

Quality Uncompromised

ROTEL[®]

Technical Manual

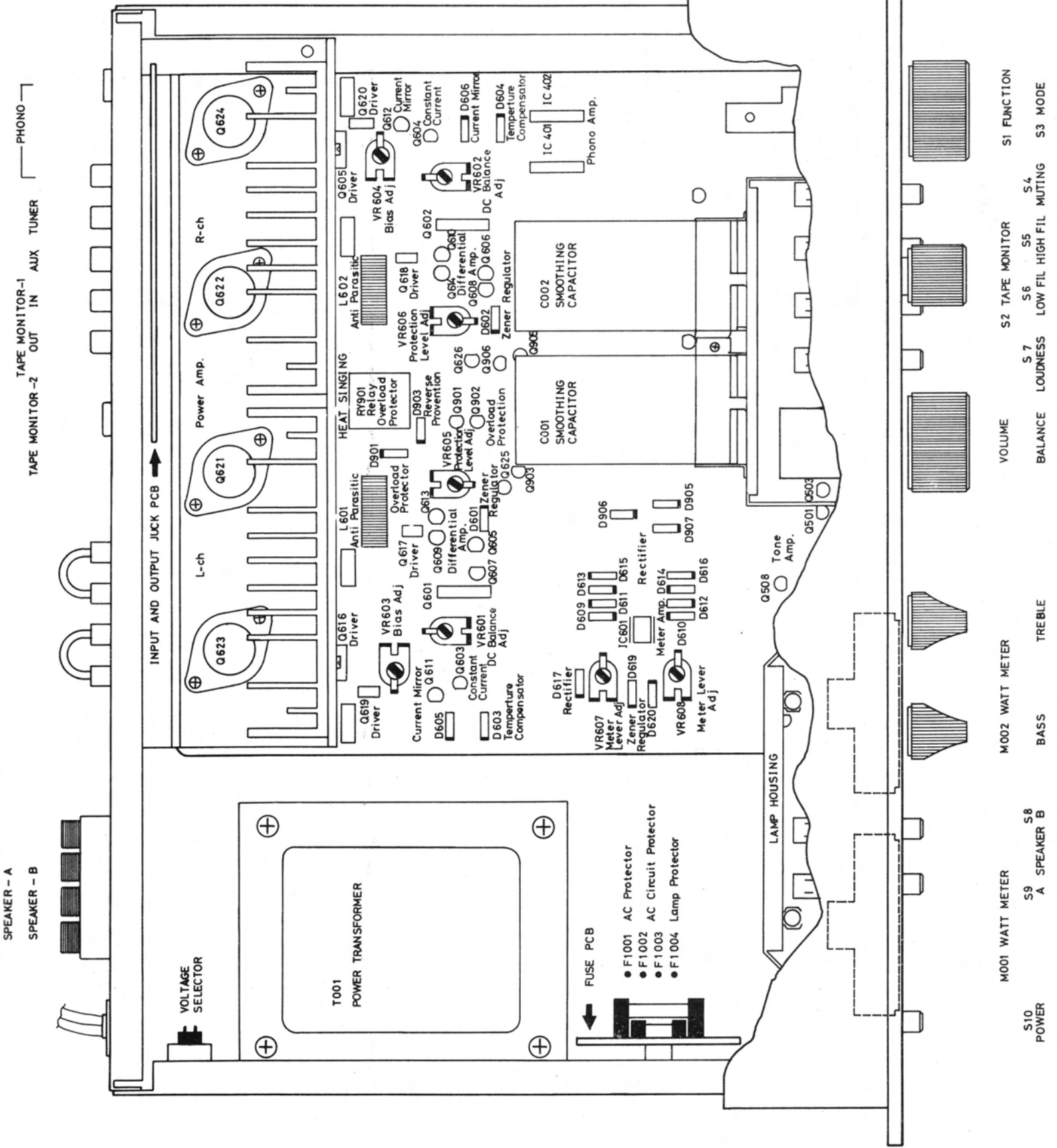
Stereo Integrated Amplifier

RA-714

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Chassis Layout



- M001 WATT METER
- S9 A SPEAKER B
- S10 POWER
- M002 WATT METER
- BASS
- TREBLE
- VOLUME
- S2 TAPE MONITOR
- S3 TAPE MONITOR
- S4 LOW FIL HIGH FIL
- S5 MUTING
- S6 M002 WATT METER
- S7 LOUDNESS
- S8 BALANCE
- S9 LOUDNESS
- S10 BALANCE
- S11 M002 WATT METER
- S12 TAPE MONITOR
- S13 TAPE MONITOR
- S14 LOW FIL HIGH FIL
- S15 M002 WATT METER
- S16 M002 WATT METER
- S17 LOUDNESS
- S18 BALANCE
- S19 LOUDNESS
- S20 BALANCE
- S21 M002 WATT METER
- S22 TAPE MONITOR
- S23 TAPE MONITOR
- S24 LOW FIL HIGH FIL
- S25 M002 WATT METER
- S26 M002 WATT METER
- S27 LOUDNESS
- S28 BALANCE
- S29 LOUDNESS
- S30 BALANCE
- S31 M002 WATT METER
- S32 TAPE MONITOR
- S33 TAPE MONITOR
- S34 LOW FIL HIGH FIL
- S35 M002 WATT METER
- S36 M002 WATT METER
- S37 LOUDNESS
- S38 BALANCE
- S39 LOUDNESS
- S40 BALANCE

