〈R42—187—0〉

Service Manual

QUADRALIZER AMPLIFIER

QL-600/FW

〈7IJ02M31D〉

PIONEER®

CONTENTS

1 • SPECIFICATIONS

SEMICONDUCTORS

Transistors	40
Diodes	8

POWER AMPLIFIER SECTION

Music Power Output (IHF)	44 Watts (4 Ω) 36 Watts (8 Ω)
Continuous Power Output (each channel driven)	16W/16W (4 Ω) 13W/13W (8 Ω)
Continuous Power Output (both channels driven)	12W + 12W (4 Ω) 10W + 10W (8 Ω)
Harmonic Distortion	Less than 0.5% (Continuous power output)
Intermodulation Distortion	Less than 1% (Continuous power output)
Power Bandwidth (IHF)	20Hz to 20kHz (8 Ω , H.D. Less than 0.5%)
Frequency Response	20Hz to 20kHz, ±1dB
Speakers	4 to 16 Ω
Damping Factor	40 (8 Ω , 1kHz)

PREAMPLIFIER SECTION (QUADRALIZER SECTION)

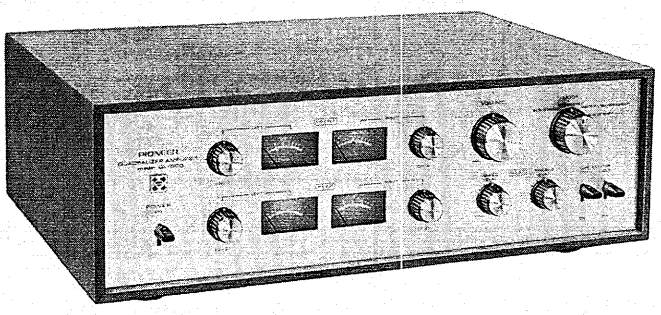
Output Voltage (OUTPUT)	1V (Rated output)
Harmonic Distortion	Less than 0.5%
Frequency Response	20Hz to 20kHz, +0.5dB, −3dB
Input Sensitivity/Impedance (1kHz, for rated output)	2CH. INPUT 100mV/60kΩ 4CH. AUX 100mV/120kΩ 2CH./4CH. TAPE MONITOR 200mV/100kΩ
Recording Output (at 200mV input)	2CH./4CH. TAPE REC 200mV (Pin jack) 2CH. TAPE REC 30mV (DIN connector)
BASS Control	−11dB, +12dB/100Hz
TREBLE Control	−10dB, +9.5dB/10kHz
Hum and Noise (IHF)	AUX More than 75dB

MISCELLANEOUS

Power Requirements		110V, 120V, 130V, 220V and 240V (Switchable) 50 – 60Hz
Power Consumption		75W (Max.)
Dimensions (Overall)		$16-\frac{15}{16}$ in./430mm (width)
		$5-\frac{11}{16}$ in./145mm (height)
		$12-\frac{3}{16}$ in./310mm (depth)
Weight	Without package	16lb, 5oz/7.4kg
	With package	20lb, 11oz/9.4kg
Furnished Accessories		

Fuse 0.5A	1
Fuse 1A	2
Pin Plug	8
Speaker Plug	4
Connecting Cords (L, R)	4 (2 each)
Polishing Cloth	1
Operating Instructions	1

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



2 • FRONT PANEL FACILITIES

POWER SWITCH

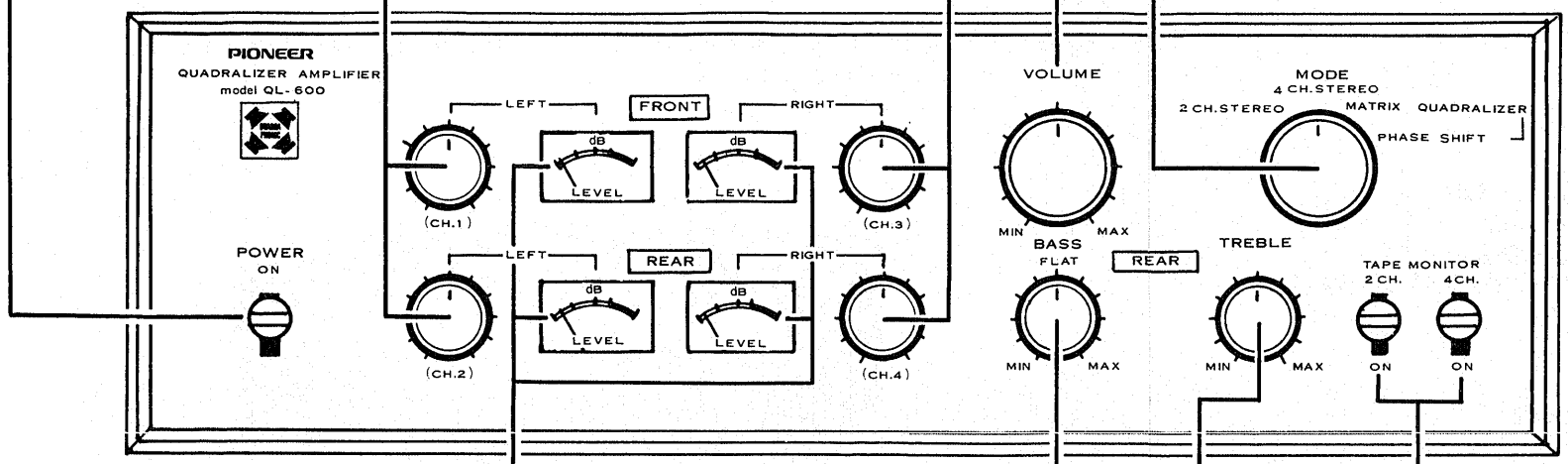
Turns the QL-600 on and off.

LEVEL CONTROLS (CH.1, CH.2, CH.3, CH.4)

Separate volume level controls for each of the four speaker systems. Clockwise rotation increase volume.

VOLUME CONTROL

This master volume control regulates the sound volume of all four channels simultaneously. Clockwise rotation increases the volume.
For controlling each channel individually, the LEVEL controls must be used.



LEVEL METERS (CH.1, CH.2, CH.3, CH.4)

These meters indicate the (preamplifier) output level for each channel. Please note that identical readings on all four meters do not necessarily mean that the system is perfectly balanced, because the actual sound volume also depends on other factors such as the power amplifier, the speaker efficiency, the listening room, etc.

NOTE: The 4 level meters indicate the QL-600's preamplifier output level. Actual volume also depends on other factors such as the output power of the stereo amplifier, speaker sensitivity, etc. For precise balancing, therefore, it is necessary to adjust with the VOLUME controls of the QL-600 and the stereo amplifier while actually listening to the program.

MODE SWITCH

2 CH. STEREO ···Playback of 2-channel stereo program in conventional 2-channel fashion.

4 CH. STEREO ···"Discrete", 4-channel stereo—playback of true 4-channel recorded tapes in 4-channel mode.

MATRIX·····4-channel playback of 2-channel stereo program material (records, FM stereo, tapes) via the QUADRALIZER, in the MATRIX method. Also for reproduction of matrix-encoded 4-channel records and FM broadcasts.

PHASE SHIFT ····4-channel reproduction of 2-channel program material via the QUADRALIZER, in the PHASE SHIFT method.

NOTE: Monophonic program sources (records, AM and FM mono broadcasts, etc.) will not produce any 4-channel sound through the QL-600.

TAPE MONITOR SWITCHES

2 CH.
Use position ON for playback of tapes on 2-channel tape deck, and for monitoring during a recording.

4 CH.
Use position ON for playback of tapes on 4-channel tape deck, and for monitoring a recording in progress.

In all other cases, both monitor switches must be left in OFF position.

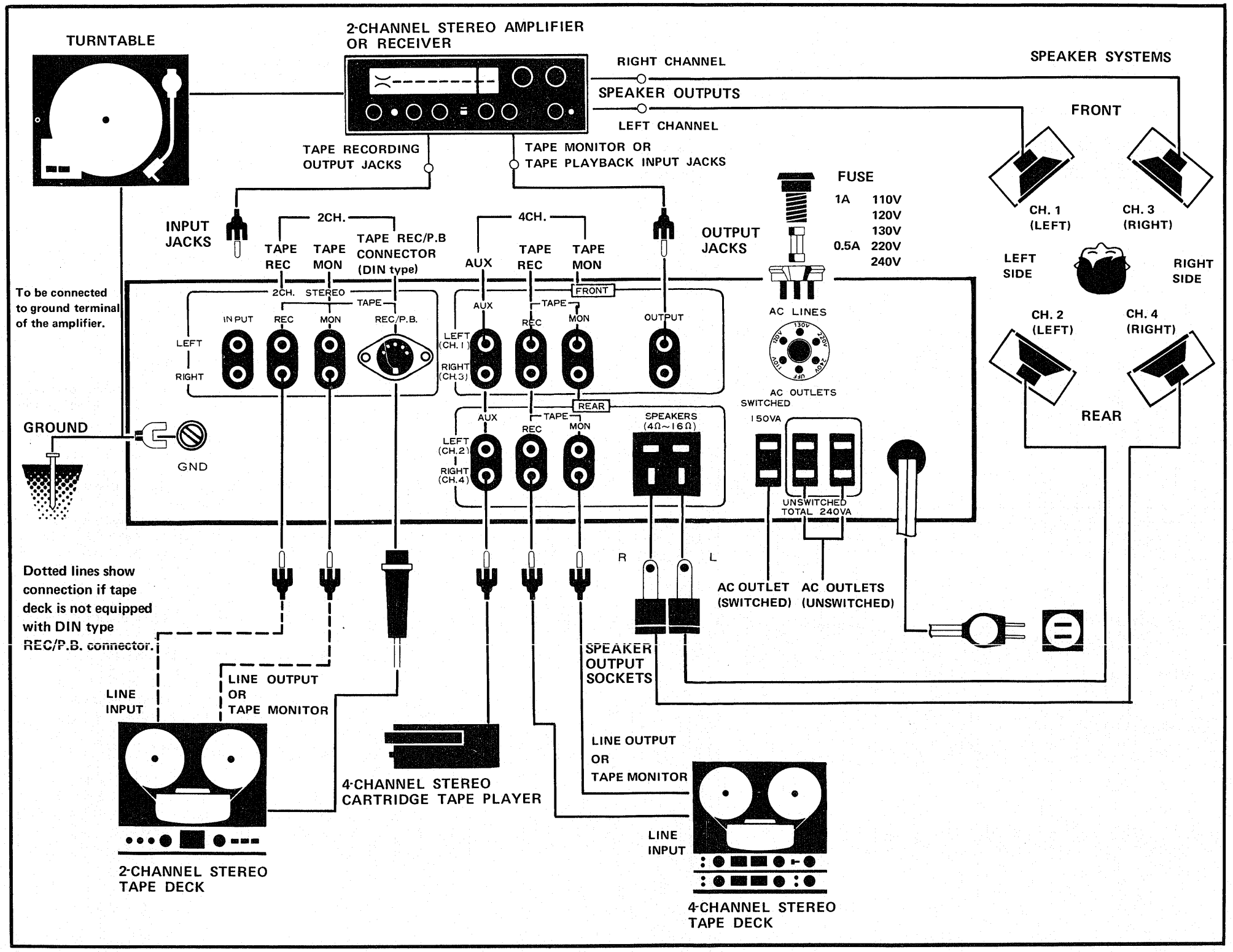
TREBLE CONTROL

Controls treble reproduction of REAR channels only.

