ROTEL®

RA-1212

STEREO PRE/MAIN AMPLIFIER

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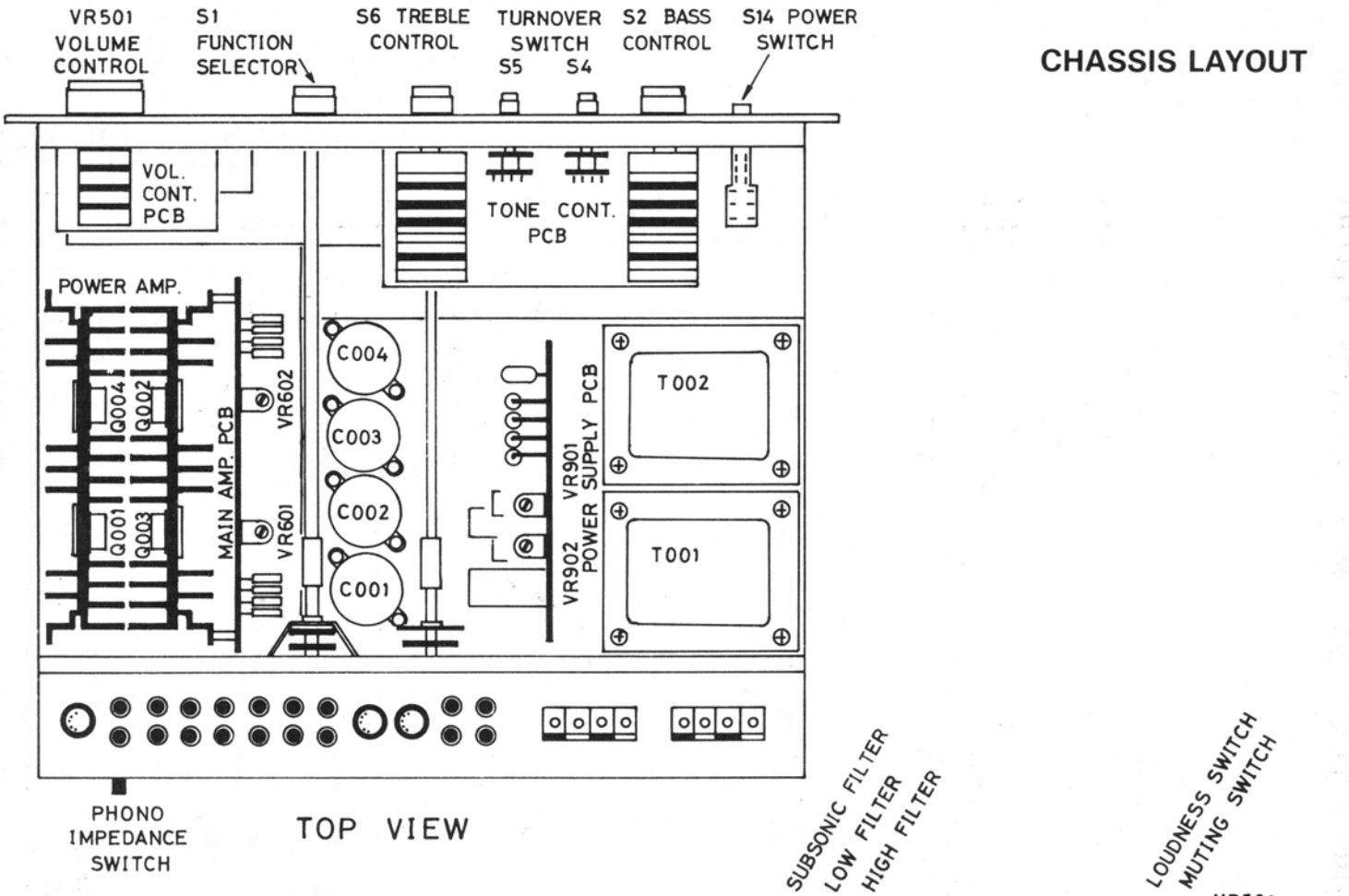
TECHNICAL MANUAL

ROLAND ELECTRONICS CO., LTD.

