ISO

Set using ISO screws

TA-1144

SONY®

SERVICE MANUAL

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SECTION 1
TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-1144 are listed in Table 1-1.

TABLE 1-1. TA-1144 TECHNICAL SPECIFICATIONS

Power Amplifier Section

Dynamic power:	70 watts, both channels operating
Rated output:	30 watts per channel, both channels operating
Power bandwidth:	10 Hz to 50 kHz, IHF (15 watts per channel) 20 Hz to 20 kHz (30 watts per channel)
Harmonic distortion:	Less than 0.1% at 1 kHz rated output
IM distortion:	Less than 0.2% at rated output
Input impedance:	100 kΩ
Input sensitivity: (for rated output)	0.8V
Signal-to-noise ratio:	greater than 90 dB (shorted input)

Preamplifier Section

Frequency response:	PHONO-1, -2, RIAA curve ±0.5 dB TAPE, TUNER, AUX-1, -2, -3, 10Hz to 100kHz $\pm^{0}_{2}$ dB
Input sensitivity and impedance:	PHONO-1, -2 1.2 mV 47 k AUX-1, -2, -3 TUNER, TAPE ※ REC/PB (※ General Export Model only) 150 mV 100 k
Signal output and output impedance:	REC OUT 150 mV 10 k PRE OUT 900 mV 15 k ※ REC/PB 20 mV 80 k (※ General Export Model only)
Signal-to-noise ratio:	PHONO-1, -2 greater than 70 dB (weighting network "B") AUX-1, -2, -3 TUNER, TAPE ※ REC/PB (※ General Export Model only) greater than 90 dB (weighting network "A")
Tone controls:	BASS ±10 dB at 100 Hz (2 dB/step) TREBLE ±10 dB at 10 kHz (2 dB/step)
Filters:	HIGH -6 dB/oct above 5 kHz LOW -6 dB/oct below 100 Hz
Loudness control:	50 Hz, +8 dB 10kHz, +4 dB (at -30 dB attenuation setting)
Power consumption:	Approx. 132W (USA, CANADA Model) Approx. 177W (General Export Model)
Power requirement:	117V ac (USA, CANADA Model only) 100, 117, 220, 240V ac (General Export Model only)
Dimensions:	422 mm (width) × 148 mm (height) × 321 mm (depth) 16⅝" (width) × 5¹³⁄₁₆" (height) × 12⅝" (depth)
Net weight:	7.8 kg (17 lb 1 oz)
Shipping weight:	12.3 kg (26 lb 15 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the functions or operations 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 audio-amplifier section contains two identical amplifier chains, only the left channel will be described. Refer to the block diagram on page 8 and schematic diagram on pages 27 to 28.

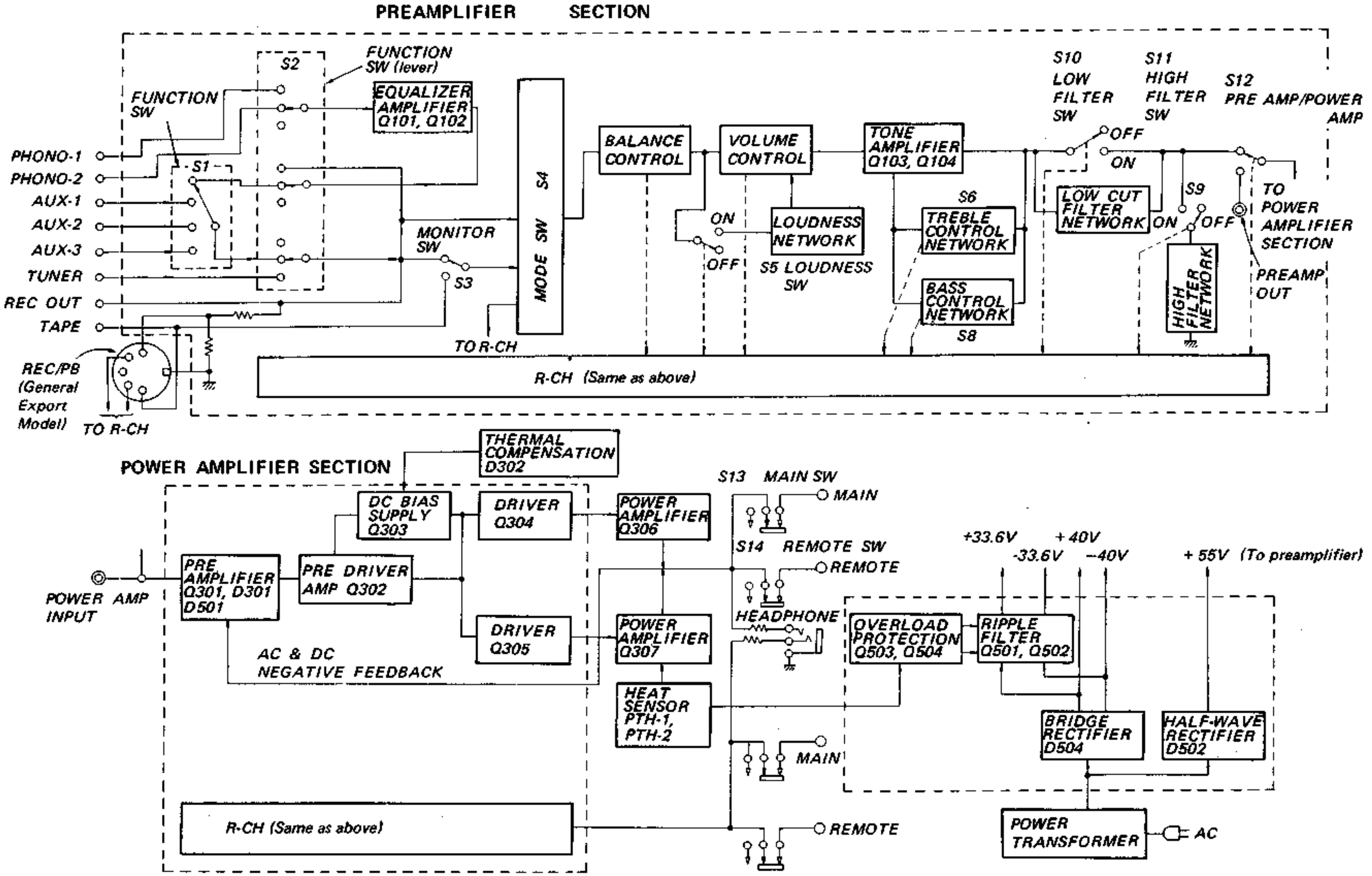
Stage/Control	*Function*
Preamplifier Section	
Equalizer amplifier Q101, Q102	This direct-coupled two stage amplifier amplifies the small signal provided by the phono cartridge (and applied to PHONO-1 and PHONO-2 input terminal) to the level required at the input of the following tone-control circuit.
Bias circuit R107, R102, R103	Dc bias voltage for Q101 is extracted from R107 in the emitter circuit of Q102 and fed back to the base of Q101 through R102 and R103. This dc negative feedback technique provides stable operation during temperature changes.
Equalization circuit R110, R111, R112 R105 C105, C106	RIAA equalization is achieved by the negative-feedback loop containing R110, R111, R112, R105, C105 and C106. Be sure to use replacement components with the exact same values. R114 (R214) in the output circuit prevents interaction between left and right channel-equalization when the MODE switch is set to L+R.
MODE switch S4	In the STEREO position of S4, left and right input signals are routed to their respective amplifiers. In the L+R position, the left and right signals are added and the sum is then fed to both amplifier channels. A rotary switch having two sections is used to obtain L+R signal even if the MONITOR switch is set to the TAPE position.
VOLUME control R125	The equalized phono signals and signals applied to the other input terminals are fed to the VOLUME control through the MONITOR and MODE switches. The level of the signal applied to the following tone control circuit is determined by the setting of R125.
BALANCE control R124	Employed to optimize stereo reproduction. To eliminate insertion loss at the mechanical center of movement, a special potentiometer having a conductive coating over half its element length is used.
LOUDNESS switch S5	This switch and R126, R127 C121 and C122 compensate for the characteristics of the human ear which vary according to the loudness of the sound being heard. When this switch is set to ON and the VOLUME control is set for 30 dB attenuation, the overall frequency response is increased 8 dB at 50 Hz and 4 dB at 10 kHz in relation to the level at 1 kHz.
Tone-control amplifier Q103, Q104	This direct-coupled two-stage amplifier has basically flat response, but it operates as a negative-feedback type tone-control circuit. The output generated at the collector circuit of Q104 is fed back to the emitter circuit of Q103 through the treble and bass tone-control network.
TREBLE control S6, (S7) R151 to R160 (R251 to R260)	Increases or decreases the amount of negative feedback voltage by switching the filter resistors in steps. Each switch step changes the treble response approximately 2 dB at 10 kHz.
BASS control S8, (S9) R161 to R170 (R261 to R270)	Similar to the treble control except for filter components and frequency characteristics. In this circuit, negative feedback and conventional RC network (R144, C140) techniques are applied to obtain proper attenu-

Stage/Control	*Function*
	ation at low frequencies.
BASS control	Each step of this switch changes the bass response approximately 2 dB at 100 Hz.
LOW FILTER switch S10	The high-pass filter (C141 and R145) cuts out unwanted low frequency components (100 Hz and lower) from the input signal when this switch is ON. These unwanted low frequencies include rumble created by the turntable record changer, or the record itself.
HIGH FILTER S11	Eliminates unwanted high-frequency components (5 kHz and higher) from the input signal when ON.
PRE•AMP/POWER AMP switch S12	In NORMAL, the output of the tone control circuit is fed to the power amplifier's input through S12. In SEPARATE, the output of the tone control circuit is disconnected from the power amplifier's input terminal, allowing you to use the sections separately.
Preamplifier Q301	Amplifies the input signal to the level required for the following driver stage. The ac output appears across load resistor R308 (2.2 k) in the collector circuit. Emitter decoupling capacitor C302 and resistor R305 in the emitter circuit form a frequency-selective ac bypass circuit to reduce the amplifier's gain at very low frequencies.
Thermal compensation D301, D501	As all the stages are directly coupled, dc stability is required. The negative temperature coefficient of D501 provides thermal compensation for this stage, and D301 compensates the following driver stage's operation. To obtain sufficient stability, dc negative feedback via R326, R306 and R307, and ac negative feedback via R326, R305, C307 and C302 are provided.
Ac balance adj.	Q301's emitter is connected to the negative power supply through R306 and R307 (ac balance adj.). To obtain the minimum harmonic distortion, R307 is adjusted to set the output terminal at zero volt dc.
Predriver Q302	Though this stage is a conventional flat amplifier, it determines the output voltage swings because the following stages are basically in the emitter-follower configuration. The ac load resistor for this stage is R313. C304 forms a bypass circuit around Q303 to drive Q304 effectively.
Dc bias adj. (idling current) Q303, R310	Q303 is forced to conduct and operates as a small resistance providing the necessary forward bias on the two cascaded emitter-followers. R310 controls the base bias of Q303, determining the impedance between the emitter and collector of Q303, and thereby controls the dc bias voltage for the following complementary circuit.
Thermal compensator for dc bias D302	The negative temperature coefficient of D302 provides thermal compensation for the complementary and power transistor circuits. D302 is attached to the power transistor's heat sink to detect heat increases in the power transistors.
Driver Q304, Q305 (Complementary circuit)	These transistors operate as emitter-followers to provide the current swings demanded of the output stages and also proivde the necessary phase inversion. Phase inversion is performed by using PNP and NPN type transistors. Resistors R318 and R315 in the collector circuit limit the maximum current flow (which occurs when the output is

Stage/Control	*Function*
	shorted) to protect the transistors from destruction.
Power transistor Q306, Q307	The output transistors (Q306 and Q307) are connected directly to a power supply of about ±40V potential. Q306 supplies power to the load during the positive half cycle and Q307 operates during the negative half cycle. As a result, the large coupling capacitor at the output (which may cause power loss or distortion at low frequencies) is eliminated.
R321, R322	R321 and R322 (0.5Ω) are inserted in the output circuit of the power transistors to avoid nonlinear distortion and improve stability.
Heat-sensitive overload protection circuit Q503, Q504	To protect overloaded power transistors from destruction, a heat-sensitive protection circuit is employed. It operates as follows: Under normal conditions, voltage dividers consisting of resistors and posistors (resistors having a positive temperature coefficient) are arranged to place nearly zero bias on Q504, thereby cutting it off. Though the collector of Q504 is directly coupled to the base of Q502 (ripple filter), it has no effect upon Q502's operation. The same is true of Q503, which is connected to the base of Q501 (ripple filter) except for its bias circuit. The base of Q503 is connected to the positive and negative ripple filter output through R513 (10k) and R512 (10k) respectively. This places nearly zero bias upon Q501, and cuts it off. In the event of a short circuit at the output terminals or a thermal runaway, excessive current flows in the power transistors (for the amount of drive voltage supplied), causing the power transistors to overheat. The heat caused by excessive dissipation at the collectors of the power transistors is sensed by the posistor attached to the transistors. These posistors have a positive temperature coefficient so the heat causes their resistance to increase at some specified temperature. This places forward bias voltage on Q504. The two posistors are arranged as an OR gate, so a malfunction in either channel will be detected. Q504's turnon turns off Q502, thereby reducing the negative supply voltage. This also makes the positive supply voltage decrease because the reduction of negative supply voltage increases the positive bias voltage upon Q503, forcing it into conduction. As a result, Q501 turns off, cutting off all power to the driver stages. Now the driver stages cannot drive the power transistors despite an input signal. Since the output transistors are operated close to class B, the absence of drive reduces their collector current to practically zero.
Power Supply Rectifier D504	A full-wave bridge rectifier provides a positive and a negative dc power supply for the power amplifier.
Rectifier D502	A half-wave rectifier (D502) and ripple filter (C513, R510, C505) supply well-filtered dc power to the preamplifier section of the TA-1144.
Ripple filter Q501, Q502 R506, R507 C515, C516, C517, C518	These components reduce the ripple voltages in the dc power supply for the preamplifier and predriver stages of the power amplifier section to an extremely-low value. Q501 and Q502 serve as an electronic filter to supply well filtered dc of about ±33.6V to

