF UNLESS OTHERWISE NOTED P: pF

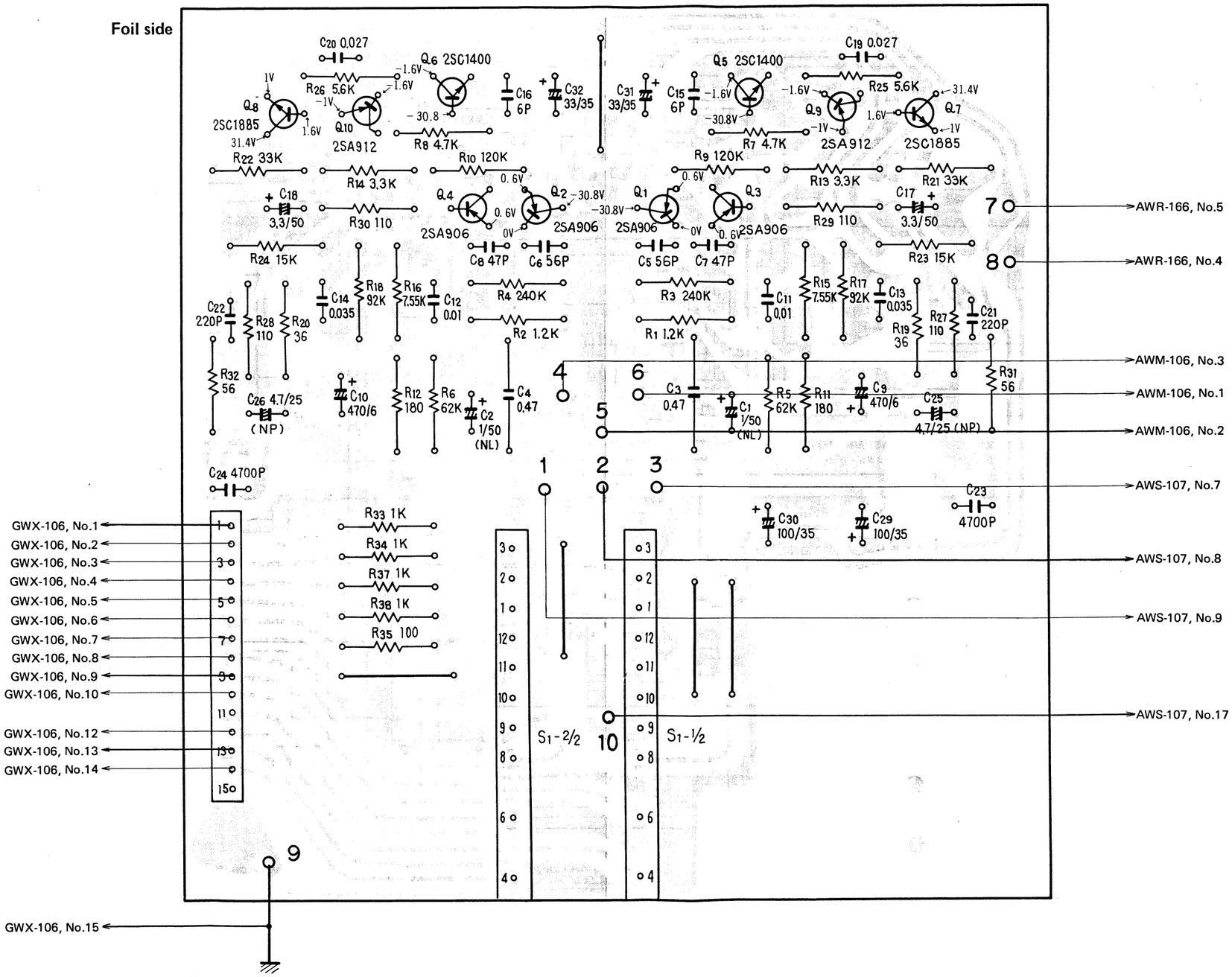
RESISTORS;
IN OHM, 1/4W ±5% TOLERANCE UNLESS OTHERWISE NOTED K: kΩ M: MΩ

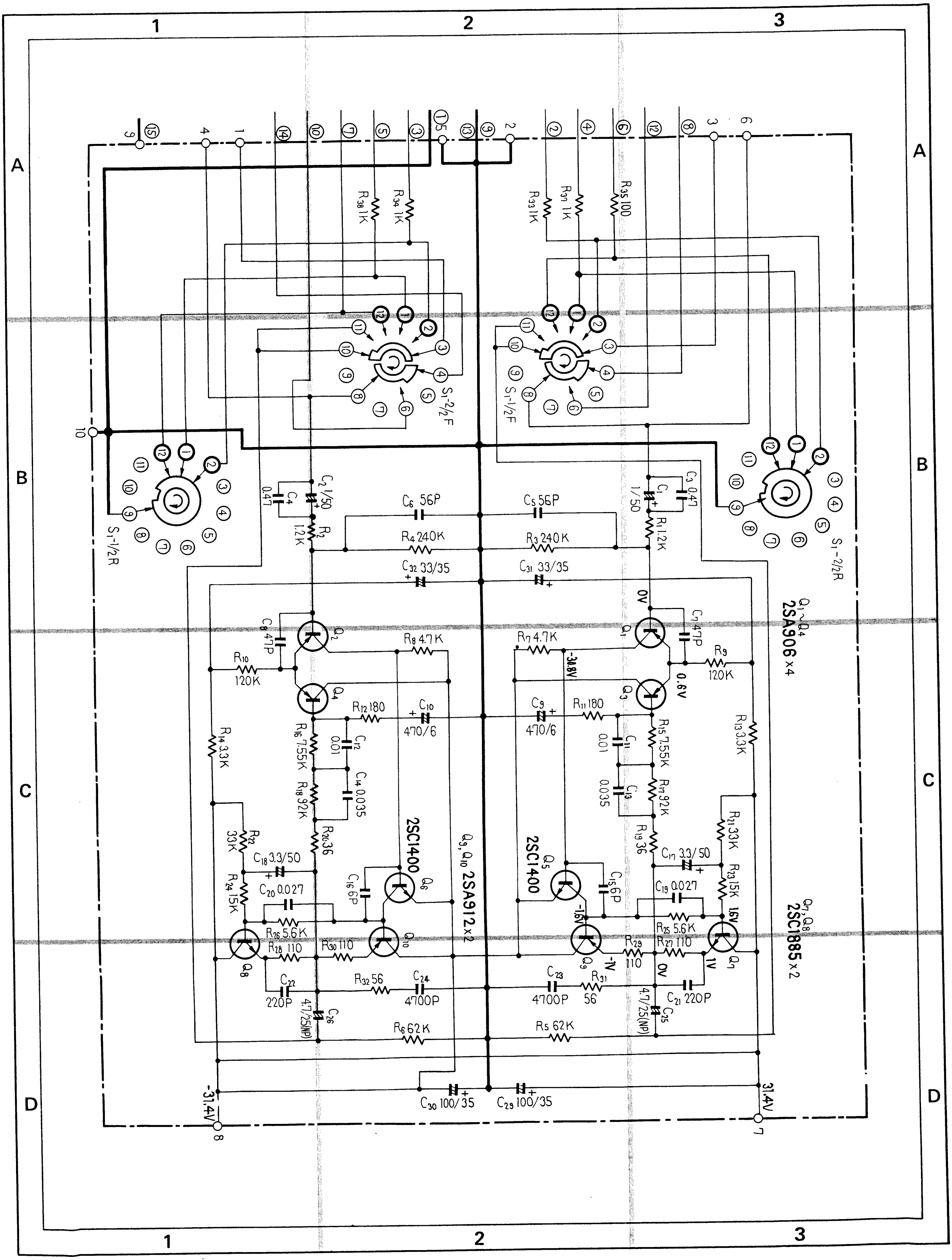
NOTES;
[V]: SIGNAL VOLTAGE NECESSARY FOR OBTAINING 2V OUTPUT (1 KHz)
V: DC VOLTAGE AT NO INPUT SIGNAL
mA: DC CURRENT AT NO INPUT SIGNAL

This is the basic schmatic diagram, but the actual circuit may vary due to improvement in design.

10.3 EQUALIZER AMPLIFIER ASSEMBLY (GWF-102)

Foil side




C6 56P
C5 56P
R4 240K
R3 240K
C32 33/35
C31 33/35
R8 4.7K
R7 4.7K
R10 120K
R9 120K
R12 180
R11 180
C10 470/6
C9 470/6
2SA906 x4
2SC1400
2SA912 x2
2SC1885 x2
C18 3.3/50
C17 3.3/50
C20 0.027
C19 0.027
R26 5.6K
R25 5.6K
R28 110
R30 110
R27 110
R32 56
C24 4700P
C23 4700P
C22 220P
C21 220P
R6 62K
R5 62K
C30 100/35
C29 100/35
-31.4V
31.4V

Parts List of Equalizer Assembly (GWF-102)

SWITCH

Symbol	Part No.	Description
	ASD-068	Rotary switch (FUNCTION)

CAPACITORS

Symbol	Part No.	Description		
C1	CEANL 010M 50	Electrolytic	1	50V
C2	CEANL 010M 50	Electrolytic	1	50V
C3	CQEA 474K 250	Mylar	0.47	250V
C4	CQEA 474K 250	Mylar	0.47	250V
C5	CQSA 560J 50	Styrol	56p	50V
C6	CQSA 560J 50	Styrol	56p	50V
C7	CQSA 470J 50	Styrol	47p	50V
C8	CQSA 470J 50	Styrol	47p	50V
C9	CEA 471P 6	Electrolytic	470	6V
C10	CEA 471P 6	Electrolytic	470	6V
C11	CQPA 103G 50	Mylar	0.01	50V
C12	CQPA 103G 50	Mylar	0.01	50V
C13	CQPA 353G 50	Mylar	0.035	50V
C14	CQPA 353G 50	Mylar	0.035	50V
C15	CCDSL 060D 50	Ceramic	6p	50V
C16	CCDSL 060D 50	Ceramic	6p	50V
C17	CEA 3R3P 50	Electrolytic	3.3	50V
C18	CEA 3R3P 50	Electrolytic	3.3	50V
C19	CQMA 273M 50	Mylar	0.027	50V
C20	CQMA 273M 50	Mylar	0.027	50V
C21	CCDSL 221K 50	Ceramic	220p	50V
C22	CCDSL 221K 50	Ceramic	220p	50V
C23	CQMA 472J 50	Mylar	0.0047	50V
C24	CQMA 472J 50	Mylar	0.0047	50V
C25	ACH-318	Electrolytic	4.7	25V
C26	ACH-318	Electrolytic	4.7	25V
C29	CEA 101P 35	Electrolytic	100	35V
C30	CEA 101P 35	Electrolytic	100	35V
C31	CEA 330P 35	Electrolytic	33	35V
C32	CEA 330P 35	Electrolytic	33	35V