Gain Diagram

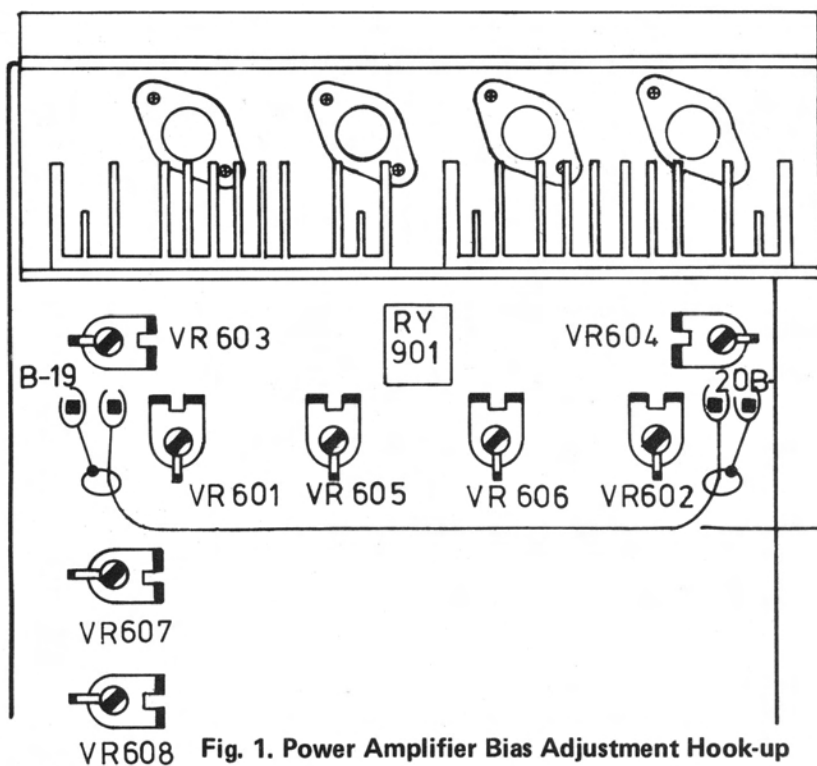
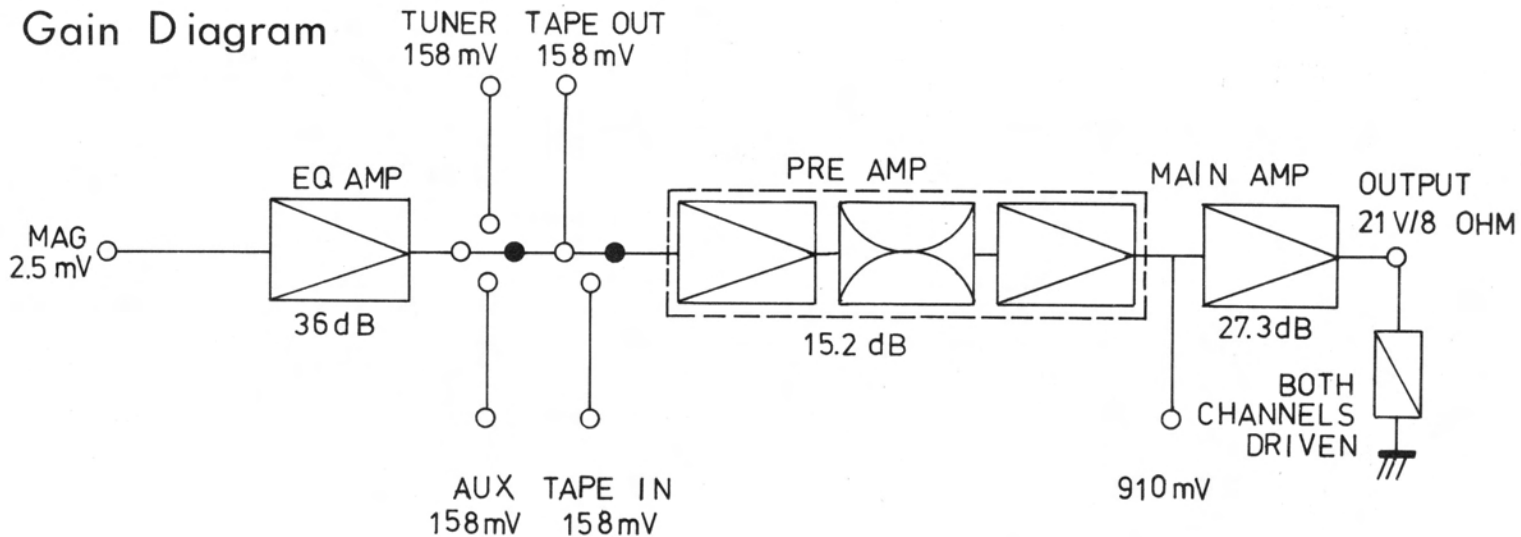
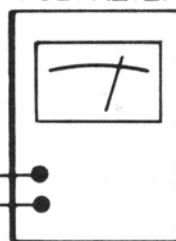


Fig. 1. Power Amplifier Bias Adjustment Hook-up

DC MILLI-VOLTMETER



- ADJUST POTENTIOMETER VR603(VR604, R-CH) TO OBTAIN A 6.6mV READING ON DC MILLIVOLTMETER
- VR601 602 DC BALANCE ADJUST POTENTIOMETER
- VR 603 604 BIAS ADJUST POTENTIOMETER
- VR 605 606 OVERLOAD PROTECTION LEVEL ADJUST POTENTIOMETER
- VR 607 608 METER CALIBRATION ADJUST POTENTIOMETER

Power Amplifier Bias Adjustment Procedure

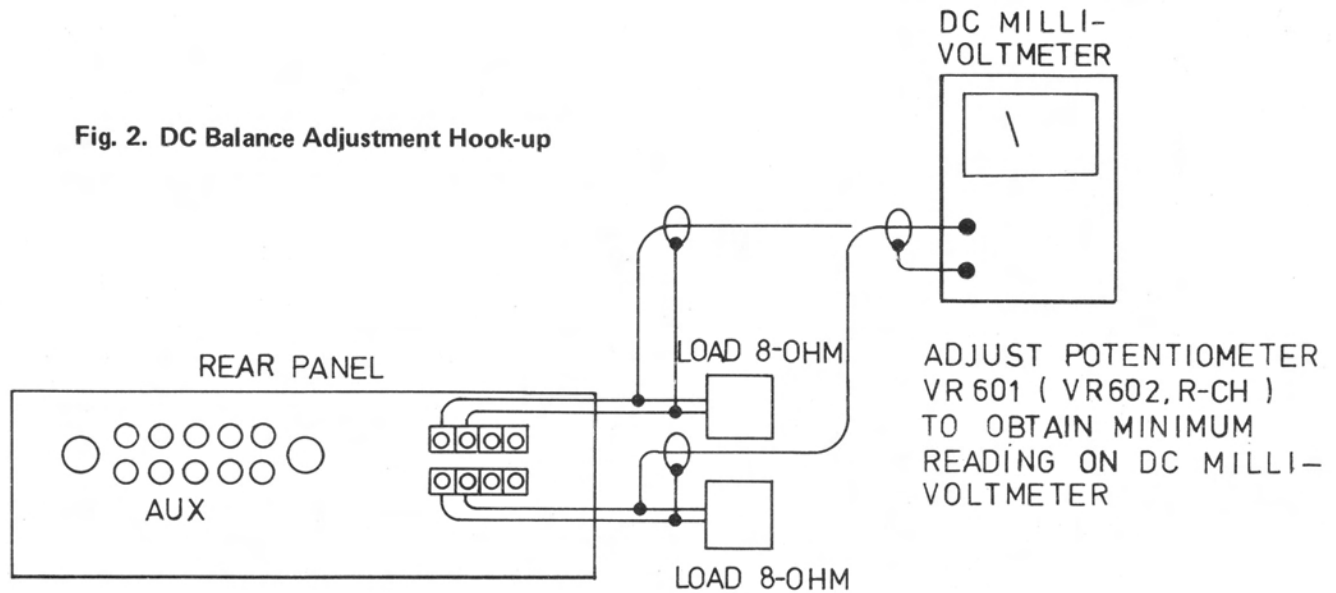
Note: Prior to BIAS ADJUSTMENT, run about 5 minutes with rated output (8ohm) and warm up Power Transistor and Heat Sink.
Prior to adjustment, move VR603 and 604 potentiometer one full turn clockwise.