BASS CONTROL

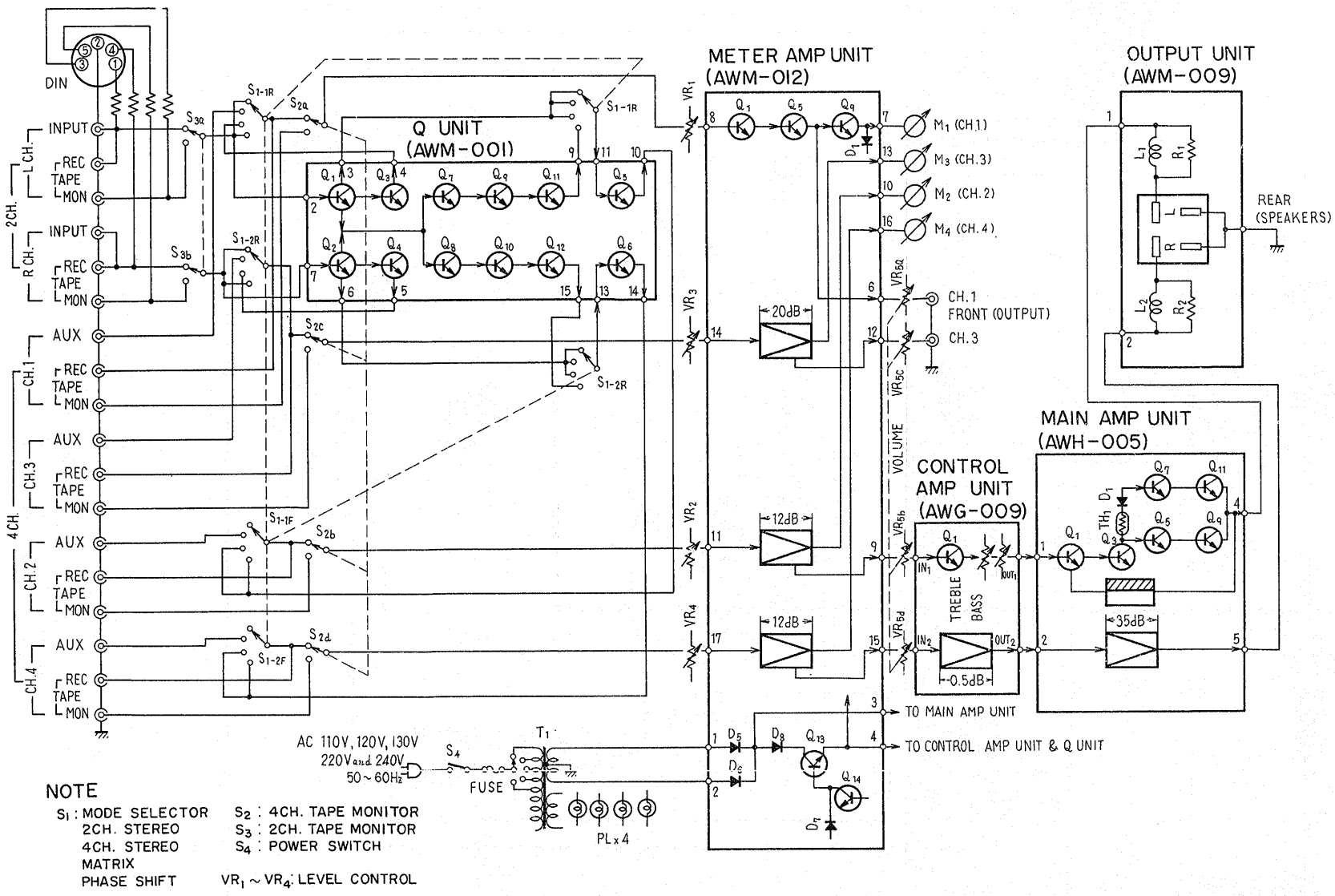
Clockwise rotation increases the bass reproduction of the REAR channels only. Starting from position FLAT, adjust this control for optimum bass quality.

3 • CONNECTION DIAGRAM



4 • CIRCUIT DESCRIPTION

4.1 BLOCK DIAGRAM



NOTE

S_1 : MODE SELECTOR
2CH. STEREO
4CH. STEREO
MATRIX
PHASE SHIFT

S_2 : 4CH. TAPE MONITOR
S_3 : 2CH. TAPE MONITOR
S_4 : POWER SWITCH

$VR_1 \sim VR_4$: LEVEL CONTROL

4.2 INPUT CIRCUITS

The 2-channel input signal supplied to the input terminals passes through the 2-CH. TAPE MONITOR switch (S3), MODE switch (S1), the 4 CH. TAPE MONITOR switch (S2) and then enters the METER AMP unit (AWM-012).
Also, the signal is always supplied to the Q unit (AWM-001) through the 2-CH. TAPE MONITOR switch.
The Q unit serves as a decoder for converting 2-channels into 4-channels. It can operate in either of two modes. In the MATRIX mode, different sum and difference signals are added to the original L and R signals to obtain four channels for the four speakers.
In the PHASE SHIFT mode, the front speakers reproduce the original L and R signals, whereas the rear speakers deliver signals with their phases shifted against those of the front channels.

4.3 METER AMP UNIT

This unit consists of four amplifiers for driving the four level meters, and a power supply section.
The four amplifiers are basically identical except that the front channels (CH. 1 & 3) have different C-R constants from the rear channels (CH. 2 & 4), wherefore the front channel gain is approximately 8dB higher.
In the power supply circuit, both parts of the AC current are rectified by diodes D5 and D6, and the DC current enters the MAIN AMP unit through a 3300μF capacitor. DC current stabilized in a stabilizer circuit (which consists of Q13, Q14 and D7) is supplied to the CONTROL AMP, Q UNIT and METER AMP.

4.4 CONTROL AMP UNIT

The CONTROL AMP unit amplifies the signal and embodies the tone controls. Each channel is equipped with one transistor.

4.5 MAIN AMP UNIT

The output stage circuit is a typical quasi-complementary design. The output stage is protected by fuses — a simple and positively operative type of protection.

5 • DISASSEMBLY

5-1 WOODEN CASE

Remove the 4 screws from bottom of wooden case. Pull the case backward off the amplifier housing.

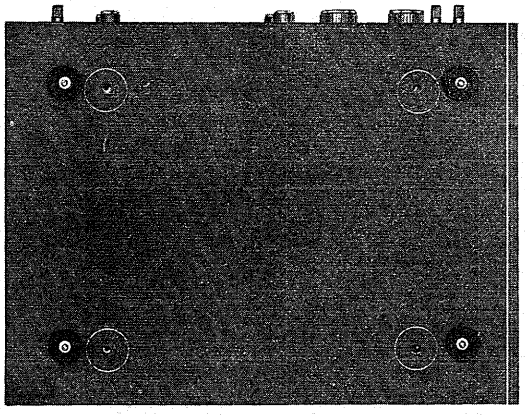


Photo 1

5-2 FRONT PANEL

Pull off all knobs, then remove nuts and washers from shafts. The front panel can now be removed.