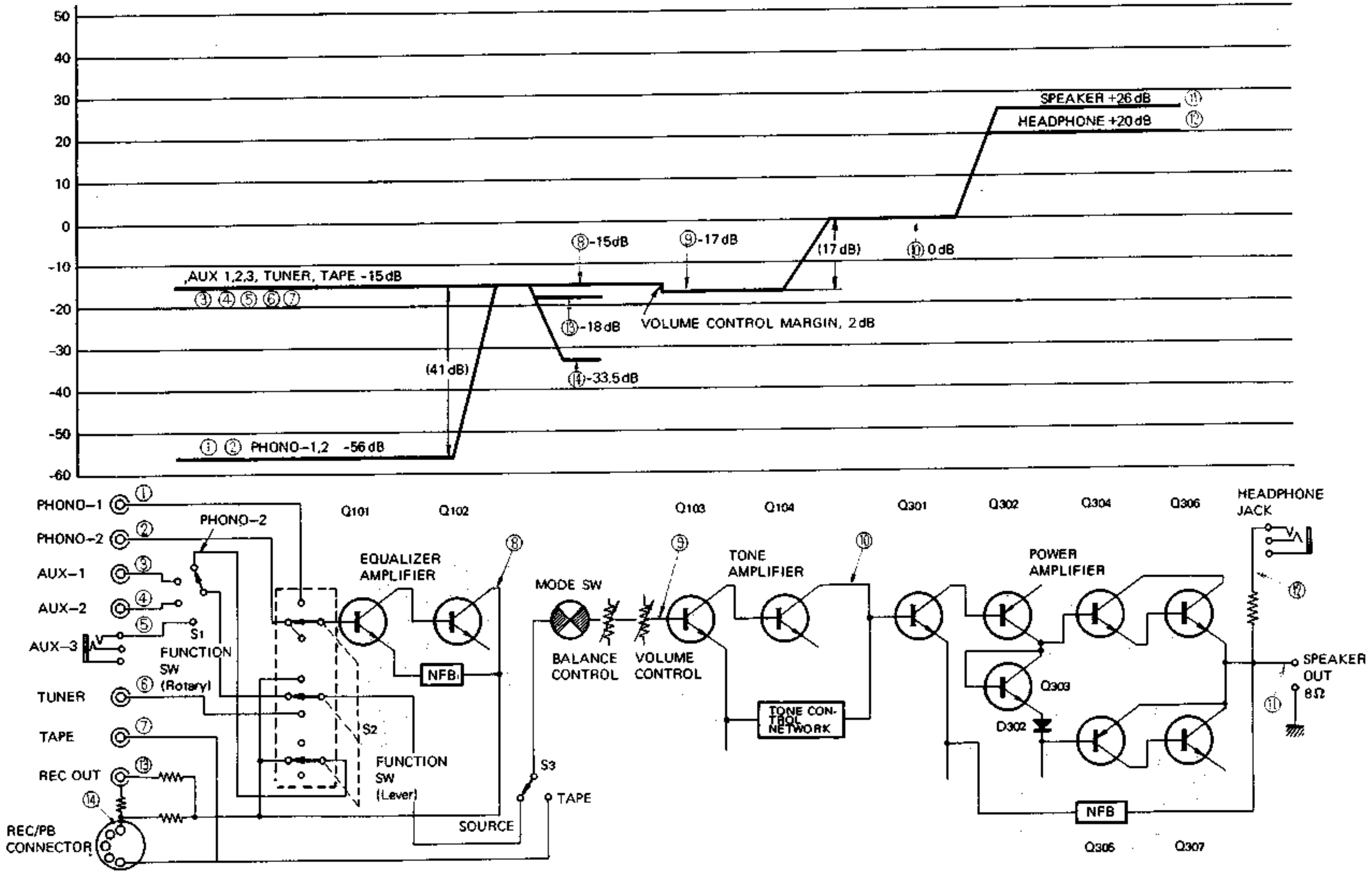
Stage/Control	*Function*
	each stage. The ripple filters also serve as a muting circuit and are part of the overload protection circuit.
Muting circuit	"Popping" noise due to initial charging current flow to the electrolytic capacitor in the emitter circuit of Q301 is relatively small. R506 and C516 (R507 and C515) comprise an RC network with a long time constant. This eliminates popping because Q501 and Q502 are brought into conduction gradually when the POWER switch is turned on.

1-3. BLOCK DIAGRAM



1-4. LEVEL DIAGRAM

Note: Signal voltages are measured with VTVM and expressed in dB referred to 0.775V, 1 kHz.



SECTION 2
DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

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

2-1. TOOLS REQUIRED

The following tools are required to perform disassembly and replacement procedures on the TA-1144.

Screwdriver, Phillips-head
Electric drill and bits
Screwdriver, 3 mm (⅛") blade
Tape, electrical
Wrench, adjustable
Diagonal cutters
Pliers, long-nose
Pliers, gripping
Soldering iron, 40 to 150W
Silicone grease
Solder, rosin core
Prick punch
Cement solvent

2-2. HARDWARE IDENTIFICATION GUIDE

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

Note: All screws in the TA-1144 are manufactured to the specifications of 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. The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

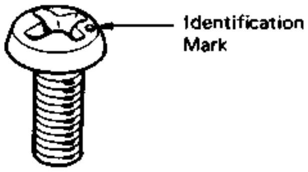
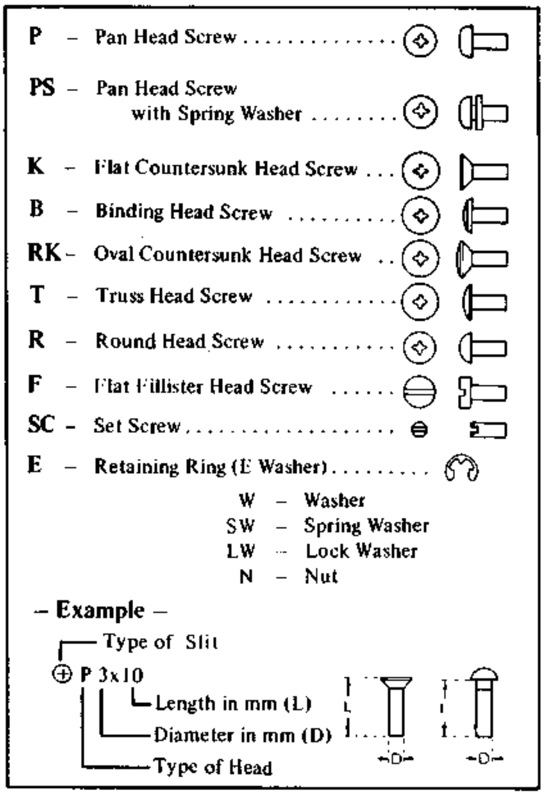


Fig. 2-1 ISO screw

— Hardware Nomenclature —



P	–	Pan Head Screw
PS	–	Pan Head Screw with Spring Washer
K	–	Flat Countersunk Head Screw
B	–	Binding Head Screw
RK	–	Oval Countersunk Head Screw
T	–	Truss Head Screw
R	–	Round Head Screw
F	–	Flat Fillister Head Screw
SC	–	Set Screw
E	–	Retaining Ring (E Washer)

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

⊕ P 3x10
Type of Slit
Length in mm (L)
Diameter in mm (D)
Type of Head

2-3. TOP COVER REMOVAL

Remove the the two machine screws at each side of the amplifier, and lift off the top cover.

2-4. FRONT PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the all control knobs by simply pulling them off.
3. Remove the three ornamental rings by loosening the hex-nuts securing them to the front panel as shown in Fig. 2-2.
4. Remove the three screws (⊕PS 4x6) behind the top edge of the front subchassis assembly, as shown in Fig. 2-3.
5. Remove the two screws (⊕P 3x6) from the front bottom edge of the amplifier securing the front panel to the front subchassis, as shown in Fig. 2-4. This frees the front panel.

2-5. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the four self-tapping screws (⊕P 3x6) securing the rear panel to the bottom plate, as shown in Fig. 2-4. This frees the rear panel.

2-6. PILOT LAMP REPLACEMENT

1. Remove the top cover as described in Procedure 2-3.
2. Straighten the tab of the pilot-lamp holder to permit the removal of the lamp socket; then pull out the lamp socket. See Fig. 2-3.
3. Unscrew the lamp and remove the plastic tube and then install the replacement lamp.

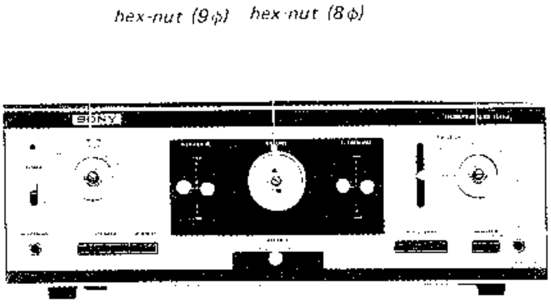


Fig. 2-2 Hex-nut removal

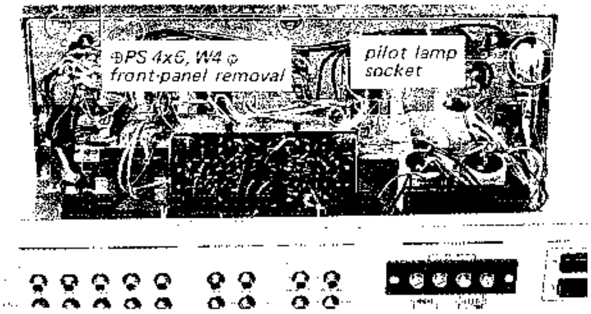


Fig. 2-3 Front-panel removel (1)

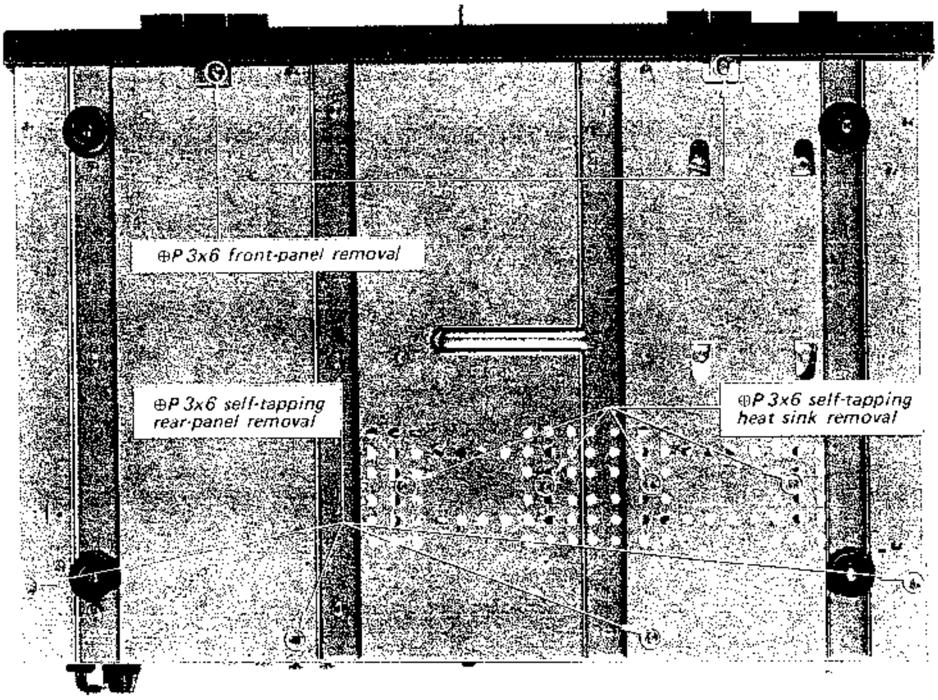


Fig. 2-4 Bottom view

2-7. CONTROL AND SWITCH REPLACEMENT

Note: The SPEAKER and LOUDNESS switches are mounted on one circuit board. The same is true for the FILTER and MONITOR switches, and for each TONE control. When replacing any of the abovementioned controls or switches, replace the whole circuit board for quick service. See boards listed below.

SERVICE SPARE PARTS LIST

Part No.	Description
98-2555-01	FILTER/MONITOR switch board
98-2555-02	SPEAKER/LOUDNESS switch board
98-2555-03	TONE (TREBLE) control board
98-2555-04	TONE (BASS) control board

Preparation

Remove the front panel as described in Procedure 2-4.

POWER Switch, FUNCTION Lever and TONE Controls

1. Remove the screws (⊕PSW3x6) securing the switch or control to the front subchassis as shown in Fig. 2-5.
2. Unsolder the leads or components from the switch or control lugs, then solder them to a new one.
3. Install the new switch or control.

MODE or Rotary FUNCTION Switch, and VOLUME control

1. Apply a drop of cement solvent to the plastic ring spacer and wait a few seconds for the cement to dissolve, then pry out the spacer with a screw driver.
2. Remove the hex nut securing the switch or control to the front subchassis.
3. Unsolder the lead wires from the switch or control lugs one by one. Solder them to a new switch, then install it.