1-36-8, OH-OKAYAMA, MEGURO-KU, TOKYO, 152, JAPAN

CHASSIS LAYOUT



PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacements for output and driver transistors, if necessary, must be made from the same hfe group as the original type.
4. If one output transistor burns out (open or short), always remove all output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohm-meter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistors failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

POWER AMPLIFIER BIAS ADJUSTMENT

Instrument: DC milli-volt meter

Notes: a. Set Volume Control is minimum position.
b. Set potentiometers VR601 and 602 to counter-clockwise position before starting this procedure.

1. Connect the plus lead of a DC milli-volt meter to test point TP1 (on main amp. pcb) and minus lead to TP3.
2. Adjust the potentiometer VR601 to obtain a 15mV reading on DC milli-volt meter.
3. Repeat the above steps 1 and 2 for Right Channel (use test point TP2, 4 and potentiometer VR602).

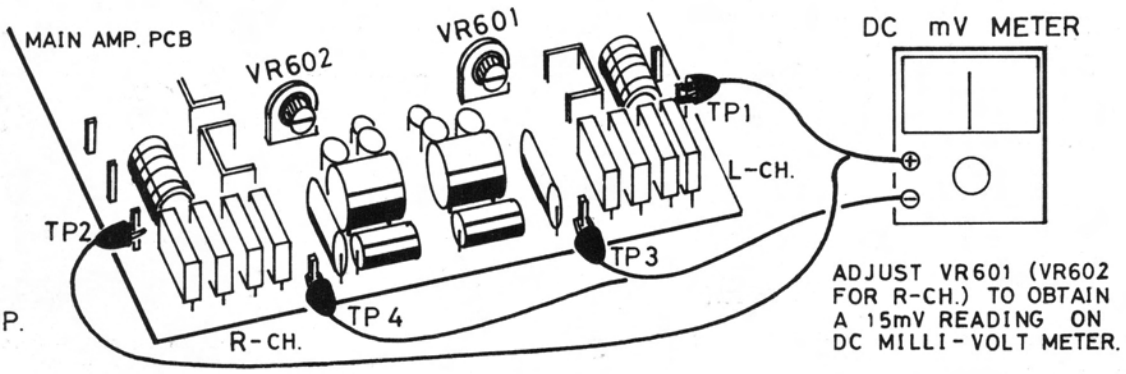


FIG. 1
POWER AMP.
BIAS ADJ.
HOOK-UP

OVERLOAD PROTECTOR ADJUSTMENT

Instruments: Audio Generator and H.D. Analyzer
Note: This adjustment must be expedited by operating one channel driven each.

1. Connect a 4-ohm, 100W, resistor across one of the speaker terminals (Left or Right channel). Then, connect H.D. Analyzer parallel to the load resistor.
2. Connect Audio Generator to the AUX input terminal and feed 1 kHz (sine wave) signal through the input.
3. Set the volume control of amplifier all the way to clockwise. Adjust the attenuator of Audio Generator so that the output of amplifier is at 1% distortion.
4. Adjust the potentiometer (VR901 for Left channel, or VR902 for Right channel) so that the overload protector just activates (i.e., the protection relay goes OFF).
5. Repeat the steps 1 through 4 for the other channel.