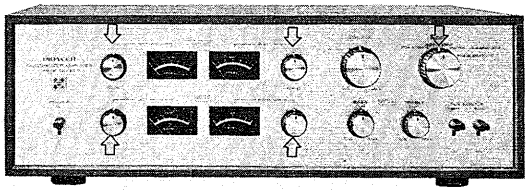
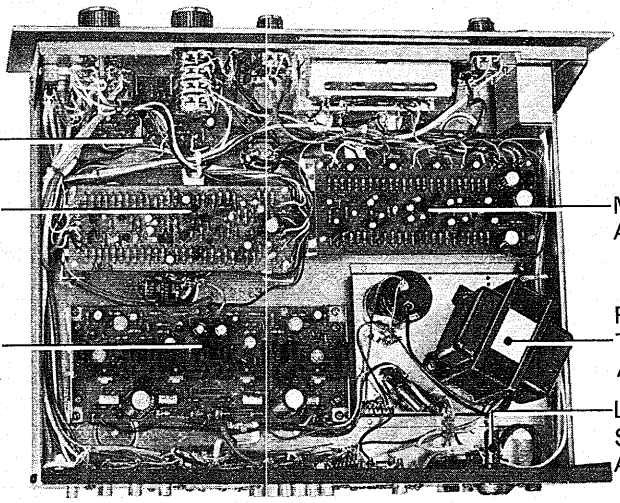
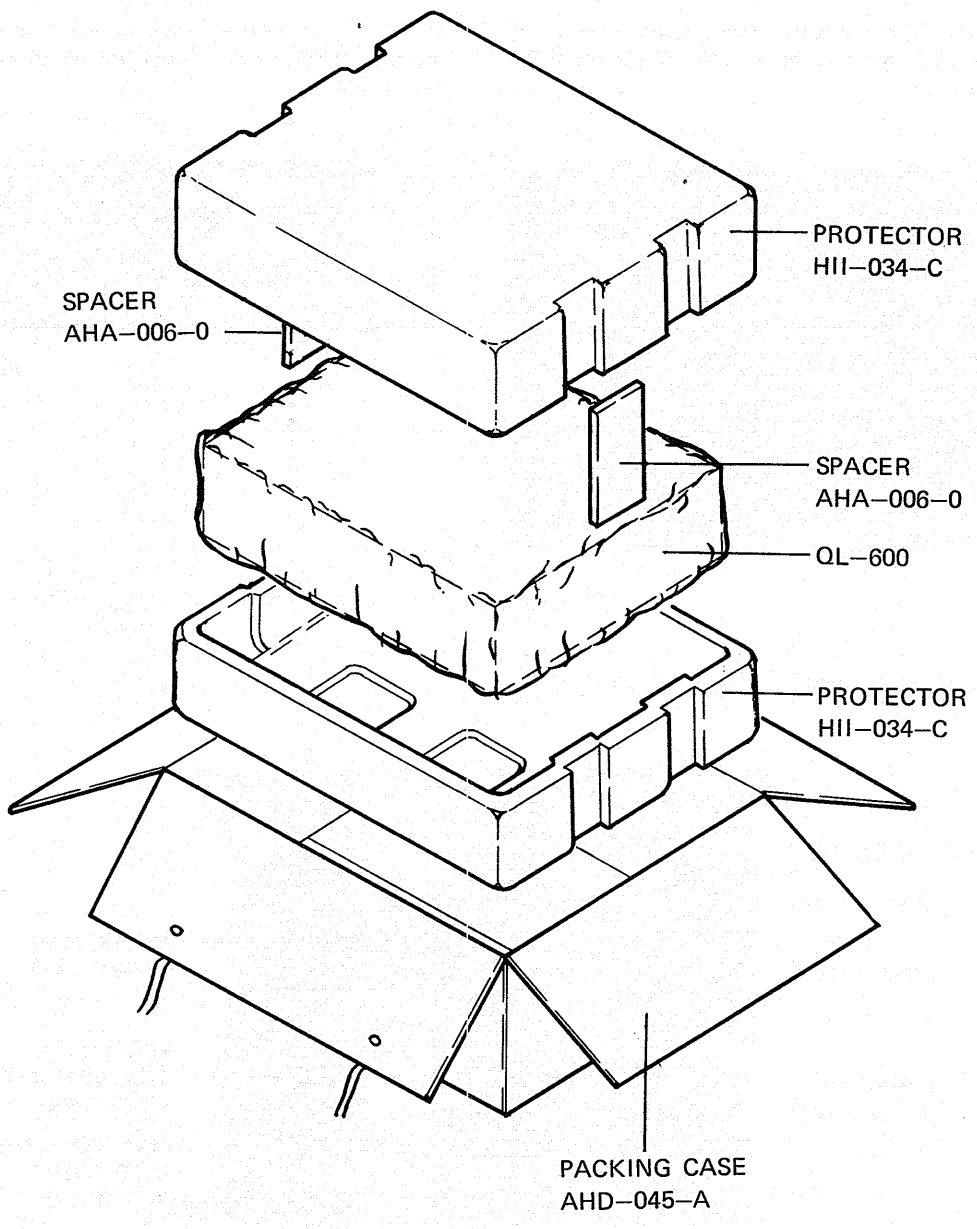


Photo 2

5-3 PARTS AND PCB LOCATION



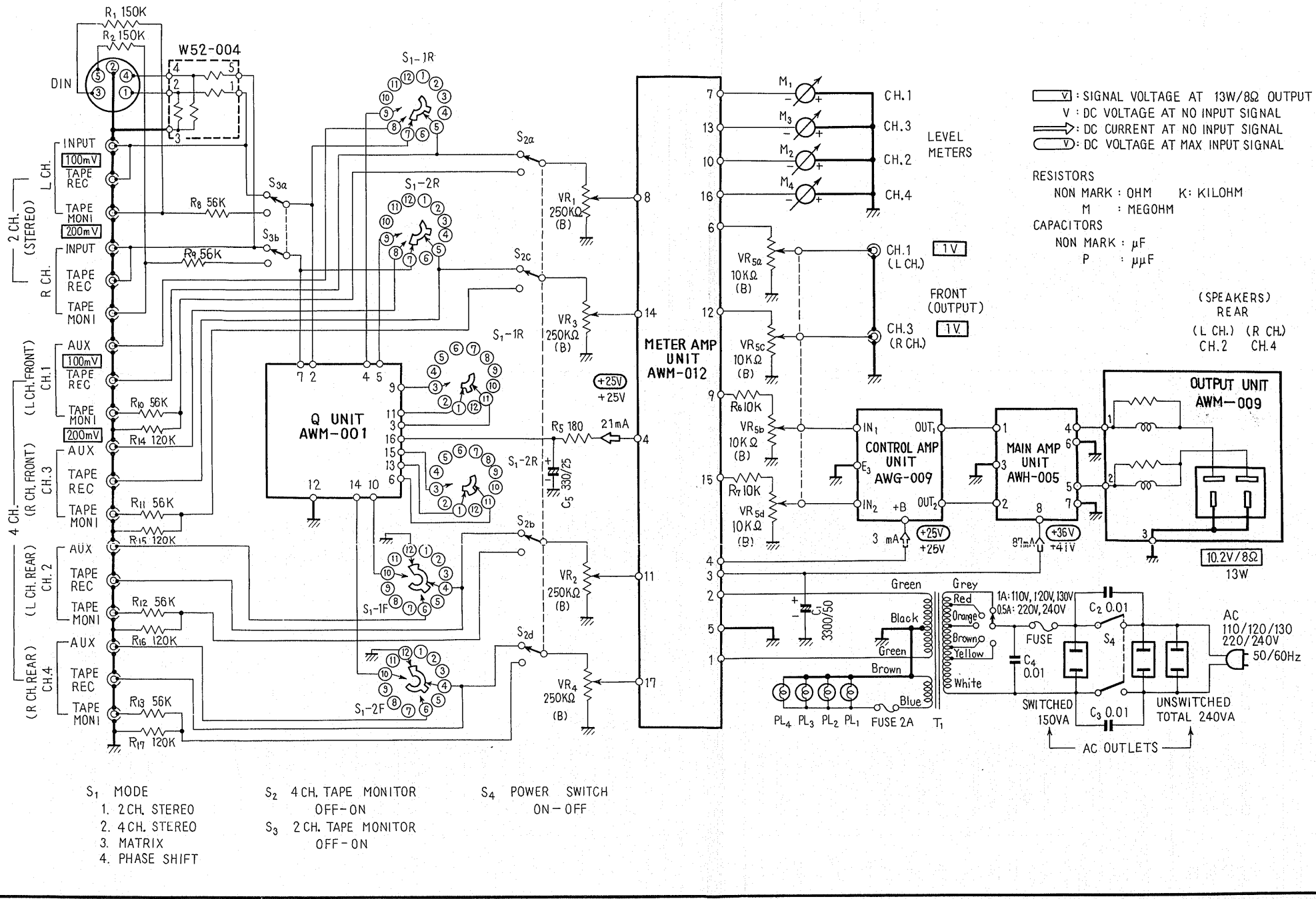
6 • PACKING METHOD AND PARTS



7 • SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

7 • 1 UNIT CONNECTION DIAGRAM

QL-600



S_1 MODE
1. 2CH. STEREO
2. 4CH. STEREO
3. MATRIX
4. PHASE SHIFT

S_2 4CH. TAPE MONITOR
OFF-ON

S_3 2CH. TAPE MONITOR
OFF-ON

S_4 POWER SWITCH
ON-OFF

MISCELLANEOUS PARTS

CAPACITORS

IN μF, UNLESS OTHERWISE NOTED. p: μμF.

Symbol	Description			Part No.	
C1	Electrolytic	3300	50V	ACH-008-0	
C2	Ceramic	0.01	DC1.4kV	C43-003-0	
C3	Ceramic	0.01	DC1.4kV	C43-003-0	
C4	Ceramic	0.01	DC1.4kV	C43-003-0	
C5	Electrolytic	330	25V	CEB 331P 25	

RESISTORS

IN Ω, ¼W UNLESS OTHERWISE NOTED. k: kΩ, M: MΩ.

Symbol	Description		Part No.	
R1	Carbon film	150k	RD¼PS 154J	
R2	Carbon film	150k	RD¼PS 154J	
R5	Carbon film	180	RD¼PS 181J	
R6	Carbon film	10k	RD¼PS 103J	
R7	Carbon film	10k	RD¼PS 103J	
R8	Carbon film	56k	RD¼PS 563J	
R9	Carbon film	56k	RD¼PS 563J	
R10	Carbon film	56k	RD¼PS 563J	
R11	Carbon film	56k	RD¼PS 563J	
R12	Carbon film	56k	RD¼PS 563J	
R13	Carbon film	56k	RD¼PS 563J	
R14	Carbon film	120k	RD¼PS 124J	
R15	Carbon film	120k	RD¼PS 124J	
R16	Carbon film	120k	RD¼PS 124J	
R17	Carbon film	120k	RD¼PS 124J	

SWITCHES

Symbol	Description	Part No.	
S1	MODE Switch	ASB-005-0	
S2	4 CH. TAPE MONITOR Switch	ASK-008-0	
S3	2 CH. TAPE MONITOR Switch	S42-011-A	
S4	POWER Switch	ASK-007-0	

POTENTIOMETERS

Symbol	Description		Part No.	
VR1	LEVEL Control	250k-B	ACV-005-0	
VR2	LEVEL Control	250k-B	ACV-005-0	
VR3	LEVEL Control	250k-B	ACV-005-0	
VR4	LEVEL Control	250k-B	ACV-005-0	
VR5	VOLUME Control	10k-B	ACV-304-0	