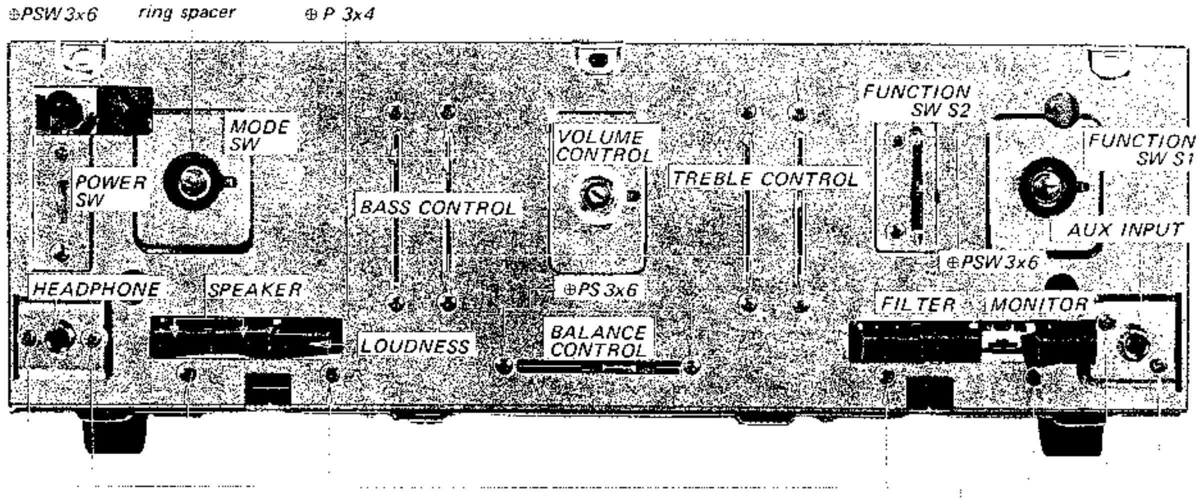


Fig. 2-5 Control and switch replacement

SPEAKER/LOUDNESS and FILTER/MONITOR switch boards

1. Pull off the push buttons. If necessary, cover the buttons with tape and use pliers to pull them off. Take care not to scratch the buttons.
2. Remove the two screws (⊕PS3x6) securing the printed circuit board to the front subchassis. See Fig. 2-5.
3. Remove the self-tapping screw (⊕P 3x6) securing electrolytic capacitor C505 (Fig. 2-6) to the bottom plate, if necessary, then remove the capacitor.
4. Unsolder the lead wires from the printed circuit board and solder them to the new one.
5. Remove the defective switch board and install the replacement.

BALANCE Control

1. Remove the preamplifier board by loosening the four screws (⊕PS 3x6) securing it to its mounting bracket. See Fig. 2-6.
2. Remove the two screws (⊕PS 3x6) securing the control to the front subchassis as shown in Fig. 2-5.
3. Unsolder the leads from the control, then solder them to a new one.
4. Install the replacement BALANCE control.

2-8. POWER TRANSISTOR REPLACEMENT

1. Remove the top cover as described in Procedure 2-3.
2. Remove the two self-tapping screws (⊕P 3x6) securing the heat sink to the bottom plate as shown in Fig. 2-4.
3. Cut the emitter and base leads of the defective power transistor with a diagonal cutter.
4. Remove the two screws (⊕P 3x12) and nuts securing the power transistor to the heat sink, then install a new transistor. See Fig. 2-7.
5. When replacing the power transistor, apply a coating of silicone grease to both sides of the insulating mica washer.
   Any excess grease, squeezed out when the mounting bolts are tightened, should be wiped off with a clean cloth. This prevents the grease from accumulating conductive dust particles that might eventually cause a short.

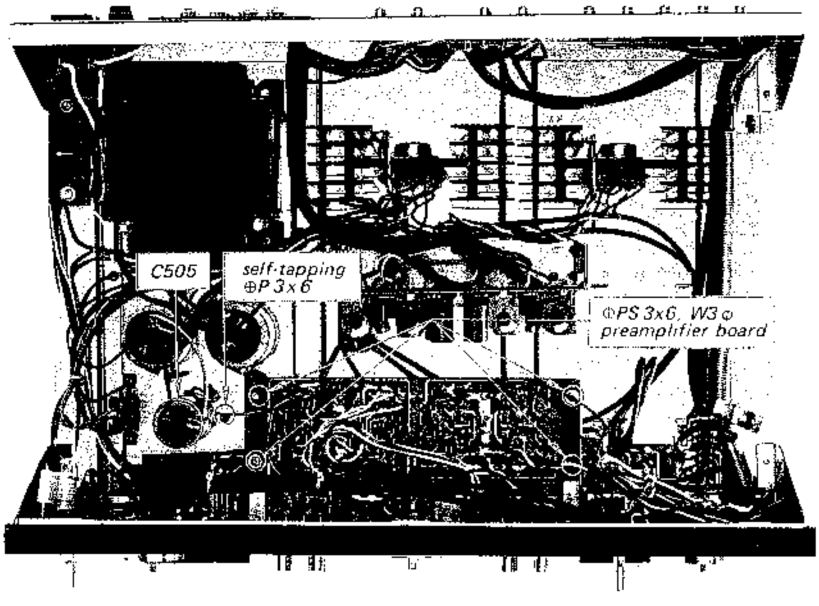


Fig. 2-6 C505 removal and preamplifier removal

2-9. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY RIVETS

1. Remove the rear panel as described in Procedure 2-5.
2. Bore out the rivet using a drill bit slightly larger in diameter than the rivet as shown in Fig. 2-8.
3. When the peened end is bored away, punch out the remainder of the rivet with a nail set or prick punch.
4. Remove the defective component, and then install a new one.
5. Secure the new component with a suitable screw and nut or a repair rivet screw (part number 3-701-402).

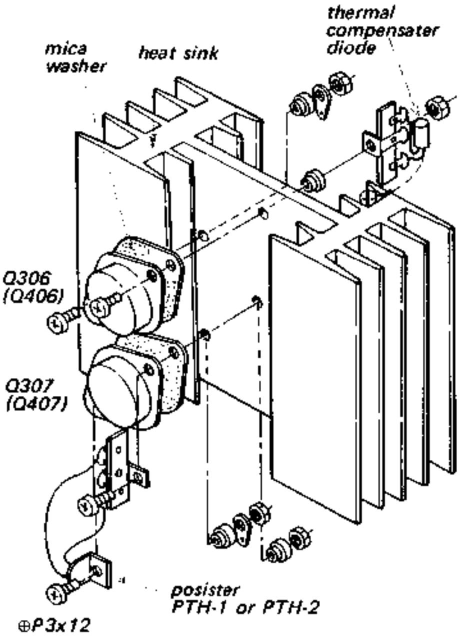


Fig. 2-7 Power transistor replacement

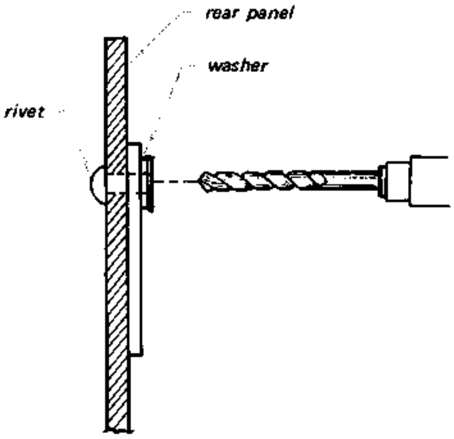
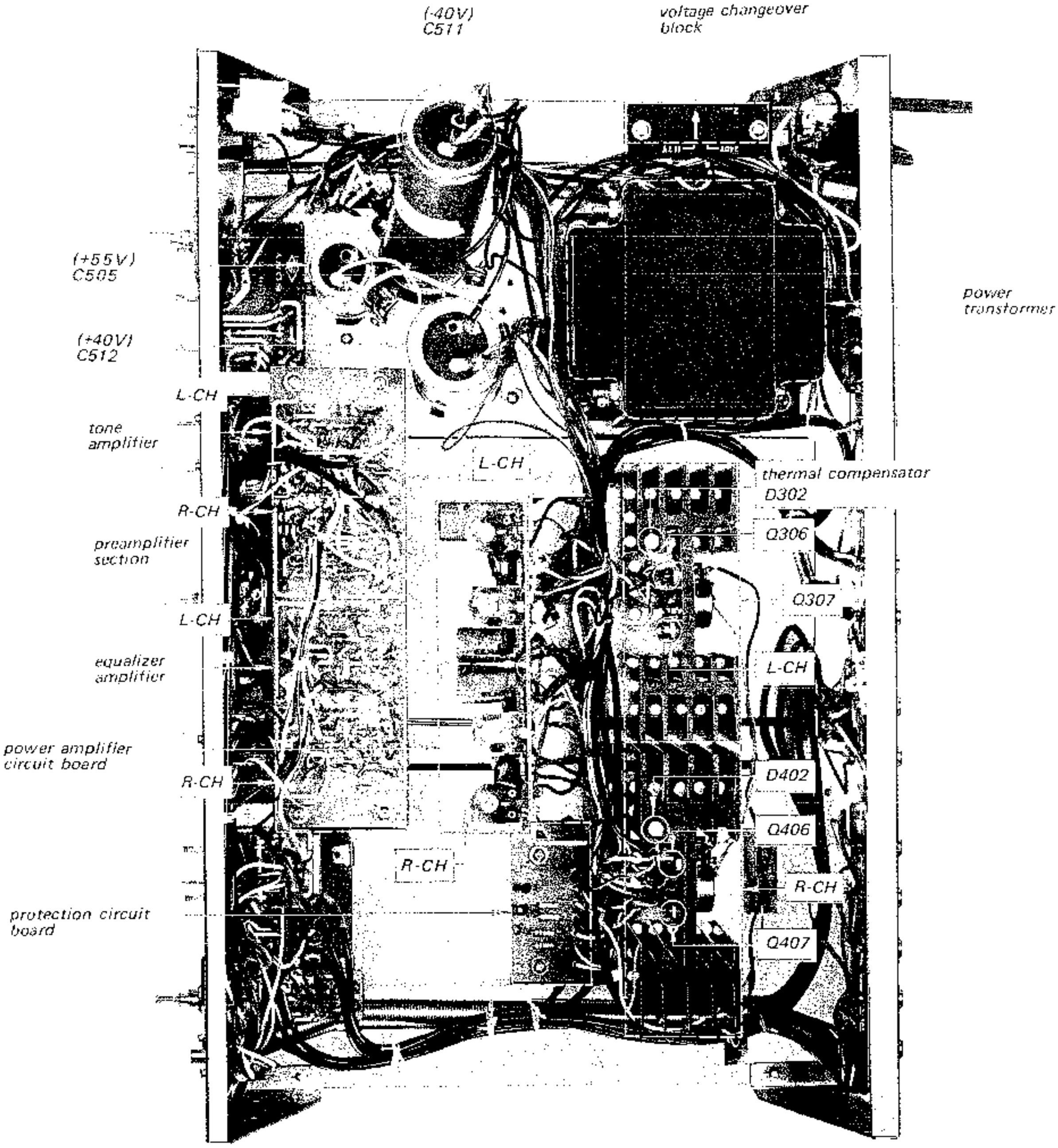


Fig. 2-8 Rivet replacement

2-10. CHASSIS LAYOUT



SECTION 3

ADJUSTMENT

Note: There are two adjustments in the power amplifier, a dc-bias adjustment and an ac-balance adjustment. These adjustments should be alternately repeated two or three times after replacing any of the power transistors until the best operation is obtained.

3-1. 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 resistors R321 and R322 (or R421 and R422) as shown in Fig. 3-1. Check to see that the reading does not exceed 50 mV. If it does, turn off the power immediately, then check and repair the trouble in the power-amplifier board.

Test Equipment Required

1. Dc millivoltmeter
2. Variable transformer
3. Screwdriver with 3 mm (1/8") blade

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Connect the dc millivoltmeter between R321 and R322 (R421 and R422) as shown in Fig. 3-1.

Procedure

1. Apply a drop of cement solvent to the semifixed resistors (Fig. 3-1).

2. Set the semifixed resistors as follows:

   R310 (L-CH, dc bias)..... fully counterclockwise
   R410 (R-CH, dc bias).... fully clockwise
   R307, R407 (ac balance)
   .... midposition

2. Set the variable transformer for minimum output.

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

4. Apply a drop of cement solvent to R310 (R410) then wait a few seconds for the cement to dissolve.

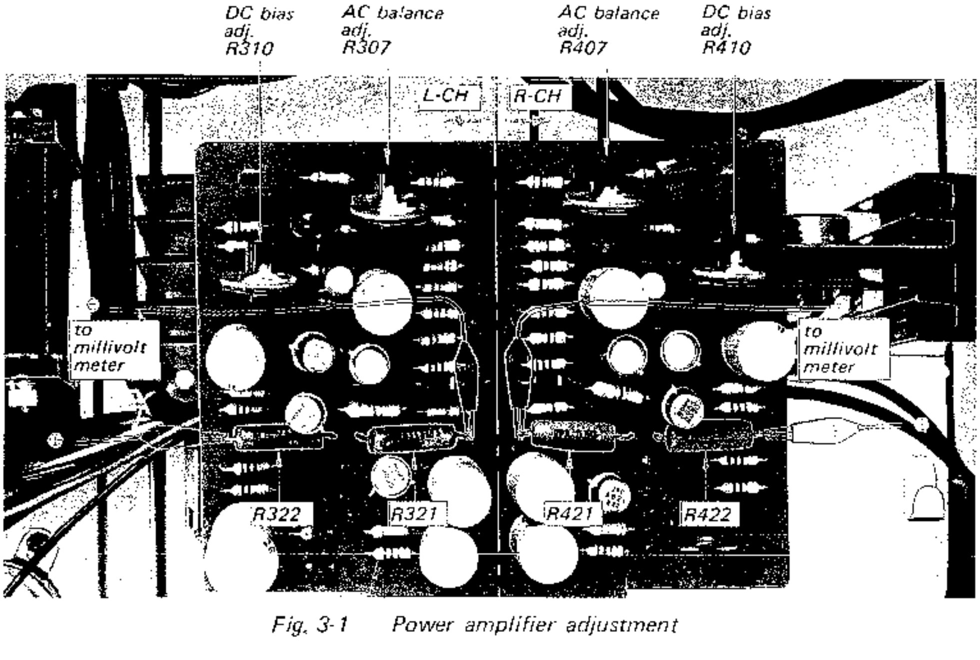


Fig. 3-1 Power amplifier adjustment

5. Adjust R310 (R410) to obtain a 50 mV reading on the meter.

3-2. AC BALANCE ADJUSTMENT

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

Test Equipment Required

1. Dc null meter or dc millivoltmeter
2. Screwdriver, with 3 mm (1/8") blade

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Set the SPEAKER switch to MAIN.
3. Connect the dc null meter or dc millivoltmeter to the MAIN speaker output terminal.