Instruments: DC milli-voltmeter

1. Set volume control to minimum (i.e. no signal input).

2. Connect the plus lead of a DC millivoltmeter to Test Point No.19 and minus lead to B-.
3. Adjust potentiometer VR603 to obtain a 6.6mV reading on DC millivoltmeter.
4. Repeat the above step 1 and 2, for Right Channel (use Test Point No.20 and potentiometer VR604).

Fig. 2. DC Balance Adjustment Hook-up



DC Balance Adjustment Procedure

Note: Prior to DC Balance Adjustment, run about 5 minutes with rated output (8ohm) and warm up Power Transistor and Heat Sink.

Prior to adjustment, move VR 601 and 602 potentiometer one full turn clockwise.

Instruments: DC milli-voltmeter

1. Set volume control to minimum (i.e. no signal input).
2. Connect 8-ohm (50W) resistor to Right and Left

Speaker "A" Terminals.

3. Connect AC VTVM in parallel with this 8-ohm load of "L" or "R" channel.
4. Adjust potentiometer VR601 to obtain minimum reading on DC millivoltmeter.
5. Repeat the above step 1 and 2, for Right Channel (use potentiometer VR602).

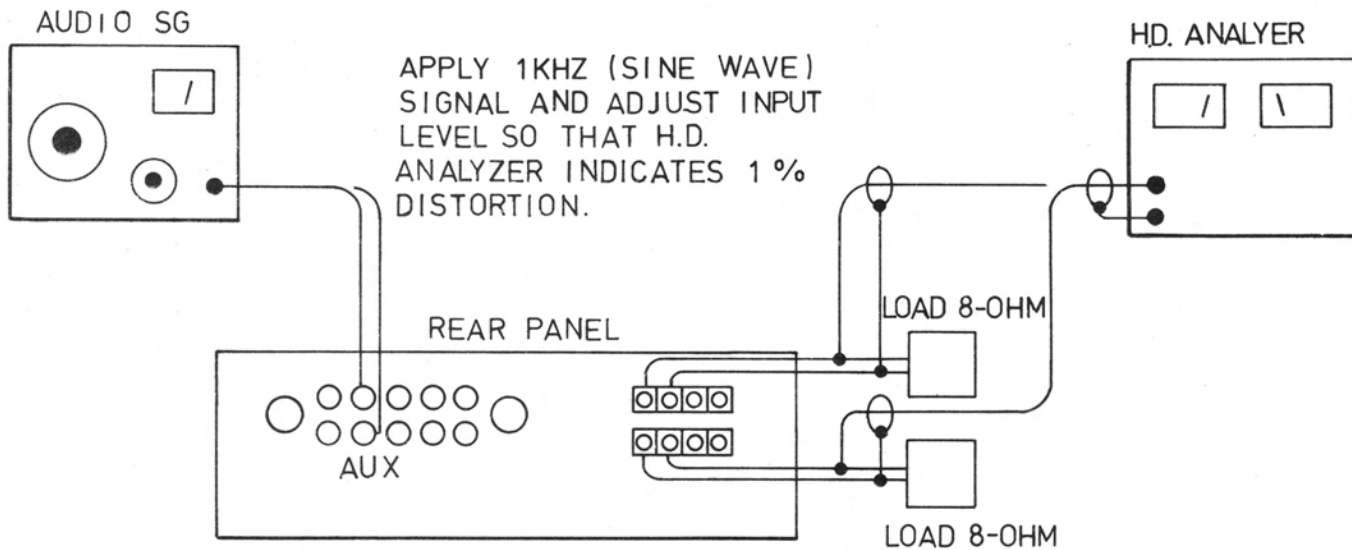


Fig. 3. Overload Protection Level Adjustment Hook-up

Overload Protection Level Adjustment Procedure

Instruments: Audio Generator and H.D. Analyzer

- Be sure to make this adjustment with one channel driven.
 - Set Function Selector to AUX position.
 - Set potentiometers VR605 and 606 to clockwise position before starting this procedure.
1. Connect 8-ohm 50 watts load resistor to output terminals (speaker-A) "L" or "R", then connect H.D. Analyzer in parallel.
 2. Connect Audio Generator to AUX input terminal

"L" or "R" and apply 1KHz (sine wave) signal. Adjust input level so that reading on H.D. Analyzer is 1% distortion.

3. Turn potentiometer VR605 or 606 so that the Protection Relay is disengaged.
4. Adjust input level to confirm that the Relay remains activated when the output distortion is 0.1%.
5. Proceed the above step from 2. to 4. for the other channel.

