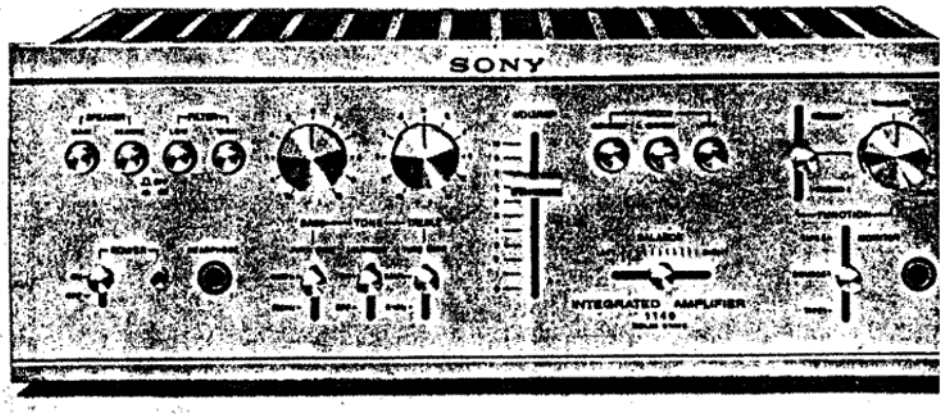
TA-1140

GEP and NEP Model

INTEGRATED STEREO AMPLIFIER



SONY®

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-1140 are listed in Table 1-1.

TABLE 1-1.
TA-1140 TECHNICAL SPECIFICATIONS

Power Amplifier Section

Dynamic power:	190 watts, both channels operating, 4 ohms 120 watts, both channels operating, 8 ohms
RMS power:	50 watts per channel, both channels operating, 4 ohms 40 watts, per channel, both channels operating, 8 ohms
Rated output:	35 watts per channel, both channels operating, 8 ohms
Power bandwidth:	6 Hz to 35 kHz, IHF
Harmonic distortion: (20 Hz ~ 20 kHz)	Less than 0.1% at rated output
IM distortion:	Less than 0.1% at rated output
Input impedance:	100 k ohms
Input sensitivity: (for rated output)	0.85 V
Signal-to-noise ratio:	greater than 110 dB (shorted input)
Residual noise:	Less than 0.05 μW (8 ohm)

Preamplifier Section

Frequency response:	PHONO-1, -2: RIAA curve ± 0.5 dB TUNER, AUX-1, -2, TAPE-1, -2, REC/PB (input): 15 Hz to 80 kHz ± 2 dB
Input sensitivity and impedance:	PHONO-1, -2: 1.2 mV 47 k ohms TUNER, AUX-1, -2, TAPE-1, -2, REC/PB (input): 130 mV 100 k ohms
Signal output and output impedance:	REC OUT: 130 mV 10 k ohms PRE OUT: 1V 3 k ohms REC/PB (output): 30 mV 80 k ohms
Signal-to-noise ratio:	PHONO-1, -2: greater than 70 dB (weighting network "B") TUNER, AUX-1, -2, TAPE-1, -2, REC/PB: greater than 90 dB (weighting network "A")
Tone controls:	BASS ± 10 dB at 50 Hz (TURNOVER FREQ. 250 Hz) ± 10 dB at 100 Hz (TURNOVER FREQ. 500 Hz) TREBLE ± 10 dB at 10 kHz (TURNOVER FREQ. 2.5 kHz) ± 10 dB at 20 kHz (TURNOVER FREQ. 5 kHz)
Loudness control:	10 dB up at 50 Hz 3 dB up at 10 kHz (VOLUME-control attenuation: 30 dB)
Filters:	LOW: 6 dB/oct, below 70 Hz HIGH: 6 dB/oct, above 5 kHz

General

Power consumption:	200 watts
Power requirement:	100, 120, 220, 240 V, ac, 50/60 Hz
Dimensions:	400 mm (width) x 149 mm (height) x 316 mm (depth) 15¾" (width) x 5 13/16" (height) x 12 7/16" (depth)
Net weight:	9.8 kg (21 lb 9 oz)
Shipping weight:	12.5 kg (27 lb 7 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the function or operation 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. Refer to the block diagram on page 7 and the schematic diagrams on page 15 to 18.

Stage/Control	*Function*
Preamplifier Section	
Equalizer Amplifier Q101, Q102	This direct-coupled two-stage amplifier (PNP-NPN) amplifies the small signal provided by the phono cartridge to the level required at the input of the following flat amplifier. A PNP type transistor is employed as it generates less noise than conventional NPN type transistors.
Bias circuit	Dc bias voltage for Q101 is extracted from R114 in the emitter circuit of Q102, divided by R106 and R105, and then fed back to the base of Q101 through R104 and R103. This dc negative feedback technique provides stable operation.
Equalization circuit	RIAA equalization is achieved by the negative-feedback loop containing R110, R111, R112, C105 and C106. Be sure to use replacement components with the exact same values. R116 (R216) in the output circuit prevents interaction between left and right channel equalization when the MODE switch is set to L+R.
FUNCTION switch	All input signals are routed to the FUNCTION-1 or FUNCTION-2 switches. Note that the TAPE-TO-TAPE positions of the FUNCTION-1 switch are provided for tape duplication as noted in Table 1-2.

TABLE 1-2.

FUNCTION-1 position	Tape Recorder-1	Tape Recorder-2
TAPE-TO-TAPE 1-2	Playback	Recording
TAPE-TO-TAPE 2-1	Recording	Playback

MONITOR switch S3	In the TAPE-1 position, input signals connected to either the TAPE-1 terminal or REC/PB connector is selected. In the TAPE-2 position, the input program connected to the TAPE-2 terminal is selected. In the SOURCE position, all other program sources are selected.
MODE switch S4, S6, (S5)	Select the desired mode of operation. Three push switches are provided to obtain the proper mode of operation. Notice that S5 acts as a dummy switch, therefore it is omitted from the schematic diagram. Only S4 and S6 deal with mode switch functions. These switches may also be used for test purposes. The relation between the positions of the MODE switch and outputs of the set are summarized in Table 1-3.

TABLE 1-3.

MODE Switch position	CENTER CHANNEL OUT	HEADPHONE OUT		REC OUT-1, 2 REC/PB OUT		OUTPUT	
		L-CH	R-CH	L-CH	R-CH	L-CH	R-CH
REVERSE	L+R	R	L	L	R	R	L
STEREO	L+R	L	R	L	R	L	R
L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R

Stage/Control	*Function*
BALANCE control R301 (R401)	Input signal is routed to the BALANCE control through MODE switches S4 and S6. This is done 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.
VOLUME control R302 (R402)	The balanced input signals from BALANCE control R301 is fed to VOLUME control R302, which regulates the signal applied to the following tone-control circuit or output circuit.
LOUDNESS switch S8	This switch and R303, C301, R304 and C302 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 10 dB at 50 Hz and 3 dB at 10 kHz with reference to the level at 1 kHz.
Flat amplifier Q301, Q302	This two-stage amplifier has a basically flat response, and provides about 17 dB voltage gain to compensate for tone-control insertion loss. It also isolates the volume-control and tone-control circuits to eliminate mutual interference. The input signals are amplified by Q301 and Q302, and then applied to the tone control circuit.
Bias circuit	Bias voltage for Q301 is extracted from R312 in the emitter circuit of Q302 and divided by R308 and R307, and then fed back to the base of Q301 through R306. Note that R311 in the collector circuit of Q302 works as both load resistor and negative feedback component.

Stage/Control	*Function*
Tone-control circuit Q303	Fig. 1-1 shows the simplified circuit of tone control incorporated with the treble and bass turnover switches. This circuit is a modified negative-feedback type tone-control. Note that the output generated at the collector circuit of Q303 is fed back to the base circuit of Q303 through the treble and bass tone-control network.

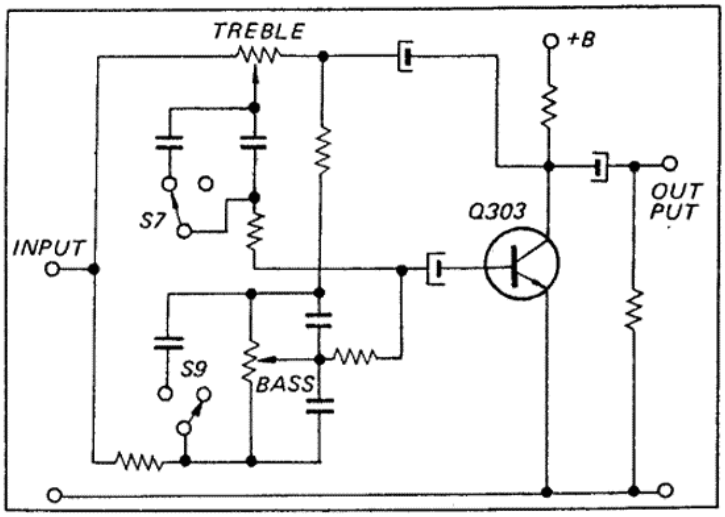


Fig. 1-1. Simplified tone control circuit

TREBLE control R317	Decreases or increases the amount of negative feedback voltage by means of R317. Each step of this control represent a change in the treble response of approximately 2 dB at the specified turnover frequencies.
TREBLE TURNOVER FREQUENCY switch S7	S7 selects the specified turnover frequencies (2.5 kHz or 5 kHz). Refer to Fig. 1-2.
BASS control R318	Decreases or increases the amount of negative feedback voltage by means of R318. Each step of this control represents a change in the bass response of approximately 2dB at the specified turnover frequencies.

Stage/Control	*Function*
BASS TURNOVER FREQUENCY switch S9	S9 selects the specified turnover frequencies (500 Hz or 250 Hz). Refer to the Fig. 1-2. (tone control response).
HIGH FILTER switch S10	The high-cut filter (R322 and C317) cuts out unwanted high frequency components (5 kHz and higher) from the input signal when this switch is ON. Refer to Fig. 1-3.
LOW FILTER switch S11	The low-cut filter (C318, R324 and C319) eliminates unwanted low-frequency components (70 Hz and lower) from the input signal when this switch is ON. Refer to Fig. 1-3.
PREAMP/POWER AMP switch S12	In NORMAL, the output of the preamplifier section is fed to the power amplifier section through S12. In SEPARATE, the output of the preamplifier section is disconnected from the power amplifier's input terminal, allowing you to use the sections separately.