Procedure

1. Apply a drop of cement solvent to R307 (R407) and wait a few seconds for the lock paint to dissolve.
2. Turn the POWER switch to ON, and then adjust R307 (R407) to obtain a 0V reading on the meter.
3. After 10 minutes warm-up, alternately repeat this and the dc bias adjustment two or three times.
4. After completing the adjustment, apply a drop of lock paint to R310 and R307 (R410 and R407).

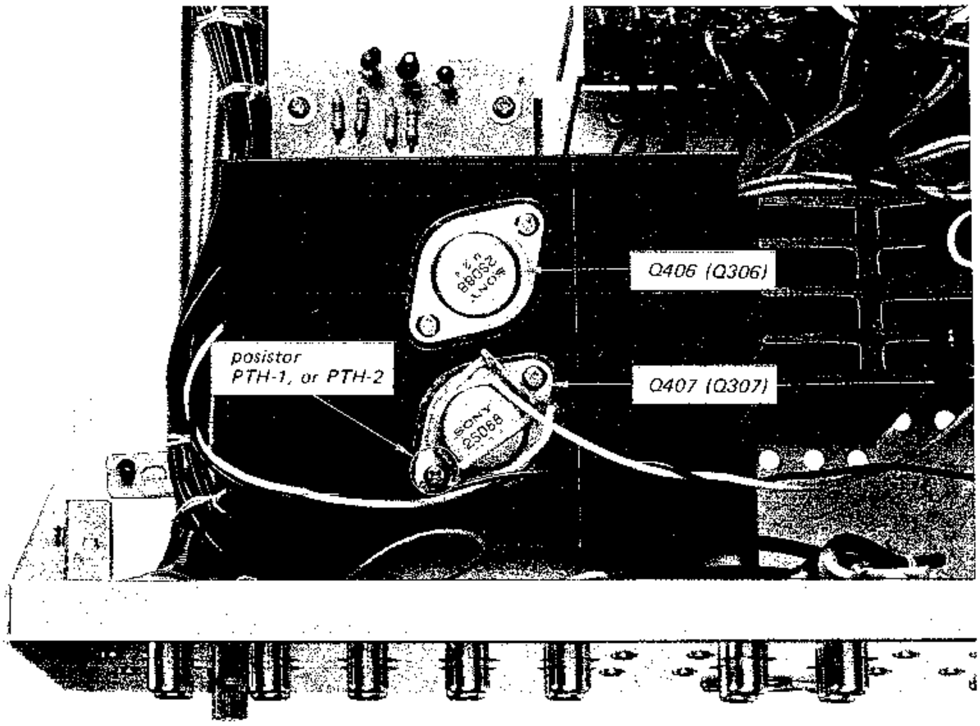


Fig. 3-2 Parts location

SECTION 4
REPACKING

The TA-1144's original shipping carton and packing material is the ideal container for shipping the unit. However, to secure the maximum protection the TA-1144 must be repacked in this material precisely as before. The proper repacking procedure is shown in Fig. 4-1.