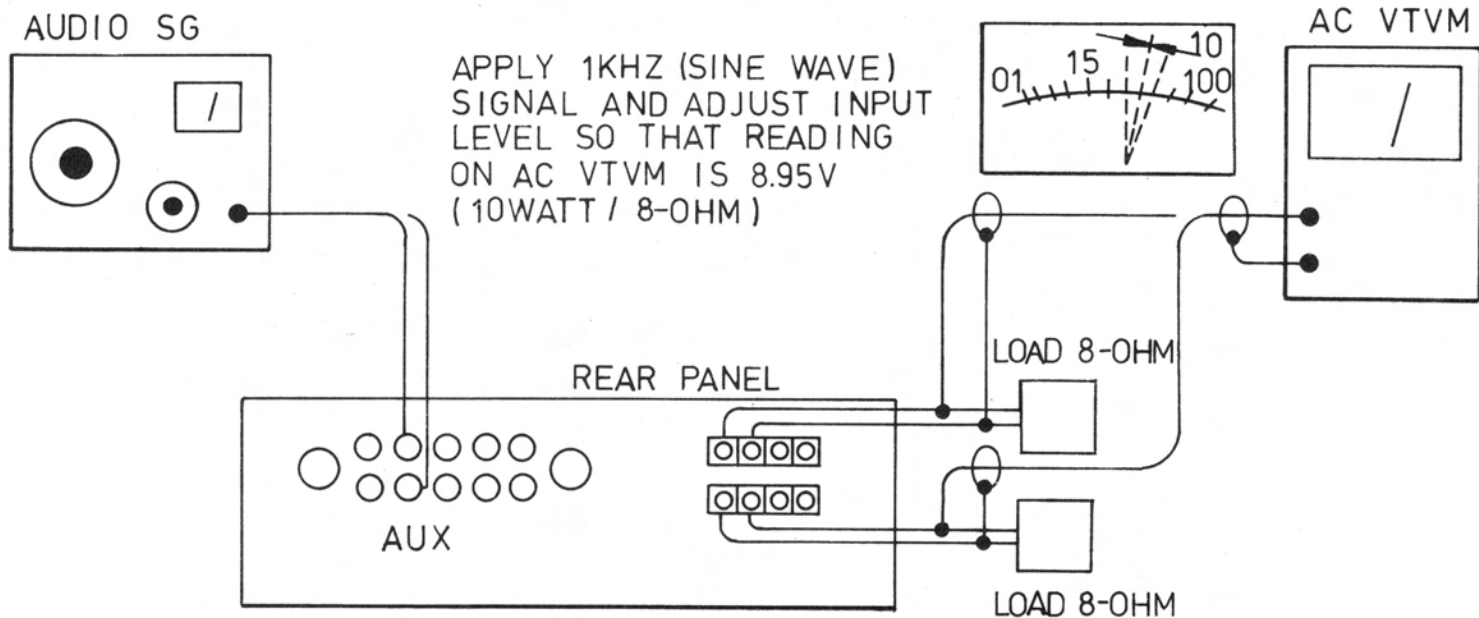


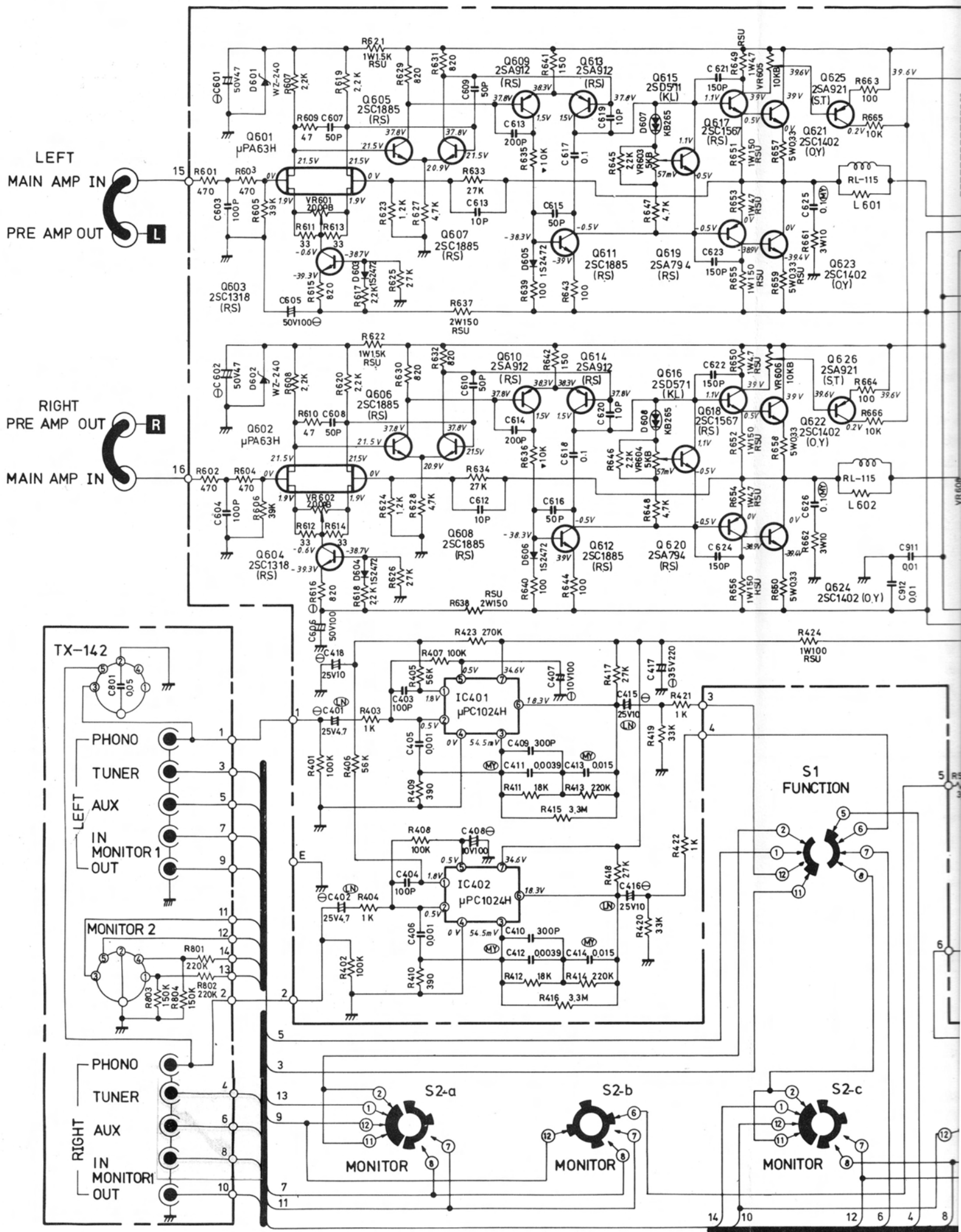
Fig. 4. Meter Calibration Adjustment Hook-up
 Abb. 4. Einchung der Aussteuerungsinstrumente
 Fig. 4. Réglage du Compteur de Calibrage