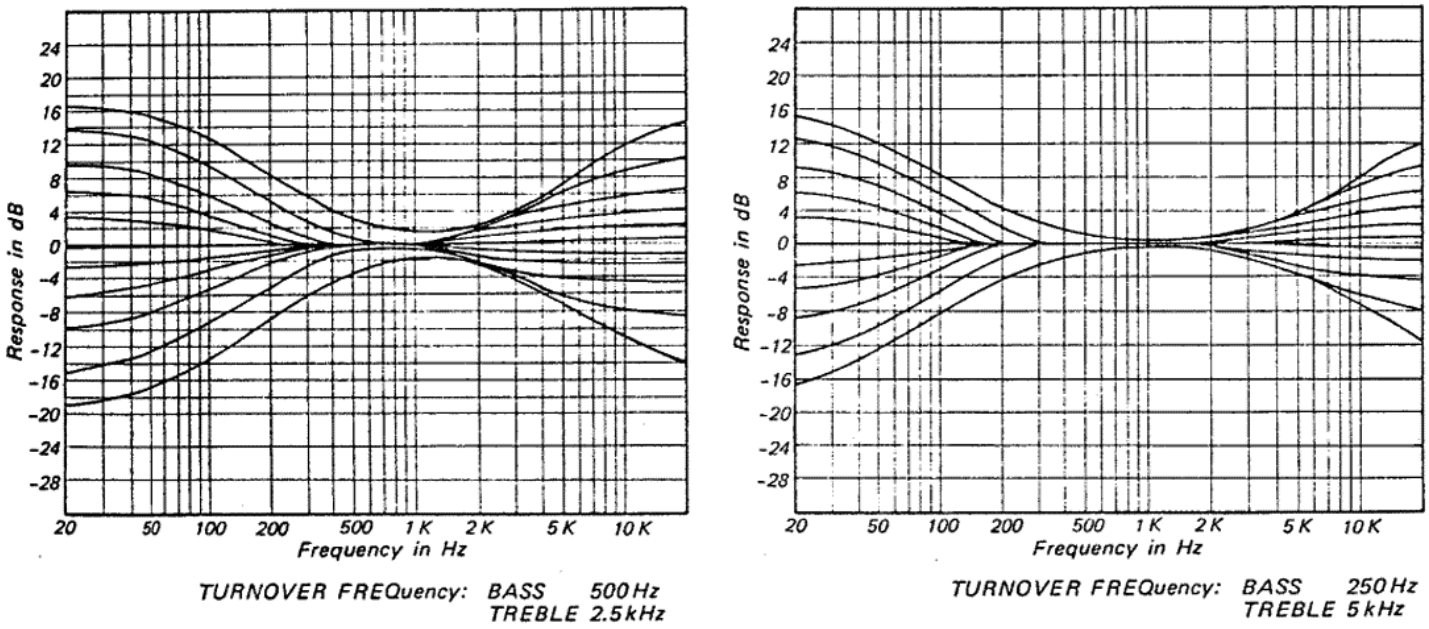


Fig. 1-2. Tone control frequency response

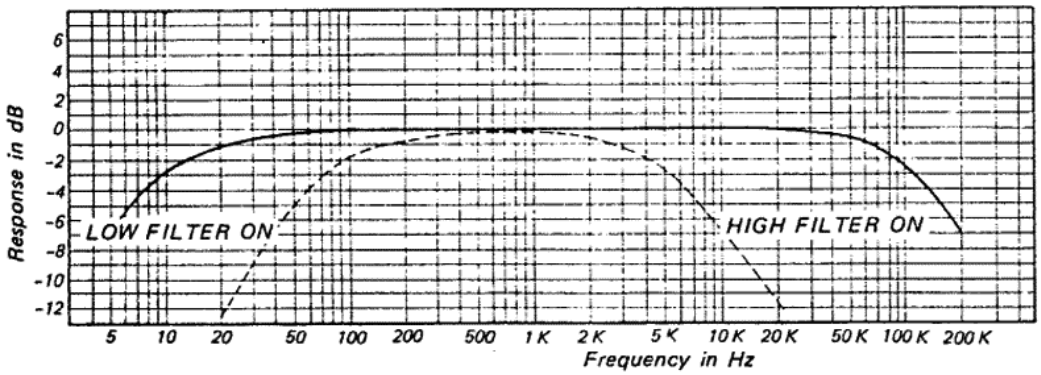
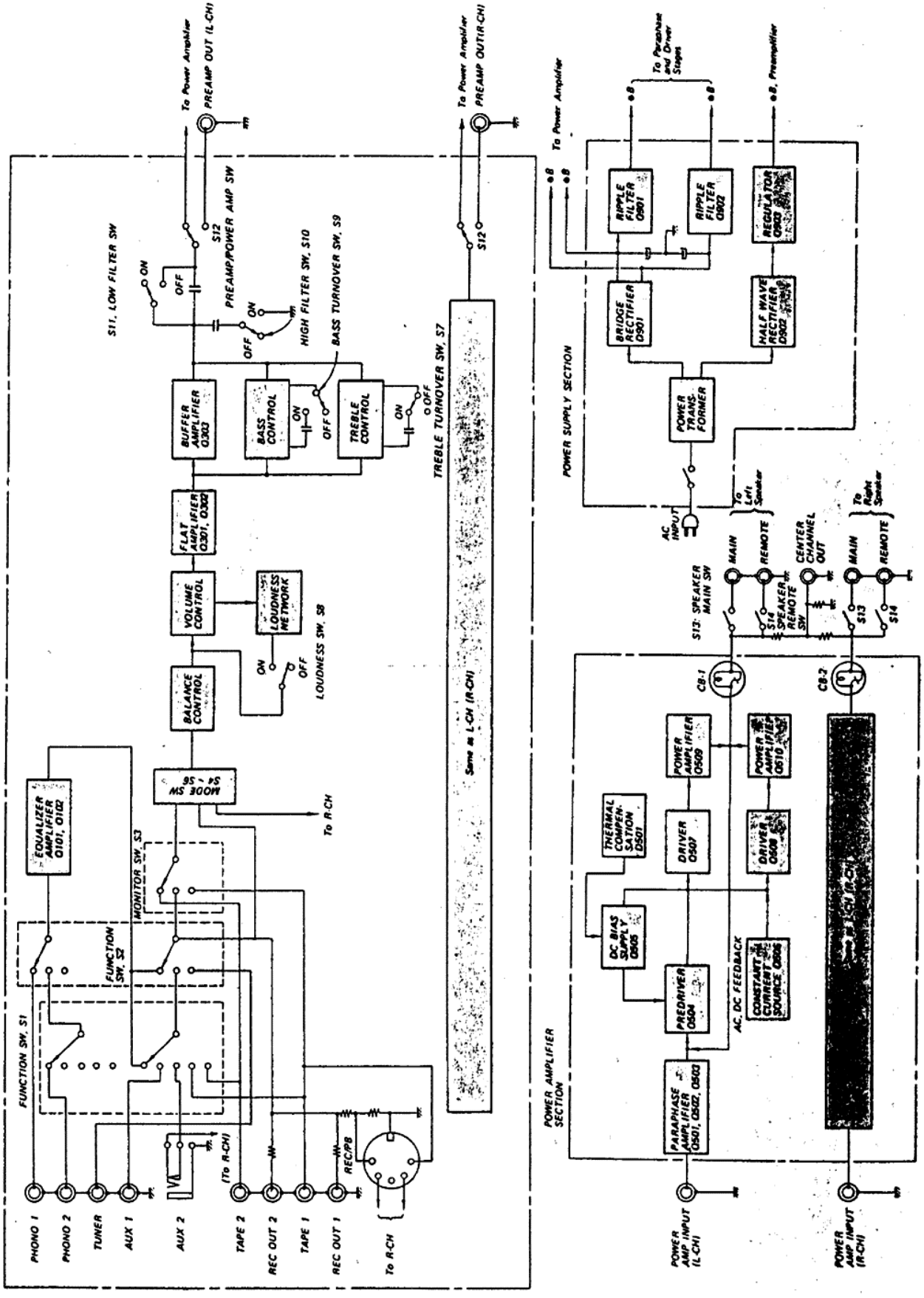


