ISO

Set using ISO screws

TA-1010

General Export Model

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-1010 are listed in Table. 1.

TABLE 1. TA-1010 TECHNICAL SPECIFICATIONS

Amplifier Section

Dynamic power output	:	58 watts both channels into 8 ohms 5% THD
Rated output	:	15 watts each channel, 8 ohms
Power bandwidth	:	25 Hz to 40 kHz, 8 ohms (IHF)
Harmonic distortion	:	Less than 0.5% at 1 kHz at rated output Less than 0.2% at 1 watt output
IM distortion	:	Less than 1% at rated output
Signal-to-noise ratio	:	PHONO-1,2: greater than 70 dB TUNER, TAPE, AUX-1,2, REC/PB: greater than 90 dB
Frequency response	:	20 Hz to 60 kHz: $\pm\frac{0}{2}$ dB
Output voltage	:	REC OUT: 250 mV 10 k ohms REC/PB: 36 mV 80k ohms
Input sensitivity and impedance	:	PHONO-1,2: 1.2 mV 47 k TUNER: 250 mV 100 k AUX-1,2: 250 mV 100 k TAPE: 250 mV 100 k REC/PB: 250 mV 100 k
Tone control	:	BASS: ±10 dB at 100 Hz TREBLE: ±10 dB at 10 kHz
High filter	:	6 dB/oct above 5 kHz

General

Power consumption	:	Approx. 75 W
Power requirements	:	100, 117, 220, or 240V, 60/50 Hz
Dimensions	:	16-9/16″(width) X 4-7/8″ (height) X 9-11/16″(depth) 420(width) X 123(height) X 246.5(depth) mm
Net weight	:	10 lb (5.4 kg)
Shipping weight	:	17 lb 8 oz (8 kg)

1-2. BLOCK AND LEVEL DIAGRAMS

The block and level diagrams of the TA-1010 are displayed on page2, for your better understanding of the circuits operation and for convenience when a signal-level check is required. They will also help you in signal tracing and trouble shooting.

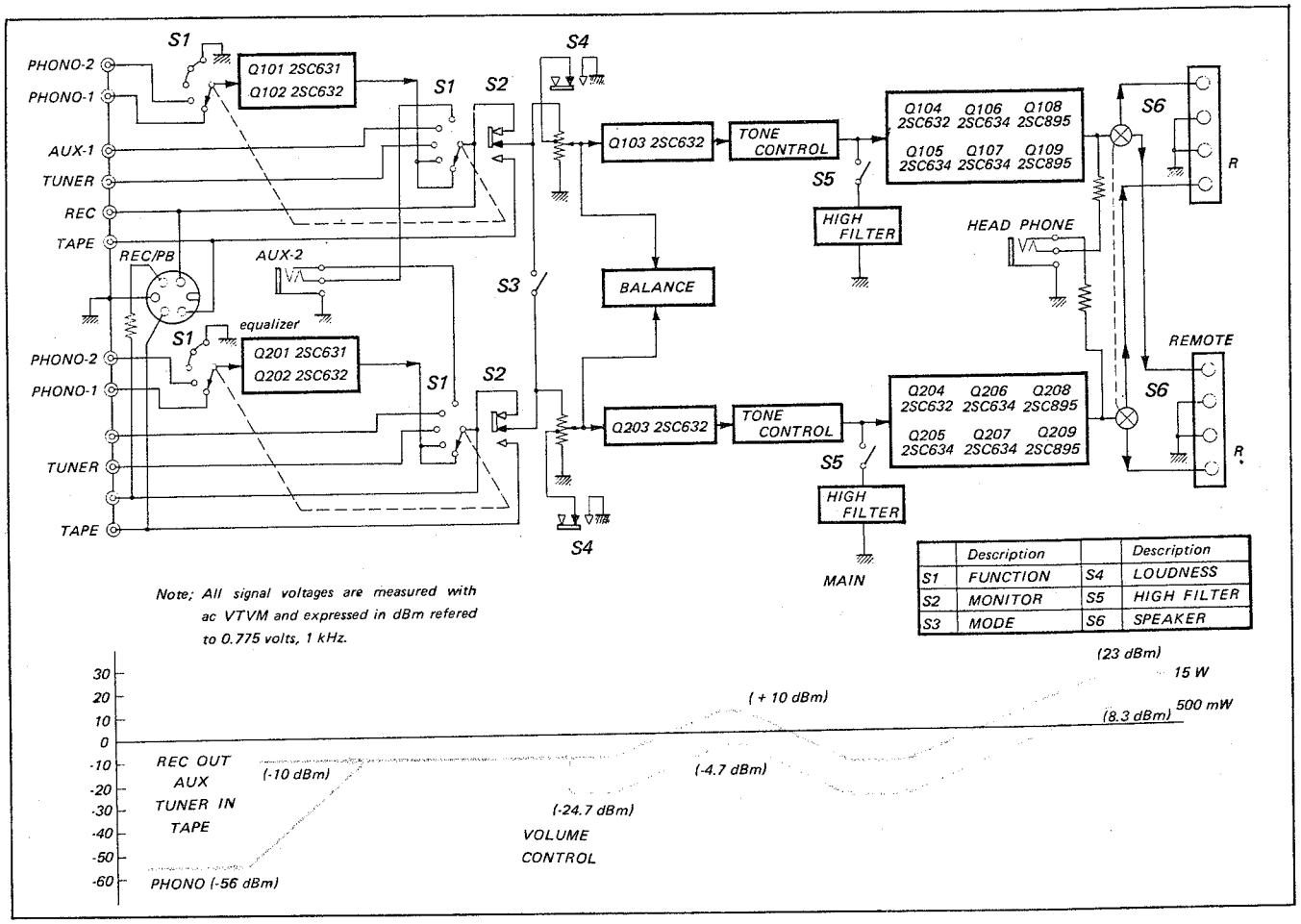
1-3. CIRCUIT ANALYSIS

The following describes the functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at the left margin: major components are also listed in a similar manner.

Since the TA-1010 contains two identical amplifiers, only the left channel will be described. Right -channel component designations are given in parentheses.

Stage/Control	*Function*
	Preamplifier
Low-level preamp Q101, Q102 (Q201, Q202)	These stages amplify the small signal produced by the phono cartridge to the level required at the input of the flat amplifier (Q103). As the signal-to-noise ratios at PHONO inputs are determined by the noise figure of Q101, a specially-selected low-noise transistor is used. The circuit employs a direct-

BLOCK AND LEVEL DIAGRAM



Stage/Control	*Function*
	coupled two-stage configuration and negative-feedback technique that provides stable operation during temperature changes and good amplification even at low frequencies. It also supplies the audio signal to the REC OUT terminal for recording convenience. Overall amplifier gain of this amplifier is about 46 dB at 1 kHz.
R112, R113, C107 to C110 (R212, R213 C270 to C210)	RIAA equalization is achieved by the negative feedback loop containing these components . Take care when replacing any of them.
FUNCTION switch S1	Selects the desired input signals from the PHONO 1, PHONO 2, TUNER, AUX 1, AUX 2, and REC/PB connectors. Only the signals from PHONO 1 and PHONO 2 are routed to the preamplifier. To avoid clicks or popping noises when switching,a make-before-break type switch mechanism is employed.
MONITOR switch S2	Switch S2 selects the signals from the TAPE jack (TAPE position), or TUNER, AUX 1 and AUX 2 preamplifier outputs (SOURCE position).
MODE switch S3	In the STEREO position of S3, left and right input signals are

Stage/Control	*Function*
	routed to their respective amplifiers. In the MONO position of S3, left and right input signals are added and the sum is fed to both amplifier channels.
VOLUME control Rv101 (Rv201)	The level of signal applied to the power-amplifier section is determined by the setting of Rv101, which has an audio taper.
SPEAKER switch S6	The power-amplifier output is supplied to the speakers connected to the MAIN or REMOTE speaker terminals through S6 as follows:

Position	Connection
REMOTE . . .	REMOTE speaker only
OFF	No connection is made.
MAIN	MAIN speaker only
BOTH . . .	MAIN and REMOTE speakers

HEADPHONE output can be obtained regardless of the SPEAKER switch position because the amplifier output is directly connected to the HEADPHONE jack.

LOUDNESS switch S4, C117, C118 R124, R125 (C217, C218 R224, R225)	These components compensate for human hearing characteristics, which vary according to the loudness of the sound. When this switch is set to the "IN" position, high-and low-frequency components are increased with decreasing volume level.

In the IN position of S5 the frequency response changes as follows:

Under 30mW output	Under 300mW output
10 dB up at 50Hz	5 dB up at 50Hz
0 dB at 1 kHz	0 dB at 1 kHz
4.5 dB up at 10kHz	1.5 dB up at 10kHz

Stage/Control	*Function*
Flat amplifier Q103 (Q203)	This amplifier provides 20 dB voltage gain to compensate for the tone-control insertion loss, and isolates the VOLUME control and TONE controls to eliminate mutual interference.
TONE controls Rv102 (Rv202) Rv103 (Rv203)	Rv102 (Rv202) controls treble response. It has a range of ±10 dB at 10 kHz. Rv103 (Rv203) controls bass response. It has a range of ±10 dB at 100 Hz.
HIGH FILTER switch S5	Eliminates unwanted high-frequency components from the input signal (6 dB/octave above 6 kHz) in the ON position.

Audio Power Amplifier

Flat amplifier Q104 (Q204)	This is a conventional direct-coupled amplifier which drives phase inverter Q105.
Ac balance adj. Rv104 (Rv204)	Sets the bias current of Q104 and Q105 at the point where the positive and negative half cylces are simultaneously clipped with excessive input signal. It also affects the rated power output.
Phase inverter Q105 (Q205)	Stage Q105 has two oppositely-phased outputs to drive the power-output stages in push pull. Equal load resistors are used in the collector and emitter circuits to provide equal but oppositely-phased signals at the base of Q107 and Q108.
Dc bias adj. Rv105 (Rv205)	Controls the bias current in Q107, Q108, Q109 and Q110 to eliminate crossover distortion at small signal levels, The bias voltage is supplied by D103, D104, and D105.
Negative feedback loop R130, C125	These components provide negative voltage feedback from the output of the power amplifier to the emitter of Q104.
Driver / limiter Q106 (Q206)	Q106 limits the amplitude of the positive-going half-cycle drive

Stage/Control	*Function*
	voltage which causes power transistor damage. This limiter can be considered as an electronic protection circuit based on the principle that power transistor damage usaully occurs when the power dissipation at the collector exceeds its safety margin. Since the collector voltage and collector current determine the power dissipation at the collector, trigger signal for Q106 is taken from the collector and emitter circuit of Q109. The limiting is performed as follows (refer to Fig.1-1): Under normal conditions, Q106 is cut off. When excessive current flows in power transistor Q109, or the power dissipation at the collector of Q109 exceeds its safety margin, the voltage drop across R145, R146 (emitter resistor of Q109) increases supplying trigger signal to the base of Q106 through trigger circuit. Thus Q106 turns on and limits the input drive voltage to protect the power transistors. Though Q106 seems only to be limiting the positive half cycle, it also works for the negative half cycle. C128 discharges during the initial negative half cycle, reducing the center voltage to nearly zero. Since the positive half cycle will not charge C128 due to the limiter's operation, the following negative half cycle cannot drive the power transistors.
Drivers Q107, Q108 (Q107, Q208)	These transistors operate as emitter followers to provide the current swings demanded of the output stages for full output.
Powr amplifier Q109, Q110 (Q209, Q210)	These SONY silicon transistors have been specially manufactured to drive the speaker system at rated output power from 20 Hz to 60 kHz. Output is coupled to the speakers through C128.
	Power Supply
D101, D102	Dc output from rectifier diodes D101 and D102 is filtered by C135 and applied to each amplifier section.