TRANSFORMER

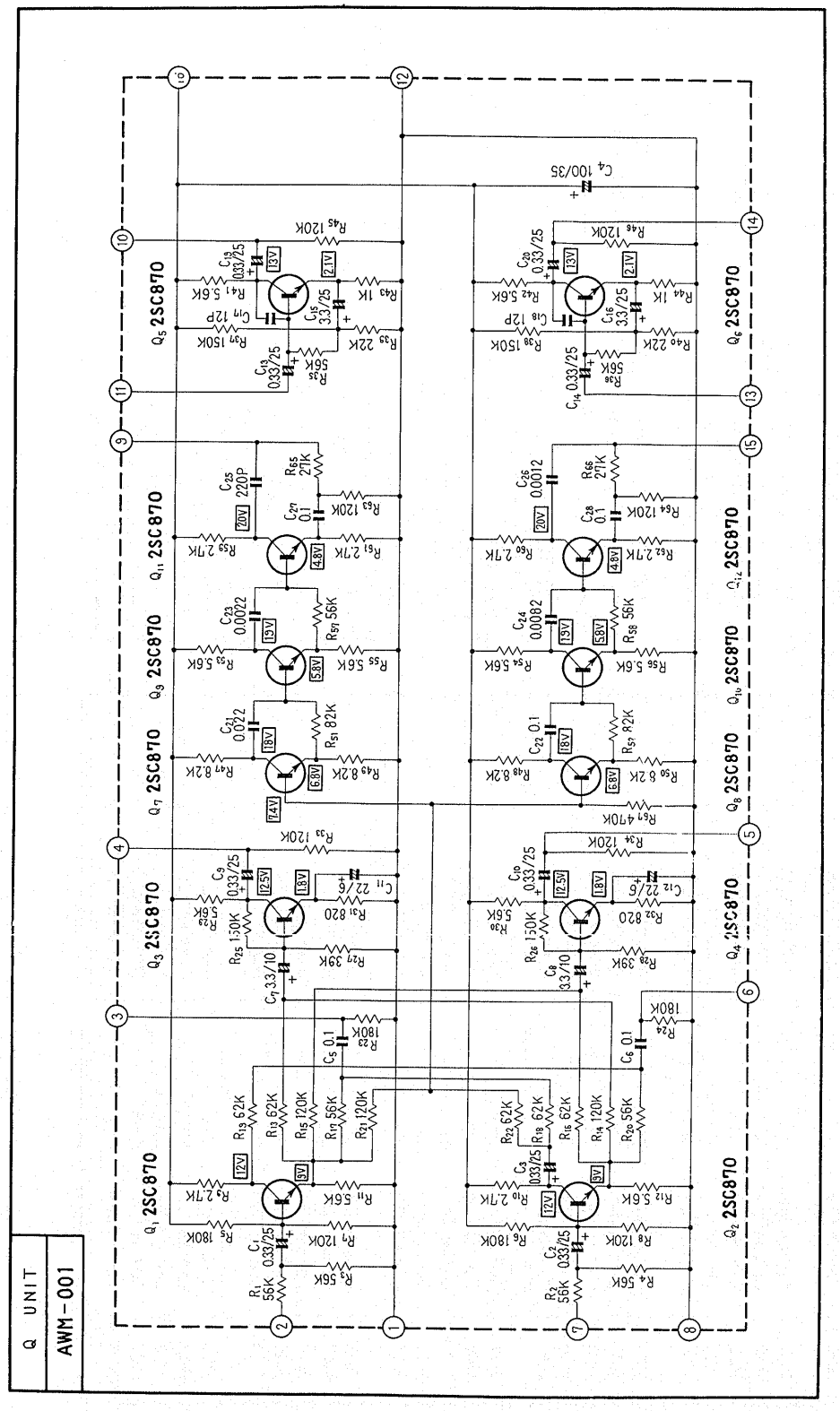
Symbol	Description	Part No.	
T1	Power Transformer	ATT-029-0	

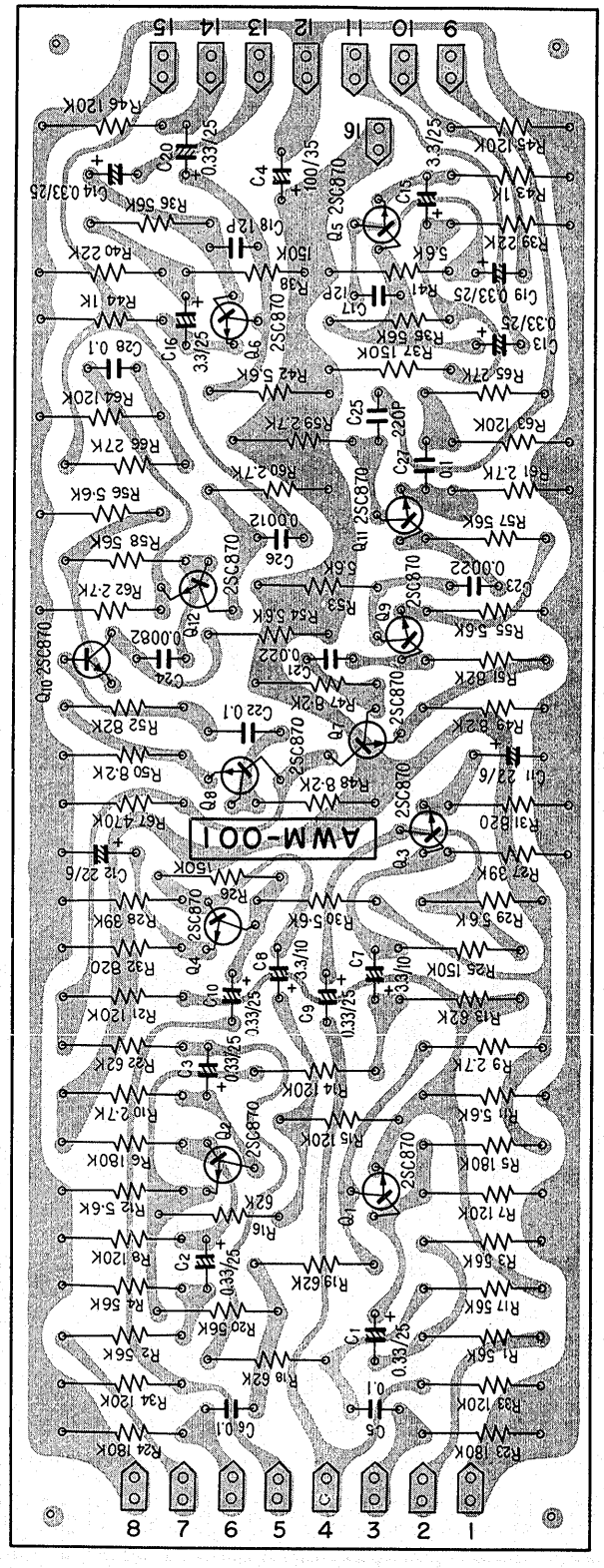
OTHERS

Symbol	Description	Part No.	
	Main Amp Unit	AWH-005-A	
	Control Amp Unit	AWG-009-0	
	Q Unit	AWM-001-A	
	Output Unit	AWM-009-0	
	Meter Amp Unit	AWM-012-A	
	Front Panel Ass'y	ANB-082-0	
	Wooden Case	AMM-005-D	
	Level Meter	AAW-004-0	
	Knob for Mode and Volume	A12-229-0	
	Knob for Bass, Treble and Level	A12-631-A	
	Knob for Lever Switch	A19-095-A	
	Quadraphonic Badge	AAM-003-A	
	6P Input Terminal Board	K22-013-D	
	2P Input Terminal Board	K21-009-D	
	4P Ground Terminal	K13-047-0	
	Speaker Socket	K72-028-0	
	Spare AC Outlet	AKP-001-A	
	Line Voltage Selector	AKR-001-0	
	Fuse Holder	K91-005-A	
	Tape REC/PB Connector (DIN type)	K93-003-B	
	Compound Part for Rec Terminal	W52-004-0	
	Pilot Lamp for Level Meter	E22-017-0	
	Fuse 0.5A	E21-007-0	
	Fuse 2A for Protection	E21-026-0	
	AC Power Cord	D11-002-B	

Symbol	Description	Part No.	
	Screw for Grounding	B11-012-A	
	Washer (Square)	M52-010-0	
	⊕ Screw to fix Wooden Case M4 x 20		
	Packing Case	AHD-045-A	
	Protector for Packing	H11-034-C	
	Packing Spacer	AHA-006-0	
	Operating Instructions	ARB-035-0	
	Vinyl Bag	E11-034-A	
	Speaker Plug	K72-007-B	
	Connection Cord (white)	D51-003-A	
	Connection Cord (red)	D51-004-A	
	Pin Plug	K72-015-A	
	Fuse 1A	E21-004-C	

7 • 2 Q UNIT (AWM-001)