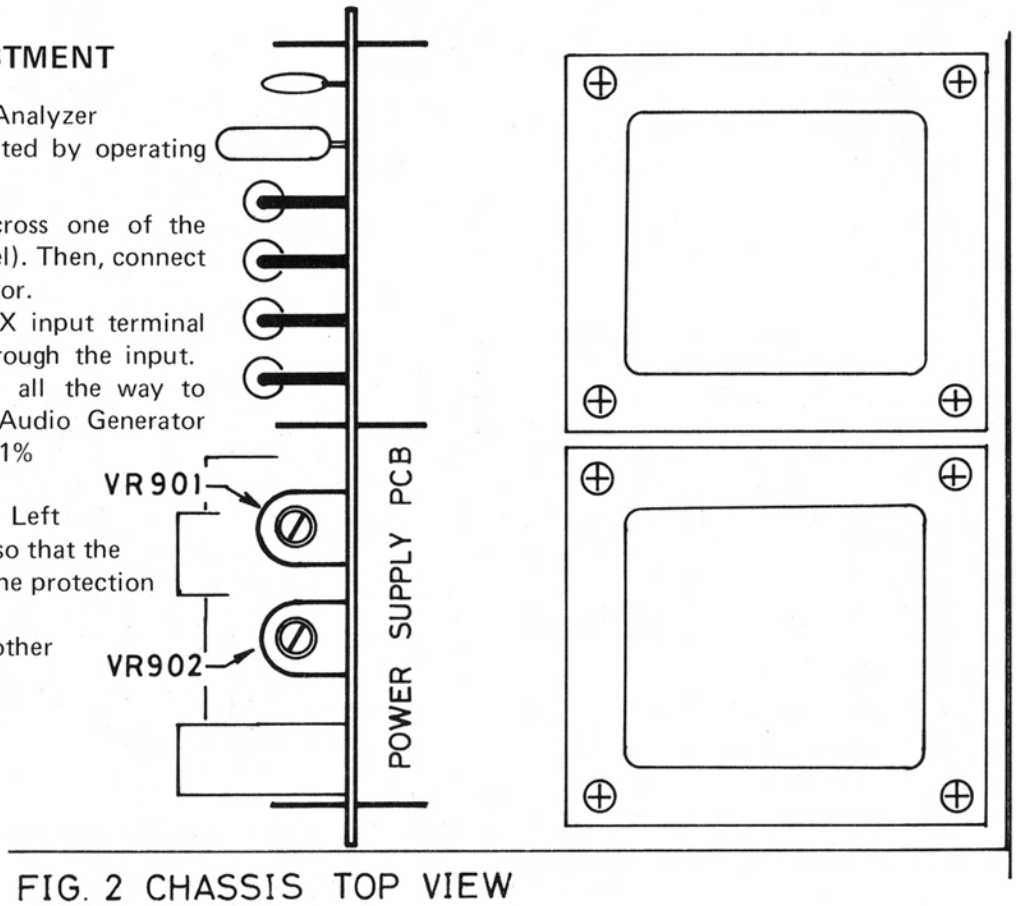


FIG. 2 CHASSIS TOP VIEW
(POWER SUPPLY PORTION)

TROUBLE SHOOTING GUIDE

I. Unit Inoperative

A. Pilot lamp does not light, – check AC Fuse.
   1. If AC Fuse is blown,
      a. Primary or Secondary winding of Power Transformer may be shorted, or
      b. Capacitor C427, 428, 901, 902, 903, 904, 905, 906, 001, 002, 003 or 004 may be shorted, or
      c. Diode D901, 902, 903, 904, 905, 906, 907 or 908 may be shorted, or
      d. Transistor Q001, 002, 003 or 004 may be shorted out.
   2. If AC Fuse is OK,
      a. Power switch may be faulty, or
      b. AC Fuse connection may be faulty.

B. Pilot lamp lights, check to see if the Overload Protection Relay operates properly.
   1. If the Relay does not operate,
      a. Transistor Q605, 606, 610, 611 or 612 may be shorted, or
      b. Output circuits (including speaker system) may be shorted, or
      c. Overload Protection Relay may be faulty, or
      d. Power switch may be faulty.