Fig. 1-3. Filter response

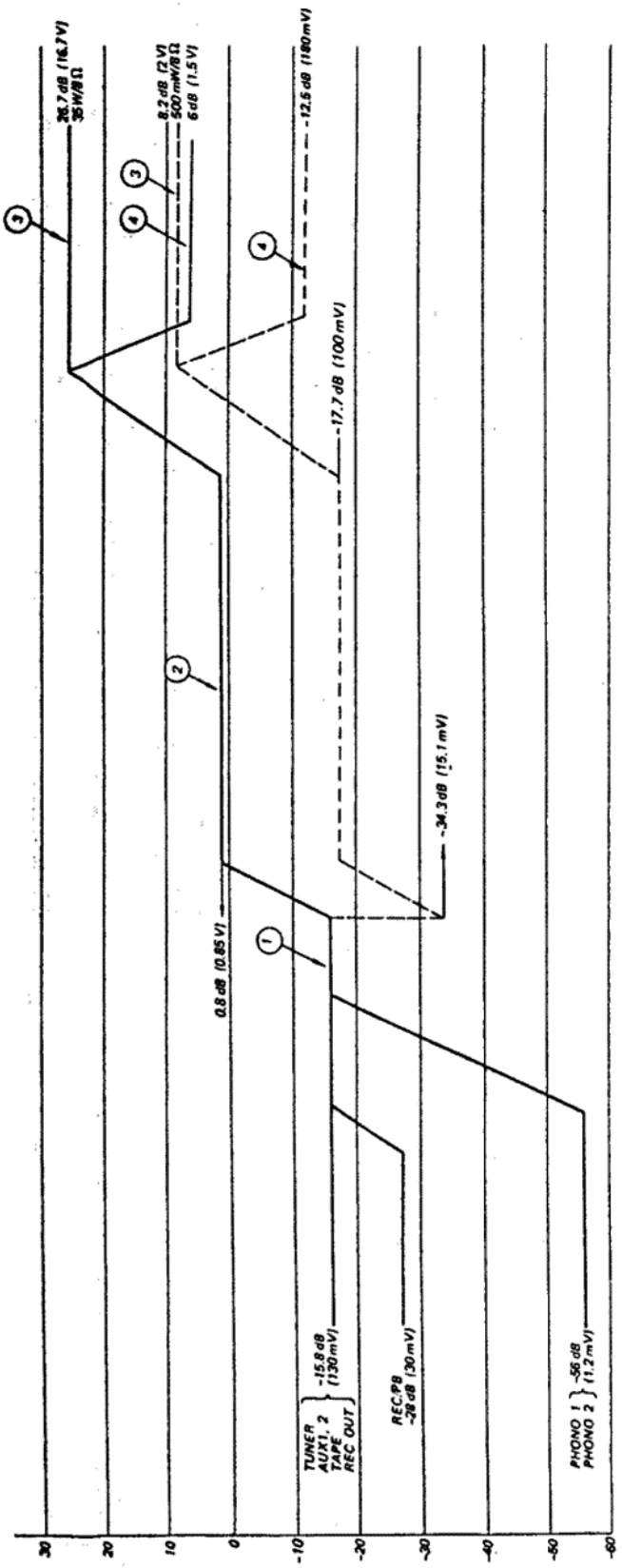
Stage/Control	*Function*
Power Amplifier Section	
Preamplifier Q501, Q502, Q503	Q501, Q502 and Q503 form a modified paraphase amplifier but output signal is extracted from the emitter circuit of Q502. Note that Q501 and Q502 are in a Darlington configuration. This circuit has various advantages in a direct-coupling system. One is high stability despite temperature variation and another is high input impedance without reducing the amplifier's gain. The ac output appears across load resistor R507 (R607) in the emitter circuit of Q502. A decoupling circuit formed by the emitter-base resistance of Q503, C503 and R510 is essentially a frequency-selective ac bypass circuit to reduce the amplifier's gain at very low frequencies. Common emitter-resistor R509 keeps the dc current flow constant in Q501, Q502 and Q503, thus increasing the dc stability.
Pre-driver Q504	Though this stage is a conventional flat amplifier, it determines the output voltage swings, because the following stages are basically emitter-followers. Note that the ac load for Q504 is the collector-emitter impedance of Q506.
Constant current source Q506	Q506 also acts as a constant-current source, enabling effective drive for the following stages.
Dc bias adj. (idling current) Q505, R514	Q505 is biased into heavy conduction and operates as a small resistance providing the necessary forward bias on the two cascaded emitter-followers. R514 controls the base bias of Q505, determining its emitter-collector impedance and thereby controls the dc bias voltage for the following complementary circuit. This circuit has the advantage of stable operation even at high power output levels.
Thermal dc bias compensator D501	The negative temperature coefficient of diode D501 provides thermal compensation for the idling current in the complementary and power amplifier stages. D501 (D601) is attached to the power transistor's heat sink to detect temperature increases in the power transistors.
Complementary (Driver) Q507, Q508	These transistors operate as emitter-followers to provide the current swings demanded of the output stages and also provide the necessary phase inversion to drive the power-output stages in push-pull. Phase inversion is performed by using PNP and NPN type transistors.
Power transistor Q509, Q510	The output transistor Q509 and Q510 are connected directly to a power supply of about ±40 V. Q509 supplies power to the load during positive half cycles and Q510 operates during negative half cycles. As all the stages are directly coupled and designed to obtain zero potential at the output terminal, the large coupling capacitor at the output (which may cause power loss or distortion at low frequencies) is eliminated.
Power transistor protection circuit circuit breaker (CB-1)	To protect overloaded power transistors from destruction, a new circuit breaker which combines a bimetal switch and lamp together is employed. In the event of a short circuit at the output terminals, the excessive current heats the contact points of the bimetal switch, causing the switch open. As the lamp is connected in parallel with the bimetal switch, the current now flows through the lamp. As a result, the breaker lamp lights, and its high resistance limits the excessive

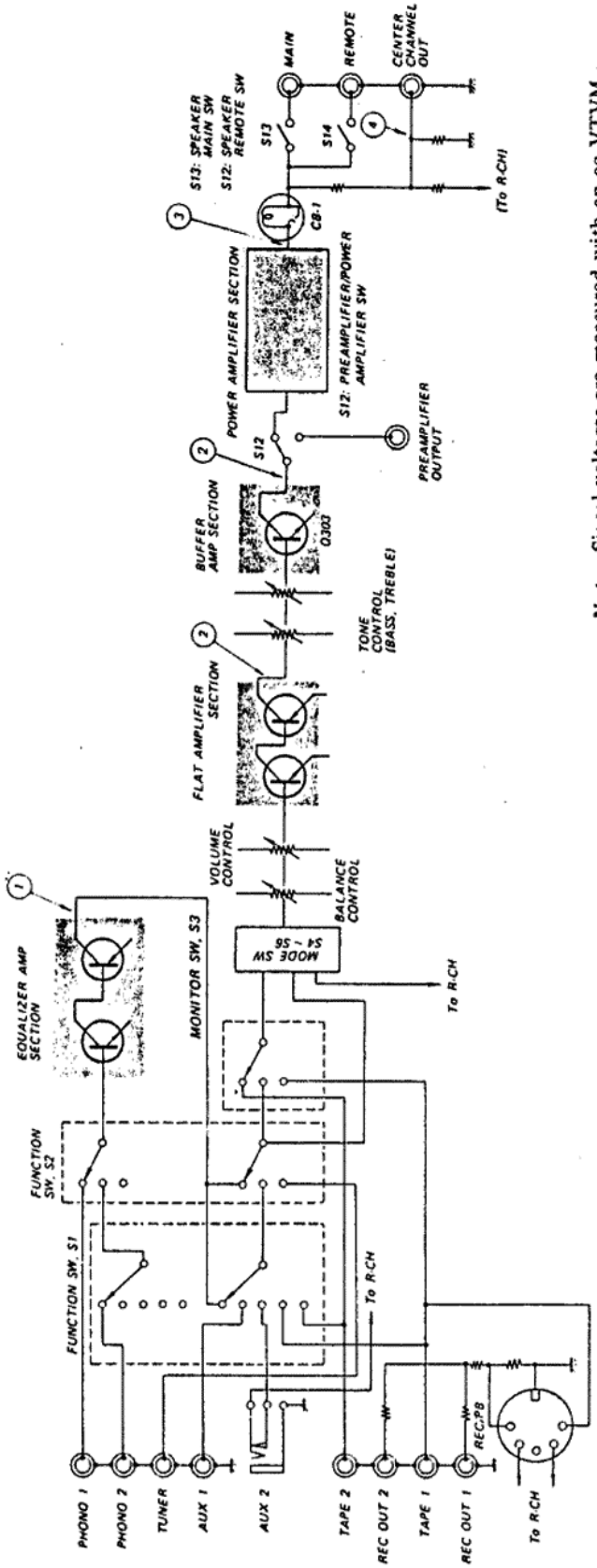
Stage/Control	*Function*
	current flow down to a low value, thereby protecting the power transistors. When the breaker lamp lights it will be noticed from the outside of the top cover. Note that the lamp lights only when a relatively large signal is applied while speaker terminal shorted.
Power Supply Section	
Rectifier D901	A full-wave bridge rectifier and center-tapped transformer provides positive and negative dc power supplies for the power amplifier.
Ripple filter Q901, R901, R903, C907 Q902 R902, R904, C908	These components reduce the ripple voltages in the dc power supply for preamplifier and driver stages of the power amplifier section to an extremely-low value. Q901 and Q902 serve as an electronic filter to supply well filtered dc of about ±38V to the preamplifier stages in the power amplifier.
Rectifier D902	A half-wave rectifier D902 provides positive dc power for the preamplifier stages.
Ripple filter Q903, R907, C919	These components reduce the ripple voltages in the dc power supply for preamplifier stages to an extremely low value. Q903 serves as an electronic filter to supply well-filtered dc of about 43 V and 30 V to the preamplifier stages.
Power switch S15-1 S15-2	Note that the power switch S15 has two functions. One is a conventional power line ON-OFF function, the other is muting operation when power switch is turned OFF. Proper muting is performed by discharging filter capacitors C913 and C914 quickly through R910 and S15-2.

1-3. BLOCK DIAGRAM



1-4. LEVEL DIAGRAM





Note: Signal voltages are measured with an ac VTVM and expressed in dB referred to 0.775 V, 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-1140.

1. Screwdriver, Phillips-head
2. Screwdriver, 3mm (1/8") blade
3. Pliers, long-nose
4. Diagonal cutters
5. Wrench, adjustable
6. Tweezers
7. Electric drill
8. Drill bits
9. Prick punch
10. Hammer, ball-peen
11. Soldering iron, 40 to 50 watts
12. Solder, rosin core
13. Cement solvent
14. Cement, contact
15. Silicone grease

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 this set 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 thread per mm compared to the old ones. The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

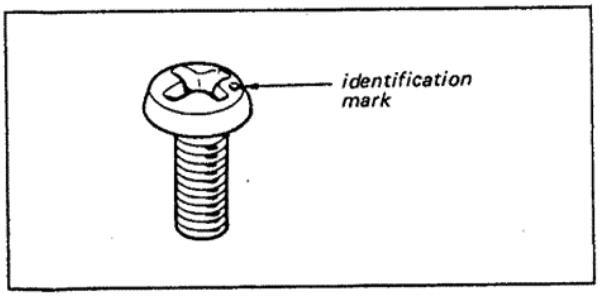
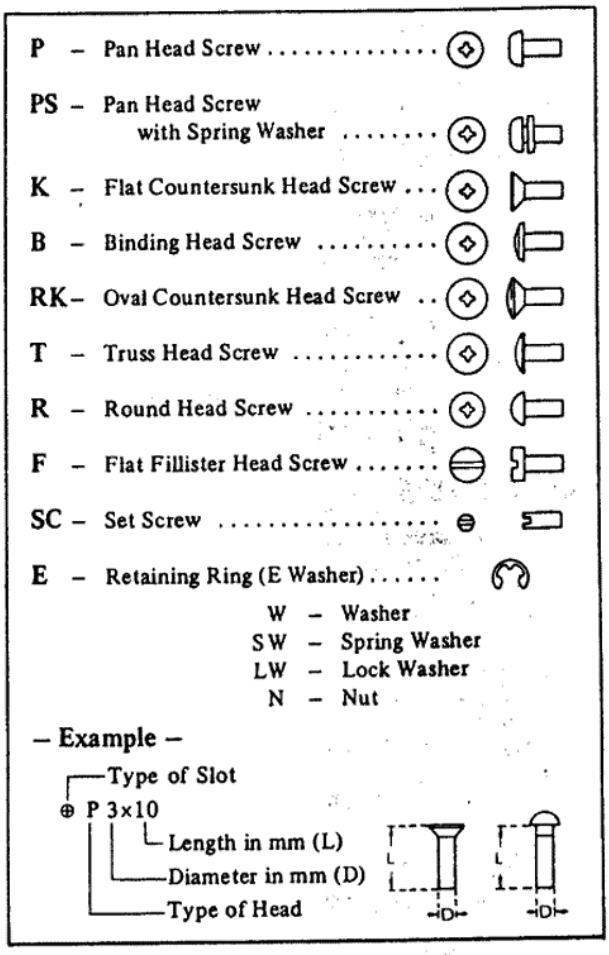


Fig. 2-1. ISO screw

– Hardware Nomenclature –



2-3. TOP COVER AND FRONT PANEL REMOVAL

1. Remove the two machine screws at each side of the case, and lift off the top cover.
2. Remove all control knobs and levers except push buttons.
   The knobs can be removed by loosening the slotted set screws and pulling the knobs straight out.
   The levers are simply pulled off.
3. Remove the three screws (⊕ PSW 4x6) behind the top edge of the front subchassis as shown in Fig. 2-2.
4. Remove the three self-tapping screws (⊕ B 3x6) at the front bottom of the chassis as shown in Fig. 2-3. This frees the front panel.