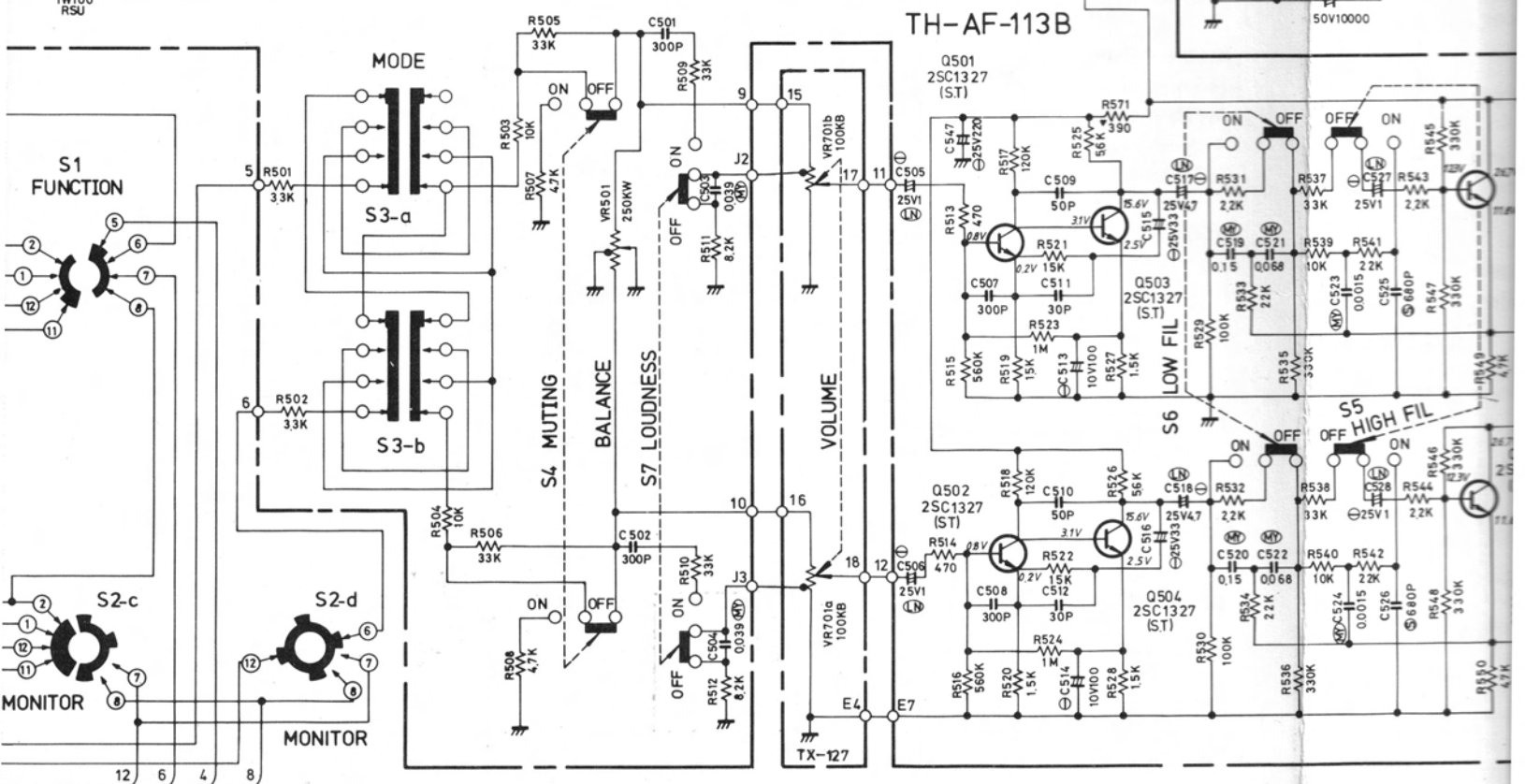
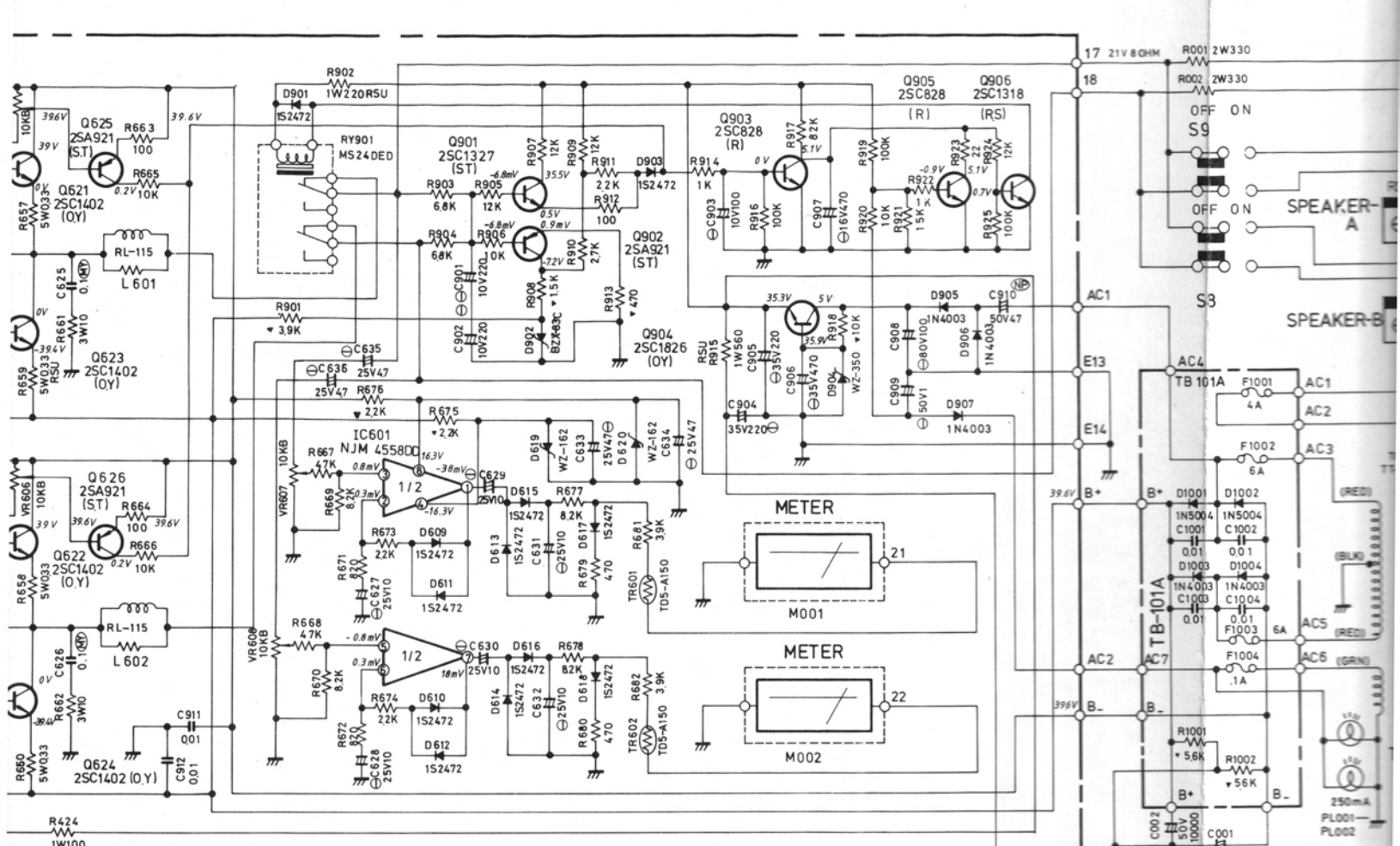
Meter Calibration Adjustment Procedure