PARTS LIST OF Q UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.33	25V	CSSAR33X25	
C2	Electrolytic	0.33	25V	CSSAR33X25	
C3	Electrolytic	0.33	25V	CSSAR33X25	
C4	Electrolytic	100	35V	CEA101P35	
C5	Mylar	0.1	50V	CQMA104K50	
C6	Mylar	0.1	50V	CQMA104K50	
C7	Electrolytic	3.3	10V	CSSA3R3X10	
C8	Electrolytic	3.3	10V	CSSA3R3X10	
C9	Electrolytic	0.33	25V	CSSAR33X25	
C10	Electrolytic	0.33	25V	CSSAR33X25	
C11	Electrolytic	22	6V	CEA220P6	
C12	Electrolytic	22	6V	CEA220P6	
C13	Electrolytic	0.33	25V	CSSAR33X25	
C14	Electrolytic	0.33	25V	CSSAR33X25	
C15	Electrolytic	3.3	25V	CEA3R3P25	
C16	Electrolytic	3.3	25V	CEA3R3P25	
C17	Ceramic	12p	50V	CCDSL120K50	
C18	Ceramic	12p	50V	CCDSL120K50	
C19	Electrolytic	0.33	25V	CSSAR33X25	
C20	Electrolytic	0.33	25V	CSSAR33X25	
C21	Mylar	0.022	50V	CQMA223J50	
C22	Mylar	0.1	50V	CQMA104J50	
C23	Mylar	0.0022	50V	CQMA222J50	
C24	Mylar	0.0082	50V	CQMA822J50	
C25	Styrol	220p	50V	CQSA221J50	
C26	Mylar	0.0012	50V	CQMA122J50	
C27	Mylar	0.1	50V	CQMA104K50	
C28	Mylar	0.1	50V	CQMA104K50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	56k	RD¼PS563J	
R2	Carbon film	56k	RD¼PS563J	
R3	Carbon film	56k	RD¼PS563J	
R4	Carbon film	56k	RD¼PS563J	
R5	Carbon film	180k	RD¼PS184K	
R6	Carbon film	180k	RD¼PS184K	
R7	Carbon film	120k	RD¼PS124K	
R8	Carbon film	120k	RD¼PS124K	
R9	Carbon film	2.7k	RD¼PS272J	
R10	Carbon film	2.7k	RD¼PS272J	
R11	Carbon film	5.6k	RD¼PS562J	
R12	Carbon film	5.6k	RD¼PS562J	
R13	Carbon film	62k	RD¼PS623J	
R14	Carbon film	120k	RD¼PS124J	
R15	Carbon film	120k	RD¼PS124J	
R16	Carbon film	62k	RD¼PS623J	
R17	Carbon film	56k	RD¼PS563J	
R18	Carbon film	62k	RD¼PS623J	
R19	Carbon film	62k	RD¼PS623J	
R20	Carbon film	56k	RD¼PS563J	
R21	Carbon film	120k	RD¼PS124J	
R22	Carbon film	62k	RD¼PS623J	
R23	Carbon film	180k	RD¼PS184J	
R24	Carbon film	180k	RD¼PS184J	
R25	Carbon film	150k	RD¼PS154J	

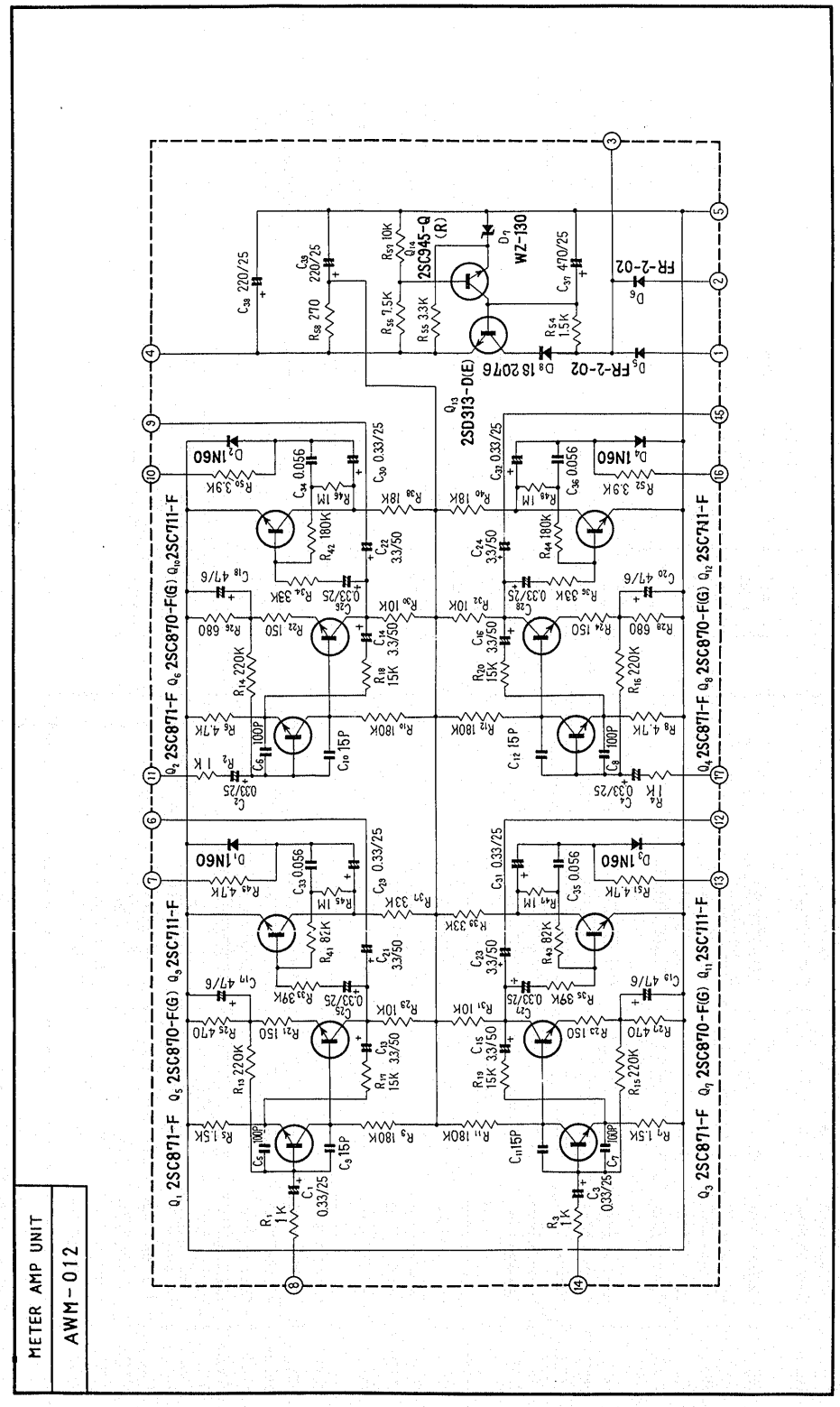
Symbol	Description		Part No.	
R26	Carbon film	150k	RD¼PS154J	
R27	Carbon film	39k	RD¼PS393K	
R28	Carbon film	39k	RD¼PS393K	
R29	Carbon film	5.6k	RD¼PS562K	
R30	Carbon film	5.6k	RD¼PS562K	
R31	Carbon film	820	RD¼PS821K	
R32	Carbon film	820	RD¼PS821K	
R33	Carbon film	120k	RD¼PS124K	
R34	Carbon film	120k	RD¼PS124K	
R35	Carbon film	56k	RD¼PS563K	
R36	Carbon film	56k	RD¼PS563K	
R37	Carbon film	150k	RD¼PS154K	
R38	Carbon film	150k	RD¼PS154K	
R39	Carbon film	22k	RD¼PS223K	
R40	Carbon film	22k	RD¼PS223K	
R41	Carbon film	5.6k	RD¼PS562J	
R42	Carbon film	5.6k	RD¼PS562J	
R43	Carbon film	1k	RD¼PS102J	
R44	Carbon film	1k	RD¼PS102J	
R45	Carbon film	120k	RD¼PS124K	
R46	Carbon film	120k	RD¼PS124K	
R47	Carbon film	8.2k	RD¼PS822K	
R48	Carbon film	8.2k	RD¼PS822K	
R49	Carbon film	8.2k	RD¼PS822K	
R50	Carbon film	8.2k	RD¼PS822K	
R51	Carbon film	82k	RD¼PS823K	
R52	Carbon film	82k	RD¼PS823K	
R53	Carbon film	5.6k	RD¼PS562K	
R54	Carbon film	5.6k	RD¼PS562K	
R55	Carbon film	5.6k	RD¼PS562K	

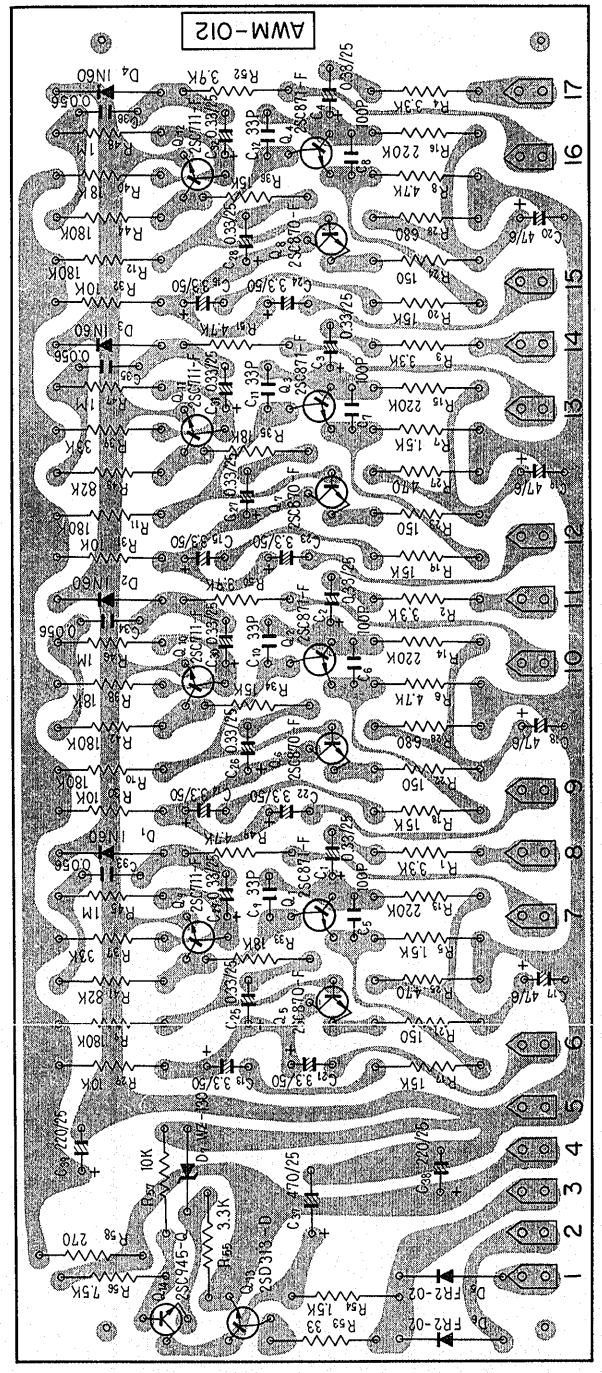
Symbol	Description		Part No.	
R56	Carbon film	5.6k	RD¼PS562K	
R57	Carbon film	56k	RD¼PS563K	
R58	Carbon film	56k	RD¼PS563K	
R59	Carbon film	2.7k	RD¼PS272K	
R60	Carbon film	2.7k	RD¼PS272K	
R61	Carbon film	2.7k	RD¼PS272K	
R62	Carbon film	2.7k	RD¼PS272K	
R63	Carbon film	120k	RD¼PS124K	
R64	Carbon film	120k	RD¼PS124K	
R65	Carbon film	27k	RD¼PS273K	
R66	Carbon film	27k	RD¼PS273K	
R67	Carbon film	470k	RD¼PS474J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	2SC870—F or G	Transistor		
Q2	2SC870—F or G	Transistor		
Q3	2SC870—F or G	Transistor		
Q4	2SC870—F or G	Transistor		
Q5	2SC870—F or G	Transistor		
Q6	2SC870—F or G	Transistor		
Q7	2SC870—F or G	Transistor		
Q8	2SC870—F or G	Transistor		
Q9	2SC870—F or G	Transistor		
Q10	2SC870—F or G	Transistor		
Q11	2SC870—F or G	Transistor		
Q12	2SC870—F or G	Transistor		