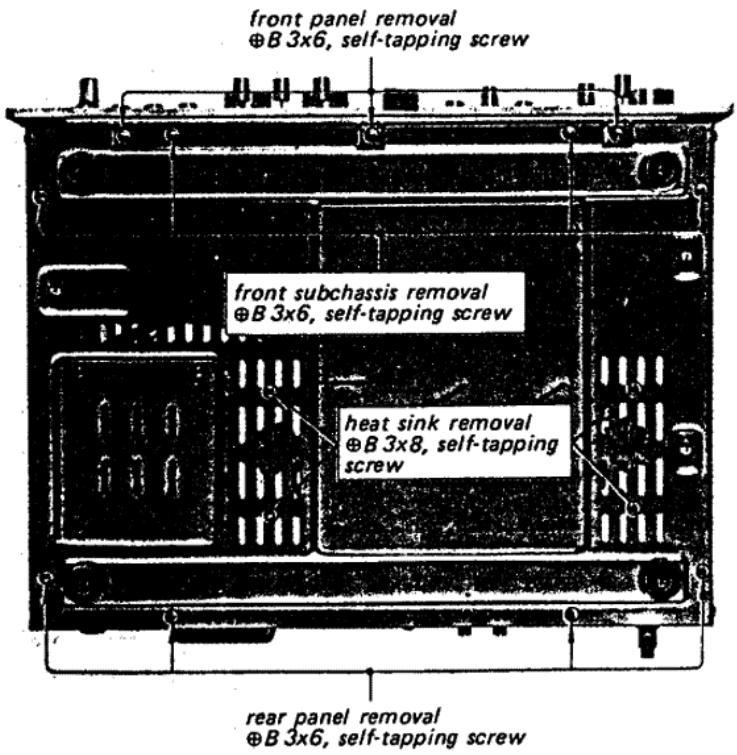


Fig. 2-3. Bottom view

2-4. FRONT SUBCHASSIS REMOVAL

The front subchassis is the vertical member on which all the controls, switches and pilot lamp are attached.

1. Remove the top cover and front panel as described in Procedure 2-3.
2. Remove the two self-tapping screws (⊕ B 3x6) at each side of the chassis (see Fig. 2-4) and four self-tapping screws (⊕ B 3x6) at the front bottom of the chassis as shown in Fig. 2-3. This frees front subchassis.

2-5. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the two self-tapping screws (⊕ B 3x6) at each side of the chassis (see Fig. 2-4) and four self-tapping screws (⊕ B 3x6) at the rear bottom of the chassis as shown in Fig. 2-3. This frees rear panel.

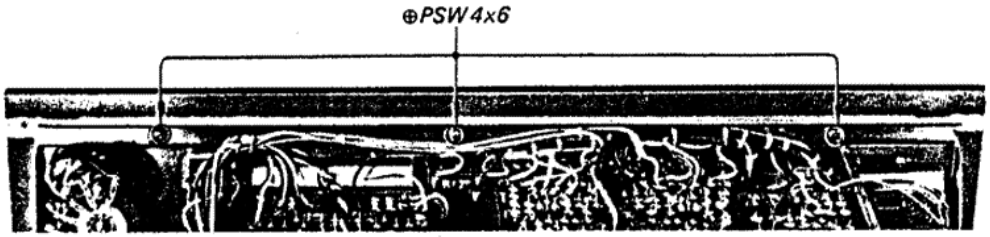


Fig. 2-2. Front panel removal

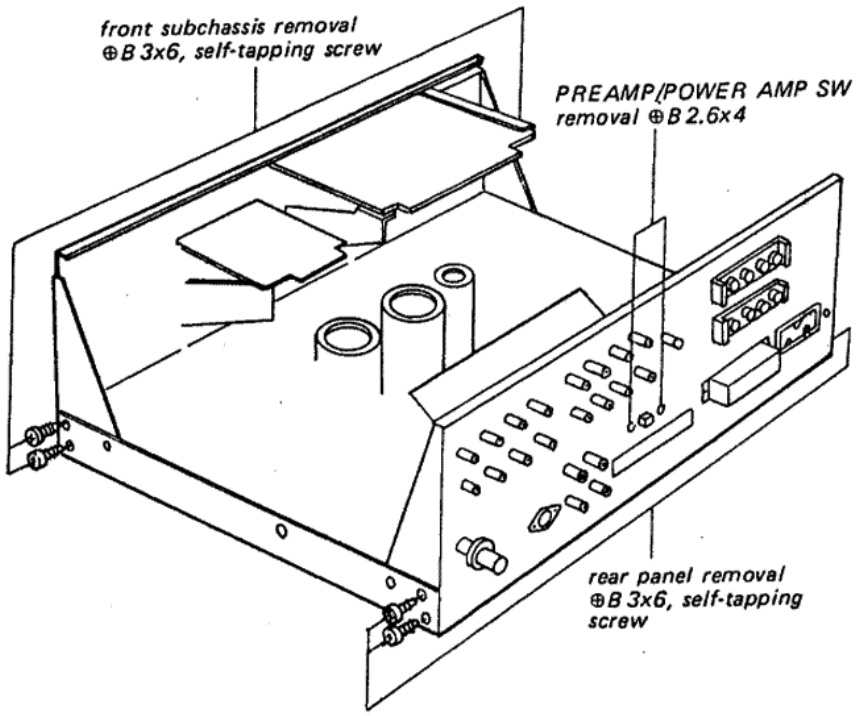


Fig. 2-4. Front subchassis removal

2-6. CONTROL AND SWITCH REPLACEMENT

Prepare for replacing any of the controls or switches by removing the front panel and front subchassis or rear panel as described in Procedure 2-3, 2-4 and 2-5.

POWER, FUNCTION-2 MONITOR, TURNOVER FREQ. and LOUDNESS Switches

1. Remove the two screws securing switches to the front subchassis as shown in Fig. 2-5.
2. Unsolder the lead wires from the defective switch, and then install the replacement switch.

TONE Controls

1. Remove the hex nuts that secure BASS and TREBLE controls to the front subchassis as shown in Fig. 2-5.
2. Remove the two screws (⊕PSW 3x6) securing the Preamplifier/Power Supply circuit board to its mounting bracket as shown in Fig. 2-6.
3. Carefully remove them along with the PCB.
4. Cut each lug of the defective control on the board to remove the part.
5. Unsolder and remove the clipped lugs, and then clean out the holes in the circuit board.
6. Install the replacement control.

FUNCTION-1 Switch

1. Remove the hex nut that secures FUNCTION-1 switch to the front subchassis as shown in Fig. 2-5.
2. Unsolder the lead wires from the defective switch, and then install the replacement switch.

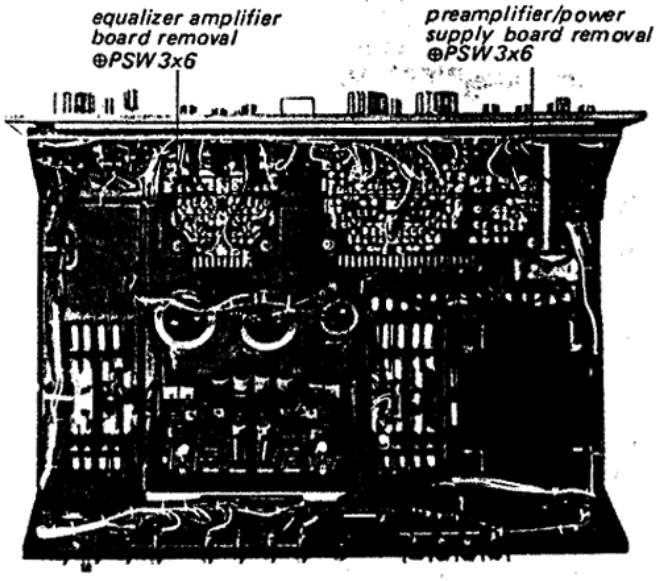


Fig. 2-6. PCB removal

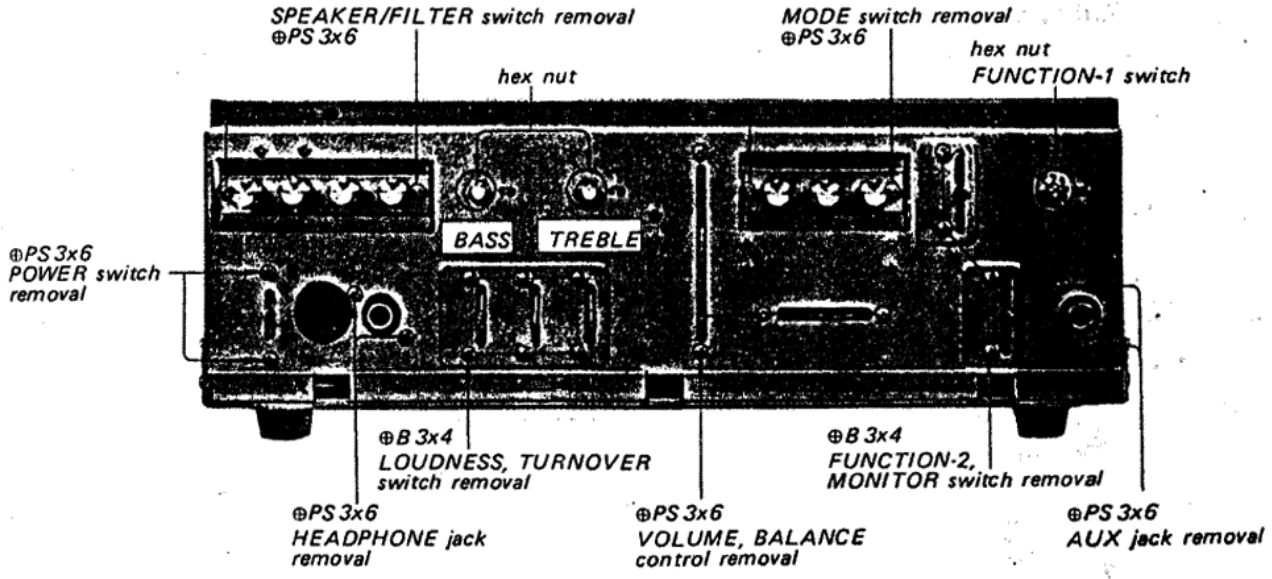


Fig. 2-5. Control and switch replacement

SPEAKER/FILTER Switch

Note: As SPEAKER and FILTER switches are combined with one bracket, whole combination switch should be replaced even one of them becomes defective.