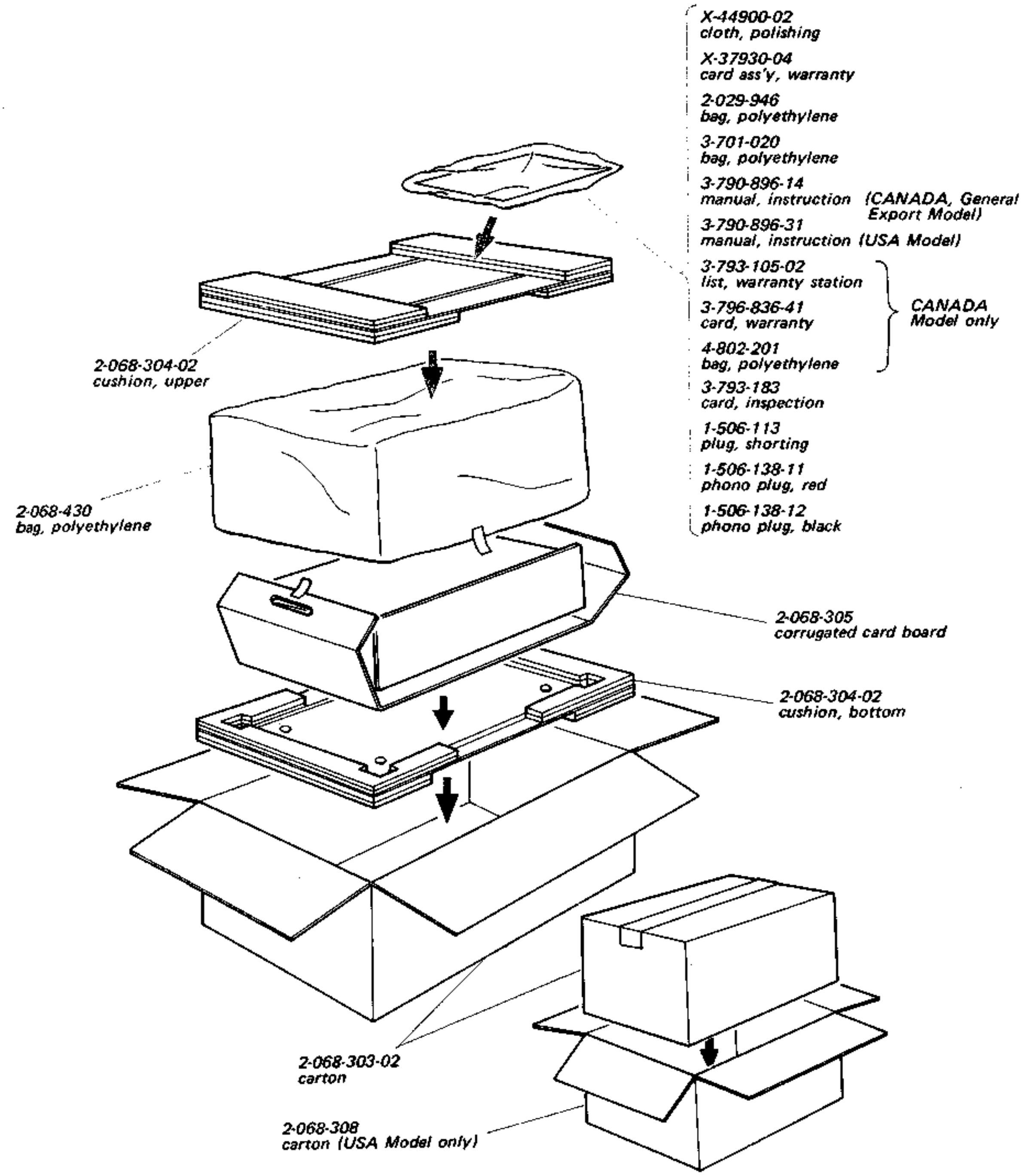


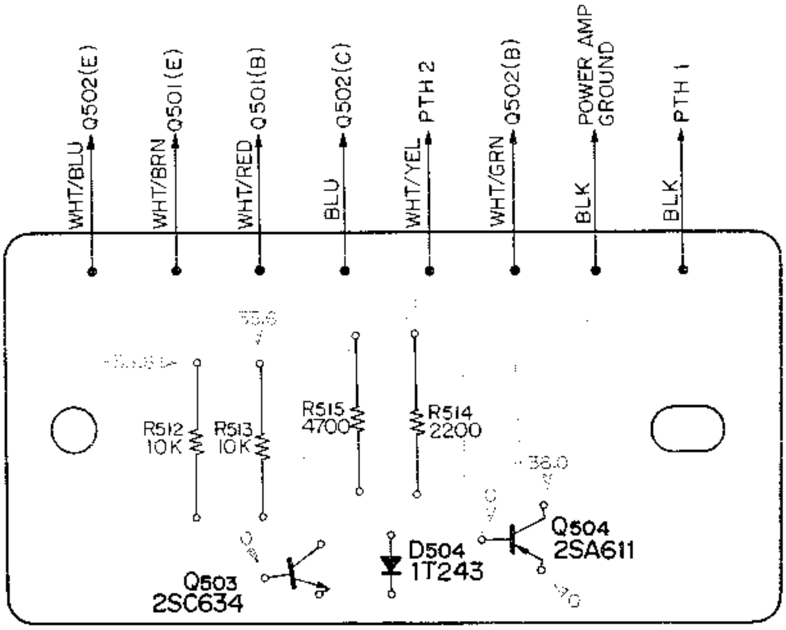
Fig. 4-1 Repacking

SECTION 5

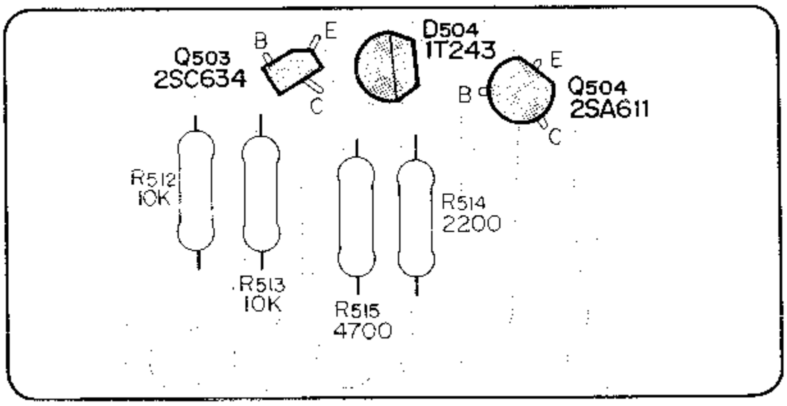
DIAGRAMS

5-1. MOUNTING DIAGRAM – Protection Circuit Board –

– Conductor Side –

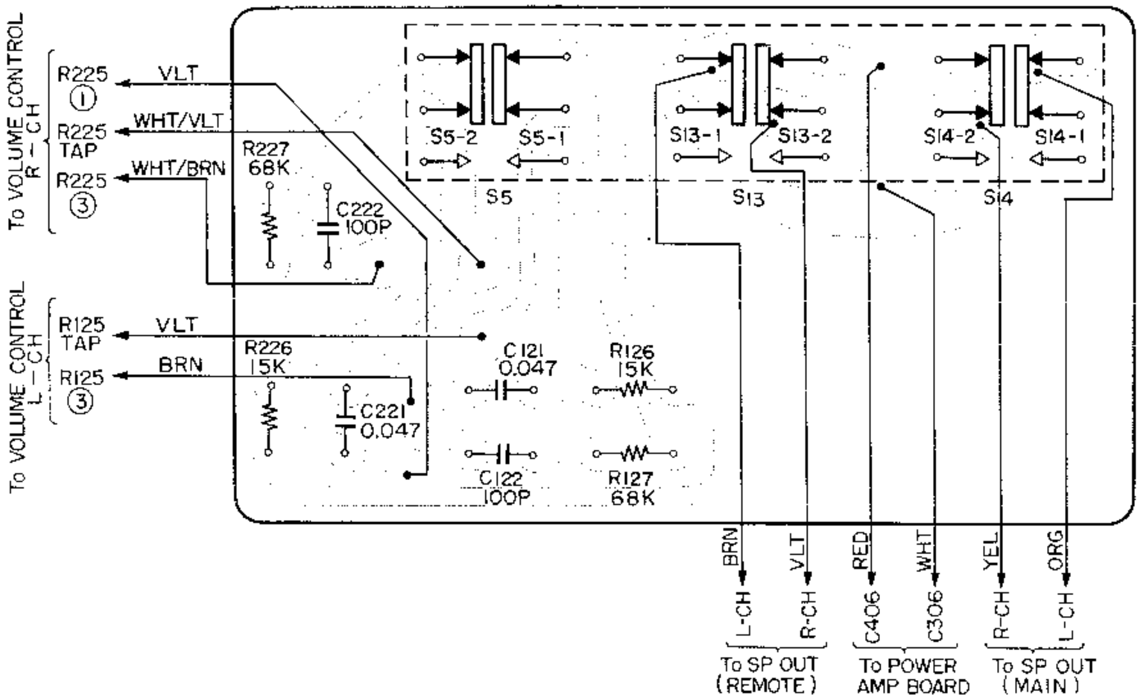


– Component Side –

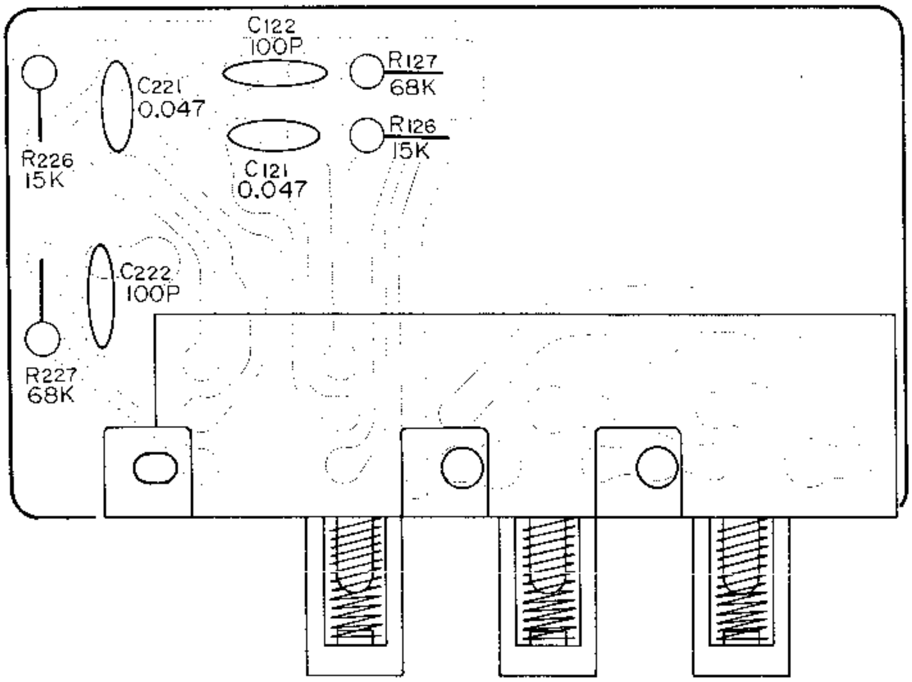


5-2. MOUNTING DIAGRAM – Speaker, Loudness Switch Board –

– Conductor Side –

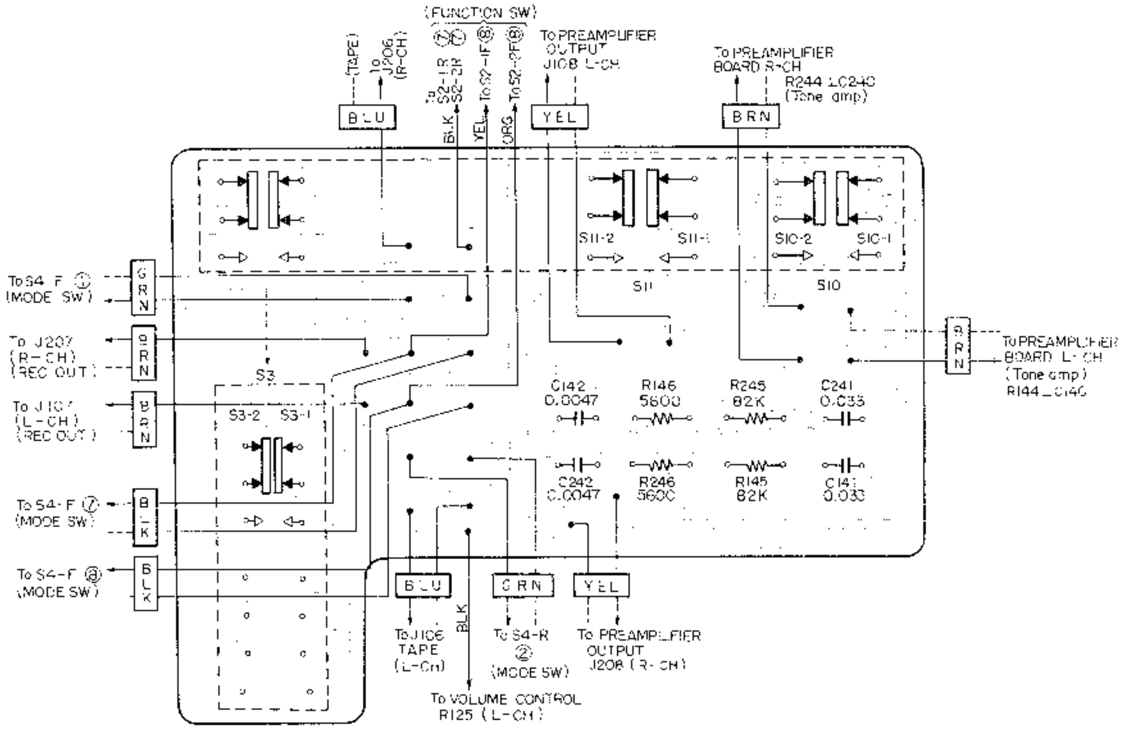


– Component Side –

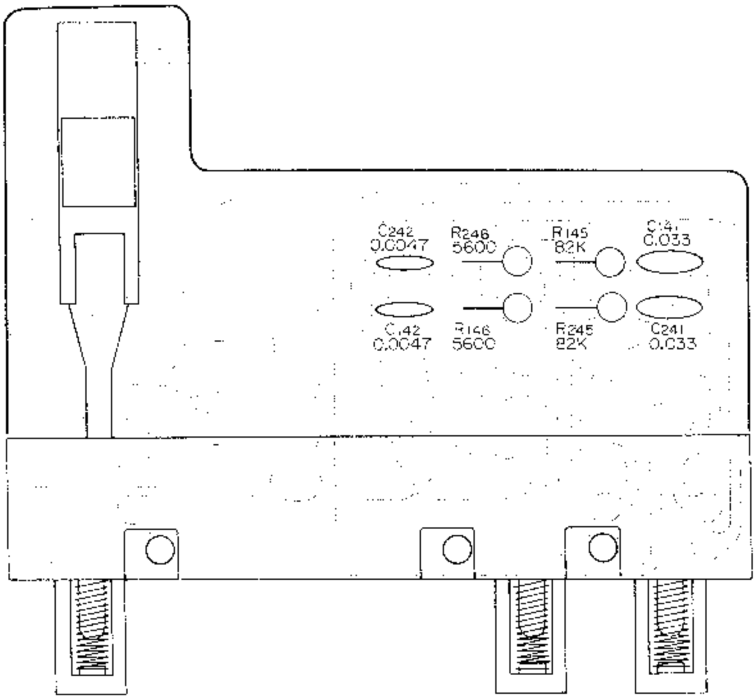


5-3. MOUNTING DIAGRAM – Filter, Monitor Switch Board –

– Conductor Side –

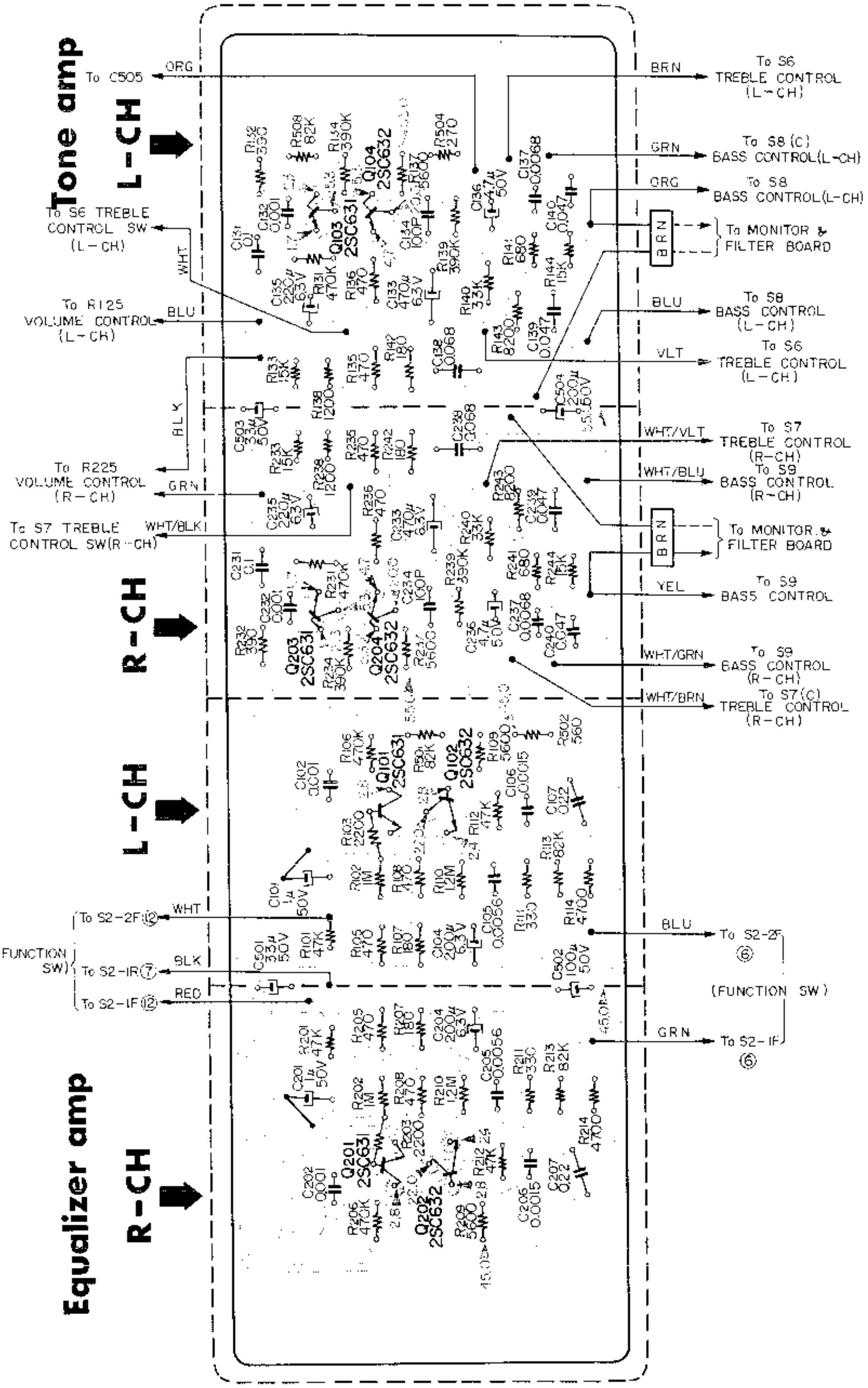


– Component Side –

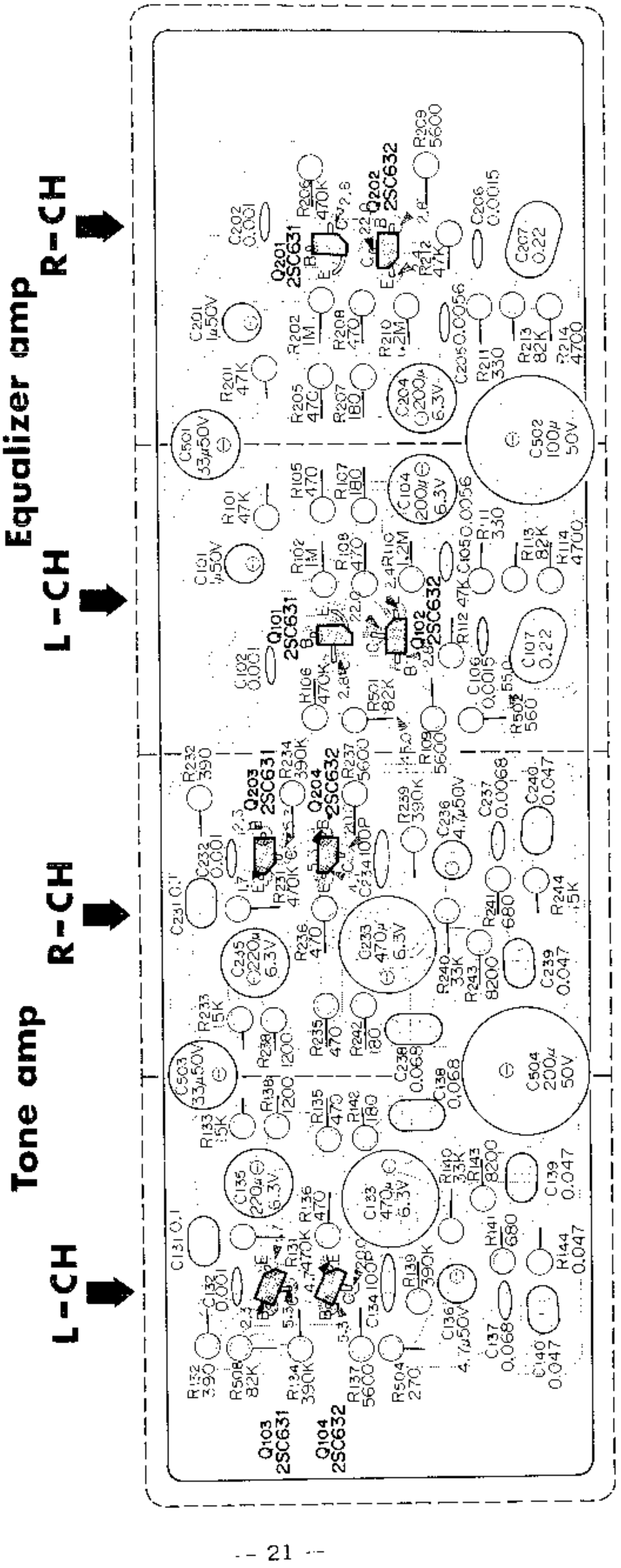


5-4. MOUNTING DIAGRAM – Preamplifier Section –

– Conductor Side –

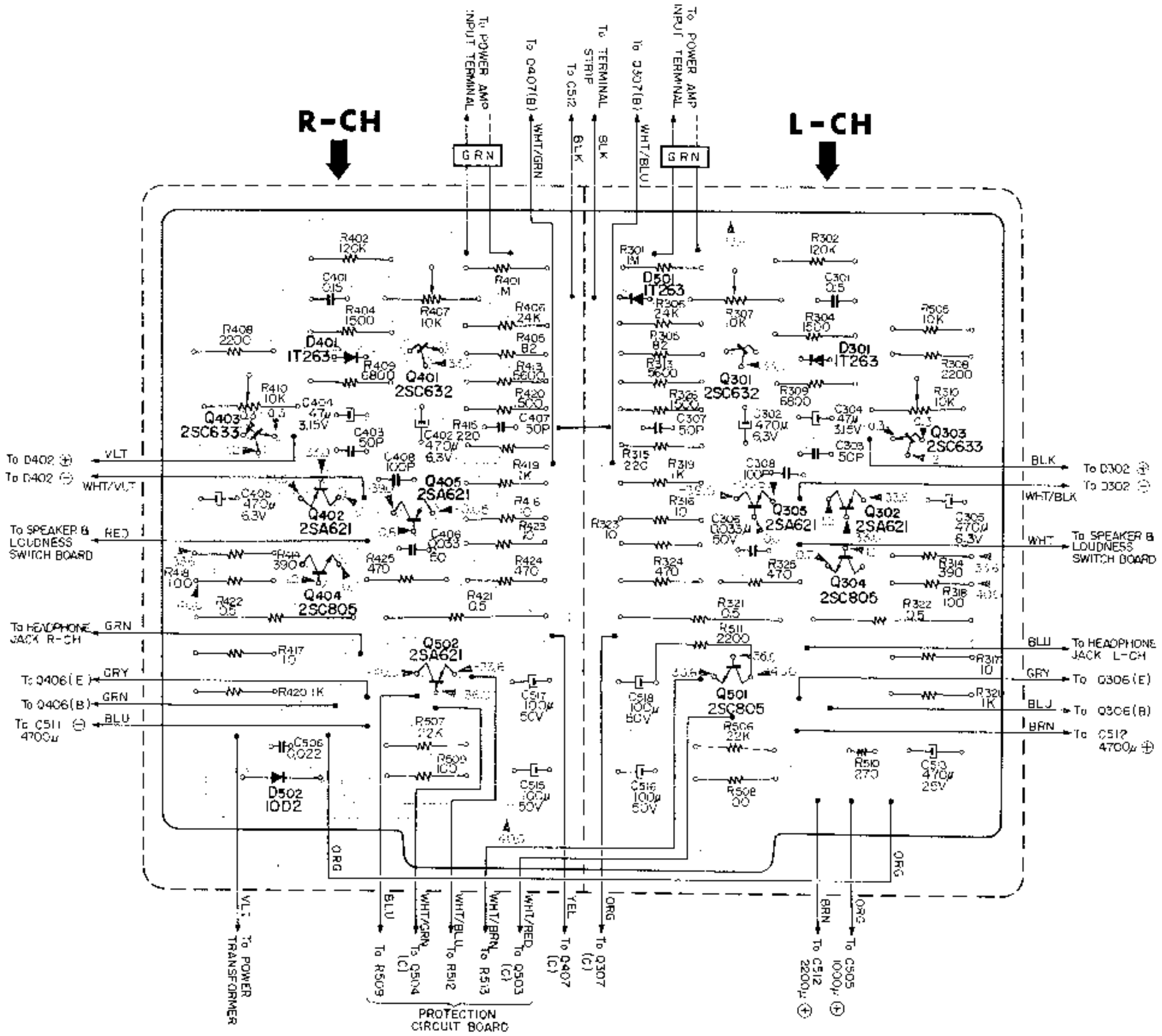


— Component Side —

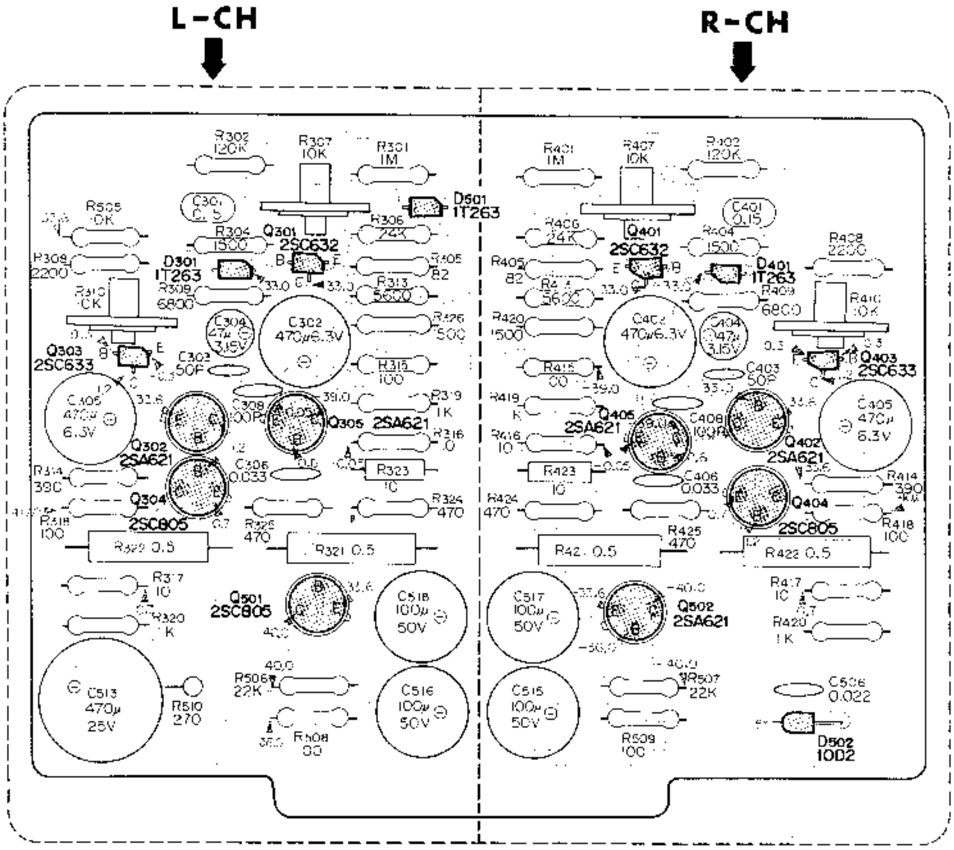


5-5. MOUNTING DIAGRAM – Power Amplifier –

– Conductor Side –

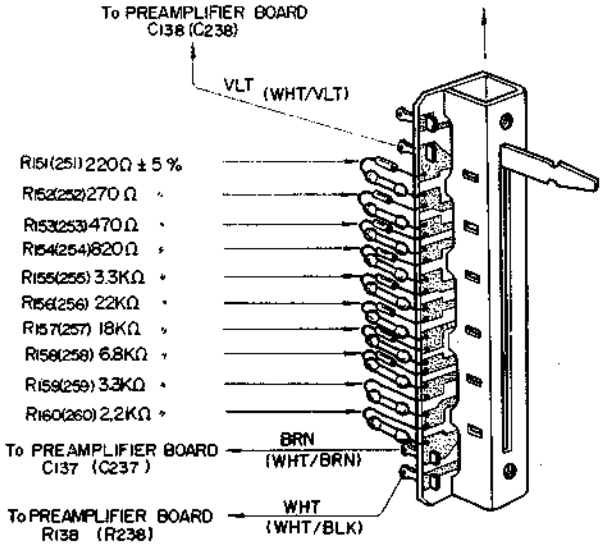


— Component Side —



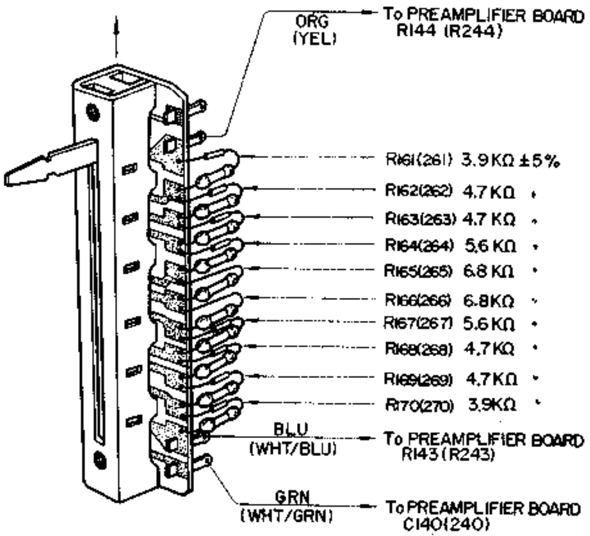
5-6. MOUNTING DIAGRAM – Tone Control Switch –

– Treble Control –