RESISTORS

Symbol	Part No.	Description	
R1	RD¼PS 122J	Carbon film	1.2k
R2	RD¼PS 122J	Carbon film	1.2k
R3	RD¼PS 244J	Carbon film	240k
R4	RD¼PS 244J	Carbon film	240k
R5	RD¼PS 623J	Carbon film	62k
R6	RD¼PS 623J	Carbon film	62k
R7	RD¼PS 472J	Carbon film	4.7k
R8	RD¼PS 472J	Carbon film	4.7k
R9	RD¼PS 124J NL	Carbon film	120k
R10	RD¼PS 124J NL	Carbon film	120k
R11	RN1/5SQ 1800F	Metal film	180	1/5W
R12	RN1/5SQ 1800F	Metal film	180	1/5W
R13	RD¼PS 332J	Carbon film	3.3k	
R14	RD¼PS 332J	Carbon film	3.3k	
R15	ACN-011	Metal film	7.55k	
R16	ACN-011	Metal film	7.55k	
R17	ACN-012	Metal film	92k	
R18	ACN-012	Metal film	92k	
R19	RD¼PS 360J	Carbon film	36	
R20	RD¼PS 360J	Carbon film	36	
R21	RD¼PS 333J	Carbon film	33k	
R22	RD¼PS 333J	Carbon film	33k	
R23	RD¼PS 153J	Carbon film	15k	
R24	RD¼PS 153J	Carbon film	15k	
R25	RD¼PS 562J	Carbon film	5.6k	
R26	RD¼PS 562J	Carbon film	5.6k	
R27	RD¼PS 111J	Carbon film	110	
R28	RD¼PS 111J	Carbon film	110	
R29	RD¼PS 111J	Carbon film	110	
R30	RD¼PS 111J	Carbon film	110	
R31	RD¼PS 560J	Carbon film	56	
R32	RD¼PS 560J	Carbon film	56	
R33	RD¼PS 102J	Carbon film	1k	
R34	RD¼PS 102J	Carbon film	1k	
R35	RD¼PS 101J	Carbon film	100	
R37	RD¼PS 102J	Carbon film	1k	
R38	RD¼PS 102J	Carbon film	1k	

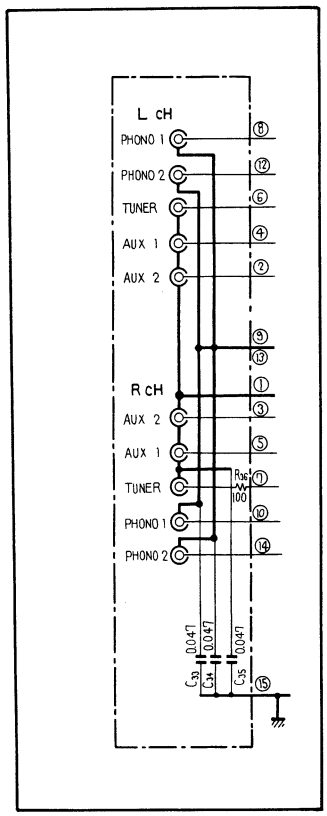
SEMICONDUCTORS

Symbol	Part No.	Description
Q1	2SA906-G or F	Transistor
Q2	2SA906-G or F	Transistor
Q3	2SA906-G or F	Transistor
Q4	2SA906-G or F	Transistor
Q5	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q6	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q7	2SC1885-S or R	Transistor
Q8	2SC1885-S or R	Transistor
Q9	2SA912-S or R	Transistor
Q10	2SA912-S or R	Transistor

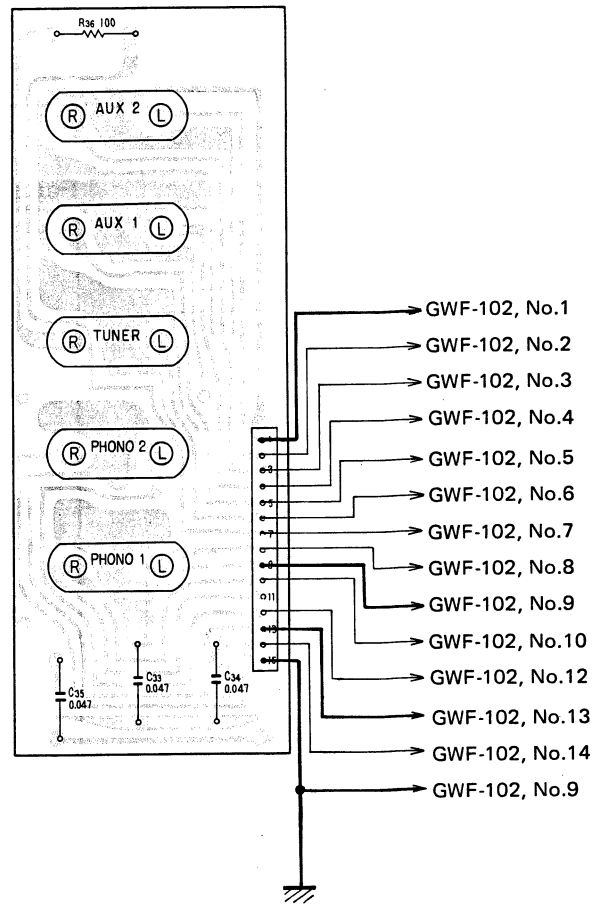
OTHER

Symbol	Part No.	Description
	ABN-024	Nut

10.4 INPUT TERMINAL ASSEMBLY (GWX-106)



Foil side



Parts List

CAPACITORS

Symbol	Part No.	Description		
C33	CKDYF 473Z 50	Ceramic	0.047	50V
C34	CKDYF 473Z 50	Ceramic	0.047	50V
C35	CKDYF 473Z 50	Ceramic	0.047	50V

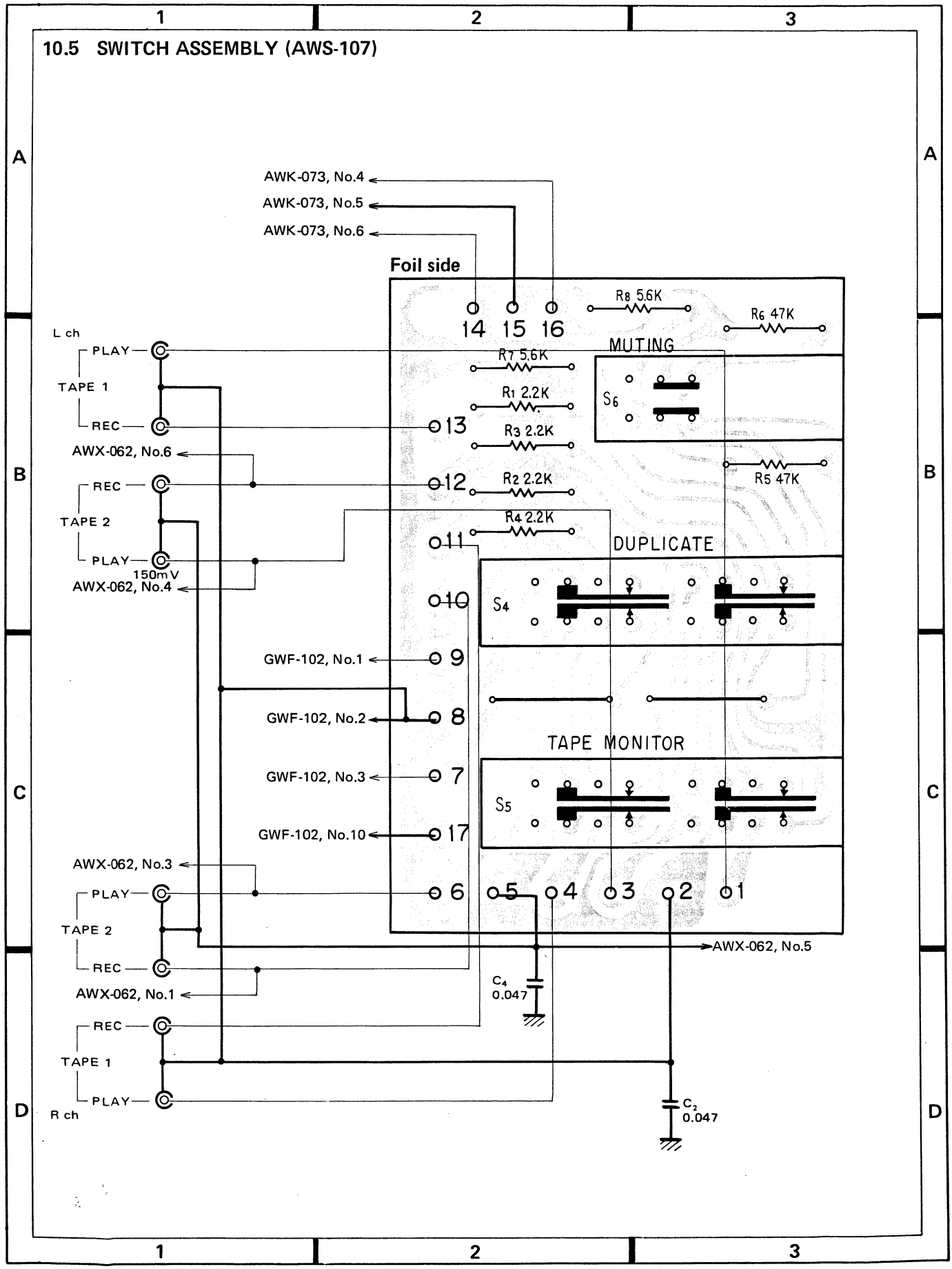
RESISTOR

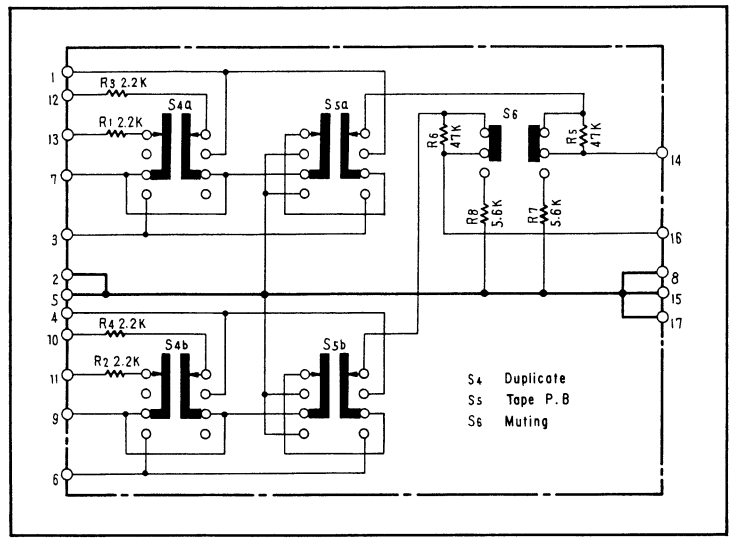
Symbol	Part No.	Description	
R36	RD¼PS 101J	Carbon film	100