1. Remove the Preamplifier/Power Supply circuit board as previously described.
2. Remove the two screws (⊕ PS 3x6) securing the combination switch to the front subchassis as shown in Fig. 2-5.
3. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the switches and the printed circuit board. This frees the combination switch.
4. Install the replacement combination switch.

MODE Switch

Note: Three switches are combined with one bracket so whole combination switch should be replaced even one of them becomes defective.

1. Remove the two screws (⊕PSW 3x6) securing the Equalizer Amplifier Board to its mounting bracket as shown in Fig. 2-6.
2. Remove the two screws (⊕PS 3x6) securing the combination switch to the front subchassis as shown in Fig. 2-5.
3. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the switches, and the printed circuit board.
4. Install the replacement switch.

VOLUME Control

1. Remove the two screws (⊕ PS 3x6) securing the control to the front subchassis as shown in Fig. 2-5.
2. Carefully remove it along with Volume/Loudness Control Board.
3. With a soldering iron having a solder-sucking tip, clean the solder from each lug of the defective control and the printed circuit board.
4. Install the replacement control.

HEADPHONE, AUX Jacks and BALANCE Control

1. Remove the two screws (⊕ PS 3x6) securing the control or jack escutcheon to the front subchassis as shown in Fig. 2-5.
2. Unsolder the lead wires from the defective control or jack and then install the new one.

PREAMP/POWER AMP Switch

1. Remove the rear panel as described in Procedure 2-5.
2. Remove the two screws (⊕ B 2.6x4) securing the switch to the rear panel as shown in Fig. 2-4.
3. Unsolder the lead wires from the defective switch, and then install the replacement switch.

2-7. PRINTED CIRCUIT BOARD REMOVAL

Prepare for removing any of the printed circuit boards, except Power Amplifier Board, by removing front panel as described in Procedure 2-3.

Equalizer Amplifier Board

1. Refer to the MODE switch replacement procedure as described in Procedure 2-6.

Preamplifier/Power Supply Board

1. Refer to the TONE control replacement procedure as described in Procedure 2-6.

Speaker Switch Board

1. Refer to the SPEAKER/FILTER switch replacement procedure as described in Procedure 2-6.

Volume/Loudness Control Board

1. Refer to the VOLUME control replacement procedures as described in Procedure 2-6.

2-8. POWER TRANSISTOR REPLACEMENT

1. Remove the top cover as described in Procedure 2-3.
2. Remove the two self-tapping screws (⊕ B 3x8) securing the heat sink to the chassis at the bottom as shown in Fig. 2-3.
3. Remove the two screws (⊕ B 3x12) securing the power transistor to the heat sink with its socket as shown in Fig. 2-7.
   Remove the defective power transistor, and then install the replacement power transistor.

   Note: When replacing the power transistor, apply a coating of a heat-transferring 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 it from accumulating conductive dust particles that might eventually cause a short.

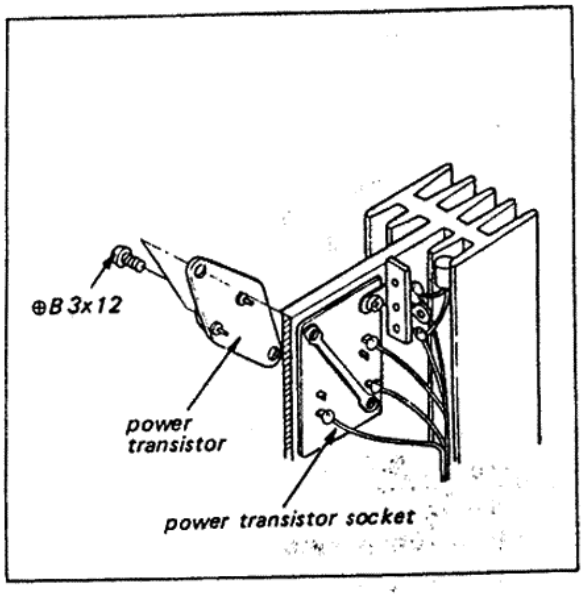
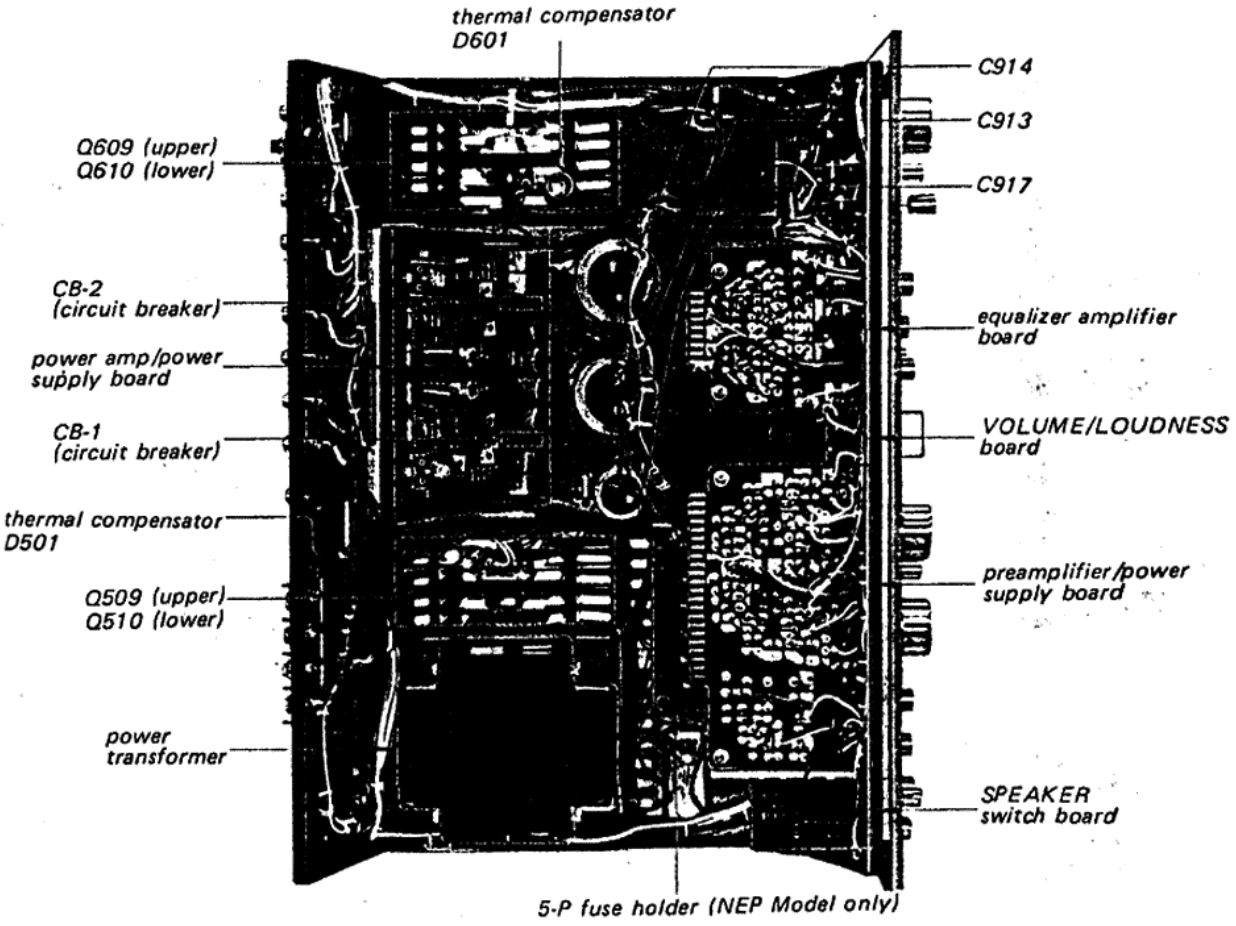


Fig. 2-7. Power transistor replacement

2-9. CHASSIS LAYOUT



SECTION 3
ADJUSTMENTS

3-1. DC BIAS ADJUSTMENT

Note: There are usually two adjustments to be made in the power amplifier. One is dc-bias adjustment and the other is dc-balance adjustment or ac-balance adjustment. These adjustments should be alternately repeated two or three times after replacing any of the power transistors until best operation is obtained. In this case, only the dc-bias adjustment is described as the newly developed circuit made it possible to omit dc-balance adjustment.

CAUTION

To avoid accidental power transistor damage, increase the ac line voltage gradually, using a variable transformer, while measuring the voltage across test points as shown in Fig. 3-1. Check to see that the reading does not exceed 50 mV. If it does, turn off the power as soon as possible, then check and repair the trouble in the power amplifier board.

Test Equipment Required

1. Dc millivoltmeter
   Capable of measuring dc voltage of 100mV or less.
2. Variable transformer
3. Screwdriver with 3mm (1/8″) blade.

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Connect the dc millivoltmeter across the test terminal posts as shown in Fig. 3-1.