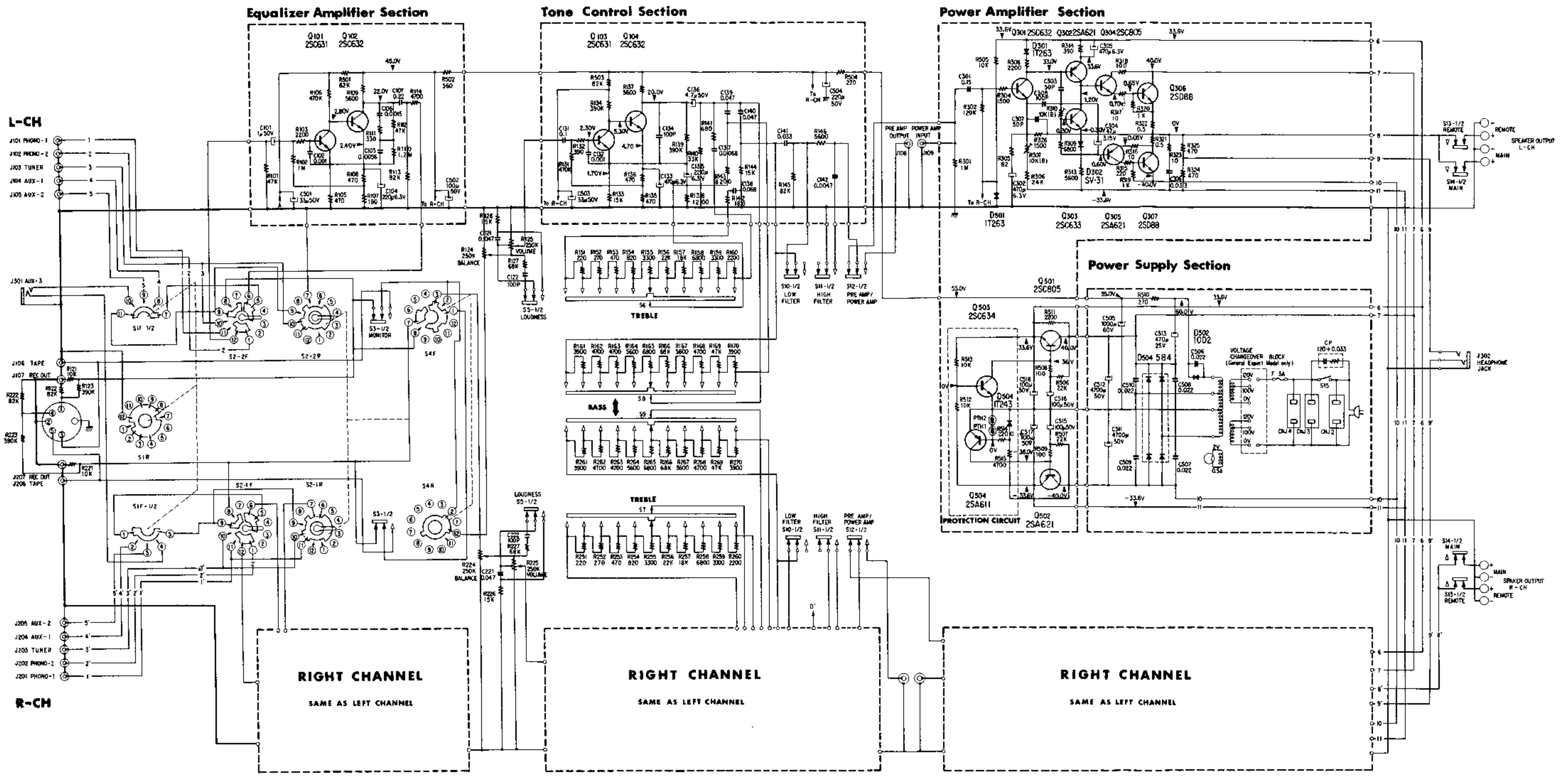
( )INDICATES RIGHT CHANNEL

– Bass Control –



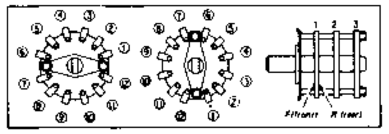
( )INDICATES RIGHT CHANNEL

SCHEMATIC DIAGRAM

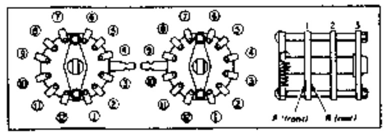


Symbol	Description	Position
S1	FUNCTION (1) [PHONO(2)-AUX(1)-AUX(2)-AUX(3)]	PHONO-2
S2	FUNCTION (2) [TUNER-FUNCTION(1)-PHONO(1)]	FUNCTION (1)
S3	MONITOR SW (TAPE-SOURCE)	SOURCE
S4	MODE SW (REVERSE-STEREO-"L+R"-"L"-"R")	STEREO
S5	LOUDNESS SW	ON
S6	TREBLE CONTROL (L-CH)	0 dB
S7	TREBLE CONTROL(R-CH)	0 dB
S8	BASS CONTROL(L-CH)	0 dB
S9	BASS CONTROL(R-CH)	0 dB
S10	LOW FILTER SW	OFF
S11	HIGH FILTER SW	OFF
S12	PRE/POWER AMP SW (NORMAL-SEPARATE)	NORMAL
S13	REMOTE SPEAKER SW	ON
S14	MAIN SPEAKER SW	ON
S15	POWER SW	OFF

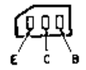
ROTARY SWITCH INDEX



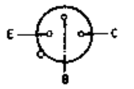
LEVER SWITCH INDEX



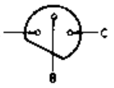
2SC631
2SC632
2SC634



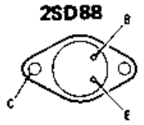
2SC805
2SA621



2SA611



2SD88



Note:

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

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 20 k ohms/volt. No signal in.