7 • 3 METER AMP UNIT (AWM-012)





PARTS LIST OF METER AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.33	25V	CSSAR33X25	
C2	Electrolytic	0.33	25V	CSSAR33X25	
C3	Electrolytic	0.33	25V	CSSAR33X25	
C4	Electrolytic	0.33	25V	CSSAR33X25	
C5	Ceramic	100p	50V	CCDSL101K50	
C6	Ceramic	100p	50V	CCDSL101K50	
C7	Ceramic	100p	50V	CCDSL101K50	
C8	Ceramic	100p	50V	CCDSL101K50	
C9	Ceramic	33p	50V	CCDSL330K50	
C10	Ceramic	33p	50V	CCDSL330K50	
C11	Ceramic	33p	50V	CCDSL330K50	
C12	Ceramic	33p	50V	CCDSL330K50	
C13	Electrolytic	3.3	50V	CEA3R3P50	
C14	Electrolytic	3.3	50V	CEA3R3P50	
C15	Electrolytic	3.3	50V	CEA3R3P50	
C16	Electrolytic	3.3	50V	CEA3R3P50	
C17	Electrolytic	47	6V	CEA470P6	
C18	Electrolytic	47	6V	CEA470P6	
C19	Electrolytic	47	6V	CEA470P6	
C20	Electrolytic	47	6V	CEA470P6	
C21	Electrolytic	3.3	50V	CEA3R3P50	
C22	Electrolytic	3.3	50V	CEA3R3P50	
C23	Electrolytic	3.3	50V	CEA3R3P50	
C24	Electrolytic	3.3	50V	CEA3R3P50	
C25	Electrolytic	0.33	25V	CSSAR33X25	

Symbol	Description			Part No.	
C26	Electrolytic	0.33	25V	CSSAR33X25	
C27	Electrolytic	0.33	25V	CSSAR33X25	
C28	Electrolytic	0.33	25V	CSSAR33X25	
C29	Electrolytic	0.33	25V	CSSAR33X25	
C30	Electrolytic	0.33	25V	CSSAR33X25	
C31	Electrolytic	0.33	25V	CSSAR33X25	
C32	Electrolytic	0.33	25V	CSSAR33X25	
C33	Mylar	0.056	50V	CQMA563K50	
C34	Mylar	0.056	50V	CQMA563K50	
C35	Mylar	0.056	50V	CQMA563K50	
C36	Mylar	0.056	50V	CQMA563K50	
C37	Electrolytic	470	25V	CEA471P25	
C38	Electrolytic	220	25V	CEA221P25	
C39	Electrolytic	220	25V	CEA221P25	

RESISTORS

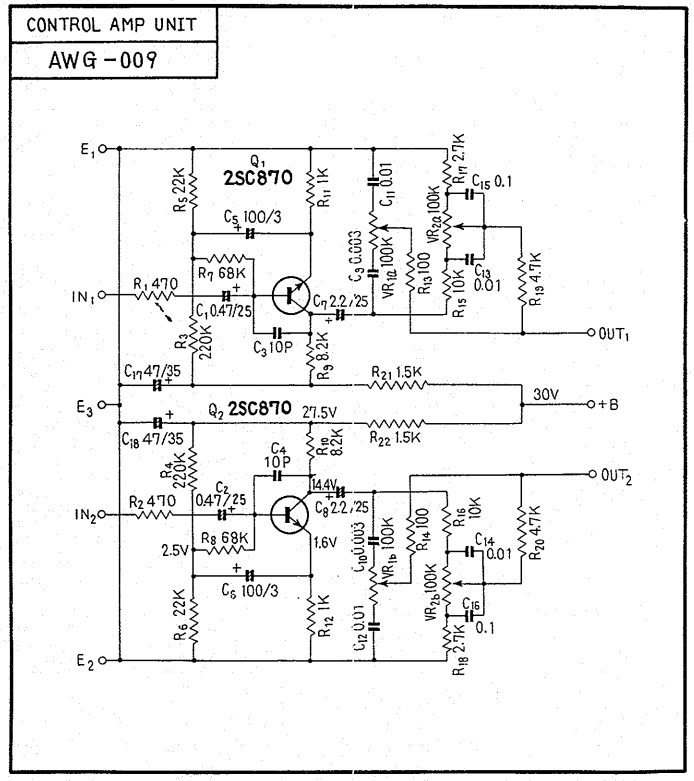
Symbol	Description		Part No.	
R1	Carbon film	3.3k	RD¼PS332J	
R2	Carbon film	3.3k	RD¼PS332J	
R3	Carbon film	3.3k	RD¼PS332J	
R4	Carbon film	3.3k	RD¼PS332J	
R5	Carbon film	1.5k	RD¼PS152J	
R6	Carbon film	4.7k	RD¼PS472J	
R7	Carbon film	1.5k	RD¼PS152J	
R8	Carbon film	4.7k	RD¼PS472J	
R9	Carbon film	180k	RD¼PS184J	
R10	Carbon film	180k	RD¼PS184J	
R11	Carbon film	180k	RD¼PS184J	
R12	Carbon film	180k	RD¼PS184J	
R13	Carbon film	220k	RD¼PS224J	
R14	Carbon film	220k	RD¼PS224J	
R15	Carbon film	220k	RD¼PS224J	
R16	Carbon film	220k	RD¼PS224J	
R17	Carbon film	15k	RD¼PS153J	
R18	Carbon film	15k	RD¼PS153J	
R19	Carbon film	15k	RD¼PS153J	
R20	Carbon film	15k	RD¼PS153J	
R21	Carbon film	150	RD¼PS151J	
R22	Carbon film	150	RD¼PS151J	
R23	Carbon film	150	RD¼PS151J	
R24	Carbon film	150	RD¼PS151J	
R25	Carbon film	470	RD¼PS471J	
R26	Carbon film	680	RD¼PS681J	
R27	Carbon film	470	RD¼PS471J	
R28	Carbon film	680	RD¼PS681J	
R29	Carbon film	10k	RD¼PS103J	
R30	Carbon film	10k	RD¼PS103J	

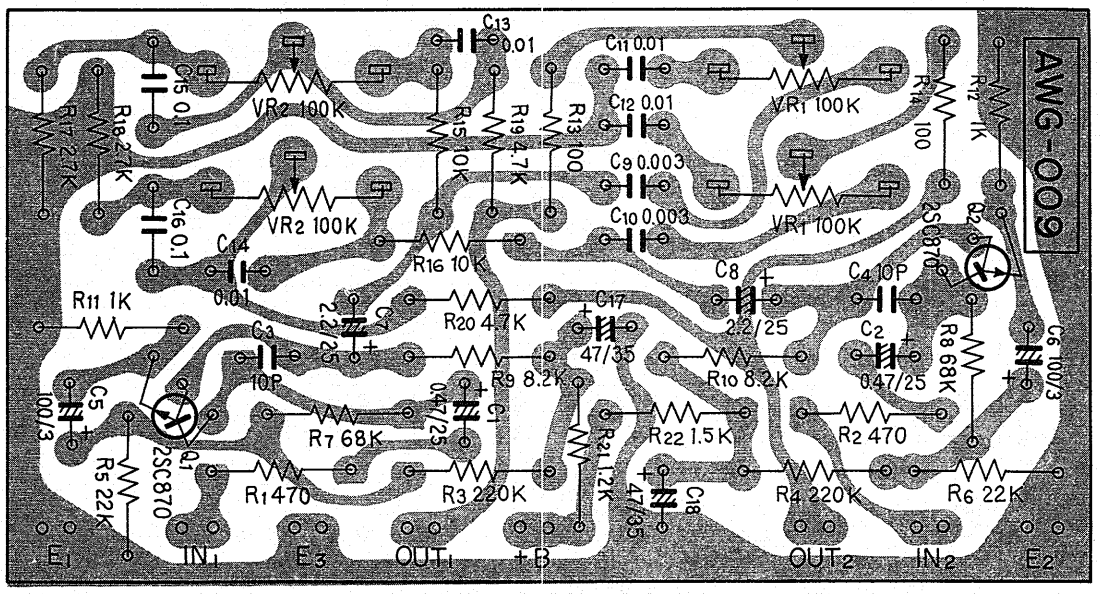
Symbol	Description		Part No.	
R31	Carbon film	10k	RD¼PS103J	
R32	Carbon film	10k	RD¼PS103J	
R33	Carbon film	18k	RD¼PS183J	
R34	Carbon film	15k	RD¼PS153J	
R35	Carbon film	18k	RD¼PS183J	
R36	Carbon film	15k	RD¼PS153J	
R37	Carbon film	33k	RD¼PS333J	
R38	Carbon film	18k	RD¼PS183J	
R39	Carbon film	33k	RD¼PS333J	
R40	Carbon film	18k	RD¼PS183J	
R41	Carbon film	82k	RD¼PS823J	
R42	Carbon film	180k	RD¼PS184J	
R43	Carbon film	82k	RD¼PS823J	
R44	Carbon film	180k	RD¼PS184J	
R45	Carbon film	1M	RD¼PS105J	
R46	Carbon film	1M	RD¼PS105J	
R47	Carbon film	1M	RD¼PS105J	
R48	Carbon film	1M	RD¼PS105J	
R49	Carbon film	4.7k	RD¼PS472J	
R50	Carbon film	3.9k	RD¼PS392J	
R51	Carbon film	4.7k	RD¼PS472J	
R52	Carbon film	3.9k	RD¼PS392J	
R53	Carbon film	33	RD¼PS330J	
R54	Carbon film	1.5k	RD¼PS152J	
R55	Carbon film	3.3k	RD¼PS332J	
R56	Carbon film	7.5k	RD¼PS752J	
R57	Carbon film	10k	RD¼PS103J	
R58	Carbon film	270	RD¼PS271J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	2SC871–F	Transistor		
Q2	2SC871–F	Transistor		
Q3	2SC871–F	Transistor		
Q4	2SC871–F	Transistor		
Q5	2SC870–F	Transistor		
Q6	2SC870–F	Transistor		
Q7	2SC870–F	Transistor		
Q8	2SC870–F	Transistor		
Q9	2SC711–F	Transistor		
Q10	2SC711–F	Transistor		
Q11	2SC711–F	Transistor		
Q12	2SC711–F	Transistor		
Q13	2SD313–D	Transistor		
Q14	2SC945–Q	Transistor		
D1	1N60	Diode		
D2	1N60	Diode		
D3	1N60	Diode		
D4	1N60	Diode		
D5	FR2–02	Diode		
D6	FR2–02	Diode		
D7	WZ–130	Zener Diode		
D8	1S2076	Diode		