Procedure

1. Apply a drop of cement solvent to the semi-fixed resistors on the power amplifier board, and then set the semi-fixed resistors (See Fig. 3-1) on the power amplifier board as follows:
   R514(L-CH, dc-bias) ..... fully counterclockwise
   R614(R-CH, dc-bias) ..... fully counterclockwise
2. Set the variable transformer for minimum output.
3. Turn the power switch to ON, and then increase the line voltage up to the rated value.
4. Adjust R514 and R614 to obtain a 50 mV reading on the meter.

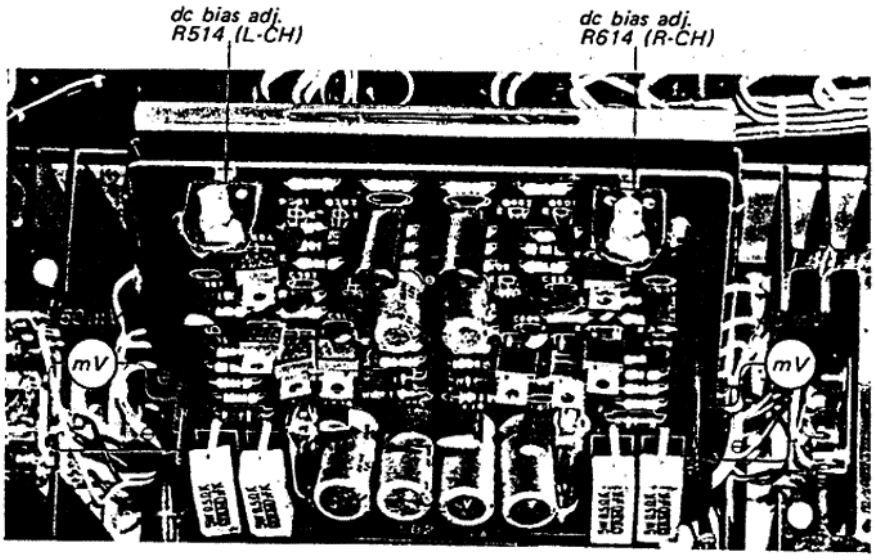
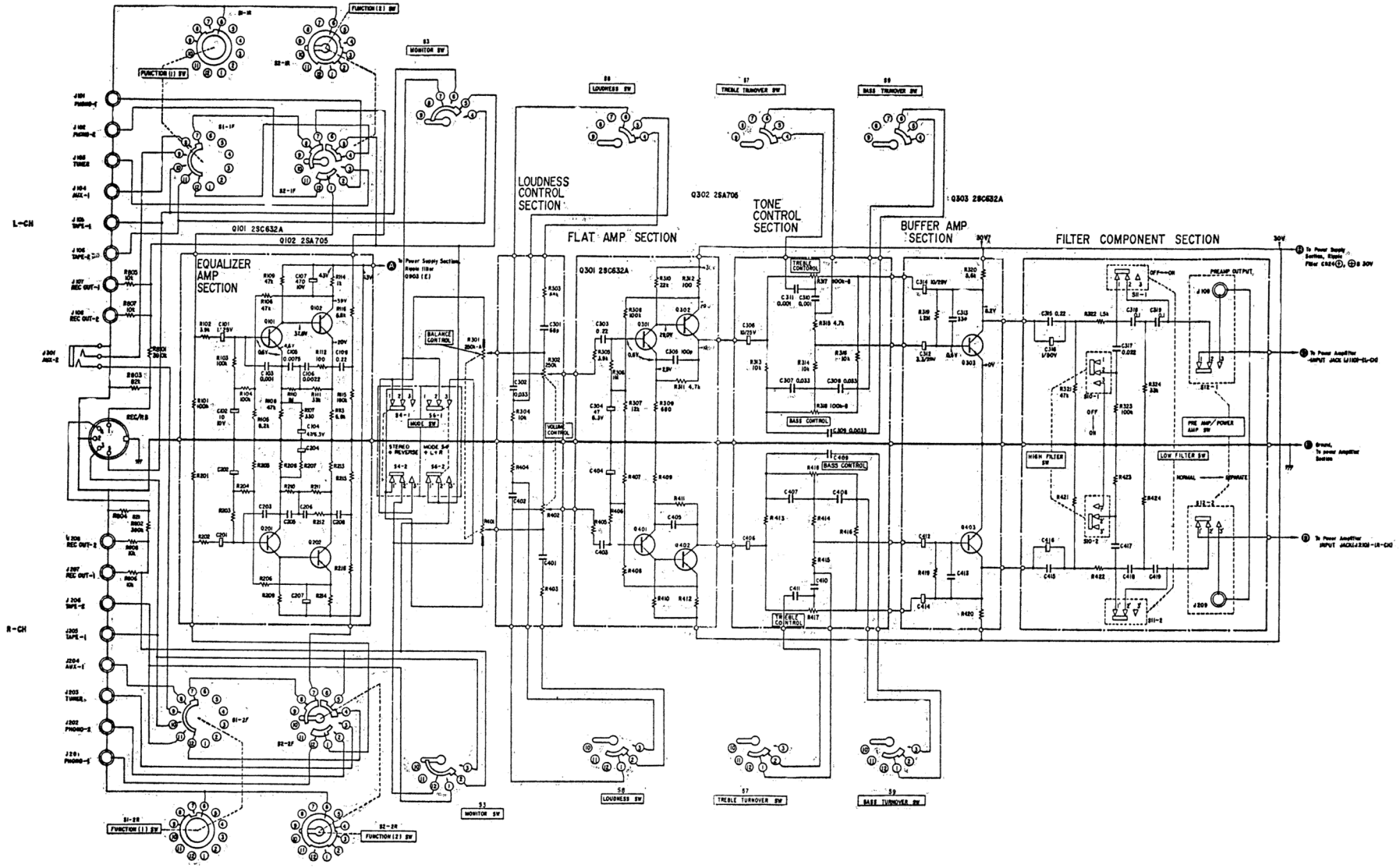


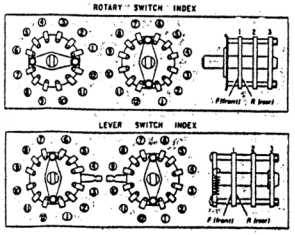
Fig. 3-1. Dc millivoltmeter connection and parts location

SECTION 4
DIAGRAMS

4-1 SCHEMATIC DIAGRAM — Preamplifier Section —



Ref. No.	Description	Position	Ref. No.	Description	Position
S1	FUNCTION(1) SW (PHONO2-AUX1-AUX2-TAPE1→2-TAPE2→1)	PHONO2	S8	LOUDNESS SW (ON-OFF)	ON
S2	FUNCTION(2) SW (TUNER-FUNCTION(1)-PHONO1)	FUNCTION(1)	S9	BASS TURNOVER SW (500 Hz-250 Hz)	500 Hz
S3	MONITOR SW (TAPE2-SOURCE-TAPE1)	SOURCE	S10	HIGH FILTER SW (OFF-ON)	OFF
S4 ~ S6	MODE SW (REVERSE-STEREO-L+R)	STEREO	S11	LOW FILTER SW (OFF-ON)	OFF
S7	TREBLE TURNOVER (2.5 kHz-5 kHz)	2.5 kHz	S12	PREAMP/POWER AMP SW (NORMAL-SEPARATE)	NORMAL



2SC632A
2SA705

Note:
All resistance values are in ohms. k = 1,000, M = 1,000 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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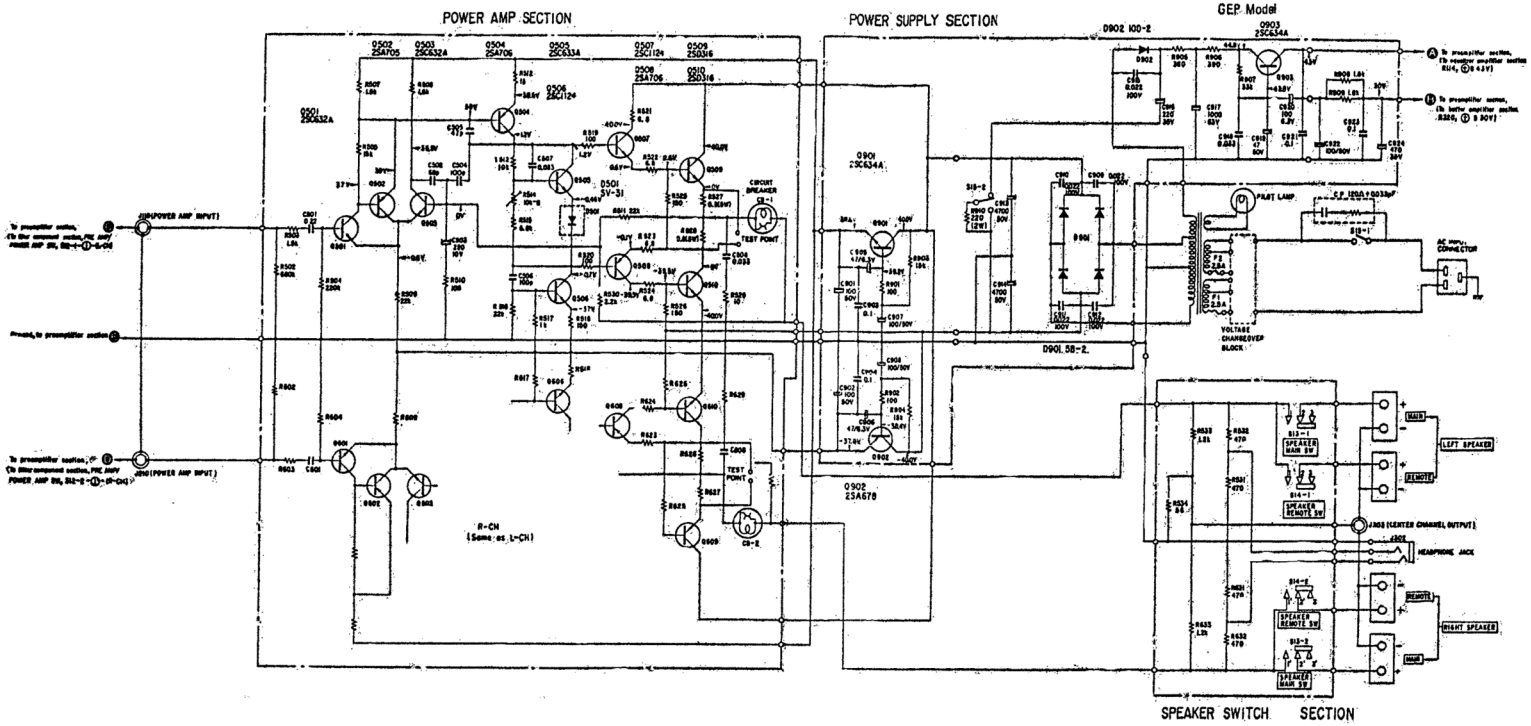
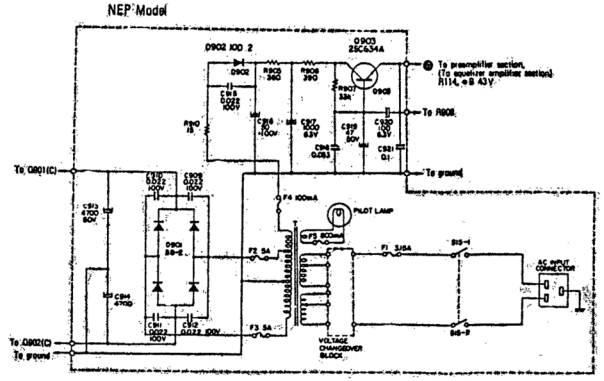
4-2 SCHEMATIC DIAGRAM — Power Amplifier Section —