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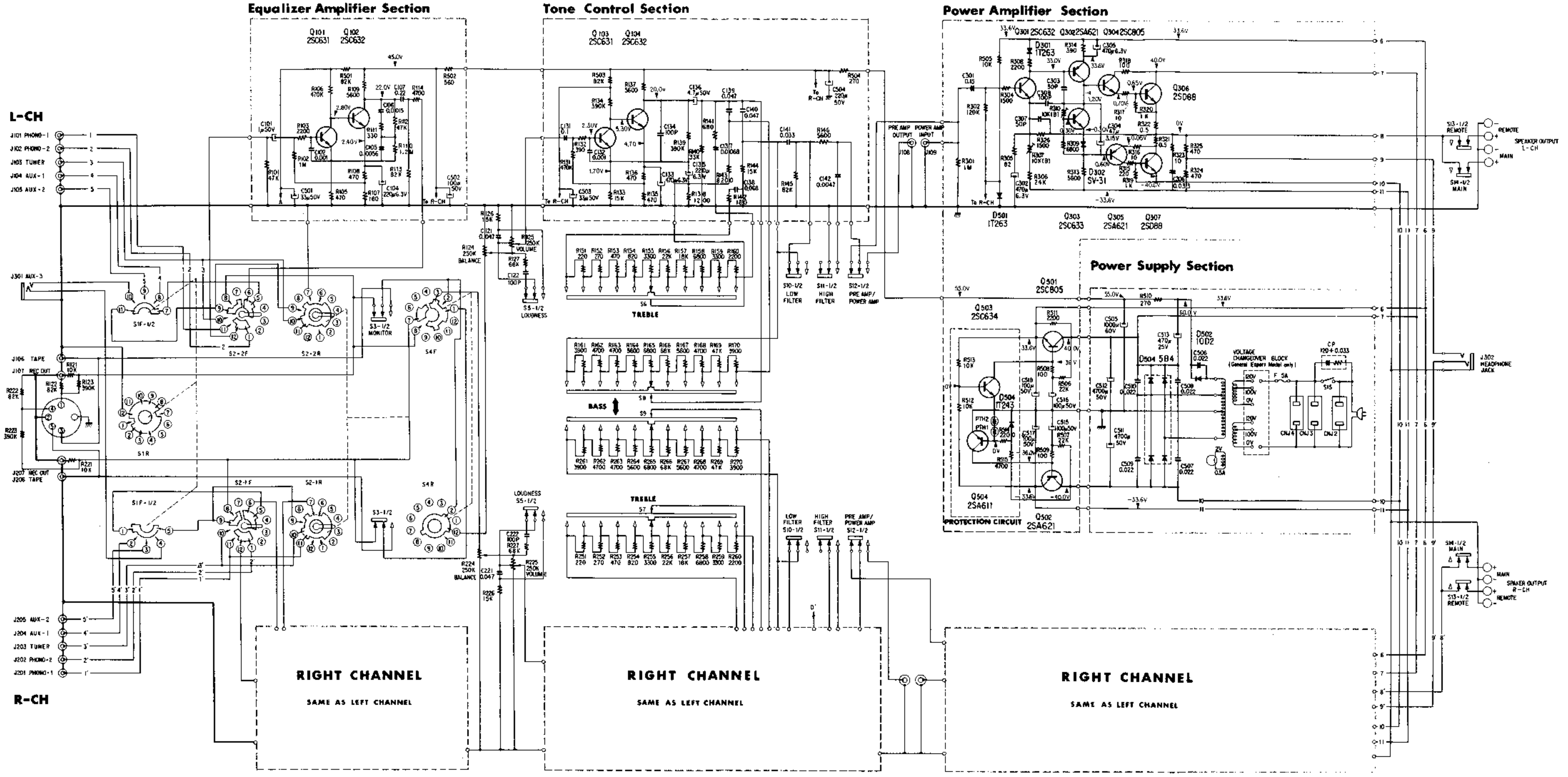
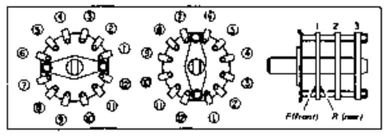
5-7. SCHEMATIC DIAGRAM

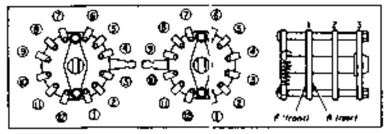


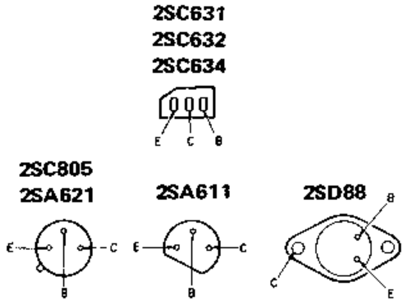
Symbol	Description	Position
S1	FUNCTION (1) [PHONO(2)-AUX(1)-AUX(2)-AUX(3)]	PHONO-2
S2	FUNCTION (2) [TUNER-FUNCTION(1)-PHONO(1)]	FUNCTION (1)
S3	MONITOR SW (TAPE-SOURCE)	SOURCE
S4	MODE SW (REVERSE-STEREO-"L+R"-"L"-"R")	STEREO
S5	LOUDNESS SW	ON
S6	TREBLE CONTROL (L-CH)	0 dB
S7	TREBLE CONTROL(R-CH)	0 dB
S8	BASS CONTROL(L-CH)	0 dB
S9	BASS CONTROL(R-CH)	0 dB
S10	LOW FILTER SW	OFF
S11	HIGH FILTER SW	OFF
S12	PRE/POWER AMP SW (NORMAL-SEPARATE)	NORMAL
S13	REMOTE SPEAKER SW	ON
S14	MAIN SPEAKER SW	ON
S15	POWER SW	OFF

ROTARY SWITCH INDEX



LEVER SWITCH INDEX





Note:

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

All capacitance values are in μF except as indicated with p, which means $\mu\mu F$.

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 20 k ohms/volt. No signal in.

SONY

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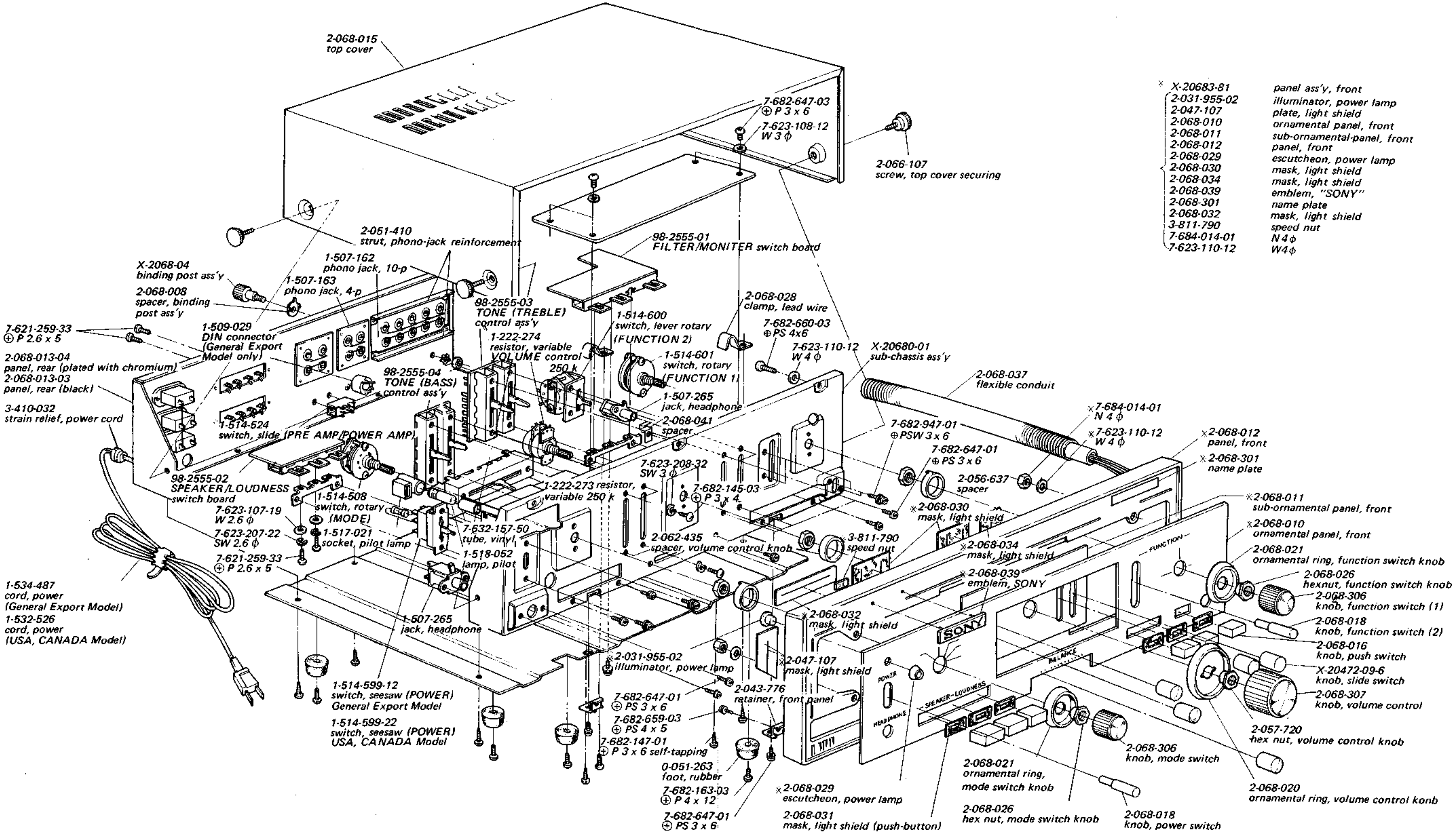
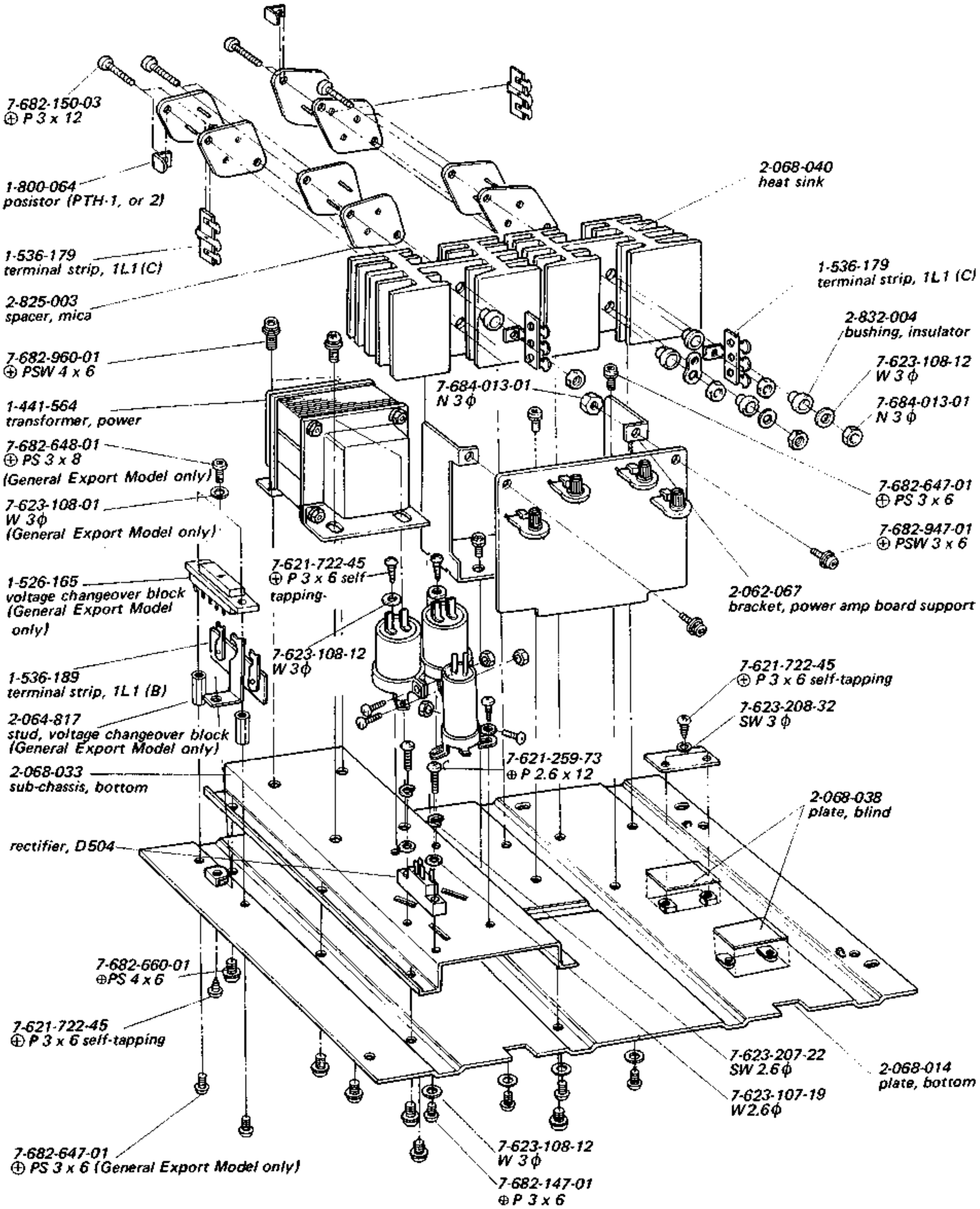
SECTION 6