Instruments: Audio Generator and AC VTVM

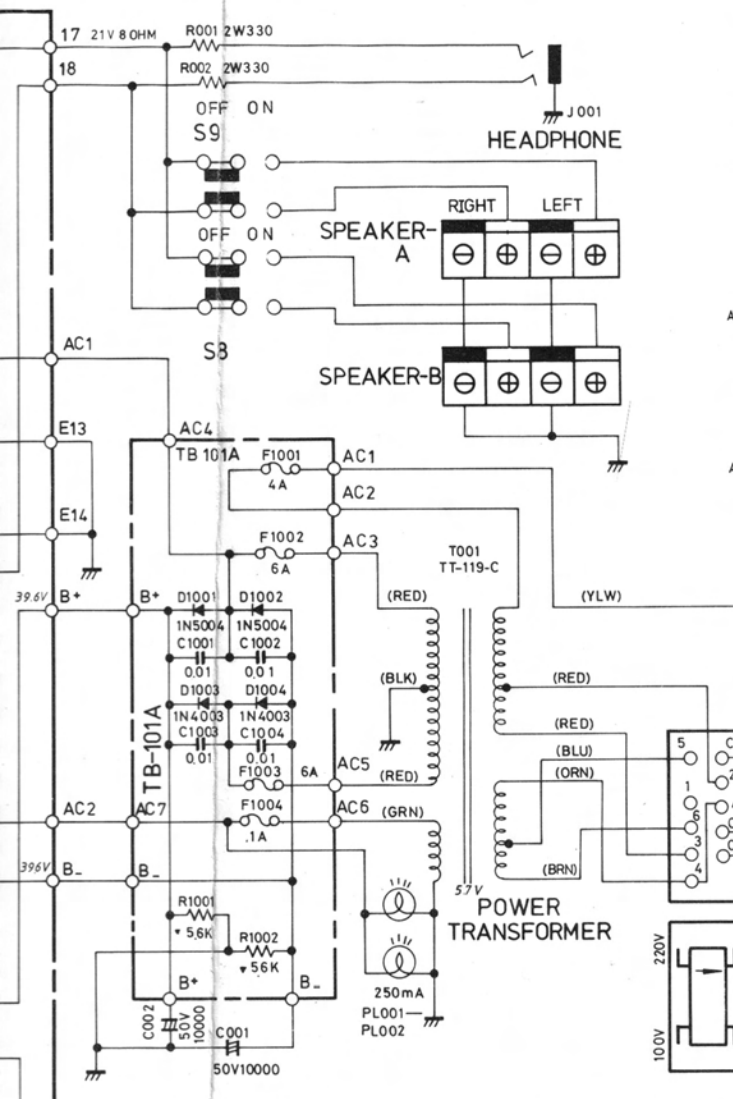
- Set Function Selector to AUX Position.
 - Set Bass and Treble to "O" (Center) position, and Muting, Loudness, High Filter and Low Filter Switch to "OFF" position. And set Mode Switch to "MONO" position.
1. Connect 8-ohm (50W) resistor to Right and Left Speaker "A" Terminals.
 2. Connect AC VTVM in parallel with this 8-ohm load of "L" or "R" channel.
 3. Connect Audio Generator to input terminal of "L" or "R" channel and apply 1KHz (sine wave) signal. And adjust input level so that reading on AC VTVM is 8.95V(10W/8 ohm)
 4. Turn and adjust VR607 (VR608 for R-ch) so that watt-meter indicates 10 watts.
 5. Then decrease input level by 10dB (output 1.5 Watts = 3.56V/8-ohm) and make sure that reading on Watt-meter is 1.5 Watts.
 6. Proceed the above steps from 2. to 5. for the other channel.

Schematic Diagram

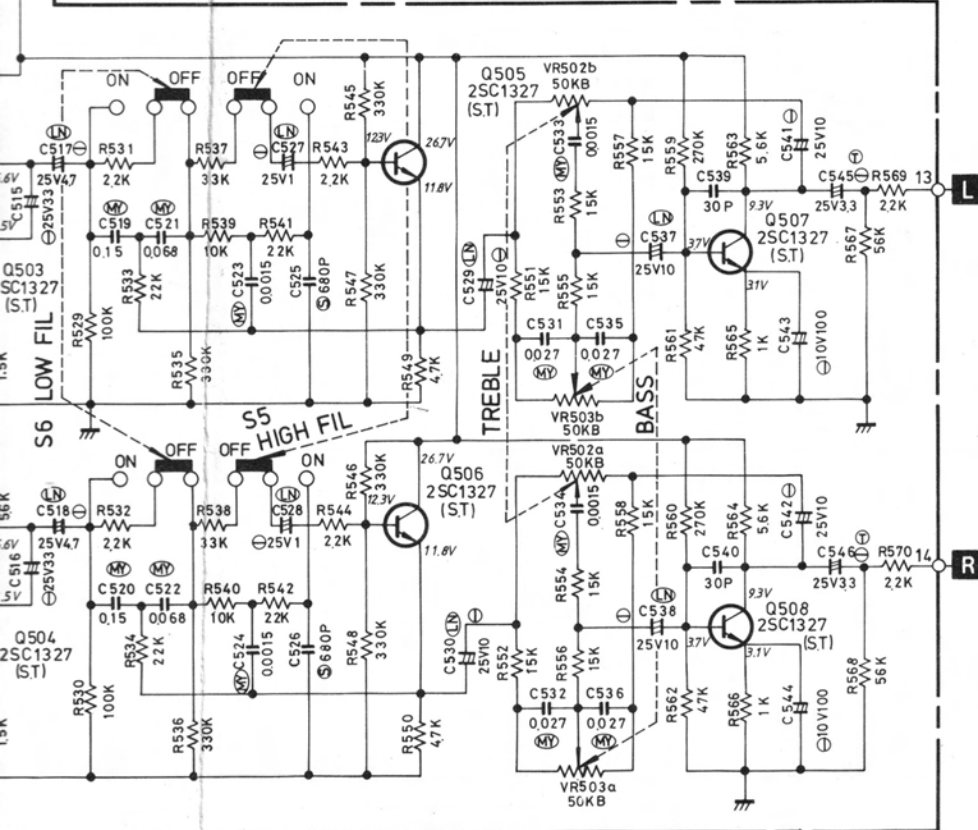
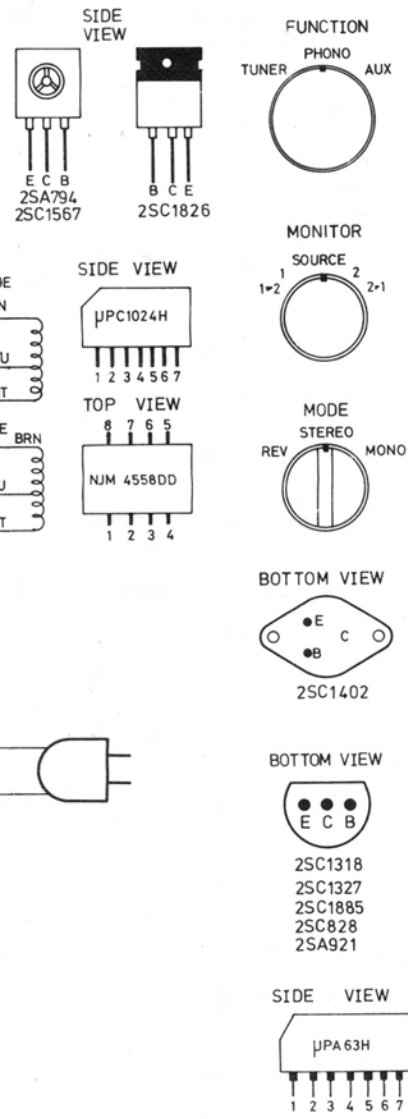