Ref. No.	Description	Position
S13	SPEAKER MAIN SW (ON-OFF)	OFF
S14	SPEAKER REMOTE SW (ON-OFF)	OFF
S15	POWER SW (ON-OFF)	OFF

Note:

All resistance values are in ohms. k = 1,000, M = 1,000 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 20k ohms/volt. No signal in.

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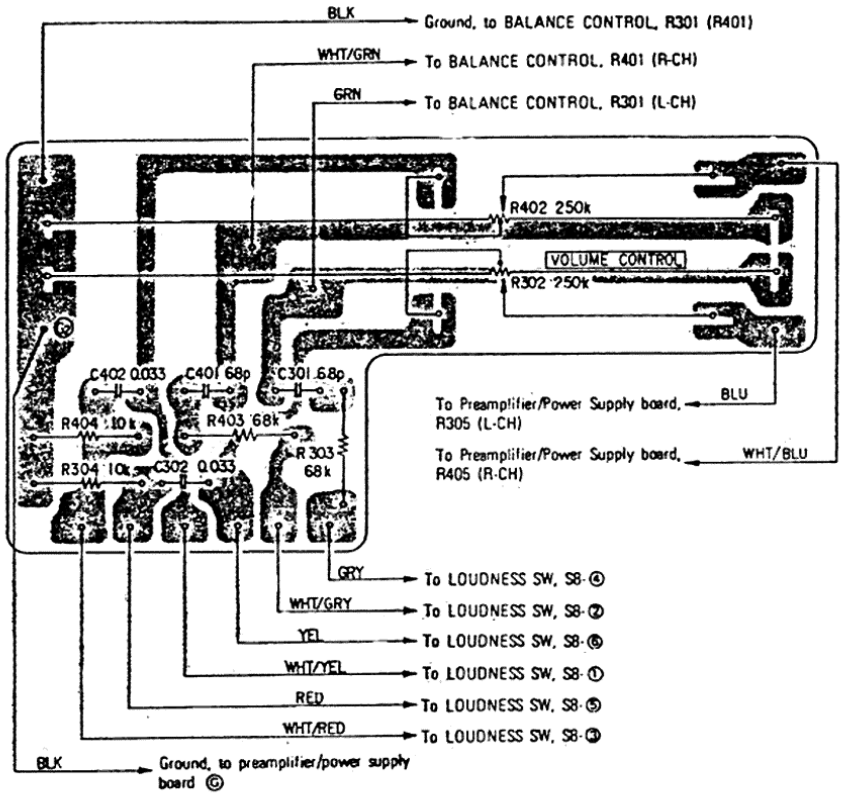
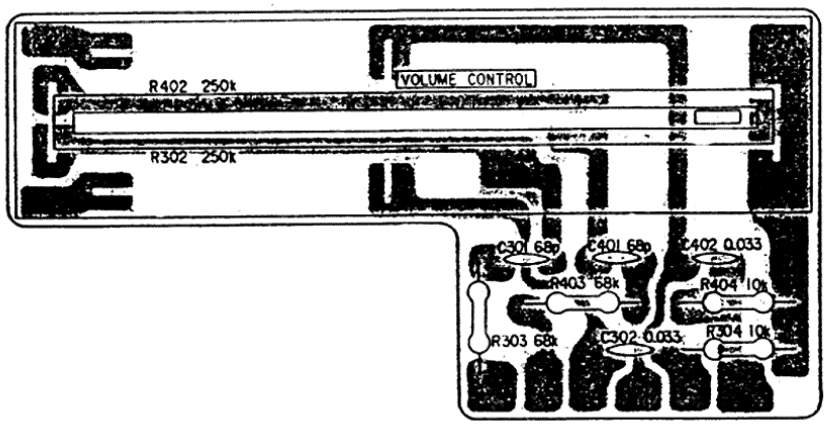
4-3. MOUNTING DIAGRAM – Volume/Loudness Control Board –