7 • 4 CONTROL AMP UNIT (AWG-009)





PARTS LIST OF CONTROL AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.47	25V	CSSAR47X25	
C2	Electrolytic	0.47	25V	CSSAR47X25	
C3	Ceramic	10p	50V	CCDSL100K50	
C4	Ceramic	10p	50V	CCDSL100K50	
C5	Electrolytic	100	6V	CEA101P6	
C6	Electrolytic	100	6V	CEA101P6	
C7	Electrolytic	2.2	25V	CSSA2R2X25	
C8	Electrolytic	2.2	25V	CSSA2R2X25	
C9	Mylar	0.003	50V	CQMA302M50	
C10	Mylar	0.003	50V	CQMA302M50	
C11	Mylar	0.01	50V	CQMA103M50	
C12	Mylar	0.01	50V	CQMA103M50	
C13	Mylar	0.01	50V	CQMA103M50	
C14	Mylar	0.01	50V	CQMA103M50	
C15	Mylar	0.1	50V	CQMA104M50	
C16	Mylar	0.1	50V	CQMA104M50	
C17	Electrolytic	47	50V	CEA470P50	
C18	Electrolytic	47	50V	CEA470P50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	470	RD¼PS471K	
R2	Carbon film	470	RD¼PS471K	
R3	Carbon film	220k	RD¼PS224K	
R4	Carbon film	220k	RD¼PS224K	
R5	Carbon film	22k	RD¼PS223K	
R6	Carbon film	22k	RD¼PS223K	
R7	Carbon film	68k	RD¼PS683K	
R8	Carbon film	68k	RD¼PS683K	
R9	Carbon film	8.2k	RD¼PS822K	
R10	Carbon film	8.2k	RD¼PS822K	
R11	Carbon film	1k	RD¼PS102K	
R12	Carbon film	1k	RD¼PS102K	
R13	Carbon film	100	RD¼PS101K	
R14	Carbon film	100	RD¼PS101K	
R15	Carbon film	10k	RD¼PS103K	
R16	Carbon film	10k	RD¼PS103K	
R17	Carbon film	2.7k	RD¼PS272K	
R18	Carbon film	2.7k	RD¼PS272K	
R19	Carbon film	4.7k	RD¼PS472K	
R20	Carbon film	4.7k	RD¼PS472K	
R21	Carbon film	1.5k	RD¼PS152K	
R22	Carbon film	1.5k	RD¼PS152K	

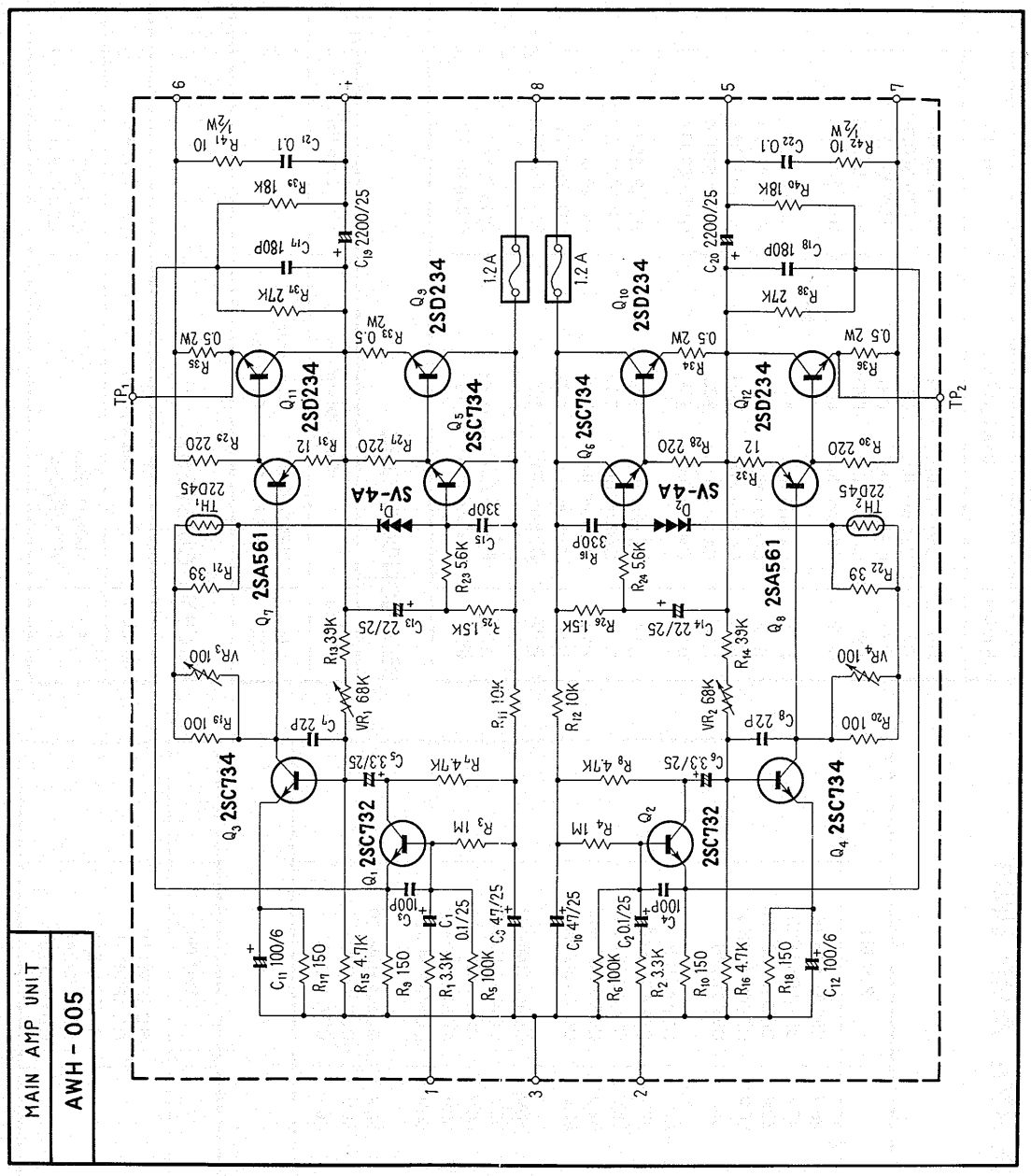
SEMICONDUCTORS

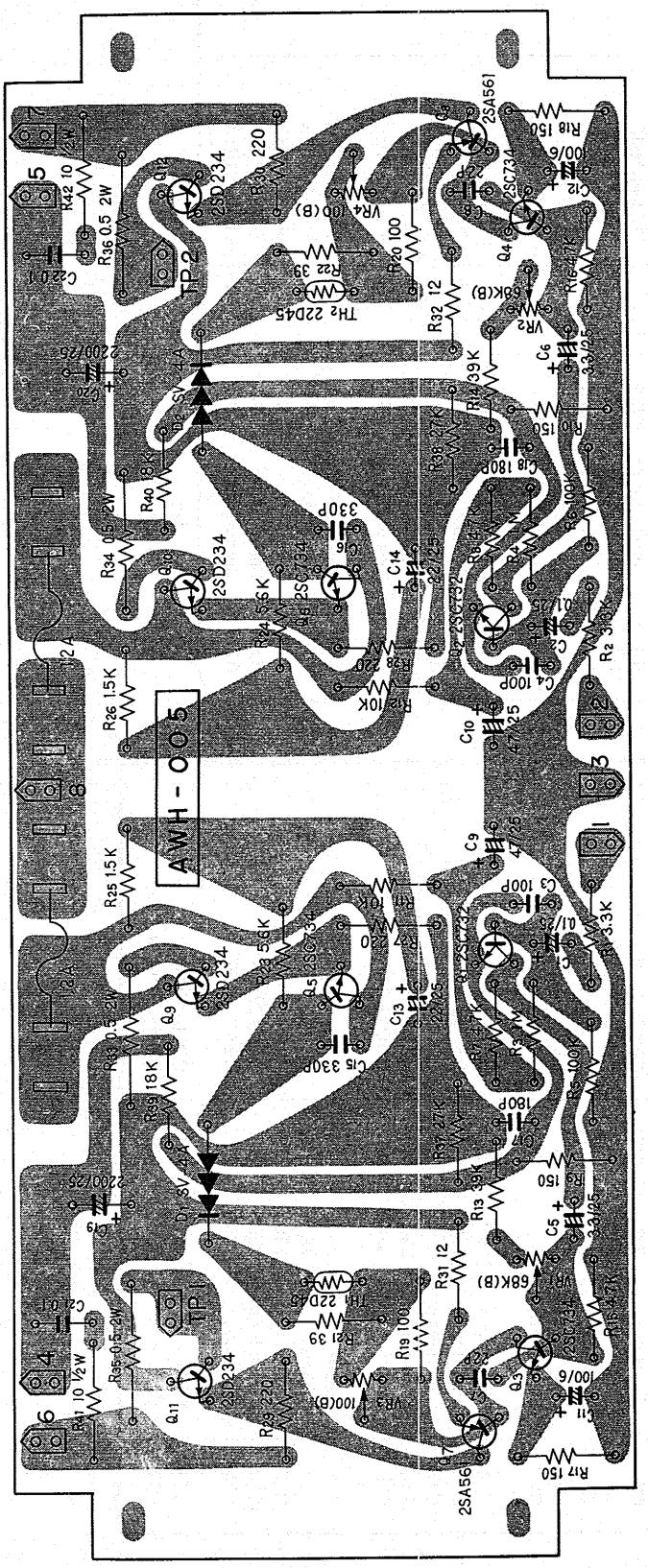
Symbol	Description		Part No.	
Q1	2SC870–BL	Transistor		
Q2	2SC870–BL	Transistor		