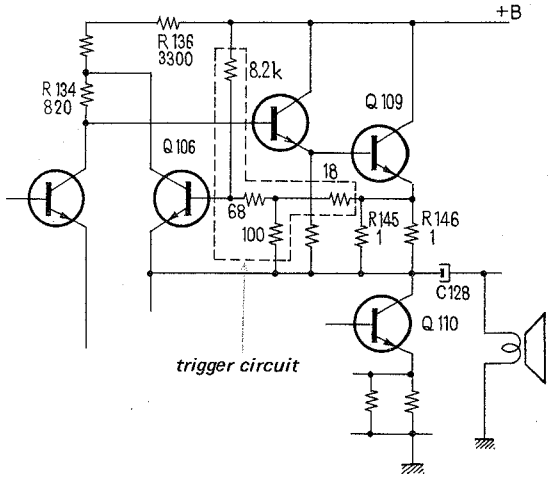


Fig. 1-1 Protection circuit

SECTION 2
DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

Unplug the ac line cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools are required for performing disassembly and replacement procedures on the TA-1010.

Screwdriver, Phillips head
Long-nose pliers
Wrench, adjustable
Nut drivers
Soldering iron
Rosin core solder
Cardboard, 3″ square

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in this service manual.

Note: Some screws in the TA-1010 are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable because ISO screws have a different number of threads per mm compared to the old ones. ISO screws have an identification mark on their heads as shown in Fig.2-1.

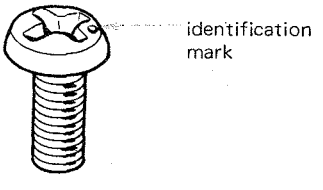
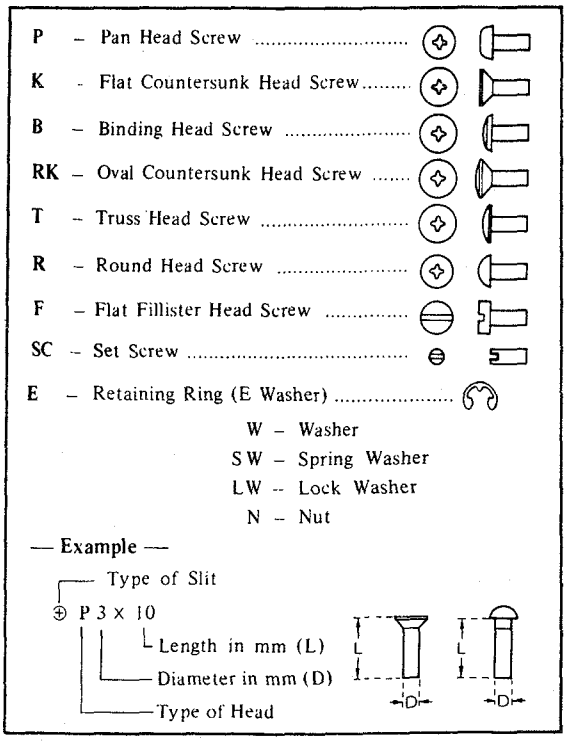


Fig. 2-1 ISO screw

— Hardware Nomenclature —



2-3. WOODEN-CASE REMOVAL

1. Remove the four corner screws (+P 4 X 16) and one screw (+P 3 X 16) securing the wooden case to the chassis as shown in Fig.2-2.

2. Carefully push the chassis's back panel to permit the wooden case removal.

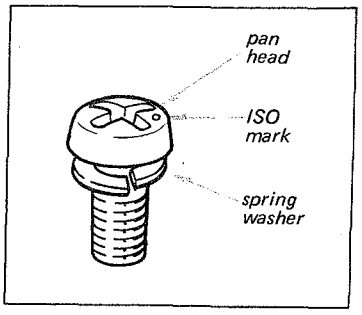
2-4. FRONT-PANEL REMOVAL

1. Remove the wooden case first as described in Procedure 2-3.

2. Remove all control knobs except the VOLUME and BALANCE control knobs by pulling them off.

3. Remove the two screws (+PS 3 X 6) securing the bottom side of the front panel to the chassis. See Fig.2-3 .

Note: The PS screw is a new type of screw which has a spring washer permanently attached to it.
This makes it impossible to lose the spring washer.



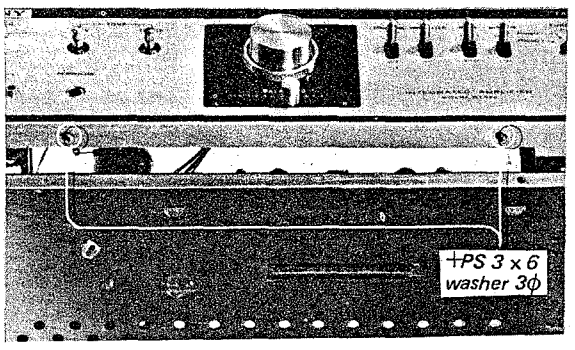


Fig. 2-3 Front panel removal

4. Remove the two hex nuts that secure the front panel to the chassis. Place a piece of cardboard between the wrench and front panel (as shown in Fig. 2-4) to avoid scratching the panel.

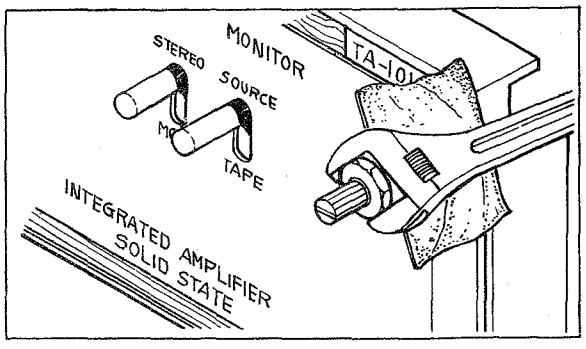


Fig. 2-4 Hex nut removal

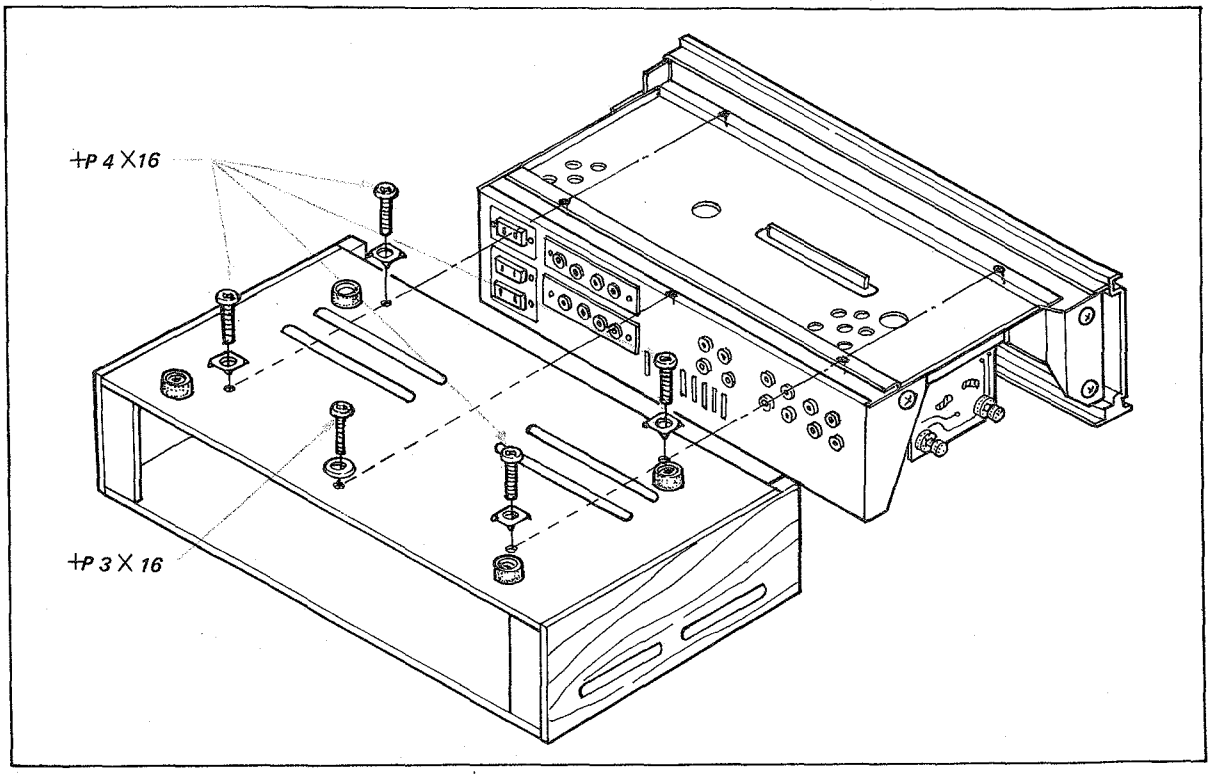


Fig. 2-2 Wooden case removal

2-5. FRONT SUB-PANEL REMOVAL

1. Remove the front panel as described in Procedure 2-4.
2. Remove the VOLUME and BALANCE control knobs by pulling them off.
3. Remove the two self-tapping screws (+R 3 X 6) securing the panel to the chassis. See Fig.2-5.

2-6. SWITCH, CONTROL, and BINAURAL JACK REPLACEMENT

First, remove the wooden case, front panel and front sub-panel as described in Procedures 2-3, 2-4 and 2-5. Then perform the following procedures while refering to Fig.2-5.

POWER, LOUDNESS, HIGH FILTER, MODE, and MONITOR Switches

1. Unsolder the lead wires from the switch lugs.
2. Remove the two screws (+PS 3 X 6) securing the switch.
3. Remove the old switch and then install a new one.
4. Solder the lead wires to the new switch.

SPEAKER and FUNCTION Switches

1. Remove the hex nut that secures the switch.
2. Remove the switch while exercising care not to damage the lead wires
3. Unsolder the lead wires from the switch terminal lugs one by one. Solder them to a new switch: then install it.

VOLUME Control

1. Remove the hex nut that secures the VOLUME control to the chassis.
2. Remove the VOLUME control.
3. Solder the lead wires to a new control and install it.

TONE Controls

1. Remove the hex nuts securing the TREBLE and BASS controls to the chassis.
2. Carefully remove them along with the tone -control circuit board.
3. Cut each lug of the defective TONE control above the board to remove the part.