TH-AF-113B



ITEM	SCHEMATIC LOCATION(LAST)	
EQUALIZER	R 424	C 418
TONE CONTROL	R 571	C 546
MAIN AMP	R 682	C 636
TERMINAL P.C.B.	R 804	C 801
POWER SUPPLY	R 925	C 912
FUSE P.C.B.	R 1002	C 1004
CHASSIS	R 002	C 005



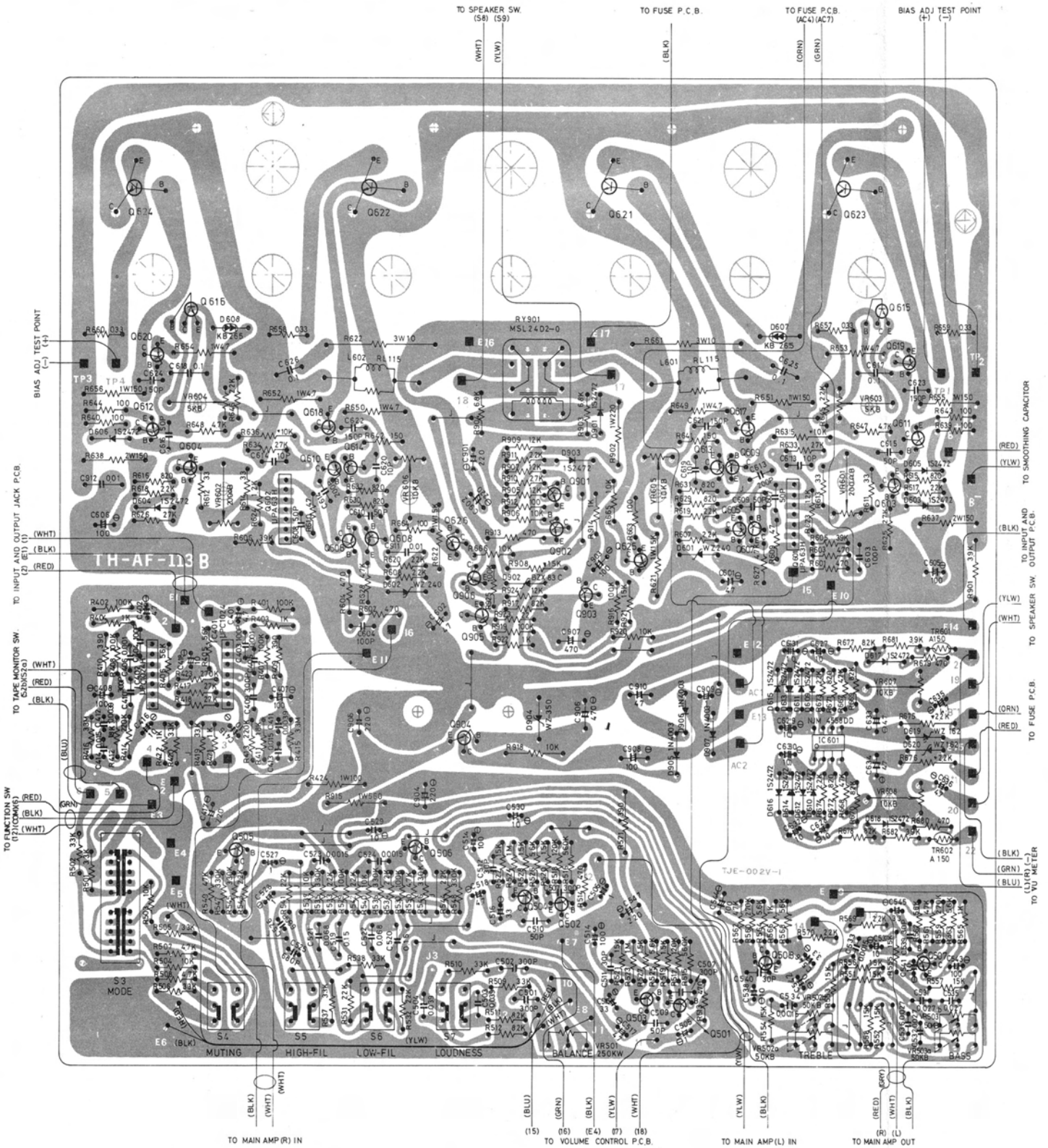
RESISTOR
 5% TOLERANCE UNLESS OTHERWISE NOTED
 K---KILO OHM
 M---MEGA OHM
 ---COMPOSITION RESISTOR 1/2 WATT
 NON MARK LOW NOISE TYPE CARBON RESISTOR 1/4 WATT

CAPACITORS
 ---MYLAR FILM CAPACITORS
 ---POLY STYRENE FILM CAPACITORS
 ---TANALUM CAPACITORS
 ---LOW NOISE TYPE CAPACITORS
 ---ELECTROLYTIC CAPACITORS
 NON MARK-CERAMIC CAPACITORS
 UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD

FOR UL CSA
 1 CHANGED TRANSFORMER T001 TO TT-119-AF (UL ONLY)
 2 CHANGED TRANSFORMER T001 TO TT-119-A
 3 CANCELED SPARK KILLER C003 C004 ADD C005 LP-3 (CSA ONLY)
 4 CHANGED TRANSFORMER T001 TO TT-119-E

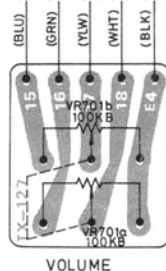
FOR BEAB CEE SEV
 1 ALL FUSE USED MINATURE FUSE WITH S.D MARK
 2 CHANGED SPARK KILLER C001 C002 TO 4700P Y TYPE
 3 CHANGED TRANSFORMER T001 TO TT-119-EF (BEAB ONLY)
 4 CHANGED TRANSFORMER T001 TO TT-119-E

Phono/Tone/Main Amp. and Power Supply Circuit Board Diagram



Volume Control Circuit Board Diagram

TO CONTROL AND MAIN AMP P.C.B.
(9) (10) (11) (12) (E7)



Troubleshooting Guide

I. Unit Inoperative

- A. Meter lamp do not light
1. Power switch may be faulty, or
 2. Power transformer may be faulty.
- B. Meter lamp light, check to see if AC Fuse is blown
1. If AC Fuse is blown.
 - a. Rectifier D1001, 1002, 1003, 1004, 905, 906 or 907 may be shorted, or
 - b. Capacitor C1001, 1002, 1003, 1004, 001 or 002 may be faulty.
 2. If AC Fuse is OK, check to see if Overload Protection Relay, RY901, operates properly.
 - a. If the Relay does not operate.
 - 1) Main Amp. Circuit may be shorted, or
 - 2) Output Circuit (including speaker system) may be shorted, or
 - 3) Relay, RY901, may be faulty, or
 - 4) Relay switch (gang with Power Switch) may be faulty.