OTHERS

Symbol	Part No.	Description
	AKB-023	4-P Input terminal
	AKB-024	6-P Input terminal

10.5 SWITCH ASSEMBLY (AWS-107)





Parts List

SWITCHES

Symbol	Part No.	Description
S4	ASK-118	Lever switch (DUPLICATE)
S5	ASK-118	Lever switch (MONITOR)
S6	ASK-122	Lever switch (MUTING)

RESISTORS

Symbol	Part No.	Description	
R1	RD¼PS 222J	Carbon film	2.2k
R2	RD¼PS 222J	Carbon film	2.2k
R3	RD¼PS 222J	Carbon film	2.2k
R4	RD¼PS 222J	Carbon film	2.2k
R5	RD¼PS 473J	Carbon film	47k
R6	RD¼PS 473J	Carbon film	47k
R7	RD¼PS 562J	Carbon film	5.6k
R8	RD¼PS 562J	Carbon film	5.6k

10.6 CR SELECTOR ASSEMBLY (AWM-106)

Parts List

SWITCHES

Symbol	Part No.	Description
S2	ASD-005	Rotary switch (CARTRIDGE LOAD)
S3	ASD-005	Rotary switch (CARTRIDGE LOAD)

CAPACITORS

Symbol	Part No.	Description		
C1	CQSA 101J 50	Styrol	100p	50V
C2	CQSA 101J 50	Styrol	100p	50V
C3	CQSA 201J 50	Styrol	200p	50V
C4	CQSA 201J 50	Styrol	200p	50V
C5	CQSA 301J 50	Styrol	300p	50V
C6	CQSA 301J 50	Styrol	300p	50V

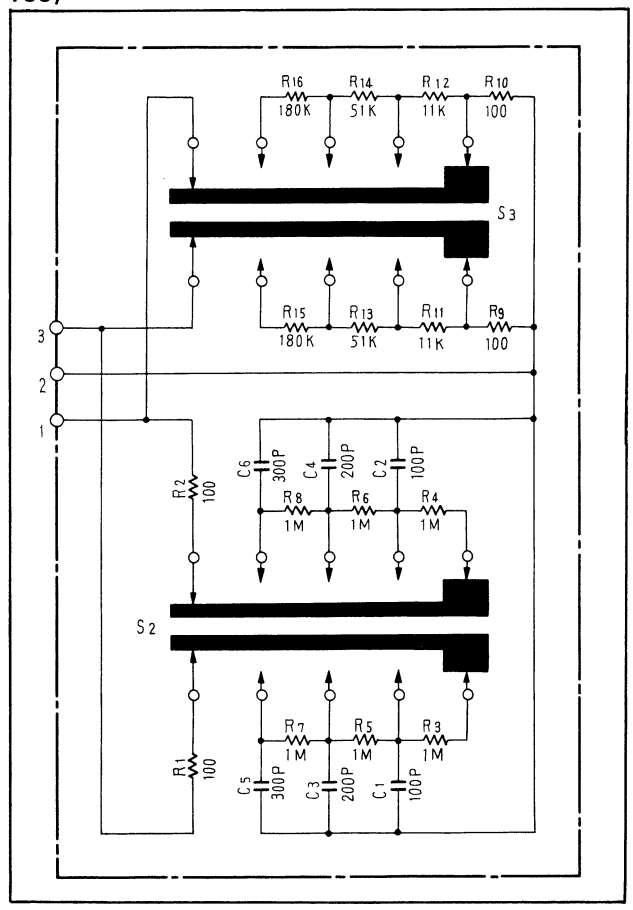
OTHERS

Symbol	Part No.	Description
	B71-010	Nut 7ϕ
	B22-014	Washer 7ϕ

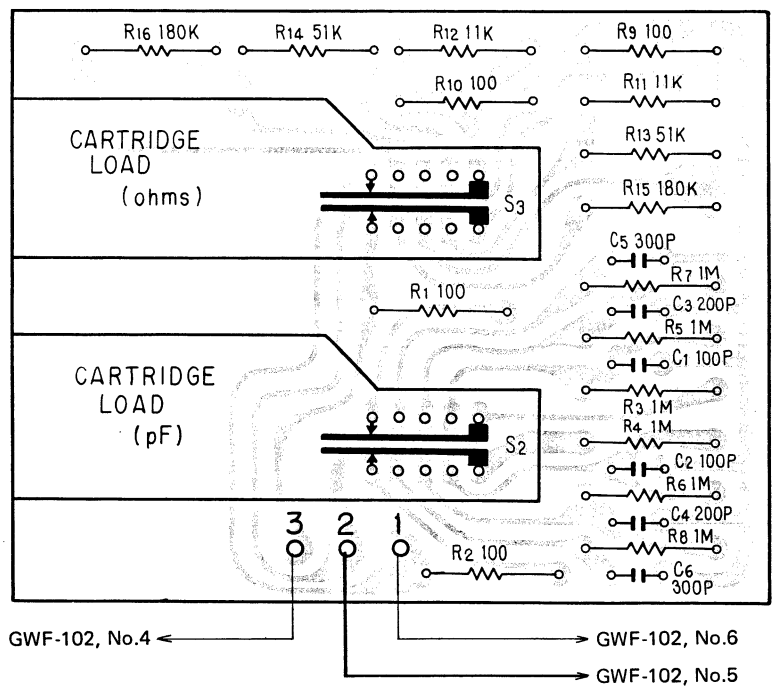
RESISTORS

Symbol	Part No.	Description	
R1	RD¼PS 101J	Carbon film	100
R2	RD¼PS 101J	Carbon film	100
R3	RD¼PS 105J	Carbon film	1M
R4	RD¼PS 105J	Carbon film	1M
R5	RD¼PS 105J	Carbon film	1M
R6	RD¼PS 105J	Carbon film	1M
R7	RD¼PS 105J	Carbon film	1M
R8	RD¼PS 105J	Carbon film	1M
R9	RD¼PS 101J	Carbon film	100
R10	RD¼PS 101J	Carbon film	100
R11	RD¼PS 113J	Carbon film	11k
R12	RD¼PS 113J	Carbon film	11k
R13	RD¼PS 513J	Carbon film	51k
R14	RD¼PS 513J	Carbon film	51k
R15	RD¼PS 184J	Carbon film	180k
R16	RD¼PS 184J	Carbon film	180k

CR Selector Assembly (AWM-106)



Foil side



10.7 OUTPUT AMPLIFIER ASSEMBLY (AWK-073)

Parts List

SWITCHES

Symbol	Part No.	Description
S7	ASD-067	Rotary switch (MODE)
S11	ASD-066	Rotary switch (OUTPUT)
S12	ASK-122	Lever switch (SUBSONIC)
S13	ASR-027	Relay

CAPACITORS

Symbol	Part No.	Description		
C1	CEANL R47M 50	Electrolytic	0.47	50V
C2	CEANL R47M 50	Electrolytic	0.47	50V
C3	CEANL R47M 50	Electrolytic	0.47	50V
C4	CEANL R47M 50	Electrolytic	0.47	50V
C5	CEANL 220M 25	Electrolytic	22	25V
C6	CEANL 220M 25	Electrolytic	22	25V
C7	ACH-323	Electrolytic	2.2	50V
C8	ACH-323	Electrolytic	2.2	50V
C9	CEA 101P 35	Electrolytic	100	35V
C10	CEA 101P 35	Electrolytic	100	35V
C11	CQEA 474K 250	Polyester	0.47	250V
C12	CQEA 474K 250	Polyester	0.47	250V
C13	CEA 220P 50	Electrolytic	22	50V
C14	ACH-327	Electrolytic	33	25V
C15	CEA 330P 50	Electrolytic	33	50V
C16	CQMA 473J 50	Mylar	0.047	50V

RESISTORS

Symbol	Part No.	Description	
VR1	ACV-135	Variable resistor (BALANCE)	
R1	RD¼PS 102J	Carbon film	1k
R2	RD¼PS 102J	Carbon film	1k
R3	RD¼PS 474J	Carbon film	470k
R4	RD¼PS 474J	Carbon film	470k
R5	RD¼PS 163J	Carbon film	16k
R6	RD¼PS 163J	Carbon film	16k
R7	RD¼PS 184J	Carbon film	180k
R8	RD¼PS 184J	Carbon film	180k
R9	RD¼PS 224J	Carbon film	220k
R10	RD¼PS 224J	Carbon film	220k
R11	RD¼PS 121J	Carbon film	120
R12	RD¼PS 121J	Carbon film	120
R13	RD¼PS 121J	Carbon film	120
R14	RD¼PS 121J	Carbon film	120
R15	RD¼PS 561J	Carbon film	560
R16	RD¼PS 561J	Carbon film	560
R17	RD¼PS 153J	Carbon film	15k
R18	RD¼PS 153J	Carbon film	15k
R19	RD¼PS 104J	Carbon film	100k
R20	RD¼PS 104J	Carbon film	100k
R21	RD¼PS 822J	Carbon film	8.2k
R22	RD¼PS 822J	Carbon film	8.2k
R23	RD¼PS 224J	Carbon film	220k
R24	RD¼PS 224J	Carbon film	220k
R27	RD¼PS 244J	Carbon film	240k
R28	RD¼PS 102J	Carbon film	1k
R30	RD¼PS 472J	Carbon film	4.7k
R31	RD¼PS 472J	Carbon film	4.7k

SEMICONDUCTORS

Symbol	Part No.	Description
Q1	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q2	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q3	2SA750-E or F (2SA872A-E or F)	Transistor
Q4	2SA750-E or F (2SA872A-E or F)	Transistor
Q5	2SC945A-P or K	Transistor
D1	10E2 (1S1885 or SIB01-01)	Diode
D2	1S2472	Diode
D3	WZ-177	Zener diode