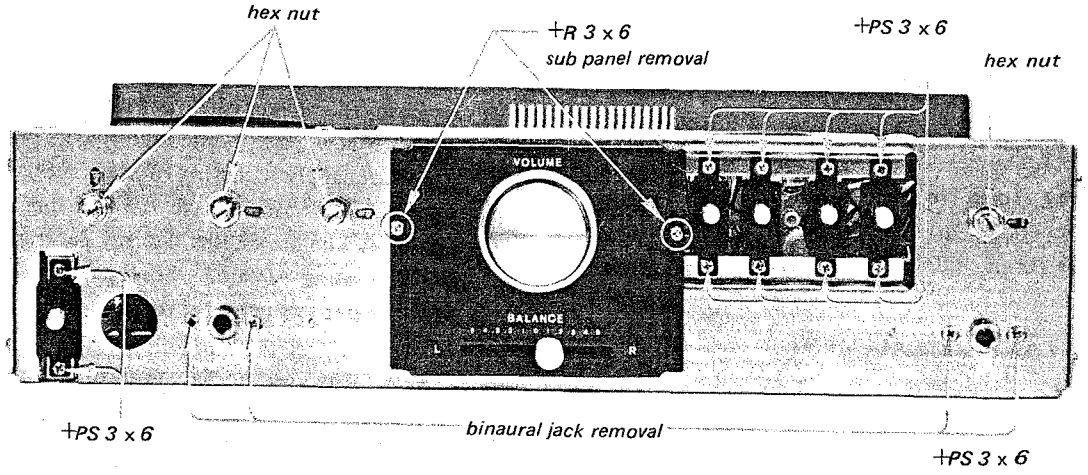


Fig. 2-5 Front sub panel, switch, control and binaural jack replacement

4. Unsolder and remove the terminal lugs individually, and clean out the holes.

5. Install the replacement control.

BALANCE Control

1. Remove the two screws (+P 3 X 4) securing the defective control to the chassis.

2. Remove the defective control.

3. Solder the lead wires to the replacement switch one by one and install it.

BINAURAL JACK

1. Remove the two screws (+R 3 X 6) at each side of the front sub chassis.

2. Tilt it forward and down to permit the removal of the hex nuts that secure the binaural jack from the back.

3. Remove the two screws (+P 3 X 6) and nuts securing the binaural jack to the chassis.

4. Unsolder the lead wires and components from the jack's lugs and remove it.

5. Install the replacement jack then solder the lead wires and components to the new jack.

2-7. PRINTED CIRCUIT BOARD REMOVAL

1. Remove the wooden case as described in Procedure 2-3.

2. All PCB's except the tone control board are extracted by removing the two rubber clamps securing them to the chassis. Stretch the rubber clamp in both direction with your fingers, then pull it out as shown in Fig.2-6.

2-8. PILOT-LAMP REPLACEMENT

1. Remove the wooden case as described in Procedure 2-3.

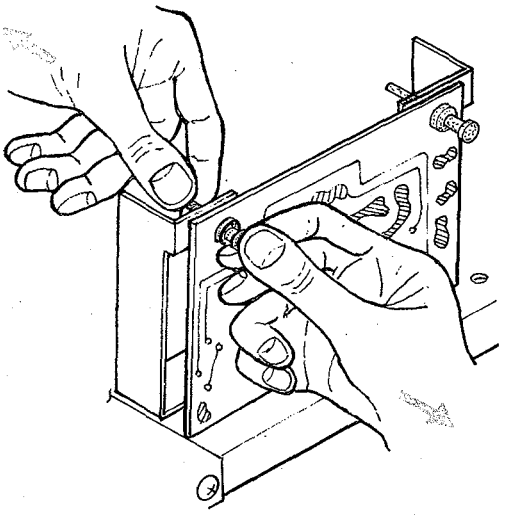


Fig. 2-6 Rubber clamp removal

2. Straighten the tab of the pilot-lamp socket bracket to permit the removal of the pilot lamp socket.
3. Pull out the lamp socket, then unscrew the defective lamp and install a new one.

2-9. POWER-TRANSISTOR REPLACEMENT

1. Remove the wooden case as described in Procedure 2-3.

2. Remove the two self-tapping screws (+R 3 X 6) at each side of the back panel.

3. Tilt it down to permit the removal of the screws (+P 3 X 12) securing the power transistor to the heat sink, as shown in Fig.2-7.

4. Remove the defective power transistor and install a new one. When replacing a power transistor, apply a coating of a heat-conducting silicone grease to both sides of the mica insulator. The grease fills the tiny depressions in the mating surfaces, thereby improving heat transfer to the heat sink.

Note: After performing the power transistor replacement, proceed to the power-amplifier adjustment described in Procedures 5-1 and 5-2 to avoid possible power-transistor damage.

2-10. PHONO JACK, DIN CONNECTOR, SPEAKER TERMINAL STRIP AND AC RECEPTACLE REPLACEMENT.

Note: All electrical parts mounted on the back panel except the GROUND terminal and line-cord strain relief can be replaced by removing the rivets securing them to the chassis.

1. Remove the wooden case as described in Procedure 2-3.
2. Remove the two self-tapping screws (+R 3 X 6) at each side of the back panel.
3. Tilt the back panel forward and down.
4. Unsolder the lead wires from the lugs of the defective part.
5. Break or bore out the end of the rivet, then knock the remaining piece out.
6. Remove the defective part.
7. Install a new part by using nuts and machine screws.

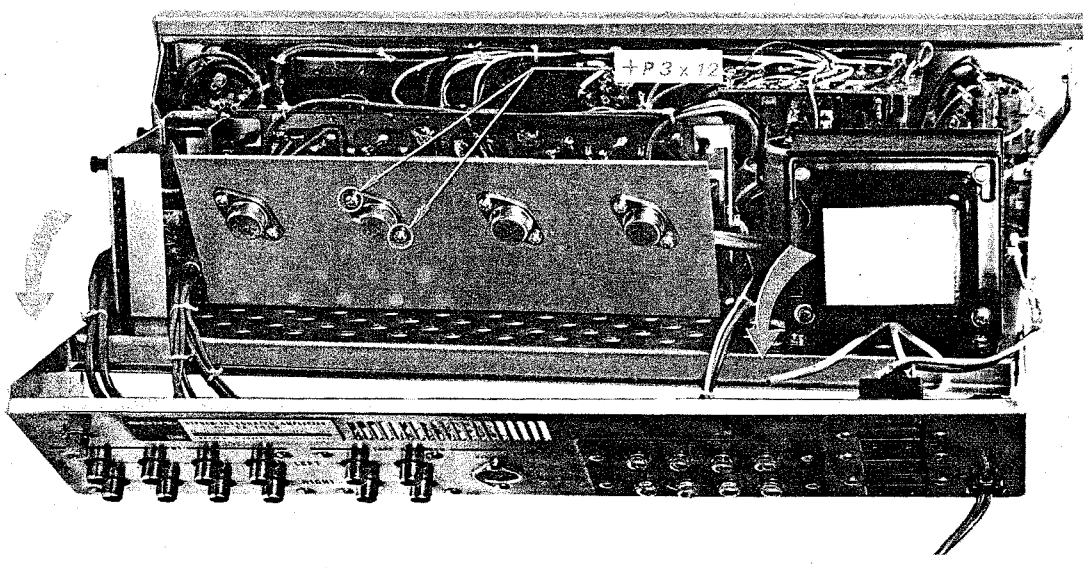
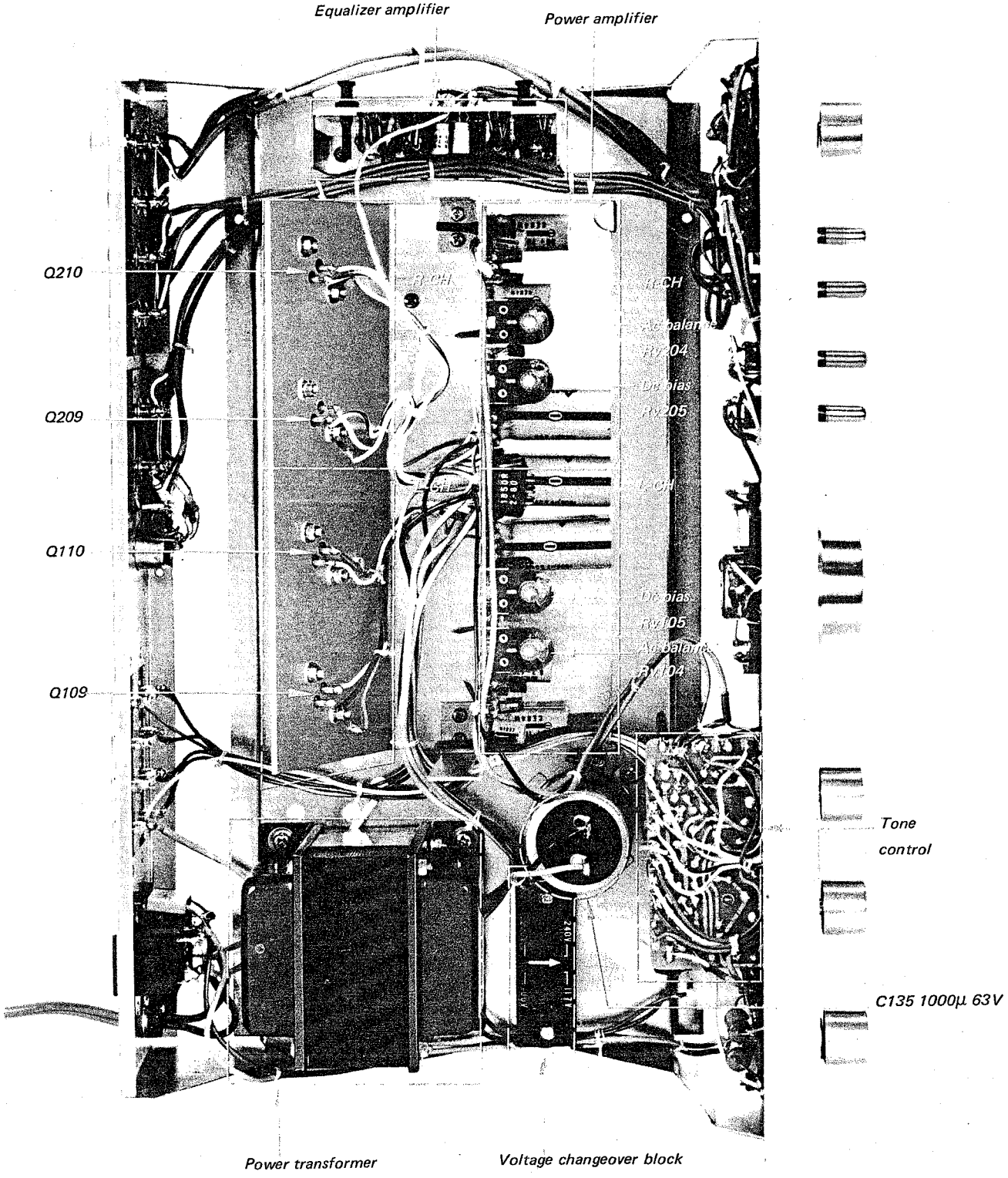