II. Left or Right channel inoperative, check to see if there is a signal at PRE OUT Terminal

- A. If there is a signal.
1. Main Amp. Circuit may be faulty, or
 2. PRE-MAIN Connector may be faulty, or
 3. Contact point of Protection Relay may be faulty.
- B. If there is no signal.
1. Check the each transistor of preamplifier circuits.
 2. Check the each coupling capacitor it pre-amplifier circuits.

III. Overload protector inoperative

- A. If Relay is disengaged or comes ON and OFF at the peak of signal.
1. There may be excessive input, or
 2. Overload Detector Level may be miss-aligned.
- B. If Relay is disengaged or comes ON and OFF at the small signal.
1. Overload Detector Level may be miss-aligned.
- C. If Relay does not deactivate at the excessive input or short-circuit of output circuit.
1. Transistor Q906 for driving Relay may be short-circuited.

IV. Hum and Noise

- A. If there is hum at minimum volume
1. Check each transistor in Main Amp.
 2. Check each coupling capacitor in Tone Amp.
- B. If there is noise at minimum volume
1. Check each transistor in Tone Amp.
 2. Check each coupling capacitor in Tone Amp.
 3. Check each resistor at collector, base and emitter ends of each transistor.
- C. If there is Hum or Noise only in Phone Amp.
1. IC401 (IC402 for R-ch) may be faulty, or
 2. Capacitor C401, 409 or 417 (C402, 410 or 418 for R-ch) may be faulty.

Repair Parts List

Schematic Location	Parts No.	Description
TRANSISTORS, DIODES AND IC'S		
Q501-508	301201134	2SC1327 (S,T), Flat, Tone Amp.
Q601, 602	303452112	μPH63H, Differential Amp.
Q603, 604	301201155	2SC1318 (R,S), Constant Current
Q605-608	301201164	2SC1885 (R,S), Differential Amp.
Q609, 610	301001142	2SA912 (R,S), Differential Amp.
Q611, 612	301201164	2SC1885 (R,S), Current Mirror
Q613, 614	301001142	2SA912 (R,S), Differential Amp.
Q615, 616	301301134	2SD571 (K,L), Driver
Q617, 618	301201150	2SC1567 (R,S), Driver
Q619, 620	301021135	2SA794 (R,S), Driver
Q621-624	301201139	2SC1402 (O,Y), Power Amp.
Q625,626	301001145	2SA921 (S,T), Overload Protection
Q901	301201134	2SC1327 (S,T), Overload Protection
Q902	301001145	2SA921 (S,T), Overload Protection
Q903	301201115	2SC828 (R), Overload Threshold
Q904	301201169	2SC1826 (O,Y), Power Regulator
Q905	301201115	2SC828 (R), Overload Threshold
Q906	301201155	2SC1318 (R,S), Protection Relay Driver
D603-606	300111010	1S2472, Temperature Compensator, Current Mirror
D607, 608	300212002	KB265, Temperature Compensator
D609-610	300111010	1S2472, Rectifier, Compensator
D619, 620	300313017	WE-162, Zener Regulator 16V, ½W
D901	300111010	1S2472, Relay Overload Protection
D902	300313023	BZX-83C, Zener Regulator 12V, ½W
D903	300111010	1S2472, Reverse Prevention
D904	300313019	WE-350, Zener Regulator 35V, 1W
D905-907	300111010	1S2472, Rectifier
D1001-1004	300919028	1N5404, Rectifier
IC401, 402	303452164	μPC1024H, Phono Amp.
IC601	303452152	NJM-4558 DD, Meter Amp.
VARIABLE RESISTORS AND TRANSFORMER		
VR501	515121126	250KW, Balance Control
VR502, 503	525101161	50KBx2, Treble, Bass Control
VR603, 604	510502152	5KB, Idling Current Adj.
VR605-608	510502153	10KB, Overload Protection Level, Meter Level Adj.
VR701	525121135	100KBx2, Volume Control
L601, 602	228641126	Anti-Parasitic
T001	201001456	Transformer, Power Supply (120V only)
	206001456	(220V, 240V)
	206001457	(for BEAB)
	205001456	(Multi-Voltage Type)

Schematic Location	Parts No.	Description
SWITCHES AND FUSES		
S1	601011329	Switch, Function Selector
S2	601011271	Switch, Tape Monitor Selector
S3	601011306	Switch, Mode Selector
S4-7 (1 set)	614040825	Switch, Push 4-key, Muting, High Low Filter and Loudness
S8,9	614020402	Switch, Push 2-key, Speaker Band A
S10	614010127	Switch, Power Supply (for UL Application)
F1001	341221400	Fuse, 4A, AC Protector (100V, 120V) (220V, 240V)
F10031003	341221600	Fuse, 6A, AC Circuit Protector (Mini Size)
	345222600	(Mini Size with "S" "D" Mark)
F1004	341221100	Fuse, 1A, Lamp Protector (Mini Size)
	345222100	(Mini Size with "S" "D" Mark)
OTHERS		
M001		Watt Meter
M001,002	231310096	Watt Meter
C001,002	120012787	Smoothing Capacitor
PL001,002	359101116	Lamp, 6.3V250mA, Meter Illumination
RY901	240111239	Relay, Overload Protector
J001	626110023	Jack, Headphone
	141010155	Control and Main Amp. PCB Ass'y
	141810869	Fuse PCB Ass'y
	648211121	Voltage Selector
	111911426	Front Panel Ass'y
	116310259	Knob (for Function Selector, Volume Control)
	116310260	Knob (for Monitor Selector)
	116310261	Knob (for Treble, Bass, Balance Control)
	116210051	Push Button
	624300210	Jack, 10P (PCB Type)
	625001114	Jack, DIN 5P, (PCB Type)
	624100104	Jack (MAIN/PRE)
	642400111	Push Terminal, 4P, Speaker Cabinet
	131011327	Cabinet
	833201310	Owner's Manual