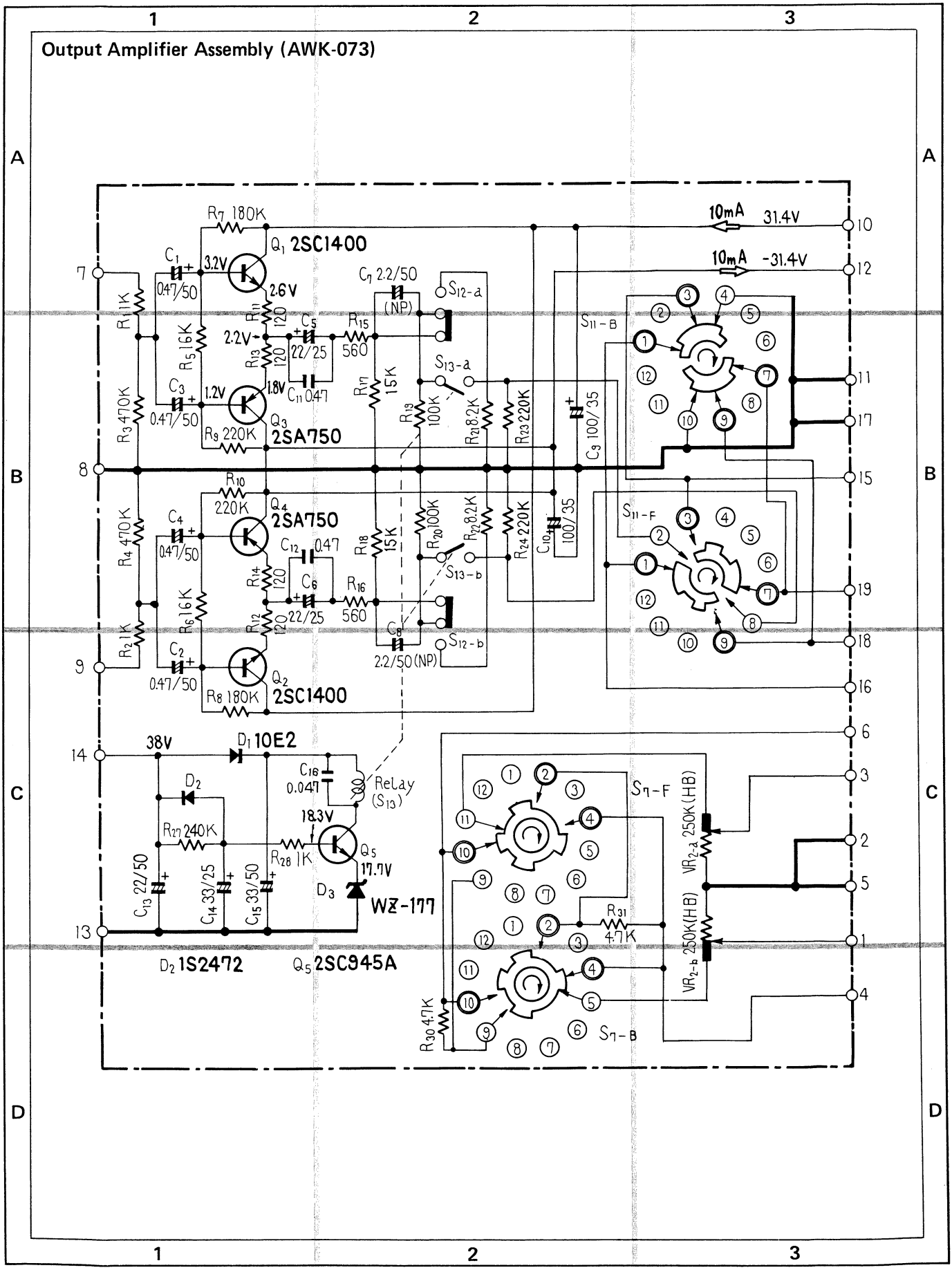
OTHER

Symbol	Part No.	Description
	ABN-024	Nut

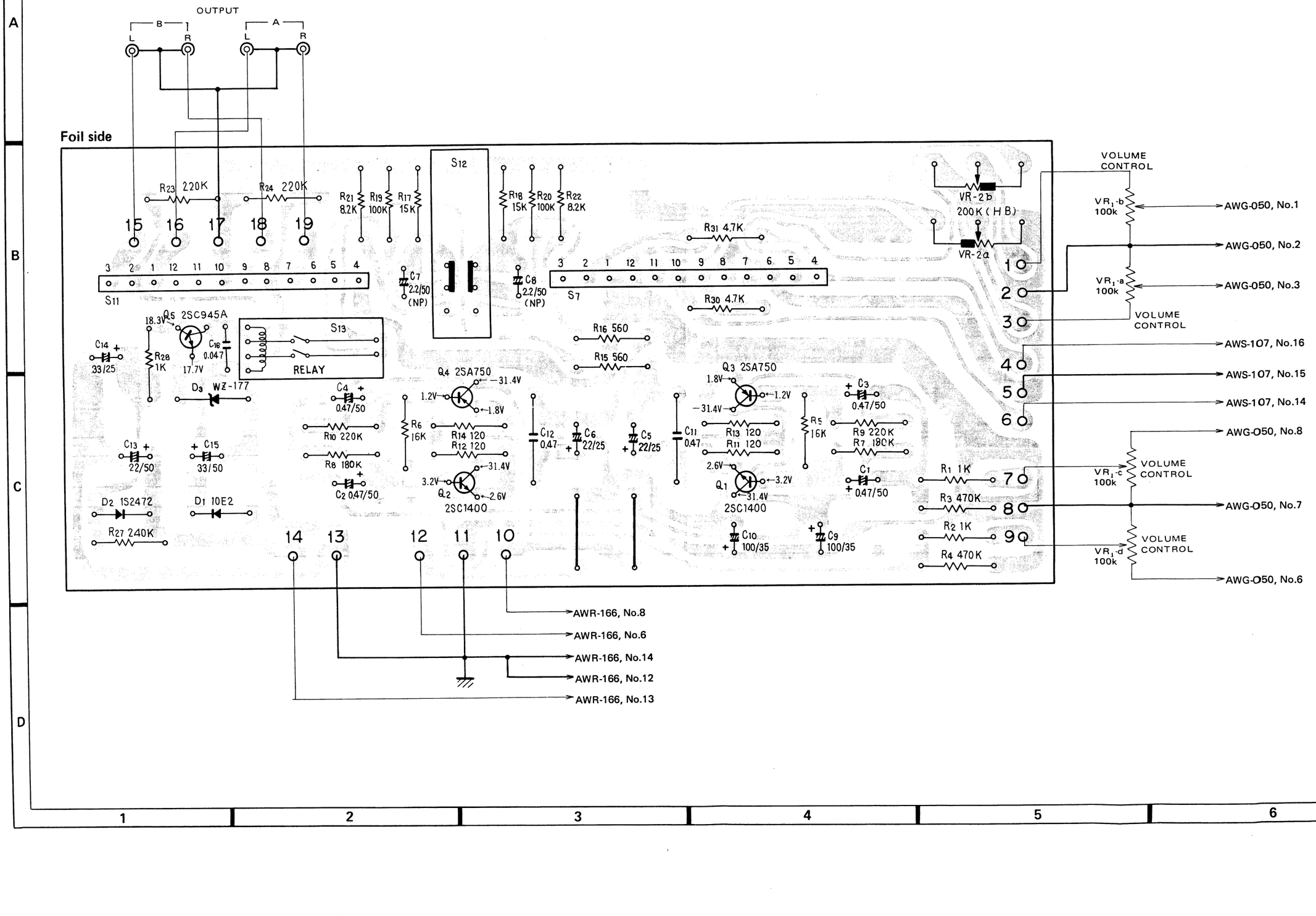
List of Changed Parts for Factory Modification

Symbol	Part No.	Description

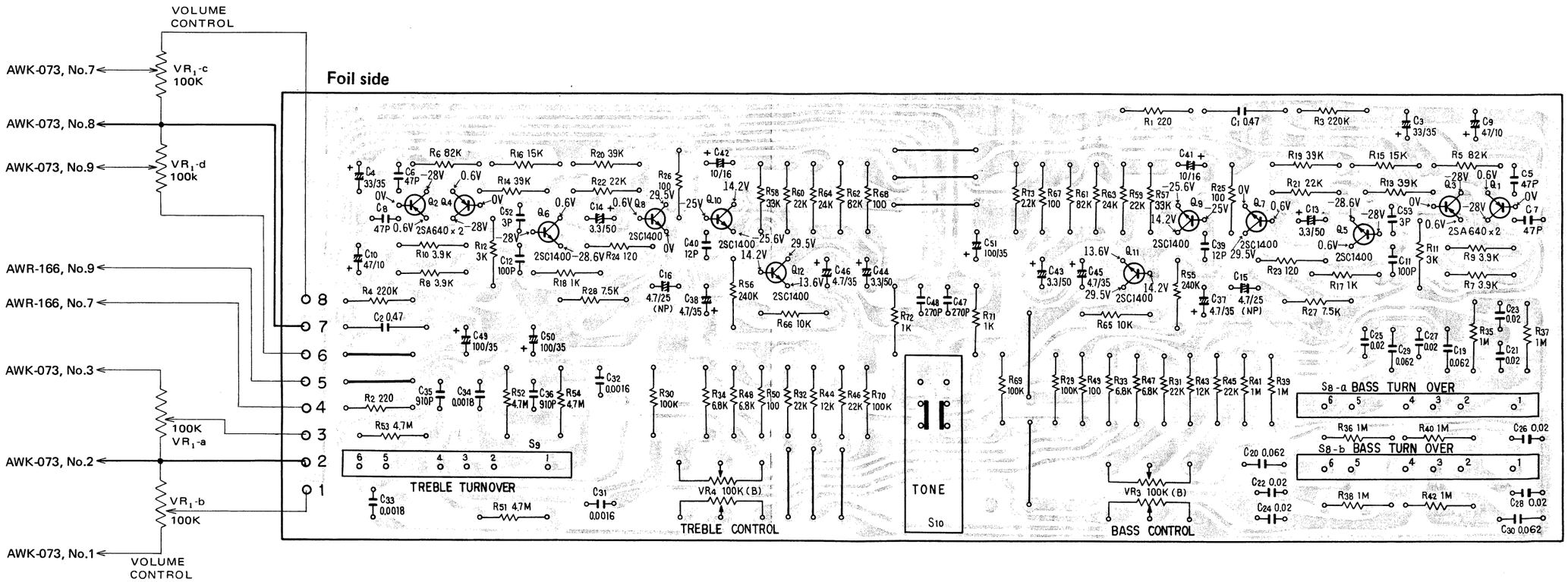
Output Amplifier Assembly (AWK-073)