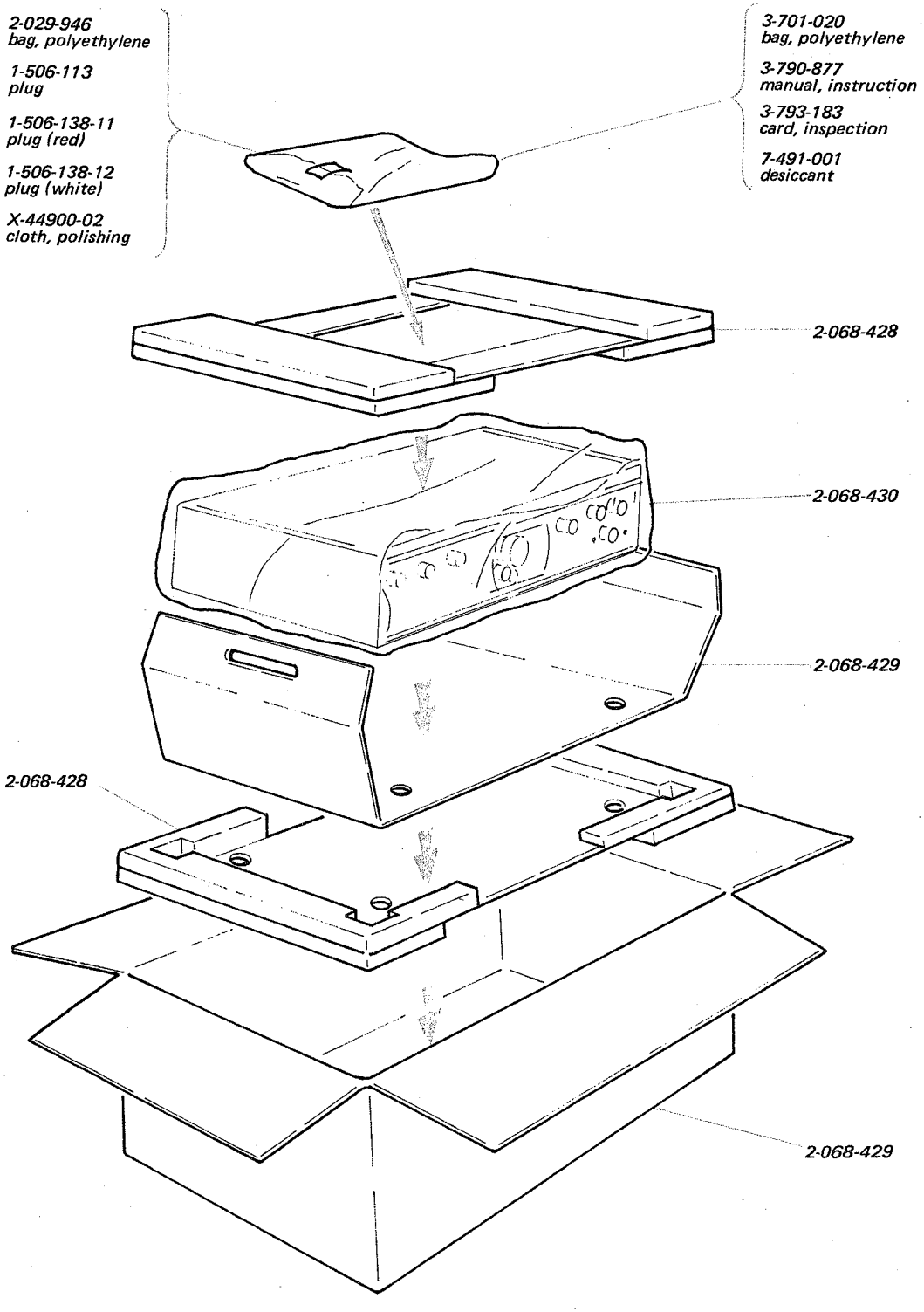
Fig. 2-7 Power transistor replacement

2-11. CHASSIS LAYOUT



SECTION 3
REPACKING

The TA-1010's original shipping carton and packing material is the ideal container for shipping the unit. However to secure the maximum protection, the TA-1010 must be repacked in this material precisely as before. The proper repacking procedure is shown in Fig.3-1.



SECTION 4
TROUBLE SHOOTING

4-1. TEST EQUIPMENT REQUIRED

The following items are reguired for troubleshooting the TA-1010.

1. Dc VTVM or VOM
2. Audio oscillator
3. Audio level meter (ac VTVM)
4. Transistor tester

4-2. TROUBLE TABLES

Power Supply

Symptom	*Cause*	*Correction*
Pilot lamp fails to light and no output	No ac line input	Trace ac line circuit
	Defective power transformer	Replace power transformer
	S7 defective	Check and replace
	C135 shorted	Replace the defective capacitor
	Two of power transistors Q107 to Q110 shorted	Check and replace
Pilot lamp becomes dim and no output	One or two diode rectifiers shorted	Replace D101 or D102
Hum in output	C315 open	Check and replace

Power Transistor and Driver Stages

Pilot lamp fails to light and no output	Two of power transistors Q107 to Q110 shorted	Check and replace defective transistor
Power transistors overheats with no input signal	Too much dc bias current for the power transistors	Check and readjust the dc bias
Hum in output	C121 open	Check and replace
Intermittent noise in output	Q104 defective	Check and replace

Symptom	*Cause*	*Correction*
	Tone Control Board	
Scratching noise occurs when turning the controls	Defective control	Replace control
No output or noise in output	Defective transistor or C130 shorted	Check and replace
	Equalizer Section	
Rushing Noise	Q101 defective	Check and replace
No output	Q101 defective or C102 shorted	Check and replace
Intermittent Noise	R108 defective	Check and replace

Note : Since the TA-1010 contains two identical amplifier chains, only the left channel is described.

SECTION 5
POWER AMPLIFIER ADJUSTMENTS

Note: This adjustment should be done after replacing any of the power-amplifier transistors. To simplify the following procedure, only the left channel is described. The right channel is identical except for component reference numbers (see the schematic diagram on pages 17 and 18).

5-1. DC-BIAS ADJUSTMENT

Serious deficiencies in performance, such as thermal runaway of power transistors, will result if this adjustment is improperly set.

CAUTION

To avoid accidental power transistor damage, increase the ac line voltage gradually, using a variable transformer, while measuring the voltage across emitter resistor R543 or R544. Check to see that the reading does not exceed 15 mV.

Test Equipment Required

1. Dc voltmeter
2. Variable transformer
3. Screwdriver with $^1/_8$" blade

Preparation

1. Remove the wooden case as described in Procedure 2-3 on page 5.
2. Connect the dc voltmeter between the emitter of Q110 and ground, as shown in Fig. 5-1.
3. Set the amplifiers controls as follows:

   Tone controls - - - - - Flat (center position)

   MODE switch - - - - - STEREO

   MONITOR switch - - TAPE

   VOLUME control - - Minimum

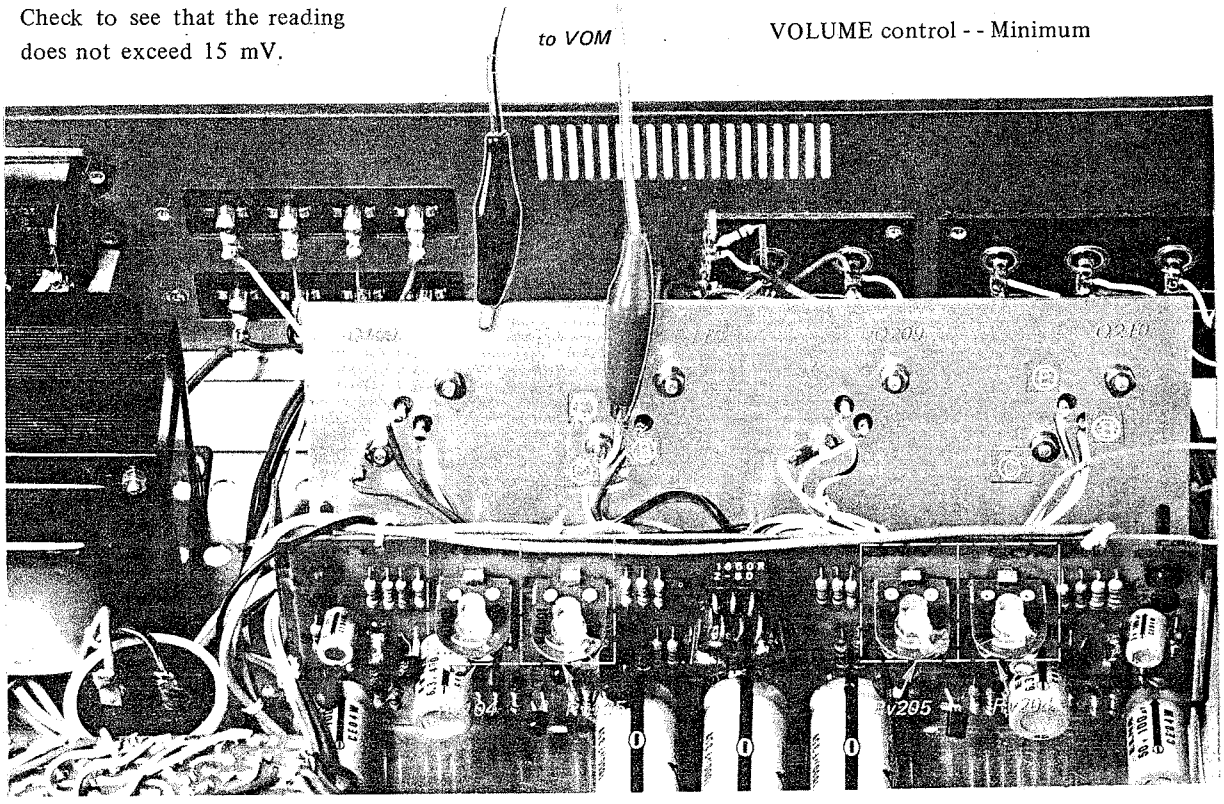


Fig. 5-1 VOM connection point and parts location

Procedure

1. Set the semi-fixed resistors (Fig. 5-1) on the power -amplifier board as follows:

   RV105 (L-CH) (dc bias) . . . . . fully clockwise
   RV205 (R-CH) (dc bias) . . . . . fully clockwise
   RV104, RV204 (ac balance) . . . . . mid-position

2. Set the variable transformer for minimum output.

3. Turn on the POWER switch; then increase the line voltage up to the rated value.

4. Adjust RV105 (RV205) to obtain a 15-mV reading in the meter.

5. After completing the adjustment, apply a drop of lock paint to RV105 (RV205).

5-2. AC-BALANCE ADJUSTMENT

Note: Excessive harmonic distortion at high levels will result if this adjustment is improperly set.

Test Equipment Required

1. Audio oscillator
2. Attenuator
3. Oscilloscope
4. Resistor, 600 ohms $^1/_4$ W
5. Dummy load, 8 ohms 20W
6. Screwdriver with $^1/_8$" blade

Procedure

1. With the equipment connected as shown in Fig. 5-2, set the POWER switch to the ON position and feed a 1-kHz, 0.775-V (0 dBm) signal to the TAPE input terminal through the attenuator.

2. While watching the waveform on the oscilloscope, alternately turn the VOLUME control and adjust RV104. Set RV104 so that the positive and negative peaks of the output waveform are simultaneously clipped (as shown in Fig. 5-3) when increasing the VOLUME control just beyond the point that causes distortion.