II. Left or Right channel inoperative

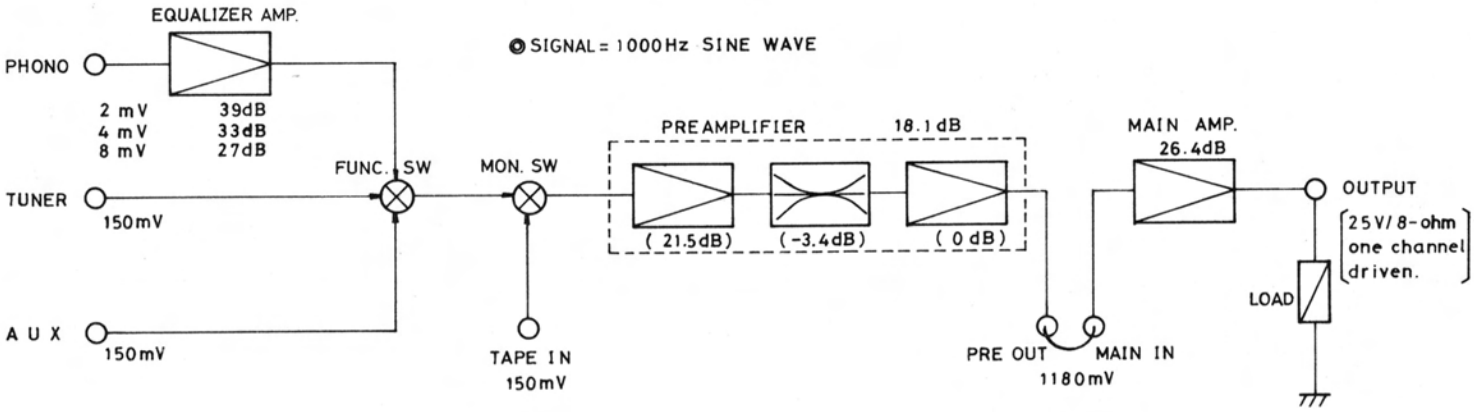
A. If there is a signal at the input terminal of main amp. pcb.
   1. Capacitor C601 (C602 for R-ch.) may be faulty, or
   2. Transistor Q601, 603 or 605 (C602, 604 or 606 for R-ch.) may be faulty, or
   3. Overload Protection Relay may be faulty, or
   4. Primary or Secondary winding of Power Transformer may be opened.

B. If there is no signal,
   1. Check the each transistor of preamplifier circuits.
   2. Check the each coupling capacitor of preamplifier circuits.

III. Phono section inoperative, hum and/or noise

A. Check the each transistor of phono amplifier circuits.
B. Check the each coupling capacitor of phono amplifier circuits.