POTENTIOMETERS

Symbol	Description	Part No.	
VR1	100k-B, dual	C82-040-A	
VR2	100k-B, dual	C82-040-A	

7 • 5 MAIN AMP UNIT (AWH-005)




AWH-005
TP1
TP2
Q1 2SA561
Q2 2SC734
Q3 2SC734
Q4 2SC734
Q5 2SC734
Q6 2SC734
Q7 2SA561
Q8 2SC732
Q9 2SD234
Q10 2SD234
Q11 2SD234
Q12 2SD234
D1 5V
D2 5V
TH1 22D45
TH2 22D45
VR1 68K(B)
VR2 68K(B)
VR3 100(B)
VR4 100(B)
C1 0.1
C2 0.1
C3 100P
C4 100P
C5 3.3/25
C6 3.3/25
C7 180P
C8 180P
C9 47/25
C10 47/25
C11 100/6
C12 100/6
C13 22/25
C14 22/25
C15 330P
C16 330P
C17 0.1/25
C18 0.1/25
C19 2200/25
C20 2200/25
R1 3.3K
R2 3.3K
R3 100
R4 100
R5 100
R6 100
R7 150
R8 150
R9 150
R10 150
R11 4.7K
R12 4.7K
R13 39K
R14 39K
R15 10K
R16 10K
R17 150
R18 150
R19 100
R20 100
R21 39
R22 39
R23 220
R24 220
R25 1.5K
R26 1.5K
R27 5.6K
R28 5.6K
R29 220
R30 220
R31 12
R32 12
R33 0.5 2W
R34 0.5 2W
R35 0.5 2W
R36 0.5 2W
R37 27K
R38 27K
R39 18K
R40 18K
R41 10 1/2W
R42 10 1/2W
J1
J2
J3
J4
J5
J6
J7
J8
J9

PARTS LIST OF MAIN AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.1	25V	CSSA0R1X25	
C2	Electrolytic	0.1	25V	CSSA0R1X25	
C3	Ceramic	100p	50V	CCDSL101K50	
C4	Ceramic	100p	50V	CCDSL101K50	
C5	Electrolytic	3.3	25V	CEA3R3P25	
C6	Electrolytic	3.3	25V	CEA3R3P25	
C7	Ceramic	22p	50V	CCDSL220K50	
C8	Ceramic	22p	50V	CCDSL220K50	
C9	Electrolytic	47	25V	CEA470P25	
C10	Electrolytic	47	25V	CEA470P25	
C11	Electrolytic	100	6V	CEA101P6	
C12	Electrolytic	100	6V	CEA101P6	
C13	Electrolytic	22	25V	CEA220P25	
C14	Electrolytic	22	25V	CEA220P25	
C15	Ceramic	330p	50V	CKDYB331K50	
C16	Ceramic	330p	50V	CKDYB331K50	
C17	Ceramic	180p	50V	CCDSL181K50	
C18	Ceramic	180p	50V	CCDSL181K50	
C19	Electrolytic	2200	25V	CEA222P25	
C20	Electrolytic	2200	25V	CEA222P25	
C21	Mylar	0.1	50V	CQMA104M50	
C22	Mylar	0.1	50V	CQMA104M50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	3.3k	RD¼PS332K	
R2	Carbon film	3.3k	RD¼PS332K	
R3	Carbon film	1M	RD¼PS105K	
R4	Carbon film	1M	RD¼PS105K	
R5	Carbon film	100k	RD¼PS104K	
R6	Carbon film	100k	RD¼PS104K	
R7	Carbon film	4.7k	RD¼PS472K	
R8	Carbon film	4.7k	RD¼PS472K	
R9	Carbon film	150	RD¼PS151K	
R10	Carbon film	150	RD¼PS151K	
R11	Carbon film	10k	RD¼PS103K	
R12	Carbon film	10k	RD¼PS103K	
R13	Carbon film	39k	RD¼PS393K	
R14	Carbon film	39k	RD¼PS393K	
R15	Carbon film	4.7k	RD¼PS472K	
R16	Carbon film	4.7k	RD¼PS472K	
R17	Carbon film	150	RD¼PS151K	
R18	Carbon film	150	RD¼PS151K	
R19	Carbon film	100	RD¼PS101K	
R20	Carbon film	100	RD¼PS101K	

Symbol	Description			Part No.	
R21	Carbon film	39		RD¼PS390K	
R22	Carbon film	39		RD¼PS390K	
R23	Carbon film	5.6k		RD¼PS562K	
R24	Carbon film	5.6k		RD¼PS562K	
R25	Carbon film	1.5k		RD¼PS152K	
R26	Carbon film	1.5k		RD¼PS152K	
R27	Carbon film	220		RD¼PS221K	
R28	Carbon film	220		RD¼PS221K	
R29	Carbon film	220		RD¼PS221K	
R30	Carbon film	220		RD¼PS221K	
R31	Carbon film	12		RD¼PS120K	
R32	Carbon film	12		RD¼PS120K	
R33	Metal oxide	0.5	2W	RN2H0R5K	
R34	Metal oxide	0.5	2W	RN2H0R5K	
R35	Metal oxide	0.5	2W	RN2H0R5K	
R36	Metal oxide	0.5	2W	RN2H0R5K	
R37	Carbon film	27k		RD¼PS273K	
R38	Carbon film	27k		RD¼PS273K	
R39	Carbon film	18k		RD¼PS183K	
R40	Carbon film	18k		RD¼PS183K	
R41	Carbon film	10	½W	RD½PS100K	
R42	Carbon film	10	½W	RD½PS100K	

POTENTIOMETERS

Symbol	Description	Part No.	
VR1	68k-B,Semi-fixed	ACP-002-0	
VR2	68k-B, Semi-fixed	ACP-002-0	
VR3	100-B, Semi-fixed	C92-063-0	
VR4	100-B, Semi-fixed	C92-063-0	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	2SC732	Transistor		
Q2	2SC732	Transistor		
Q3	2SC734—Y or GR	Transistor		
Q4	2SC734—Y or GR	Transistor		
Q5	2SC734	Transistor		
Q6	2SC734	Transistor		
Q7	2SA561	Transistor		
Q8	2SA561	Transistor		
Q9	2SD234	Transistor		
Q10	2SD234	Transistor		
Q11	2SD234	Transistor		
Q12	2SD234	Transistor		
D1	SV—4A	Varistor		
D2	SV—4A	Varistor		
TH1	22D45	Thermistor		
TH2	22D45	Thermistor		

OTHERS

Symbol	Description	Part No.	
	Heat sink	ANH-031-A	
	Insulated spacer	E32-102-0	
	Insulated screw	ABB-001-0	
	Fuse holder	K91-006-0	
	Fuse 1.2A	AEK-010-0	

PARTS LIST OF OUTPUT UNIT

RESISTORS

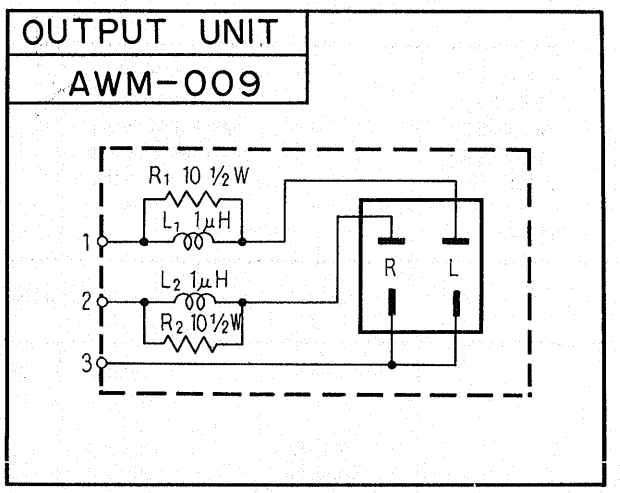
Symbol	Description	Part No.	
R1	Carbon film 10 ½W	RD½PS100K	
R2	Carbon film 10 ½W	RD½PS100K	

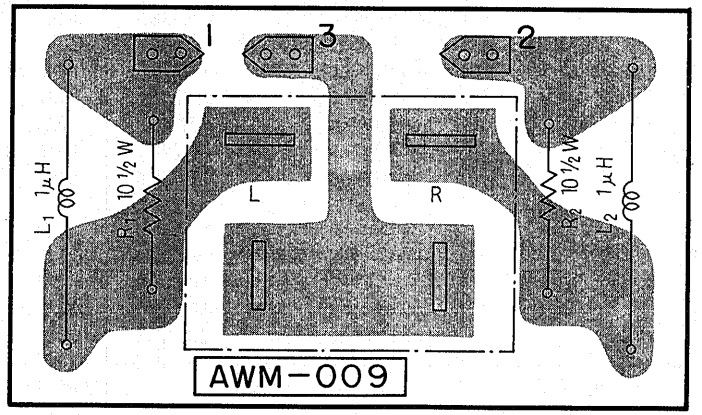
COILS

Symbol	Description	Part No.	
L1	Chok coil	ATH-003-0	
L2	Chok coil	ATH-003-0	

OTHER

Symbol	Description	Part No.	
	Speaker socket	K72-028-0	





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