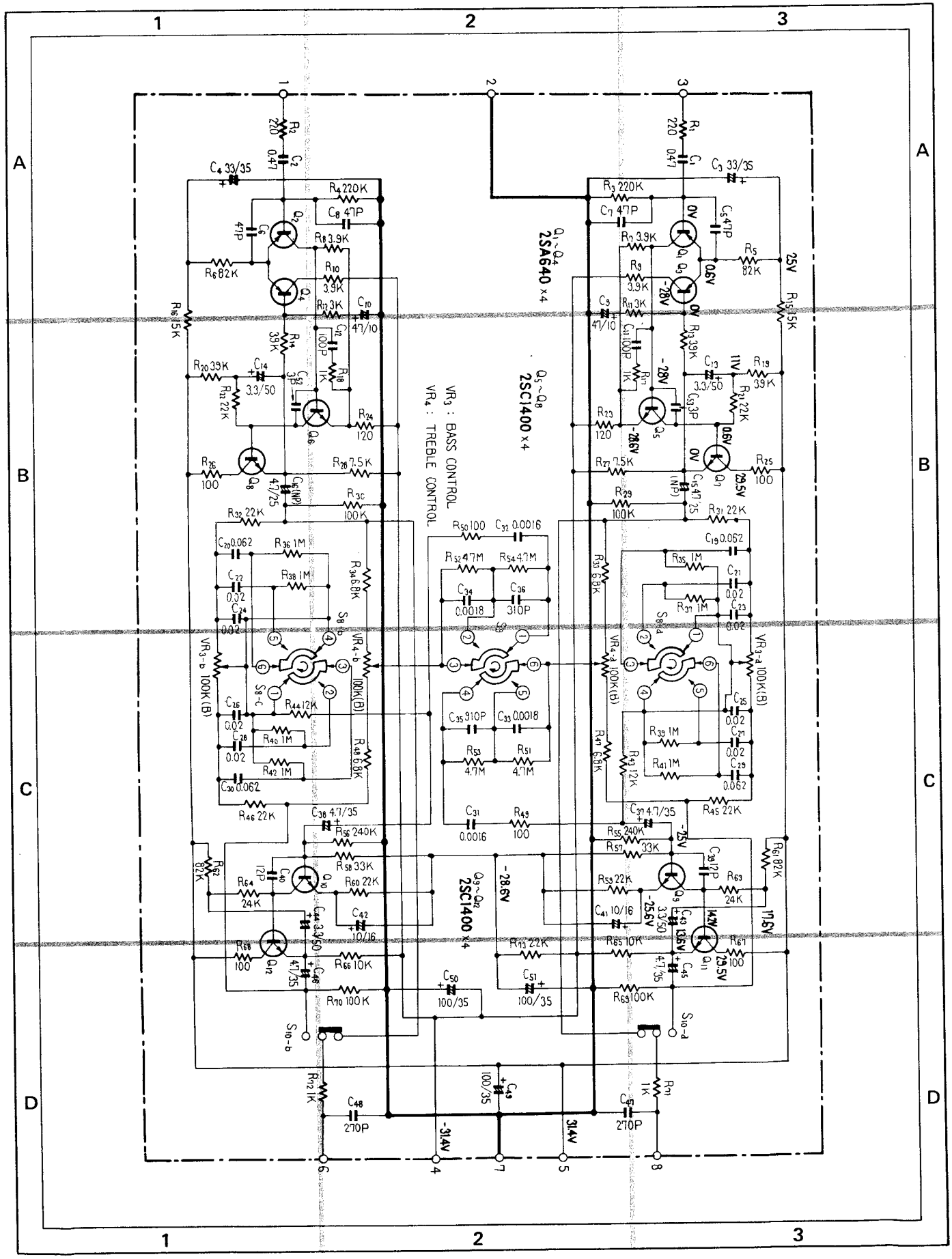


Foil side


OUTPUT
B
A
L
R
L
R
R23 220K
R24 220K
R21 8.2K
R19 100K
R17 15K
S12
R18 15K
R20 100K
R22 8.2K
R31 4.7K
R30 4.7K
VR-2b
200K (HB)
VR-2a
VOLUME CONTROL
VR1-b 100k
VR1-a 100k
VOLUME CONTROL
AWG-050, No.1
AWG-050, No.2
AWG-050, No.3
15 16 17 18 19
3 2 1 12 11 10 9 8 7 6 5 4
S11
S7
C7 2.2/50 (NP)
C8 2.2/50 (NP)
1 2 3 4 5 6
AWS-107, No.16
AWS-107, No.15
AWS-107, No.14
Q5 2SC945A
18.3V
17.7V
C16 0.047
C14 33/25
R28 1K
S13
RELAY
D3 WZ-177
R16 560
R15 560
Q4 2SA750
1.2V
31.4V
1.8V
C4 0.47/50
R10 220K
R8 180K
C2 0.47/50
R6 16K
R14 120
R12 120
C12 0.47
C6 22/25
C5 22/25
Q3 2SA750
1.8V
1.2V
31.4V
C11 0.47
R13 120
R11 120
2.6V
3.2V
Q1
31.4V
2SC1400
R5 16K
C3 0.47/50
R9 220K
R7 180K
C1 0.47/50
R1 1K
R3 470K
R2 1K
R4 470K
7 8 9
VOLUME CONTROL
VR1-c 100k
VOLUME CONTROL
VR1-d 100k
AWG-050, No.8
AWG-050, No.7
AWG-050, No.6
C13 22/50
C15 33/50
D2 1S2472
D1 10E2
R27 240K
C10 100/35
C9 100/35
14 13 12 11 10
AWR-166, No.8
AWR-166, No.6
AWR-166, No.14
AWR-166, No.12
AWR-166, No.13

10.8 TONE AMPLIFIER ASSEMBLY (AWG-050)




VR3 : BASS CONTROL
VR4 : TREBLE CONTROL
Q1~Q4 2SA640 x4
Q5~Q8 2SC1400 x4
Q9~Q12 2SC1400 x4
-28.6V
-31.4V
31.4V

Parts List of Tone Amplifier Assembly (AWG-050)

SWITCHES

Symbol	Part No.	Description
S8	ASD-057	Rotary switch (BASS)
S9	ASD-056	Rotary switch(TREBLE)
S10	ASK-122	Lever switch (TONE)

CAPACITORS

Symbol	Part No.	Description		
C1	CQEA 474K 250	Mylar	0.47	250V
C2	CQEA 474K 250	Mylar	0.47	250V
C3	CEA 330P 35	Electrolytic	33	35V
C4	CEA 330P 35	Electrolytic	33	35V
C5	CCDSL 470K 50	Ceramic	47p	50V
C6	CCDSL 470K 50	Ceramic	47p	50V
C7	CCDSL 470K 50	Ceramic	47p	50V
C8	CCDSL 470K 50	Ceramic	47p	50V
C9	CEA 470P 10	Electrolytic	47	10V
C10	CEA 470P 10	Electrolytic	47	10V
C11	CCDSL 101K 50	Ceramic	100p	50V
C12	CCDSL 101K 50	Ceramic	100p	50V
C13	CEA 3R3P 50	Electrolytic	3.3	50V
C14	CEA 3R3P 50	Electrolytic	3.3	50V
C15	ACH-318	Electrolytic	4.7	25V
C16	ACH-318	Electrolytic	4.7	25V
C19	CQMA 623J 50	Mylar	0.062	50V
C20	CQMA 623J 50	Mylar	0.062	50V
C21	CQMA 203J 50	Mylar	0.02	50V
C22	CQMA 203J 50	Mylar	0.02	50V
C23	CQMA 203J 50	Mylar	0.02	50V
C24	CQMA 203J 50	Mylar	0.02	50V
C25	CQMA 203J 50	Mylar	0.02	50V
C26	CQMA 203J 50	Mylar	0.02	50V
C27	CQMA 203J 50	Mylar	0.02	50V
C28	CQMA 203J 50	Mylar	0.02	50V
C29	CQMA 623J 50	Mylar	0.062	50V
C30	CQMA 623J 50	Mylar	0.062	50V
C31	CQMA 162J 50	Mylar	0.0016	50V
C32	CQMA 162J 50	Mylar	0.0016	50V
C33	CQMA 182J 50	Mylar	0.0018	50V
C34	CQMA 182J 50	Mylar	0.0018	50V
C35	CQSA 911J 50	Styrol	910p	50V
C36	CQSA 911J 50	Styrol	910p	50V
C37	CEANL 4R7P 35	Electrolytic	4.7	35V
C38	CEANL 4R7P 35	Electrolytic	4.7	35V
C39	CCDSL 120K 50	Ceramic	12p	50V
C40	CCDSL 120K 50	Ceramic	12p	50V
C41	CEA 100P 16	Electrolytic	10	16V
C42	CEA 100P 16	Electrolytic	10	16V
C43	CEA 3R3P 50	Electrolytic	3.3	50V
C44	CEA 3R3P 50	Electrolytic	3.3	50V
C45	CEANL 4R7P 35	Electrolytic	4.7	35V
C46	CEANL 4R7P 35	Electrolytic	4.7	35V
C47	CCDSL 271K 50	Ceramic	270p	50V
C48	CCDSL 271K 50	Ceramic	270p	50V
C49	CEA 101P 35	Electrolytic	100	35V
C50	CEA 101P 35	Electrolytic	100	35V
C51	CEA 101P 35	Electrolytic	100	35V
C52	CCDSL 030D 50	Ceramic	3p	50V
C53	CCDSL 030D 50	Ceramic	3p	50V

RESISTORS

Symbol	Part No.	Description	
VR3	ACV-136	Variable resistor (BASS)	
VR4	ACV-136	Variable resistor (TREBLE)	
R1	RD¼PS 221J	Carbon film	220
R2	RD¼PS 221J	Carbon film	220
R3	RD¼PS 224JNL	Carbon film	220k
R4	RD¼PS 224JNL	Carbon film	220k
R5	RD¼PS 823JNL	Carbon film	82k
R6	RD¼PS 823JNL	Carbon film	82k
R7	RD¼PS 392J	Carbon film	3.9k
R8	RD¼PS 392J	Carbon film	3.9k
R9	RD¼PS 392J	Carbon film	3.9k
R10	RD¼PS 392J	Carbon film	3.9k
R11	RD¼PS 302J	Carbon film	3k
R12	RD¼PS 302J	Carbon film	3k
R13	RD¼PS 393J	Carbon film	39k
R14	RD¼PS 393J	Carbon film	39k
R15	RD¼PS 153J	Carbon film	15k
R16	RD¼PS 153J	Carbon film	15k
R17	RD¼PS 102J	Carbon film	1k
R18	RD¼PS 102J	Carbon film	1k
R19	RD¼PS 393J	Carbon film	39k
R20	RD¼PS 393J	Carbon film	39k
R21	RD¼PS 223J	Carbon film	22k
R22	RD¼PS 223J	Carbon film	22k
R23	RD¼PS 121J	Carbon film	120
R24	RD¼PS 121J	Carbon film	120
R25	RD¼PS 101J	Carbon film	100
R26	RD¼PS 101J	Carbon film	100
R27	RD¼PS 752J	Carbon film	7.5k
R28	RD¼PS 752J	Carbon film	7.5k
R29	RD¼PS 104J	Carbon film	100k
R30	RD¼PS 104J	Carbon film	100k