3. After completing the adjustment, apply a drop of lock paint to RV104.

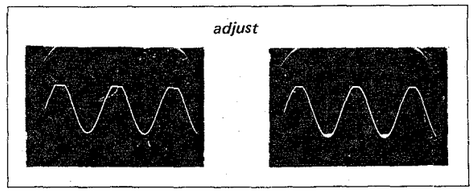


Fig. 5-3 Ac balance adustment

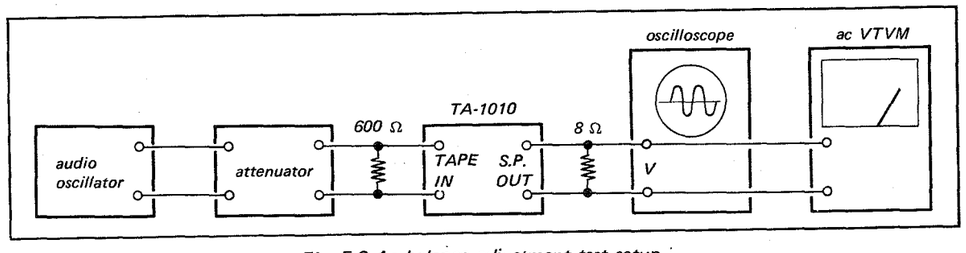
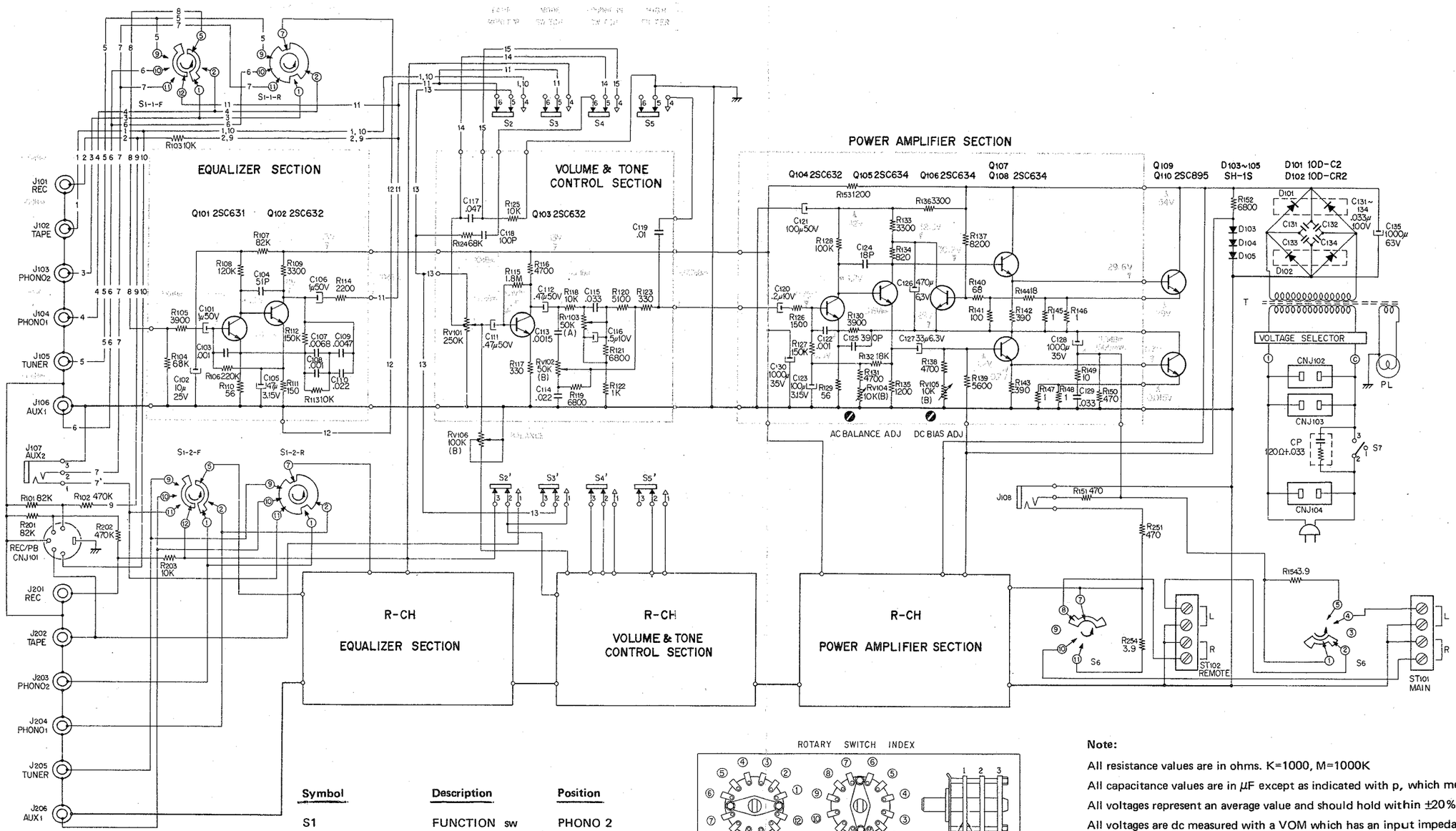


Fig. 5-2 Ac balance adjustment test setup

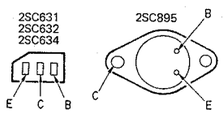
SECTION 6
DIAGRAMS

6-1. SCHEMATIC DIAGRAM



Symbol	Description	Position
S1	FUNCTION sw	PHONO 2
	(PHONO 2-PHONO 1-TUNER-AUX 1—AUX 2)	
S2	MONITOR sw	SOURCE
S3	MODE sw	STEREO
S4	LOUDNESS sw	ON
S5	HIGH FILTER	OFF
S6	SPEAKER sw	REMOTE
	(REMOTE-OFF-MAIN-BOTH)	

ROTARY SWITCH INDEX



Note:

All resistance values are in ohms. K=1000, M=1000K

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ±20%.

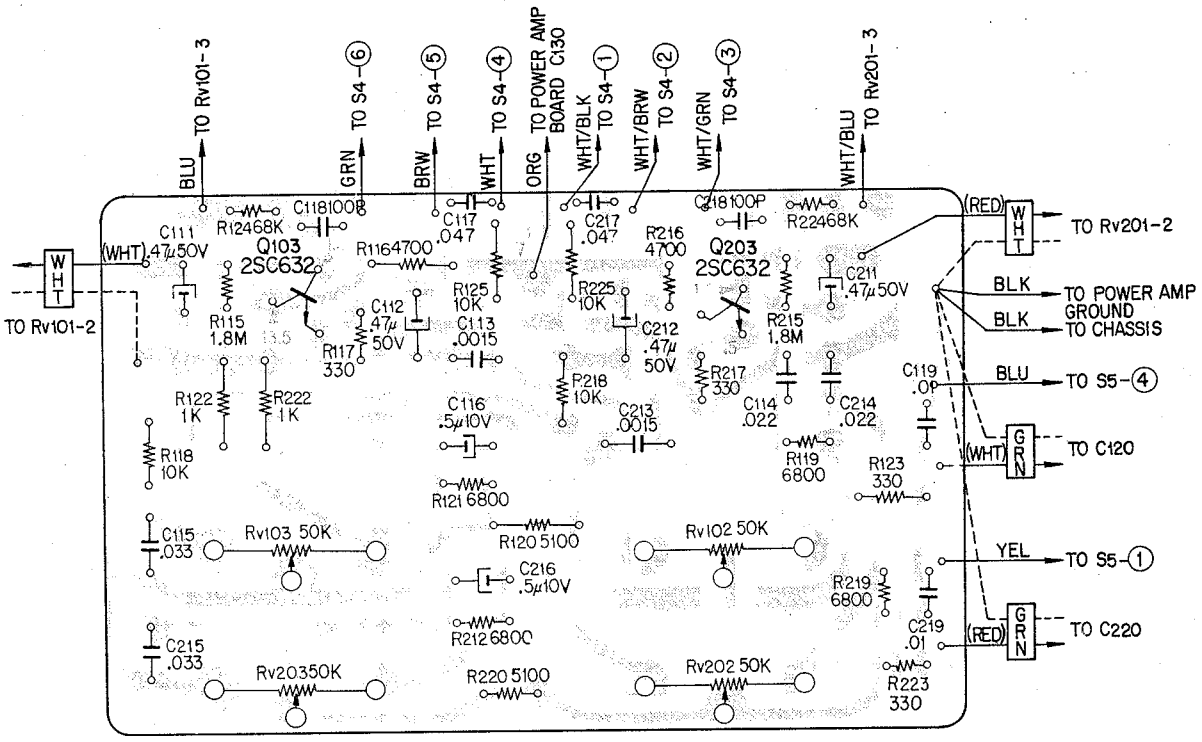
All voltages are dc measured with a VOM which has an input impedance of 33.3 k ohms/volt at no signal.

signal voltages are measured with ac VTVM and expressed in dBm refered to 0.775 volts, 1 kHz.