EXPLODED VIEW



× X-20683-81	panel ass'y, front
2-031-955-02	illuminator, power lamp
2-047-107	plate, light shield
2-068-010	ornamental panel, front
2-068-011	sub-ornamental-panel, front
2-068-012	panel, front
2-068-029	escutcheon, power lamp
2-068-030	mask, light shield
2-068-034	mask, light shield
2-068-039	emblem, "SONY"
2-068-301	name plate
2-068-032	mask, light shield
3-811-790	speed nut
7-684-014-01	N 4ϕ
7-623-110-12	W4ϕ


7-682-150-03
⊕ P 3 x 12
1-800-064
posistor (PTH-1, or 2)
1-536-179
terminal strip, 1L1 (C)
2-825-003
spacer, mica
7-682-960-01
⊕ PSW 4 x 6
1-441-564
transformer, power
7-682-648-01
⊕ PS 3 x 8
(General Export Model only)
7-623-108-01
W 3ϕ
(General Export Model only)
1-526-165
voltage changeover block
(General Export Model
only)
1-536-189
terminal strip, 1L1 (B)
2-064-817
stud, voltage changeover block
(General Export Model only)
2-068-033
sub-chassis, bottom
rectifier, D504
7-682-660-01
⊕PS 4 x 6
7-621-722-45
⊕ P 3 x 6 self-tapping
7-682-647-01
⊕ PS 3 x 6 (General Export Model only)
7-621-722-45
⊕ P 3 x 6 self-
tapping
7-623-108-12
W 3ϕ
7-684-013-01
N 3ϕ
2-068-040
heat sink
1-536-179
terminal strip, 1L1 (C)
2-832-004
bushing, insulator
7-623-108-12
W 3 ϕ
7-684-013-01
N 3 ϕ
7-682-647-01
⊕ PS 3 x 6
7-682-947-01
⊕ PSW 3 x 6
2-062-067
bracket, power amp board support
7-621-722-45
⊕ P 3 x 6 self-tapping
7-623-208-32
SW 3 ϕ
7-621-259-73
⊕ P 2.6 x 12
2-068-038
plate, blind
7-623-207-22
SW 2.6ϕ
7-623-107-19
W2.6ϕ
2-068-014
plate, bottom
7-623-108-12
W 3 ϕ
7-682-147-01
⊕ P 3 x 6

SECTION 7
ELECTRICAL PARTS LIST

MOUNTED CIRCUIT BOARDS

Ref. No.	*Part No.*	*Description*
	98-2555-01	FILTER/MONITOR switch board
	98-2555-02	SPEAKER/LOUDNESS switch board
	98-2555-03	TONE (TREBLE) control ass'y
	98-2555-04	TONE (BASS) control ass'y
	98-2555-21	pre-amplifier circuit board
	98-2555-22	power amplifier circuit board
	X-20680-27	protection circuit board

SEMICONDUCTORS

Ref. No.	*Part No.*	*Description*	
D301(D401)		diode	1T263
D302(D402)		diode	SV31
D501		diode	1T263
D502		diode	10D2
D503		diode	5B4
D504		diode	1T243M
Q101(Q201)		transistor	2SC631
Q102(Q202)		transistor	2SC632
Q103(Q203)		transistor	2SC631
Q104(Q204)		transistor	2SC632
Q301(Q401)		transistor	2SC632
Q302(Q402)		transistor	2SA621
Q303(Q403)		transistor	2SC633
Q304(Q404)		transistor	2SC805
Q305(Q405)		transistor	2SA621
Q306(Q406)		transistor	2SD88
Q307(Q407)		transistor	2SD88
Q501		transistor	2SC805
Q502		transistor	2SA621
Q503		transistor	2SC634
Q504		transistor	2SA611
PTH1	1-800-064	posistor	SB-26
PTH2	1-800-064	posistor	SB-26

TRANSFORMER

Ref. No.	*Part No.*	*Description*
	1-441-564-14	transformer, power

CAPACITORS

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

Ref. No.	*Part No.*	*Description*			
C101(C201)	1-121-343	1	$\pm^{150}_{10}\%$	50V,	electrolytic
C102(C202)	1-105-821-12	0.001	±20%	50V,	mylar
C104(C204)	1-121-295	220	$\pm^{100}_{10}\%$	6.3V,	electrolytic
C105(C205)	1-105-510-12	0.0056	±5%	50V,	mylar
C106(C206)	1-105-503-12	0.0015	±5%	50V,	mylar
C107(C207)	1-105-689-12	0.22	±10%	50V,	mylar
C121(C221)	1-105-681-12	0.047	±10%	50V,	mylar
C122(C222)	1-107-004	100p	±10%	500V,	silvered mica
C131(C231)	1-105-685-12	0.1	±10%	50V,	mylar
C132(C232)	1-105-821-12	0.001	±20%	50V,	mylar
C133(C233)	1-121-359	470	$\pm^{100}_{10}\%$	6.3V,	electrolytic
C134(C234)	1-107-004	100p	±10%	50V,	silvered mica
C135(C235)	1-121-295	220	$\pm^{100}_{10}\%$	6.3V,	electrolytic
C136(C236)	1-121-346	4.7	$\pm^{100}_{10}\%$	50V,	electrolytic
C137(C237)	1-105-671-12	0.0068	±10%	50V,	mylar
C138(C238)	1-105-683-12	0.068	±10%	50V,	mylar
C139(C239)	1-105-681-12	0.047	±10%	50V,	mylar
C140(C240)	1-105-681-12	0.047	±10%	50V,	mylar
C141(C241)	1-105-679-12	0.033	±10%	50V,	mylar
C142(C242)	1-105-669-12	0.0047	±10%	50V,	mylar
C301(C401)	1-105-687-12	0.15	±10%	50V,	mylar
C302(C402)	1-121-359	470	$\pm^{100}_{10}\%$	6.3V,	electrolytic
C303(C403)	1-107-002	50p	±10%	50V,	silvered mica
C304(C404)	1-121-287	47	$\pm^{100}_{10}\%$	3.15V,	electrolytic
C305(C405)	1-121-359	470	$\pm^{100}_{10}\%$	6.3V,	electrolytic
C306(C406)	1-105-679-12	0.033	±10%	50V,	mylar
C307(C407)	1-107-002	50p	±10%	50V,	silvered mica
C308(C408)	1-107-004	100p	±10%	50V,	silvered mica
C501	1-121-351	33	$\pm^{100}_{10}\%$	50V,	electrolytic
C502	1-121-384	100	$\pm^{100}_{10}\%$	50V,	electrolytic
C503	1-121-351	33	$\pm^{100}_{10}\%$	50V,	electrolytic
C504	1-121-385	220	$\pm^{100}_{10}\%$	50V,	electrolytic
C505	1-121-330	1,000		60V,	electrolytic
C506	1-105-877-12	0.022	±20%	100V,	mylar
C507	1-105-877-12	0.022	±20%	100V,	mylar
C508	1-105-877-12	0.022	±20%	100V,	mylar
C509	1-105-877-12	0.022	±20%	100V,	mylar
C510	1-105-877-12	0.022	±20%	100V,	mylar
C511	1-121-800	4,700	$\pm^{100}_{10}\%$	50V,	electrolytic
C512	1-121-800	4,700	$\pm^{100}_{10}\%$	50V,	electrolytic
C513	1-121-234	470	$\pm^{100}_{10}\%$	25V,	electrolytic
C515	1-121-384	100	$\pm^{100}_{10}\%$	50V,	electrolytic
C516	1-121-384	100	$\pm^{100}_{10}\%$	50V,	electrolytic
C517	1-121-384	100	$\pm^{100}_{10}\%$	50V,	electrolytic
C518	1-121-384	100	$\pm^{100}_{10}\%$	50V,	electrolytic

RESISTORS

All resistance values are in Ω, ±5%, ¼W and
carbon type unless otherwise indicated.

Ref. No.	*Part No.*	*Description*
R101(R201)	1-242-713	47k
R102(R202)	1-242-745	1M

Ref. No.	*Part No.*	*Description*
R103(R203)	1-242-681	2.2 k
R105(R205)	1-242-665	470
R106(R206)	1-242-737	470 k
R107(R207)	1-242-655	180
R108(R208)	1-242-665	470
R109(R209)	1-242-691	5.6 k
R110(R210)	1-242-747	1.2 M
R111(R211)	1-242-661	330
R112(R212)	1-242-713	47 k
R113(R213)	1-242-719	82 k
R114(R214)	1-242-689	4.7 k
R121(R221)	1-244-697	10 k
R122(R222)	1-244-719	82 k
R123(R223)	1-244-735	390 k
R124(R224)	1-222-273	250 k, variable
R125(R225)	1-222-274	250 k, variable
R126(R226)	1-242-701	15 k
R127(R227)	1-242-717	68 k
R131(R231)	1-242-737	470 k
R132(R232)	1-242-663	390
R133(R233)	1-242-701	15 k
R134(R234)	1-242-735	390 k
R135(R235)	1-242-665	470
R136(R236)	1-242-665	470
R137(R237)	1-242-691	5.6 k
R138(R238)	1-242-675	1.2 k
R139(R239)	1-242-735	390 k
R140(R240)	1-242-709	33 k
R141(R241)	1-242-669	680
R142(R242)	1-242-655	180
R143(R243)	1-242-695	8.2 k
R144(R244)	1-242-701	15 k
R145(R245)	1-242-719	82 k
R146(R246)	1-242-691	5.6 k
R151(R251)	1-242-657	220
R152(R252)	1-242-659	270
R153(R253)	1-242-665	470
R154(R254)	1-242-671	820
R155(R255)	1-242-685	3.3 k
R156(R256)	1-242-705	22 k
R157(R257)	1-242-703	18 k
R158(R258)	1-242-693	6.8 k
R159(R259)	1-242-685	3.3 k
R160(R260)	1-242-681	2.2 k
R161(R261)	1-242-687	3.9 k
R162(R262)	1-242-689	4.7 k
R163(R263)	1-242-689	4.7 k
R164(R264)	1-242-691	5.6 k
R165(R265)	1-242-693	6.8 k
R166(R266)	1-242-693	6.8 k
R167(R267)	1-242-691	5.6 k
R168(R268)	1-242-689	4.7 k

Ref. No.	*Part No.*	*Description*
R169(R269)	1-242-689	4.7 k
R170(R270)	1-242-687	3.9 k
R301(R401)	1-244-745	1 M
R302(R402)	1-244-723	120 k
R304(R404)	1-244-677	1.5 k
R305(R405)	1-244-647	82
R306(R406)	1-244-706	24 k
R307(R407)	1-221-967	10 k (B) ±20%, semi-fixed
R308(R408)	1-244-681	2.2 k
R309(R409)	1-244-693	6.8 k
R310(R410)	1-221-967	10 k (B) ±20%, semi-fixed
R313(R413)	1-244-691	5.6 k
R314(R414)	1-244-663	390
R315(R415)	1-202-557	220
R316(R416)	1-244-625	10
R317(R417)	1-244-625	10
R318(R418)	1-244-649	100
R319(R419)	1-244-673	1 k
R320(R420)	1-244-673	1 k
R321(R421)	1-207-151	0.5 ±10% 1.5W, wire-wound
R322(R422)	1-207-151	0.5 ±10% 1.5W, wire-wound
R323(R423)	1-201-094	10 ±10% ½W, composition
R324(R424)	1-244-665	470
R325(R425)	1-201-096	470 ±10% ½W, composition
R326(R426)	1-244-677	1.5 k
R501	1-242-719	82 k
R502	1-242-667	560
R503	1-242-719	82 k
R504	1-242-659	270
R505	1-242-697	10 k
R506	1-244-705	22 k
R507	1-244-705	22 k
R508	1-244-649	100
R509	1-244-649	100
R510	1-242-659	270
R511	1-202-581	2.2 k
R512	1-244-697	10 k
R513	1-244-681	2.2 k
R514	1-244-689	4.7 k

SWITCHES

S1	1-514-601	switch, rotary (FUNCTION 1)
S2	1-514-600	switch, rotary (FUNCTION 2)
S3	1-514-598	switch, slide (MONITOR)
S4	1-514-508	switch, rotary (MODE)
S5		(LOUDNESS)
S13	1-514-604	switch, push (REMOTE SPEAKER)
S14		(MAIN SPEAKER)

Ref. No.	Part No.	Description
S6	1-514-637	switch, slide (TONE TREBLE, LEFT)
S7	1-514-637	switch, slide (TONE TREBLE, RIGHT)
S8	1-514-637	switch, slide (TONE BASS, LEFT)
S9	1-514-637	switch, slide (TONE BASS, RIGHT)
S10		(LOW FILTER)
S11	1-514-602	switch, push (HIGH FILTER)
(S3)		(MONITOR)
S12	1-514-524	switch, slide (PRE AMP/POWER AMP)
S15	1-514-599-12	switch, seesaw (POWER) (General Export Model)
	1-514-599-22	switch, seesaw (POWER) (USA, CANADA Model)

MISCELLANEOUS

Ref. No.	Part No.	Description
	1-231-057-12	encapsulated component, 0.033μF + 120Ω
	1-507-162	phono jack, 10-p
	1-507-163	phono jack, 4-p
	1-507-265	jack, headphone
	1-509-029	DIN connector
	1-509-341	AC outlet
	1-517-021	socket, pilot lamp
	1-518-052	lamp, pilot
	1-526-165	voltage changeover block (General Export Model only)
	1-532-214	fuse (USA, CANADA Model)
	1-532-255	fuse (General Export Model)
	1-534-487	cord, power (General Export Model)
	1-534-526	cord, power (USA, CANADA Model)
	1-536-151	terminal strip, 2L2 (USA, CANADA Model only)
	1-536-179	terminal strip, 1L1 (C)
	1-536-182	terminal strip, 2L2 (C)
	1-536-183	terminal strip, 2L3 (C)
	1-536-189	terminal strip, 1L1 (B)
	1-536-226	terminal strip, 4-p

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