Symbol	Part No.	Description	
R31	RD¼PS 223J	Carbon film	22k
R32	RD¼PS 223J	Carbon film	22k
R33	RD¼PS 682J	Carbon film	6.8k
R34	RD¼PS 682J	Carbon film	6.8k
R35	RD¼PS 105J	Carbon film	1M
R36	RD¼PS 105J	Carbon film	1M
R37	RD¼PS 105J	Carbon film	1M
R38	RD¼PS 105J	Carbon film	1M
R39	RD¼PS 105J	Carbon film	1M
R40	RD¼PS 105J	Carbon film	1M
R41	RD¼PS 105J	Carbon film	1M
R42	RD¼PS 105J	Carbon film	1M
R43	RD¼PS 123J	Carbon film	12k
R44	RD¼PS 123J	Carbon film	12k
R45	RD¼PS 223J	Carbon film	22k
R46	RD¼PS 223J	Carbon film	22k
R47	RD¼PS 682J	Carbon film	6.8k
R48	RD¼PS 682J	Carbon film	6.8k
R49	RD¼PS 101J	Carbon film	100
R50	RD¼PS 101J	Carbon film	100
R51	RD¼PS 475J	Carbon film	4.7M
R52	RD¼PS 475J	Carbon film	4.7M
R53	RD¼PS 475J	Carbon film	4.7M
R54	RD¼PS 475J	Carbon film	4.7M
R55	RD¼PS 244JNL	Carbon film	240k
R56	RD¼PS 244JNL	Carbon film	240k
R57	RD¼PS 333J	Carbon film	33k
R58	RD¼PS 333J	Carbon film	33k
R59	RD¼PS 223J	Carbon film	22k
R60	RD¼PS 223J	Carbon film	22k
R61	RD¼PS 823JNL	Carbon film	82k
R62	RD¼PS 823JNL	Carbon film	82k
R63	RD¼PS 243J	Carbon film	24k
R64	RD¼PS 243J	Carbon film	24k
R65	RD¼PS 103J	Carbon film	10k
R66	RD¼PS 103J	Carbon film	10k
R67	RD¼PS 101J	Carbon film	100
R68	RD¼PS 101J	Carbon film	100
R69	RD¼PS 104J	Carbon film	100k
R70	RD¼PS 104J	Carbon film	100k
R71	RD¼PS 102J	Carbon film	1k
R72	RD¼PS 102J	Carbon film	1k
R73	RD¼PS 222J	Carbon film	2.2k

SEMICONDUCTORS

Symbol	Part No.	Description
Q1	2SA640-E or F (2SA726-F or G)	Transistor
Q2	2SA640-E or F (2SA726-F or G)	Transistor
Q3	2SA640-E or F (2SA726-F or G)	Transistor
Q4	2SA640-E or F (2SA726-F or G)	Transistor
Q5	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q6	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q7	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q8	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q9	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q10	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q11	2SC1400-E or U (2SC1775A-E or F)	Transistor
Q12	2SC1400-E or U (2SC1775A-E or F)	Transistor

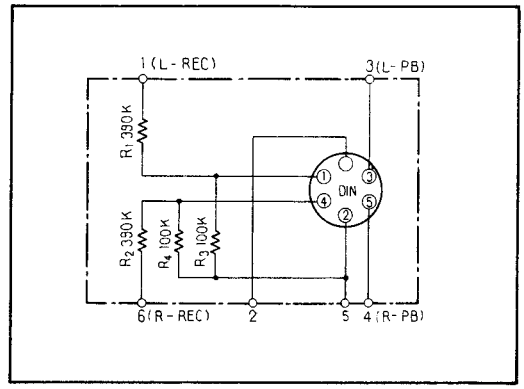
OTHER

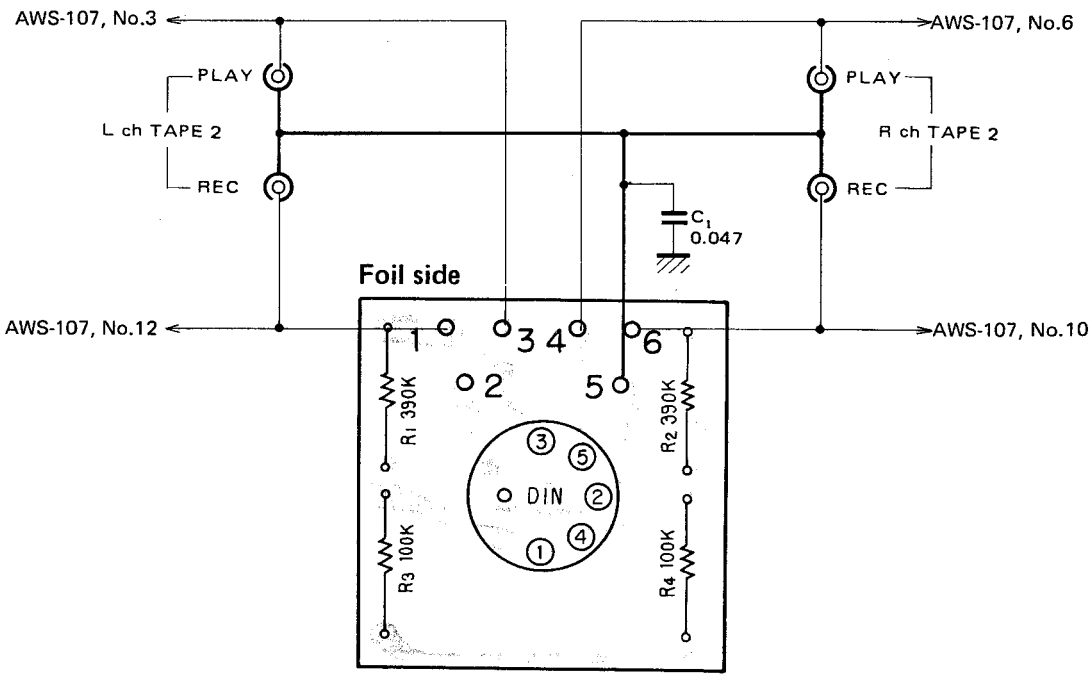
Symbol	Part No.	Description
	ABN-024	Nut

List of Changed Parts for Factory Modification

Symbol	Part No.	Description

10.9 DIN CONNECTOR ASSEMBLY (AWX-062)





Parts List

RESISTORS

Symbol	Part No.	Description	
R1	RD¼PS 394J	Carbon film	390k
R2	RD¼PS 394J	Carbon film	390k
R3	RD¼PS 104J	Carbon film	100k
R4	RD¼PS 104J	Carbon film	100k

OTHER

Symbol	Part No.	Description
	AKP-011	5-P Connector socket

10.10 POWER SUPPLY ASSEMBLY (AWR-166)

Parts List

CAPACITORS

Symbol	Part No.	Description		
C1	ACG-004	Ceramic	0.01	150V
C2	ACG-004	Ceramic	0.01	150V
C3	CEA 331P 50	Electrolytic	330	50V
C4	CEA 331P 50	Electrolytic	330	50V
C5	CEA 101P 50	Electrolytic	100	50V
C6	CEA 101P 50	Electrolytic	100	50V
C7	CEA 101P 35	Electrolytic	100	35V
C8	CEA 101P 35	Electrolytic	100	35V
C9	CEA 3R3P 50	Electrolytic	3.3	50V
C10	CEA 3R3P 50	Electrolytic	3.3	50V
C13	ACG-001	Ceramic	0.01	250V

RESISTORS

Symbol	Part No.	Description		
R1	RD¼PS 182J	Carbon film	1.8k	
R2	RD¼PS 182J	Carbon film	1.8k	
R3	RD¼PS 182J	Carbon film	1.8k	
R4	RD¼PS 182J	Carbon film	1.8k	
R5	RD¼PS 101J	Carbon film	100	
R6	RD¼PS 101J	Carbon film	100	
R9	RS3P 681J	Metal oxide	680	3W
R10	RD½PS 472J	Carbon film	4.7k	½W

SEMICONDUCTORS

Symbol	Part No.	Description
Q1	2SC1626-Y or O (2SD381-M or L)	Transistor
Q2	2SA816-Y or O (2SB526-C or D)	Transistor
D1	10E2 (1S1885 or SIB01-01)	Diode
D2	10E2 (1S1885 or SIB01-01)	Diode
D3	10E2 (1S1885 or SIB01-01)	Diode
D4	10E2 (1S1885 or SIB01-01)	Diode
D5	10E2 (1S1885 or SIB01-01)	Diode
D6	WZ-320	Zener diode
D7	WZ-320	Zener diode