MODEL RA-1212 GAIN DIAGRAM

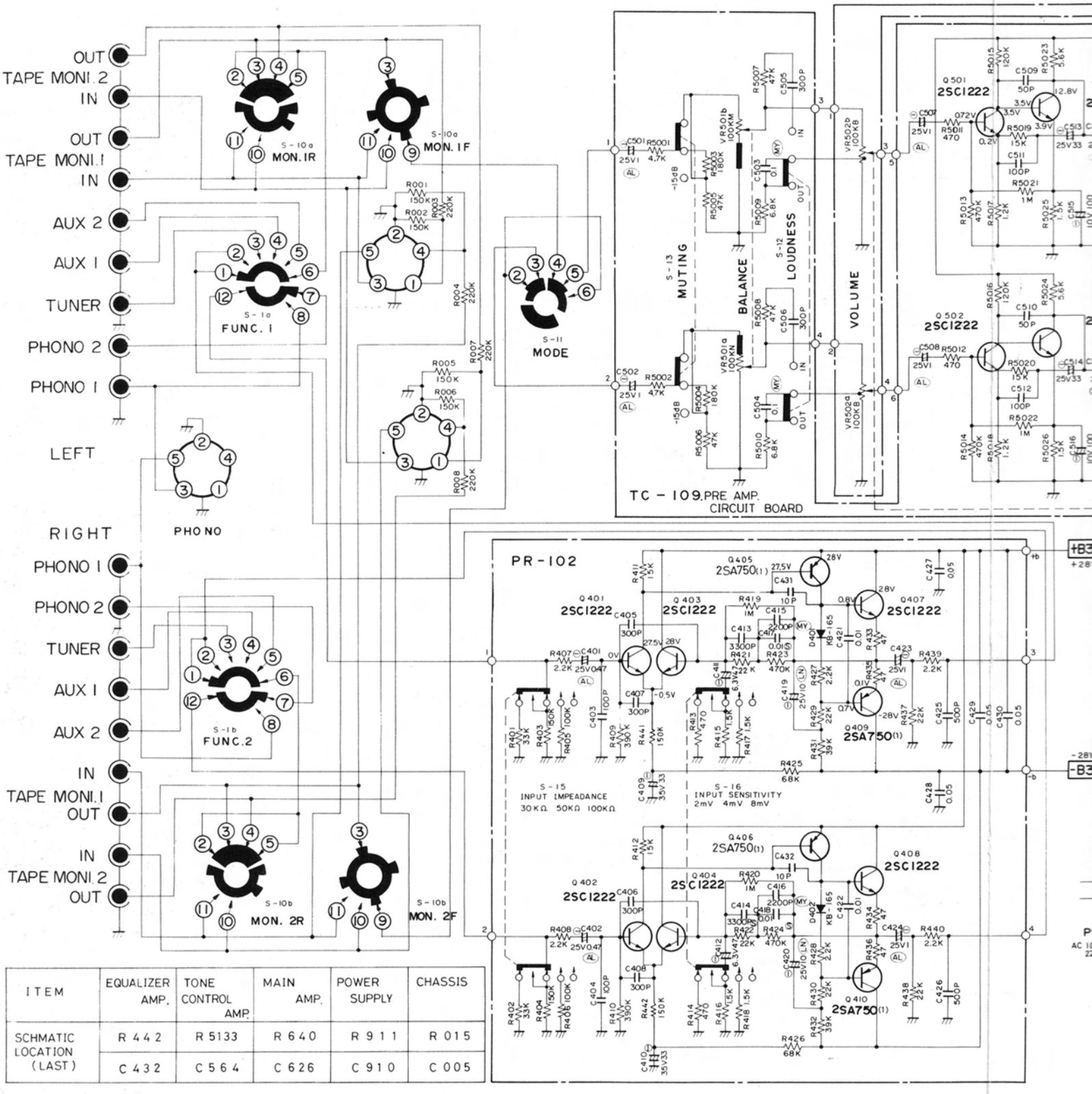


REPAIR PARTS LIST

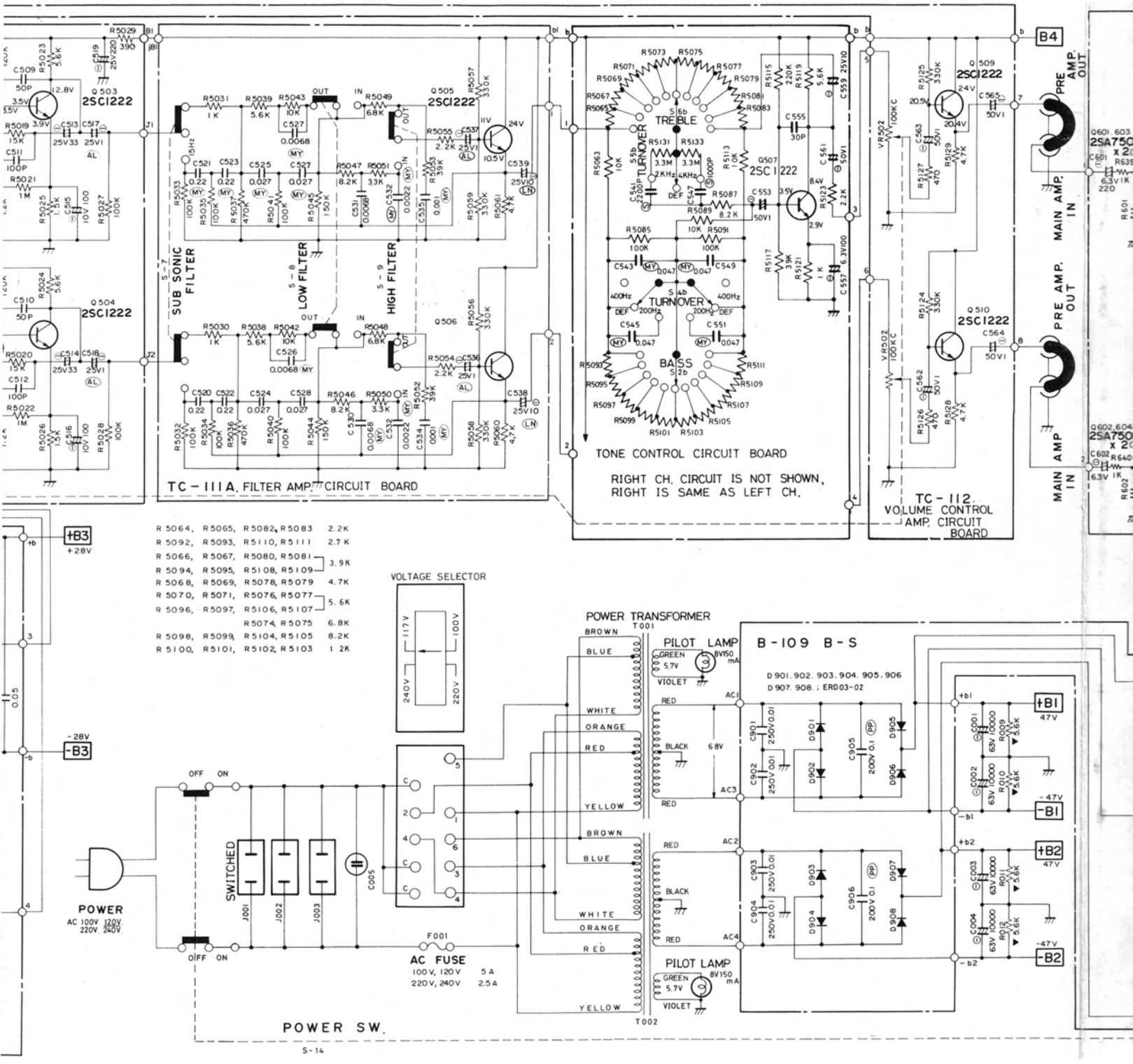
Schematic Location	Description	Part No.
	TRANSISTORS AND DIODES	
Q401, 402, 403 404, 407, 408 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 904.	2SC1222, Phono Amp., Preamp., etc.	301201156
Q405, 406, 601 602, 603, 604.	2SA750 (1) (E), Phono Amp., Main Differential Amp.	301001134
Q605, 606.	2SC1628 (Y), Predriver	301201161
Q607, 608, 903.	2SC1384, Main Amp. Bias Compensator, etc.	301201132
Q609, 610	2SC1567, Driver	301201158
Q611, 612, 902.	2SA794, Driver —B Stabilizer	301001135
Q901.	2SC789, +B Stabilizer	301201142
Q905, 906.	2SA750 (E), Overload Detector	301001133
Q001, 002, 003, 004.	2SD426, Power Amp.	301301130
D401, 402.	KB-165, Phono Amp. Bias Compensator	300212008
D901, 902, 903, 904, 905, 906, 907, 908.	ERD03-02, Rectifier	300919020
D909, 910.	BZ-270, Zener Regulator, 27V	300313006
D001, 002.	SV-02, Power Amp. Bias Compensator	300212011
	VARIABLE RESISTORS	
VR501.	100K MN, Balance Control	525101132
VR502.	100K BTx2 +100K Cx2, Volume Control	525121136
VR601, 602.	1 KB, Power Amp., Bias Adj.	510502119
VR901, 902.	10 KB, Overload Protection Level Adj.	510502125