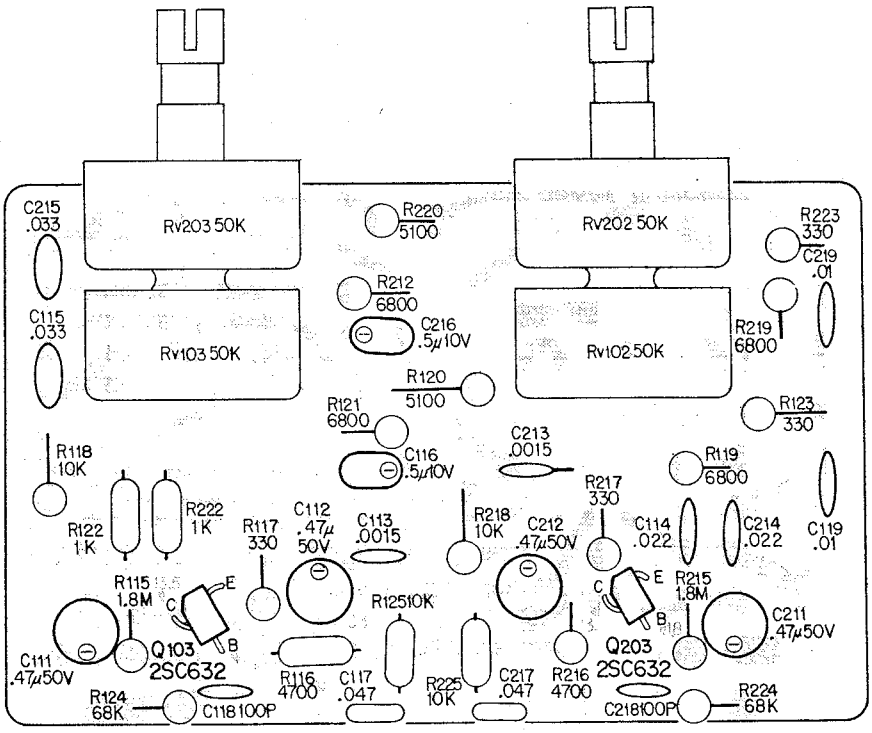
SONY®
TA-1010

6-2. MOUNTING DIAGRAM– Tone Control

–Conductor Side–

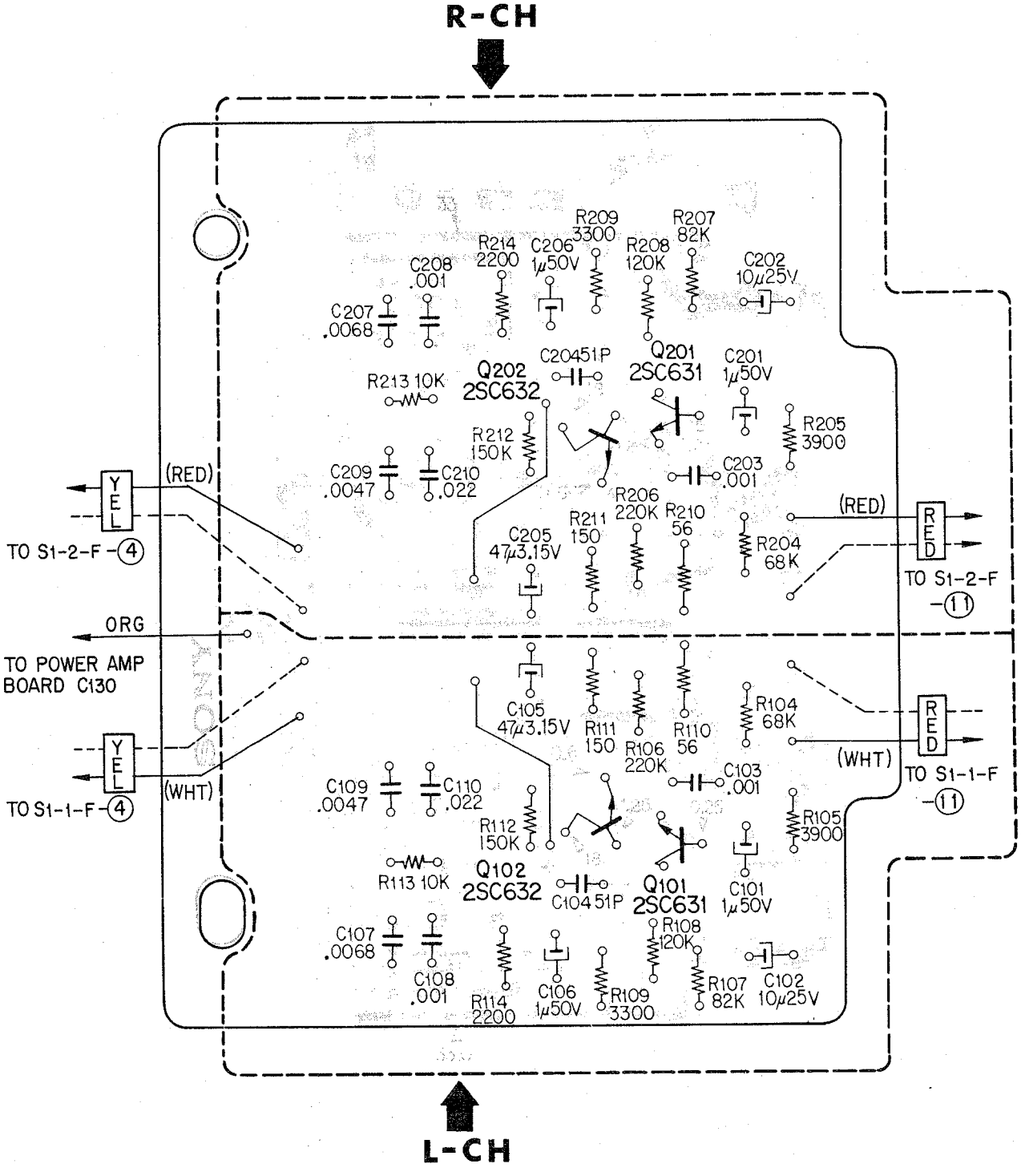


–Component Side–



6-3. MOUNTING DIAGRAM– Preamplifier

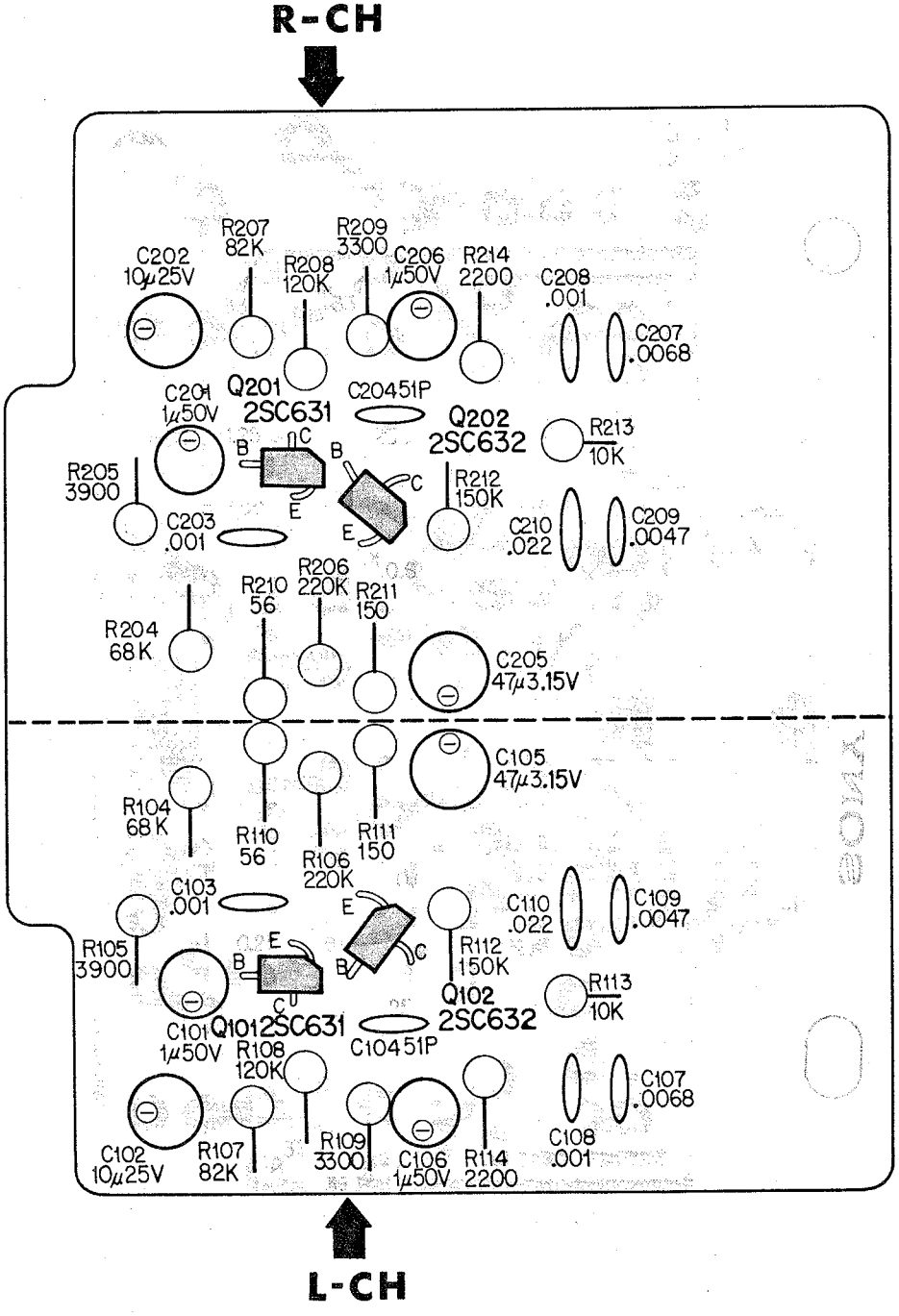
–Conductor Side–



6-3. MOUNTING DIAGRAM

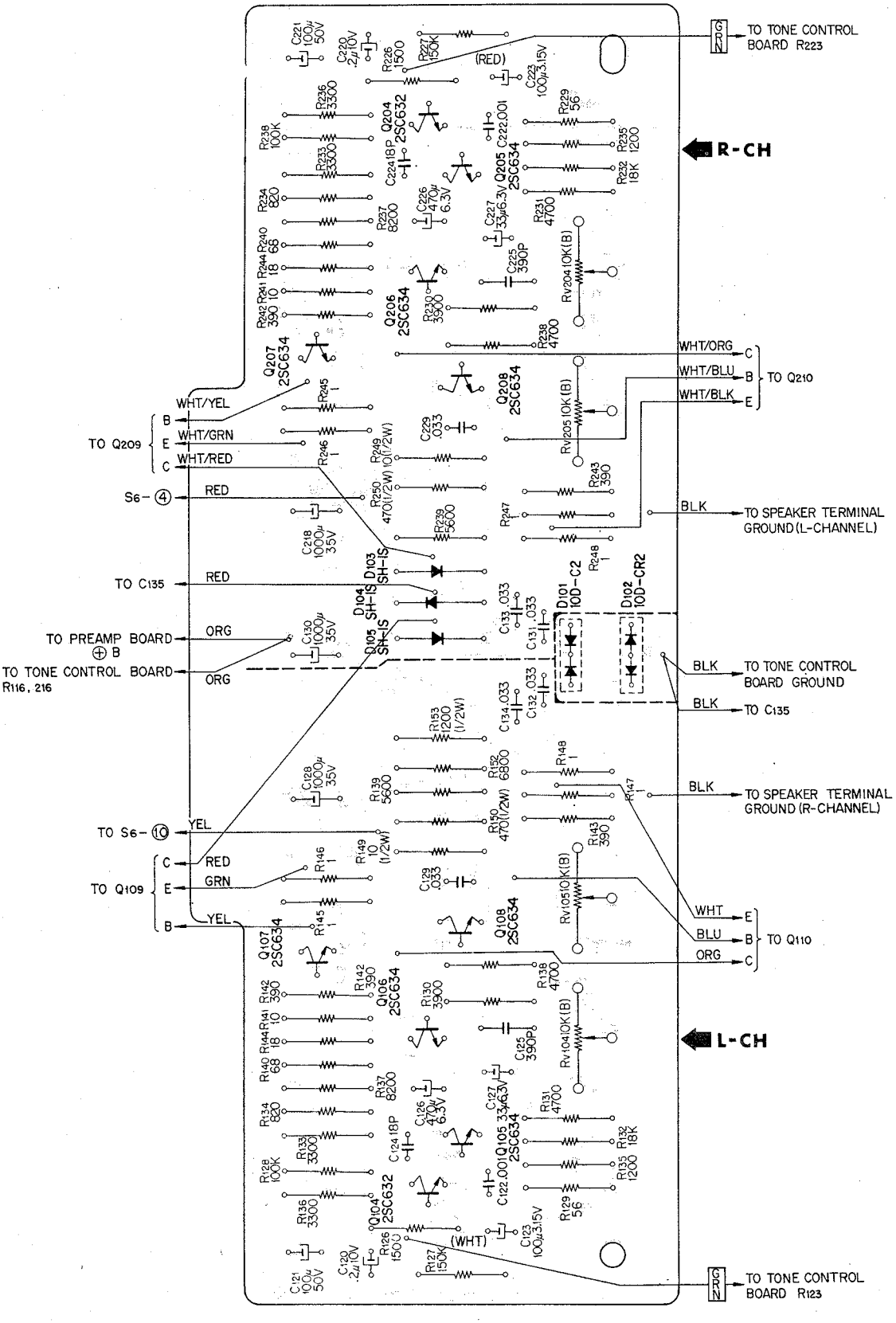
Preamplifier

–Component Side–



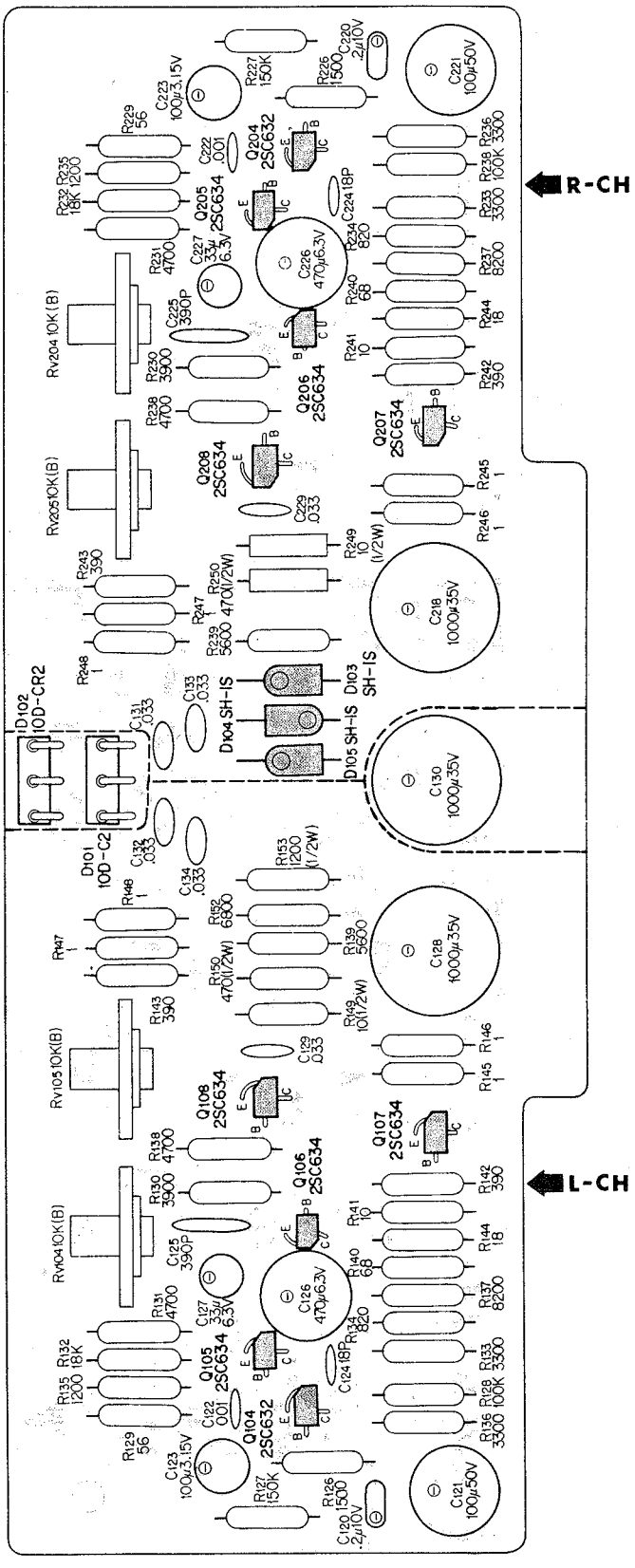
6-4. MOUNTING DIAGRAM–Power Amplifier

–Component Side–

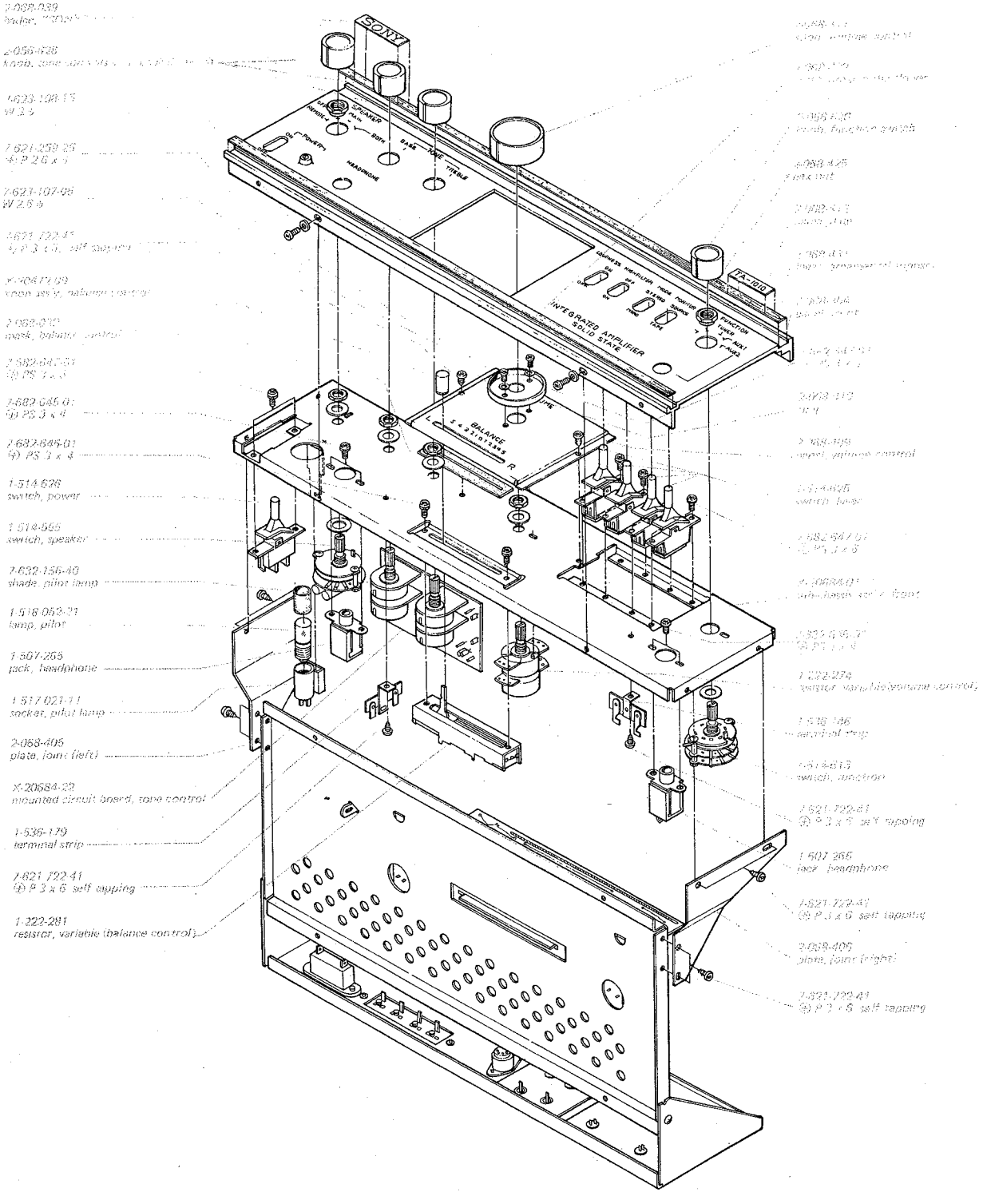


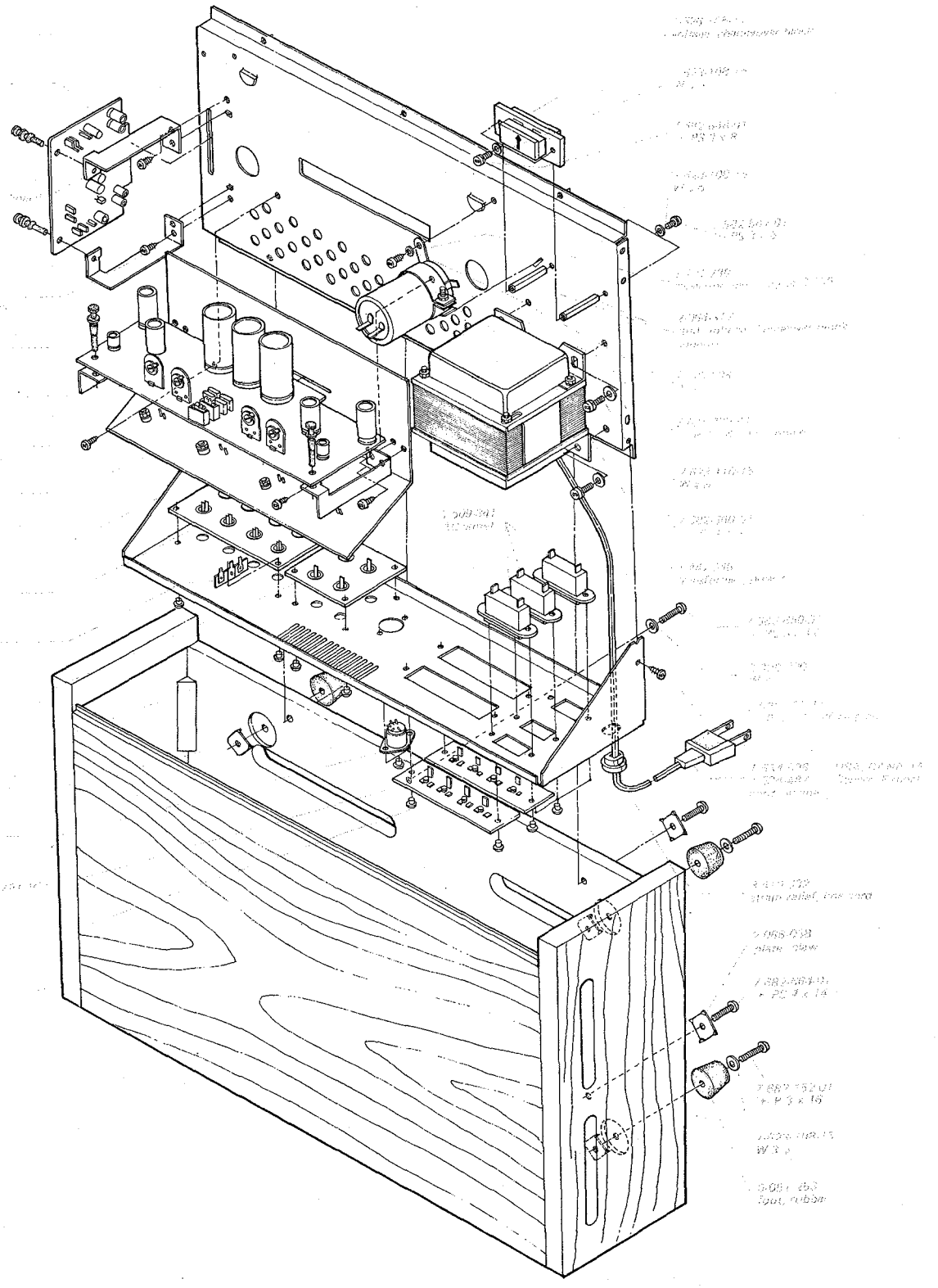
6-4. MOUNTING DIAGRAM–Power Amplifier

–Conductor Side–



SECTION 7
EXPLODED VIEW





SECTION 8
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
		Mounted Circuit Boards
	X-20684-21	power amplifier circuit board
	X-20684-22	tone control circuit board
	X-20684-23	equalizer circuit board
		Semiconductors
Q101 (Q201)		transistor, 2SC631
Q102 (Q202)		transistor, 2SC632
Q103 (Q203)		transistor, 2SC632
Q104 (Q204)		transistor, 2SC632
Q105 (Q205)		transistor, 2SC634
Q106 (Q206)		transistor, 2SC634
Q107 (Q207)		transistor, 2SC634
Q108 (Q208)		transistor, 2SC634
Q109 (Q209)		transistor, 2SC895
Q110 (Q210)		transistor, 2SC895
D101		diode 10DC-2
D102		diode 10DCR-2
D103		diode SH-1S
D104		diode SH-1S
D105		diode SH-1S
		Transformer
T	1-441-546-12	transformer, power

Capacitors

All capacitance values are in microfarads unless otherwise indicated.