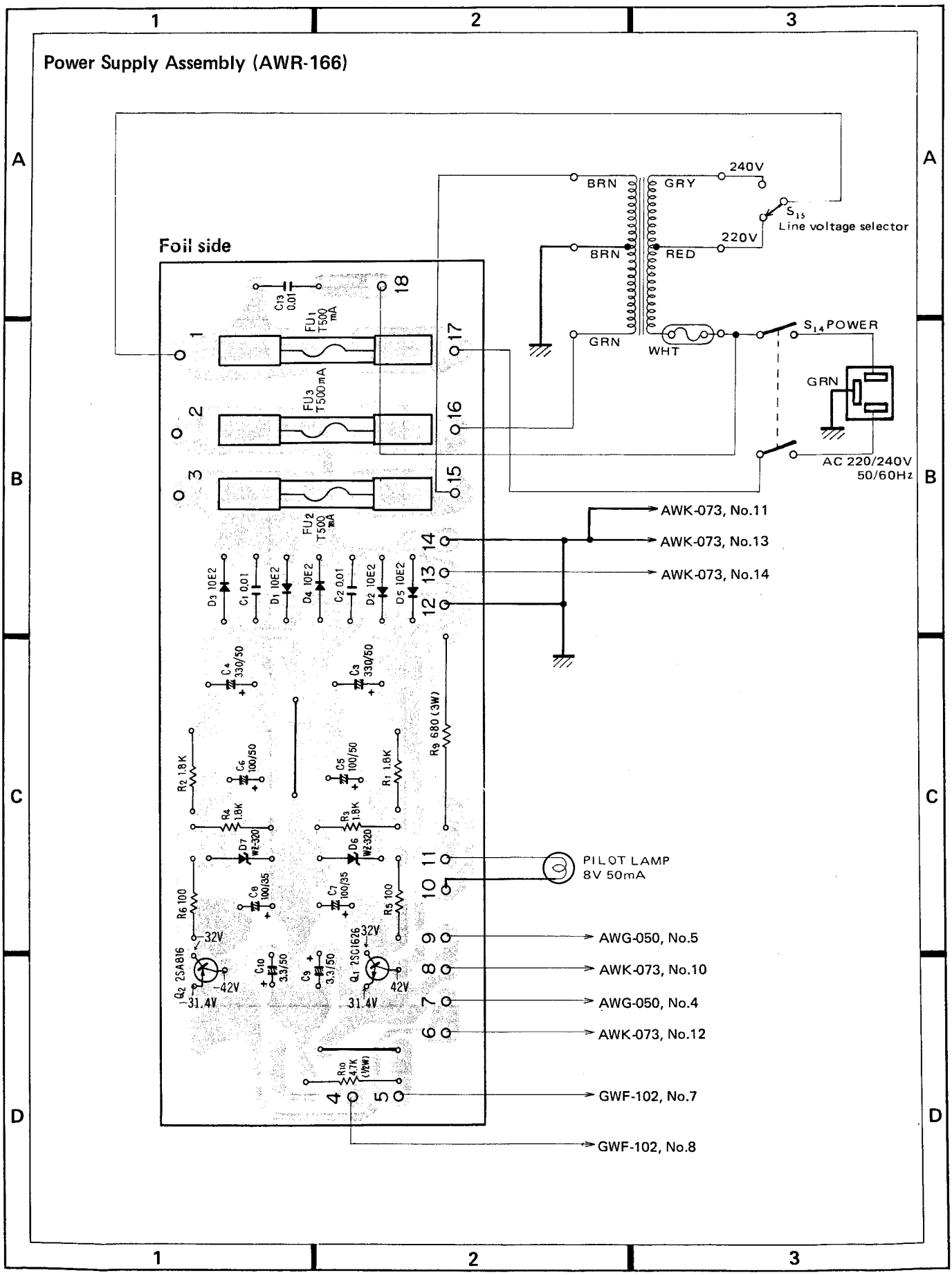
OTHER

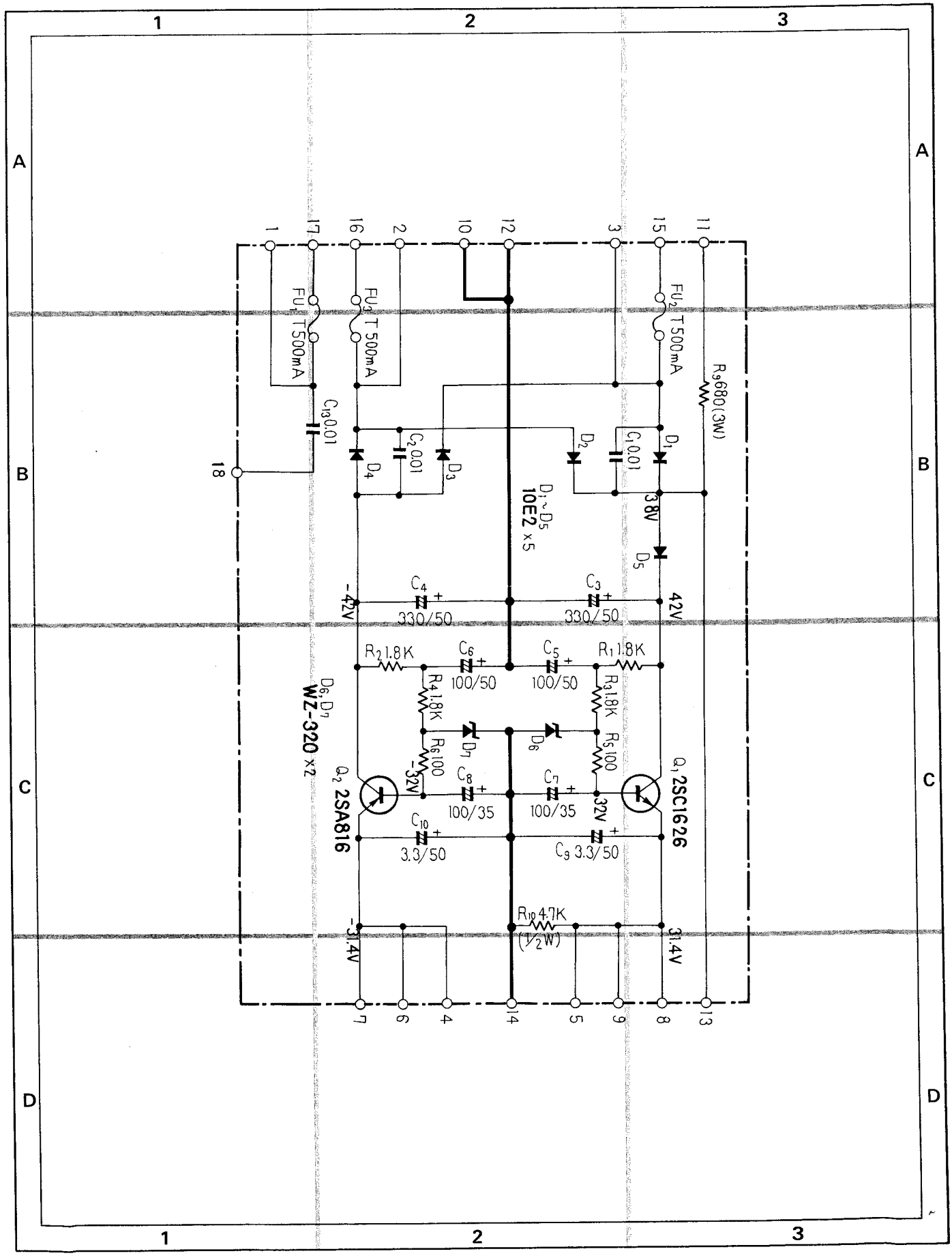
Symbol	Part No.	Description
	AKR-010	Fuse clip

List of Changed Parts for Factory Modification

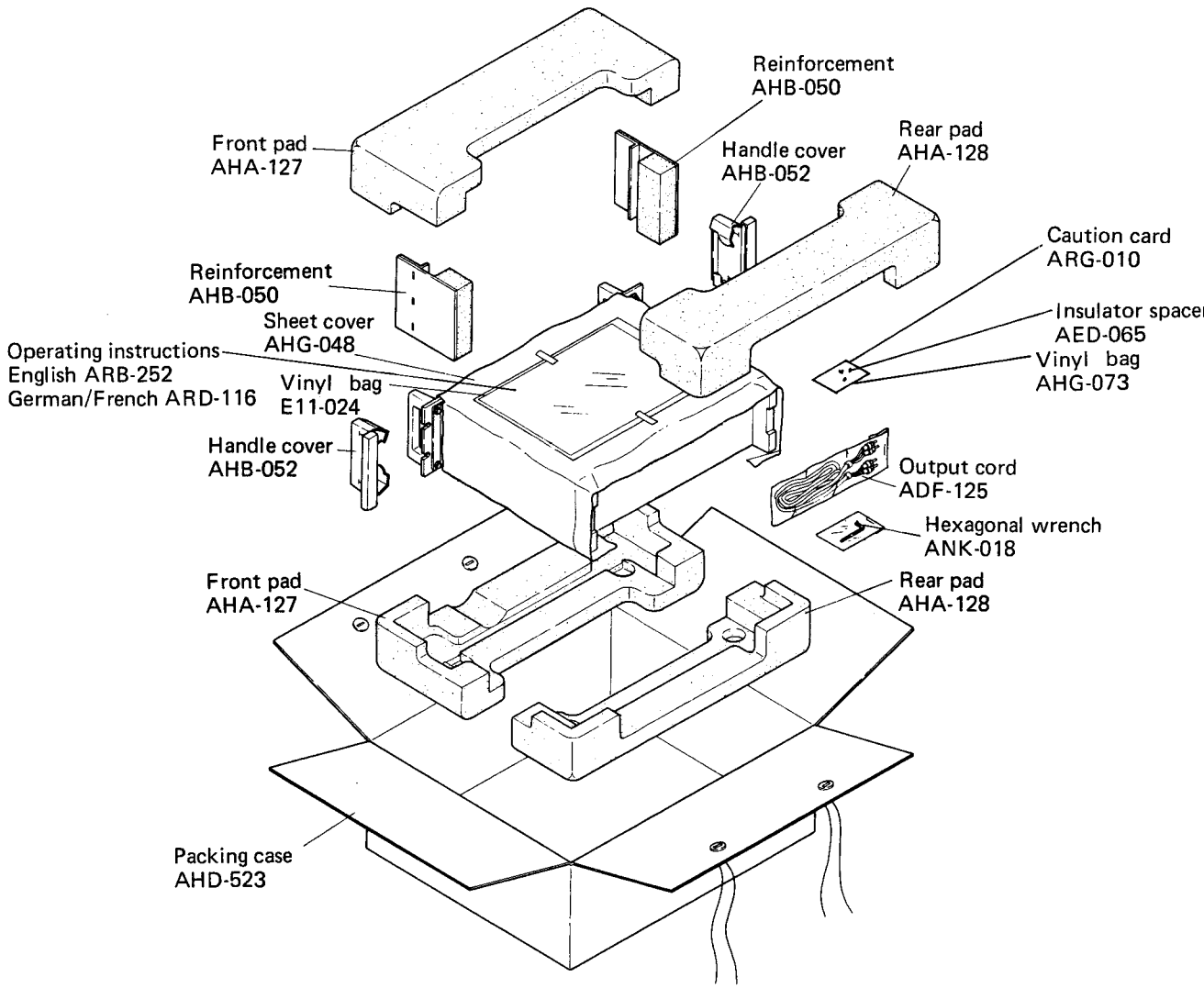
Symbol	Part No.	Description

Power Supply Assembly (AWR-166)