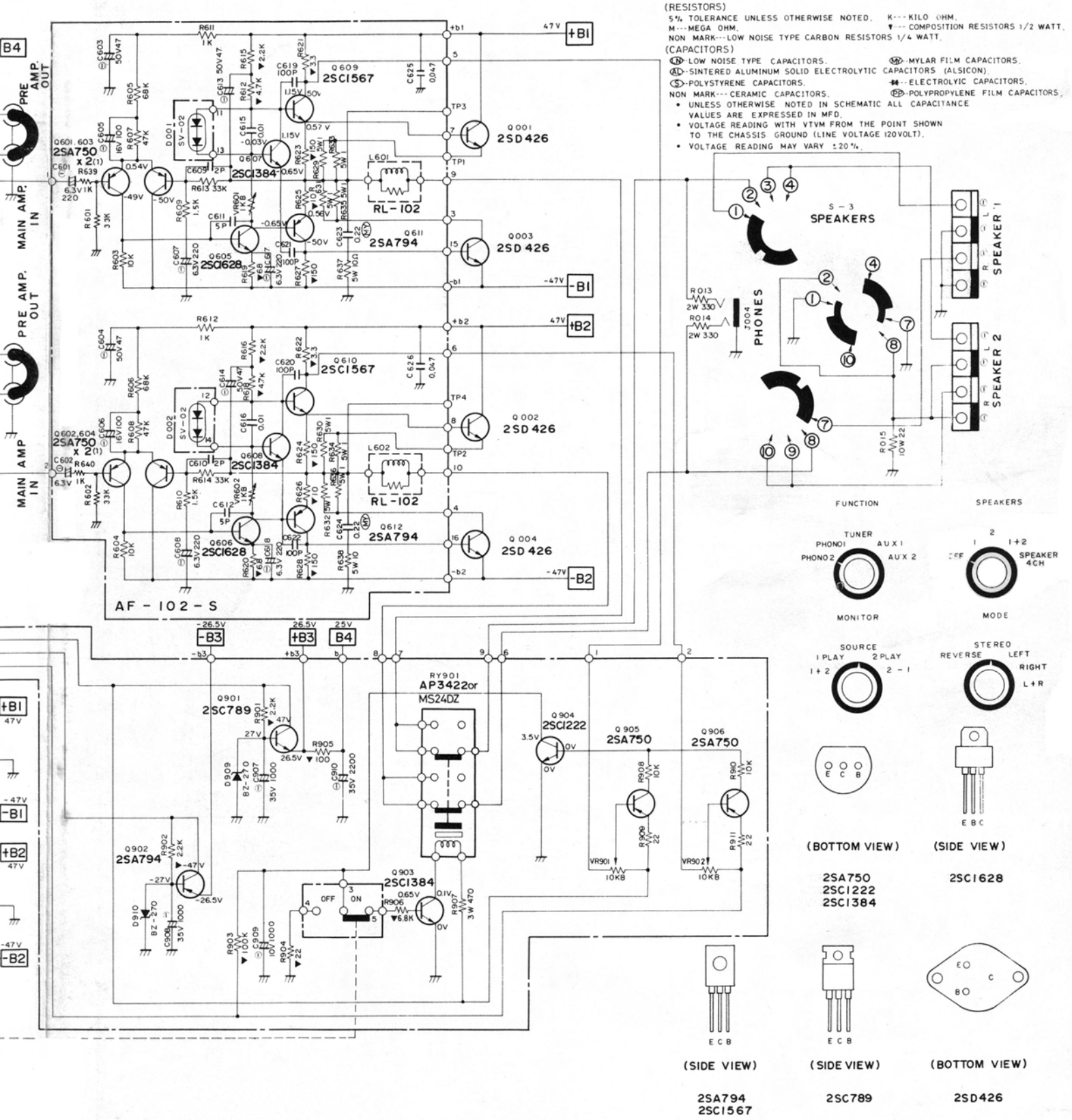
Shcematic Location	Description	Part No.
	SWITCHES	
S1.	Function Selector	601011270
S2, 6.	Tone Control	601011274
S3.	Speaker Selector	601011265
S4, 5.	Turnover Selector	601011279
S7,8,9 (1 set)	Lever 3-key, High Filter, etc.	611001636
S10.	Monitor	601011271
S11.	Mode	601011276
S12, 13. (1 set)	Lever 2-key, Loudness, Muting	611001634
S14.	Power Supply	614010117
S15, 16.	Phono Input Sensitivity Selector, etc.	613000023
	MISCELLANEOUS	
T001, 002.	Power Transformer (Multivoltage)	205001394
	Power Transformer (220V/240V)	206001394
RY901.	Overload Protection Relay	240111226
PL001.	Lamp, 8V, 0.15A, Pilot	351080015
F001.	Fuse, 5A-3AG, (AC 100V/120V)	341220050
	Fuse, 2.5A, (AC 220V/240V)	341220025
	Phono Amp. Circuit Board Assembly	141510151
	Preamplifier Circuit Board Assembly	141710268
	Filter Circuit Board Assembly	141710269
	Tone Control Circuit Board Assembly	141710271
	Volume Control Circuit Board Assembly	141710270
	Main Amplifier Circuit Board Assembly	141610274
	Power Supply Circuit Board Assembly	141810631