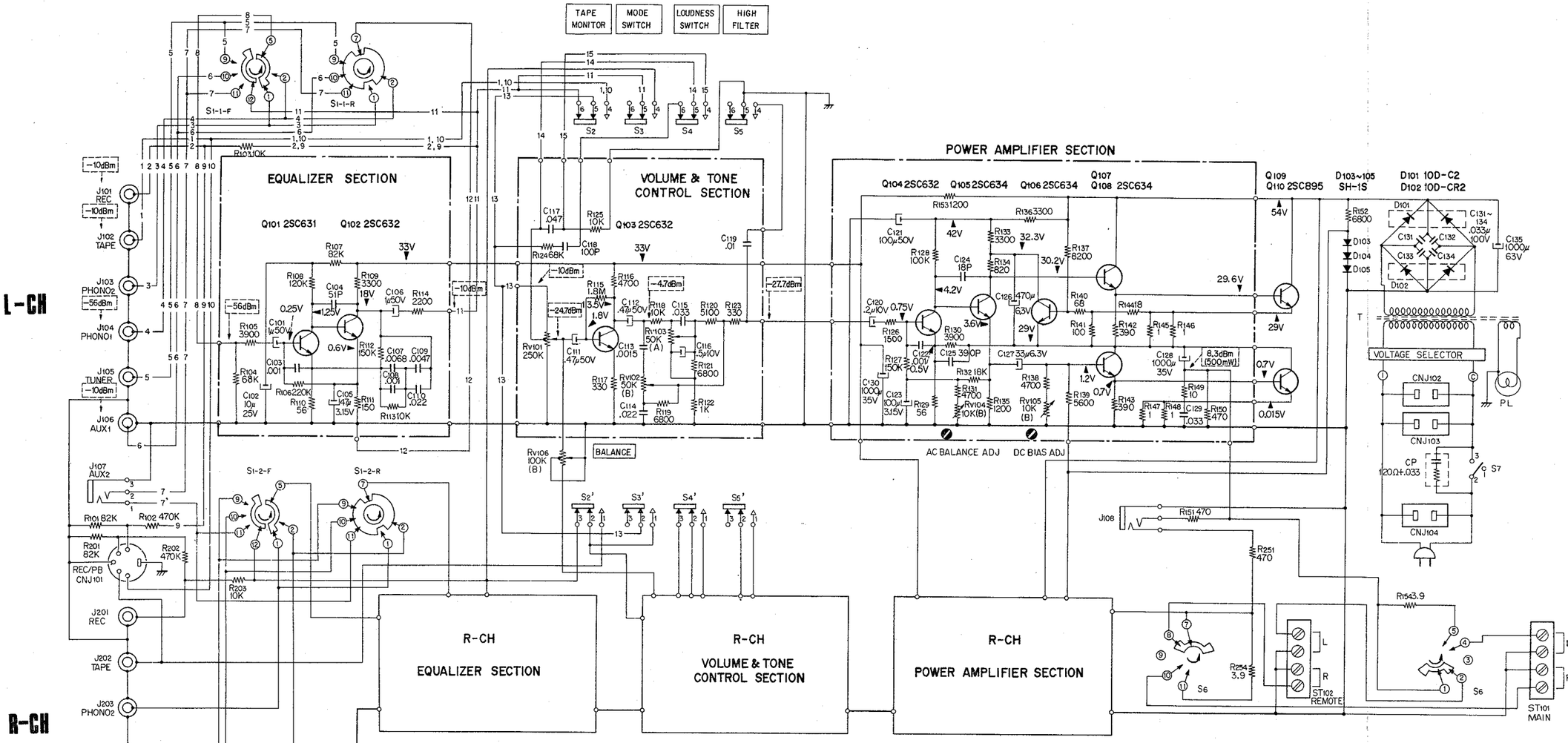
Ref. No.	Part No.				
C101(C201)	1-121-343	1	$\pm^{50}_{10}$%	50V	electrolytic
C102(C202)	1-121-283	10	$\pm^{100}_{10}$%	25V	electrolytic
C103(C203)	1-105-821	0.001	±20%	50V	mylar
C104(C204)	1-101-883	51P	±5%	50V	ceramic
C105(C205)	1-121-742	47	$\pm^{30}_{10}$%	3.15V	electrolytic
C106(C206)	1-121-343	1	$\pm^{50}_{10}$%	50V	electrolytic
C107(C207)	1-106-021	0.0068	±5%	50V	mylar
C108(C208)	1-105-661	0.001	±10%	50V	mylar
C109(C209)	1-105-667	0.0047	±10%	50V	mylar
C110(C210)	1-106-033	0.022	±5%	50V	mylar
C111(C211)	1-121-726	0.47	$\pm^{50}_{10}$%	50V	electrolytic
C112(C212)	1-121-726	0.47	$\pm^{50}_{10}$%	50V	electrolytic
C113(C213)	1-105-663	0.0015	±10%	50V	mylar
C114(C214)	1-105-677	0.022	±10%	50V	mylar
C115(C215)	1-105-679	0.033	±10%	50V	mylar
C116(C216)	1-127-911	0.5	$\pm^{50}_{20}$%	10V	electrolytic
C117(C217)	1-105-681	0.047	±10%	50V	mylar
C118(C218)	1-107-085	100P	±5%	50V	silvered mica
C119(C219)	1-105-673	0.01	±10%	50V	mylar
C120(C220)	1-127-072	0.2	$\pm^{80}_{20}$%	10V	electrolytic (aluminum)
C121(C221)	1-121-384	100	$\pm^{100}_{10}$%	50V	electrolytic
C122(C222)	1-105-821	0.001	±20%	50V	mylar
C123(C223)	1-121-290	100	$\pm^{100}_{10}$%	3.15V	electrolytic
C124(C224)	1-107-113	18P	±10%	50V	silvered mica
C125(C225)	1-107-242	390P	±10%	50V	silvered mica
C126(C226)	1-121-359	470	$\pm^{100}_{10}$%	6.3V	electrolytic
C127(C227)	1-121-284	33	$\pm^{100}_{10}$%	6.3V	electrolytic
C128(C228)	1-121-388	1000	$\pm^{150}_{10}$%	35V	electrolytic
C129(C229)	1-105-821	0.001	±20%	50V	myiar
C130(C230)	1-121-388	1000	$\pm^{150}_{10}$%	35V	electrolytic
C131	1-105-879	0.033	±20%	50V	mylar
C132	1-105-879	0.033	±20%	50V	mylar
C133	1-105-879	0.033	±20%	50V	mylar
C134	1-105-879	0.033	±20%	50V	mylar
C135	1-121-788	1000	$\pm^{100}_{10}$%	63V	electrolytic

Resistors

All resistance values are in ohms, ±5%, 1/4w, fixed, carbon type unless otherwise indicated.

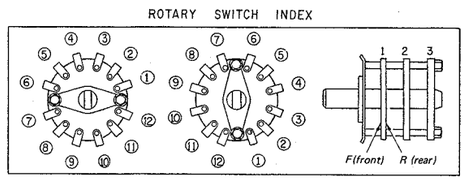
Ref. No.	Part No.	
R101(R201)	1-244-719	82k
R102(R202)	1-244-737	470k
R103(R203)	1-244-697	10k
R104(R204)	1-242-717	68k
R105(R205)	1-242-687	39k
R106(R206)	1-242-729	220k
R107(R207)	1-242-719	82k
R108(R208)	1-242-732	120k
R109(R209)	1-242-685	3.3k
R110(R210)	1-242-643	56
R111(R211)	1-242-653	150
R112(R212)	1-242-725	150k
R113(R213)	1-242-697	10k
R114(R214)	1-242-681	2.2k
R115(R215)	1-242-751	1.8M
R116(R216)	1-242-689	4.7k
R117(R217)	1-242-661	330
R118(R218)	1-242-697	10k
R119(R219)	1-242-693	6.8k
R120(R220)	1-242-690	5.1k
R121(R221)	1-242-693	6.8k

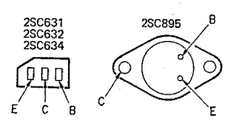
SCHEMATIC DIAGRAM



Symbol	Description	Position
S1	FUNCTION sw	PHONO 2
	(PHONO 2-PHONO 1-TUNER-AUX 1—AUX 2)	
S2	MONITOR sw	SOURCE
S3	MODE sw	STEREO
S4	LOUDNESS sw	ON
S5	HIGH FILTER	OFF
S6	SPEAKER sw	REMOTE
	(REMOTE-OFF-MAIN-BOTH)	

ROTARY SWITCH INDEX





Note:

All resistance values are in ohms. K=1000, M=1000K

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ±20%.

All voltages are dc measured with a VOM which has an input impedance of 33.3 k ohms/volt at no signal.

[----] signal voltages are measured with ac VTVM and expressed in dBm refered to 0.775 volts, 1 kHz.

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Ref. No.	Part No.	Description		
R122(R222)	1-242-673	1k		
R123(R223)	1-242-661	330		
R124(R224)	1-242-717	68k		
R125(R225)	1-242-697	10k		
R126(R226)	1-244-677	1.5k		
R127(R227)	1-244-725	150k		
R128(R228)	1-244-721	100k		
R129(R229)	1-244-643	56		
R130(R230)	1-244-687	3.9k		
R131(R231)	1-244-689	4.7k		
R132(R231)	1-244-703	18k		
R133(R233)	1-244-685	3.3k		
R134(R234)	1-244-671	820		
R135(R235)	1-244-675	1.2k		
R136(R236)	1-244-685	3.3k		
R137(R237)	1-244-695	8.2k		
R138(R238)	1-244-689	4.7k		
R136(R239)	1-244-691	5.6k		
R140(R240)	1-244-645	68		
R141(R241)	1-244-625	10		
R142(R242)	1-244-663	390		
R143(R243)	1-244-663	390		
R144(R144)	1-244-631	18		
R145(R245)	1-244-601	1		
R146(R246)	1-244-601	1		
R147(R247)	1-244-601	1		
R148(R248)	1-244-601	1		
R149(R249)	1-202-525	10	±20%	1/2W omposition
R150(R250)	1-202-565	470	±20%	1/2W composition
R151(R251)	1-202-565	470	±20%	1/2W composition
R152	1-244-693	6.8k		
R153	1-202-575	1.2k	±10%	1/2W composition
R154(R254)	1-207-310	3.9	±10%	3W wire-wound
RV101, RV201	1-222-274	250k/250k		varibale
RV102, RV202	1-222-203	50k/50k		variable
RV103, RV203	1-222-203	50k/50k		variable
RV104(RV204)	1-221-967	10k		somifixed
RV105(RV205)	1-221-967	10k		somifixed
RV106(RV206)	1-222-281	100k		variable

Ref. No.	Part No.	Description
		Switches
S1	1-514-613	switch, rotary (FUNCTION)
S2	1-514-625	switch, lever slide (TAPE MONITOR)
S3	1-514-625	switch, lever slide (MODE)
S4	1-514-625	switch, lever slide (LOUDNESS)
S5	1-514-625	switch, lever slide (HIGH FILTER)
S6	1-514-555	switch, rotary (SPEAKER SELECTOR)
S7	1-514-626	switch, lever seesaw (AC POWER)
		Miscellaneous
	1-231-057	encapsulated component, 0.033μF + 120Ω
	1-507-163	phono jack, 4-P
	1-507-265	jack, headphone
	1-507-268	phono jack, 8-p
	1-509-029	din connector
	1-509-341	ac outlet
	1-517-021	socket, pilot lamp
	1-518-052	lamp, pilot
	1-536-146	terminal strip, 1L1 (A)
	1-536-179	terminal strip, 1L1 (C)
	1-536-226	terminal strip, 4-P
	1-526-165	selector, voltage
	1-534-487-22	ac cord