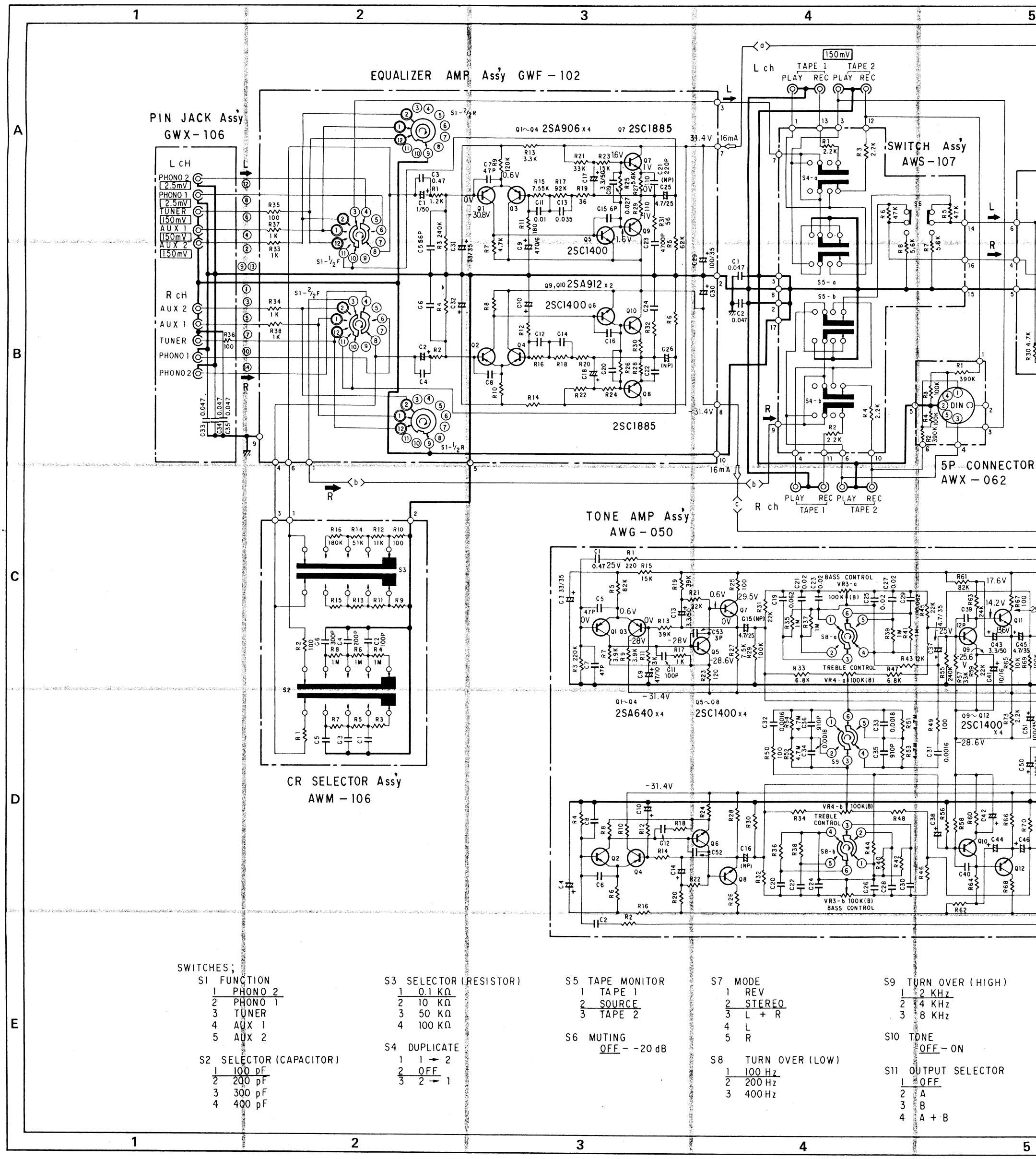



1
2
3
A
B
C
D
FU1 T500mA
FU2 T500mA
FU3 T500mA
R9 680(3W)
C13 0.01
C2 0.001
C1 0.001
D1
D2
D3
D4
D5
D1~D5 1OE2 x5
38V
-42V
42V
C4 330/50
C3 330/50
R2 1.8K
R1 1.8K
C6 100/50
C5 100/50
R4 1.8K
R3 1.8K
R6 100
R5 100
D6, D7 WZ-320 x2
D7
D6
-32V
32V
C8 100/35
C7 100/35
C10 3.3/50
C9 3.3/50
Q2 2SA816
Q1 2SC1626
R10 4.7K (1/2W)
-31.4V
31.4V
1 17 16 2 10 12 3 15 11 18
7 6 4 14 5 9 8 13

11. PACKING


Reinforcement
AHB-050
Front pad
AHA-127
Handle cover
AHB-052
Rear pad
AHA-128
Caution card
ARG-010
Reinforcement
AHB-050
Sheet cover
AHG-048
Insulator spacer
AED-065
Operating instructions
English ARB-252
German/French ARD-116
Vinyl bag
E11-024
Vinyl bag
AHG-073
Handle cover
AHB-052
Output cord
ADF-125
Hexagonal wrench
ANK-018
Front pad
AHA-127
Rear pad
AHA-128
Packing case
AHD-523

SPEC-3 HG



SWITCHES;

S1 FUNCTION
1 PHONO 2
2 PHONO 1
3 TUNER
4 AUX 1
5 AUX 2

S2 SELECTOR (CAPACITOR)
1 100 pF
2 200 pF
3 300 pF
4 400 pF

S3 SELECTOR (RESISTOR)
1 0.1 KΩ
2 10 KΩ
3 50 KΩ
4 100 KΩ

S4 DUPLICATE
1 1 → 2
2 OFF
3 2 → 1

S5 TAPE MONITOR
1 TAPE 1
2 SOURCE
3 TAPE 2

S6 MUTING
OFF – -20 dB

S7 MODE
1 REV
2 STEREO
3 L + R
4 L
5 R

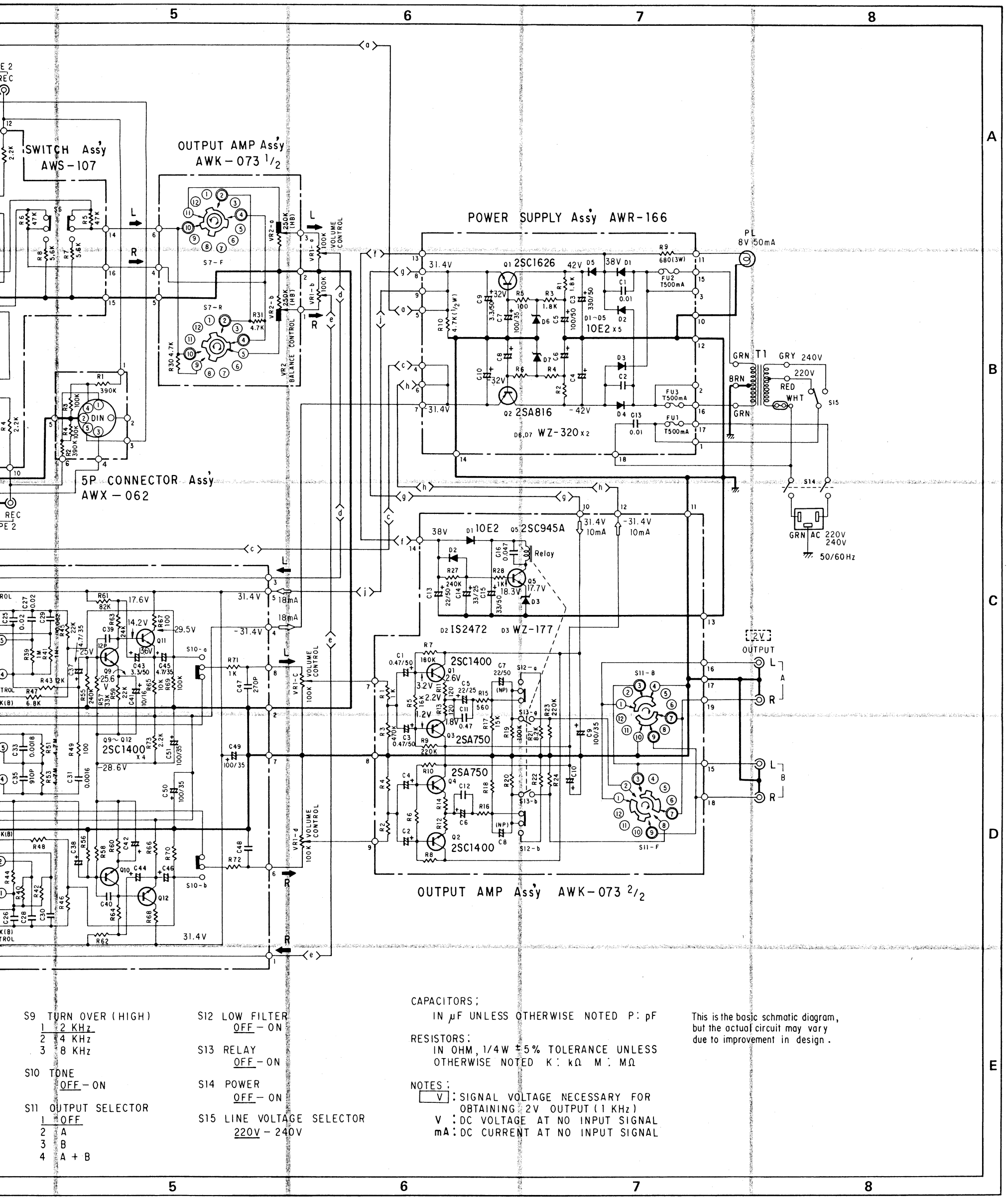
S8 TURN OVER (LOW)
1 100 Hz
2 200 Hz
3 400 Hz

S9 TURN OVER (HIGH)
1 2 KHz
2 4 KHz
3 8 KHz

S10 TONE
OFF – ON

S11 OUTPUT SELECTOR
1 OFF
2 A
3 B
4 A + B

PIONEER®



S9 TURN OVER (HIGH)
1 2 KHz
2 4 KHz
3 8 KHz

S10 TONE
OFF – ON

S11 OUTPUT SELECTOR
1 OFF
2 A
3 B
4 A + B

S12 LOW FILTER
OFF – ON

S13 RELAY
OFF – ON

S14 POWER
OFF – ON

S15 LINE VOLTAGE SELECTOR
220V – 240V

CAPACITORS;
IN μF UNLESS OTHERWISE NOTED P: pF

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

NOTES;
[V]: SIGNAL VOLTAGE NECESSARY FOR OBTAINING 2V OUTPUT (1 KHz)
V: DC VOLTAGE AT NO INPUT SIGNAL
mA: DC CURRENT AT NO INPUT SIGNAL

This is the basic schmatic diagram, but the actual circuit may vary due to improvement in design.