SCHEMATIC DIAGRAM



ITEM	EQUALIZER AMP.	TONE CONTROL AMP.	MAIN AMP.	POWER SUPPLY	CHASSIS
SCHMATIC LOCATION (LAST)	R 4 4 2	R 5133	R 6 4 0	R 9 1 1	R 0 1 5
	C 4 3 2	C 5 6 4	C 6 2 6	C 9 1 0	C 0 0 5


TC-111A. FILTER AMP. CIRCUIT BOARD
SUB SONIC FILTER
LOW FILTER
HIGH FILTER
TONE CONTROL CIRCUIT BOARD
RIGHT CH. CIRCUIT IS NOT SHOWN, RIGHT IS SAME AS LEFT CH.
TC-112. VOLUME CONTROL AMP. CIRCUIT BOARD
TREBLE
TURNOVER
BASS
PRE AMP. OUT
MAIN AMP. IN
R 5064, R5065, R5082, R5083 2.2K
R 5092, R5093, R5110, R5111 2.7 K
R 5066, R5067, R5080, R5081 3.9K
R 5094, R5095, R5108, R5109 3.9K
R 5068, R5069, R5078, R5079 4.7K
R 5070, R5071, R5076, R5077 5.6K
R 5096, R5097, R5106, R5107 5.6K
R5074, R5075 6.8K
R 5098, R5099, R5104, R5105 8.2K
R 5100, R5101, R5102, R5103 1.2K
VOLTAGE SELECTOR
117V
100V
240V
220V
POWER TRANSFORMER T001
BROWN
BLUE
WHITE
ORANGE
RED
YELLOW
PILOT LAMP
GREEN 5.7V
VIOLET
8V150 mA
B-109 B-S
D 901. 902. 903. 904. 905. 906
D 907. 908. ; ERD03-02
+B3 +28V
-B3 -28V
+B1 47V
-B1 -47V
+B2 47V
-B2 -47V
POWER
AC 100V 120V 220V 240V
SWITCHED
OFF ON
AC FUSE
100 V, 120 V 5 A
220 V, 240 V 2.5 A
POWER SW.
S-14



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