– Conductor Side –

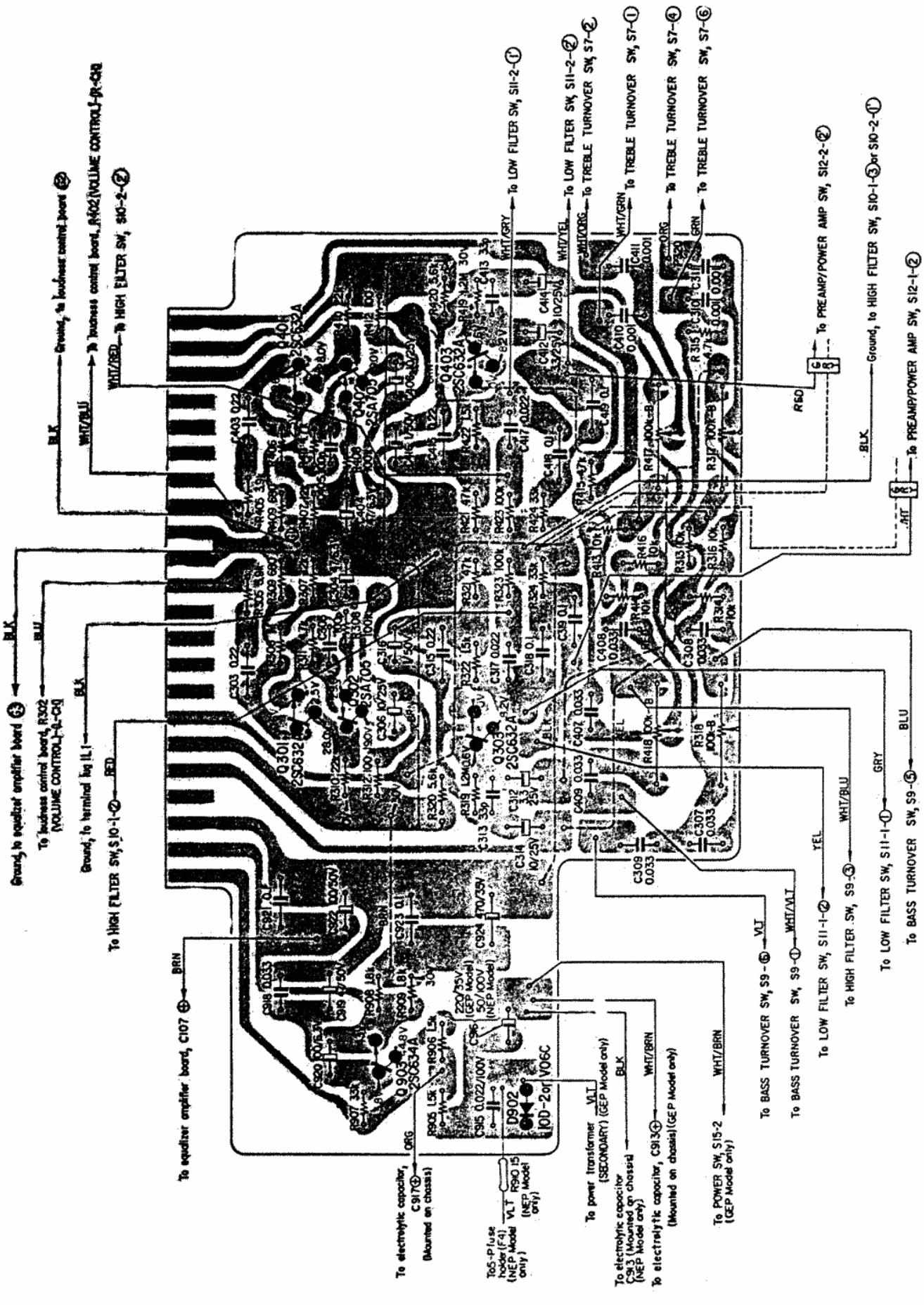


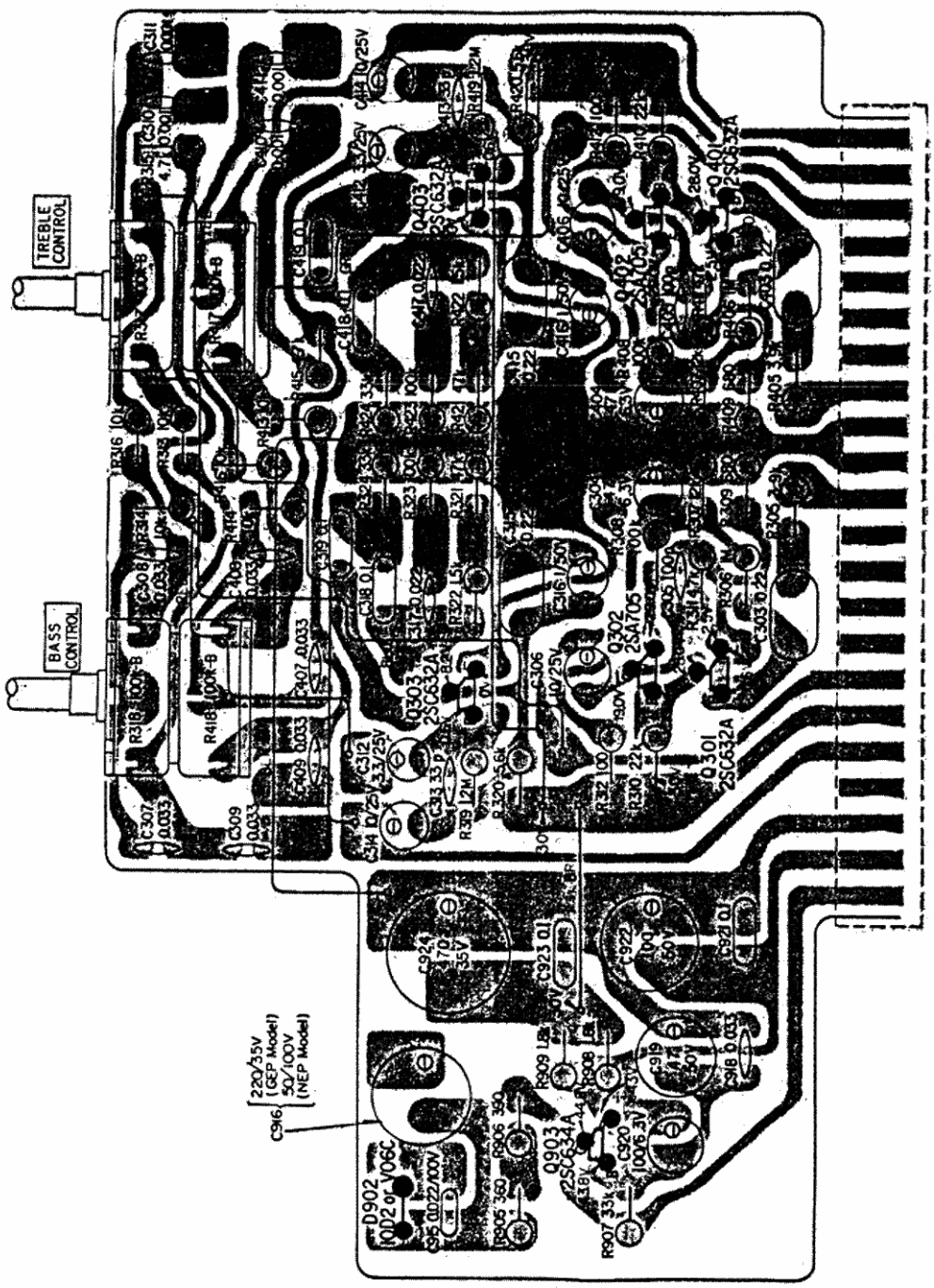
– Component Side –



4-4 MOUNTING DIAGRAM — Preamplifier/Power Supply Board —

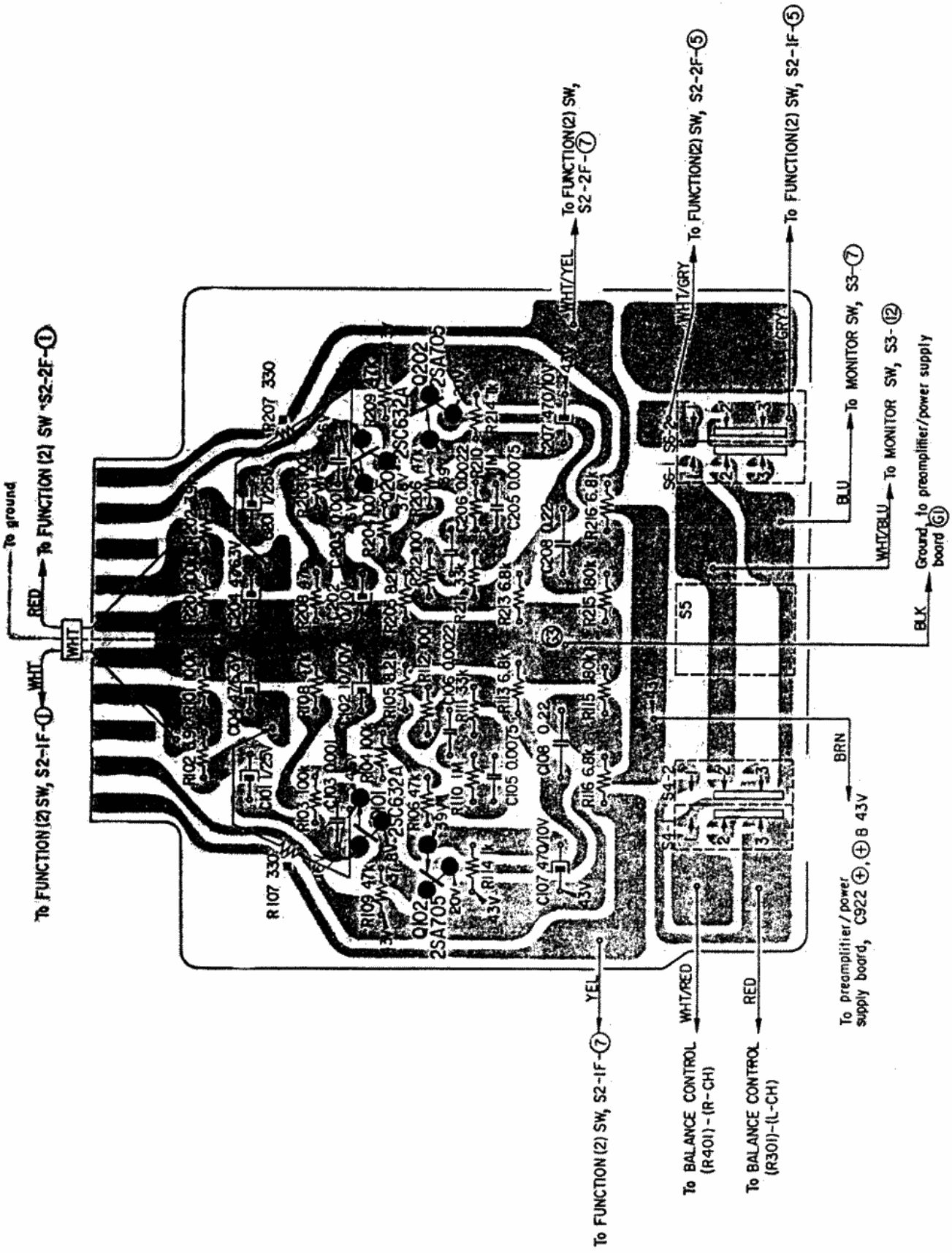
Conductor Side ←



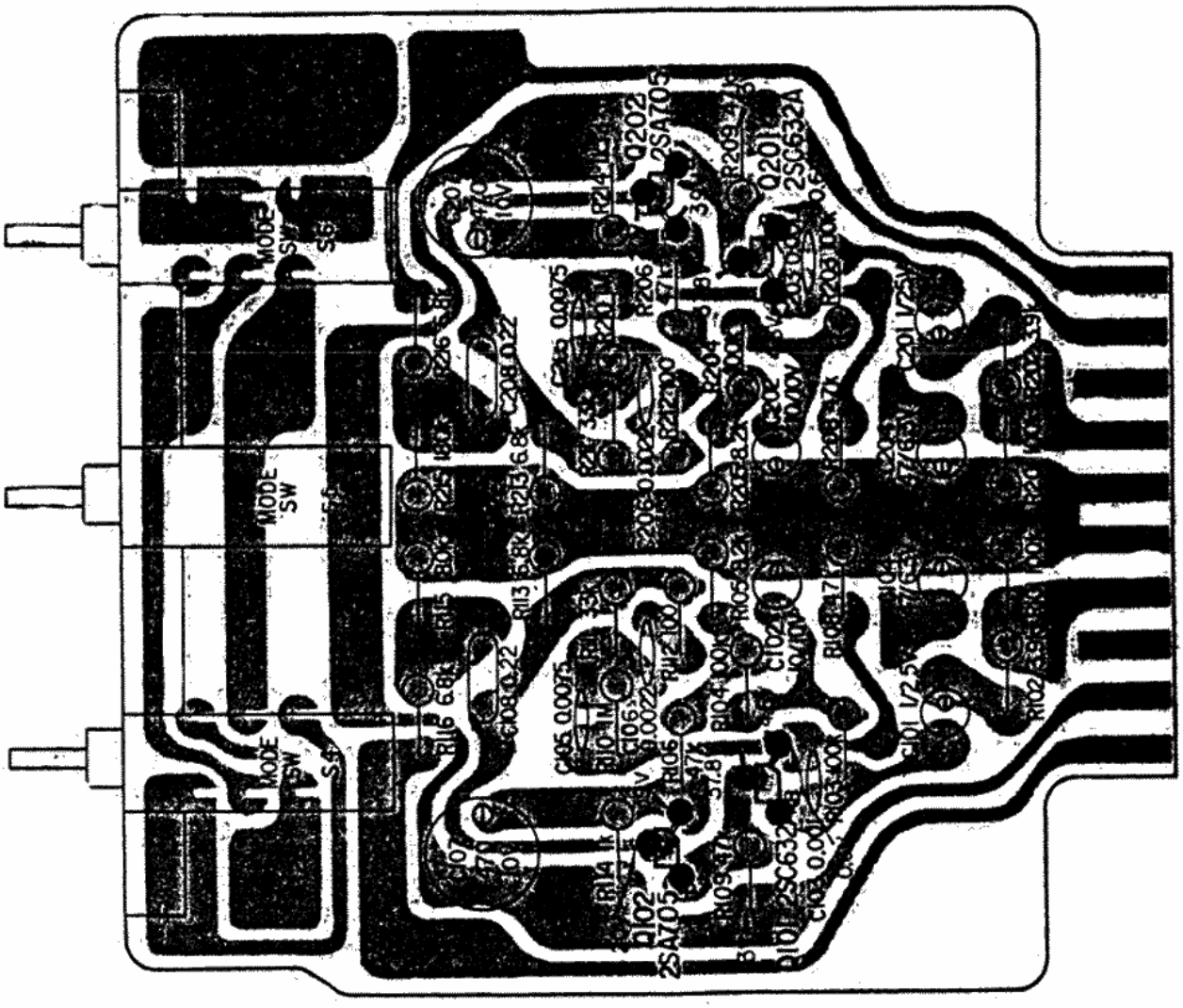

TREBLE CONTROL
BASS CONTROL
220/35V (GEP Model) 50/100V (NEP Model)

4-5. MOUNTING DIAGRAM — Equalizer Amplifier Board —

Conductor Side —

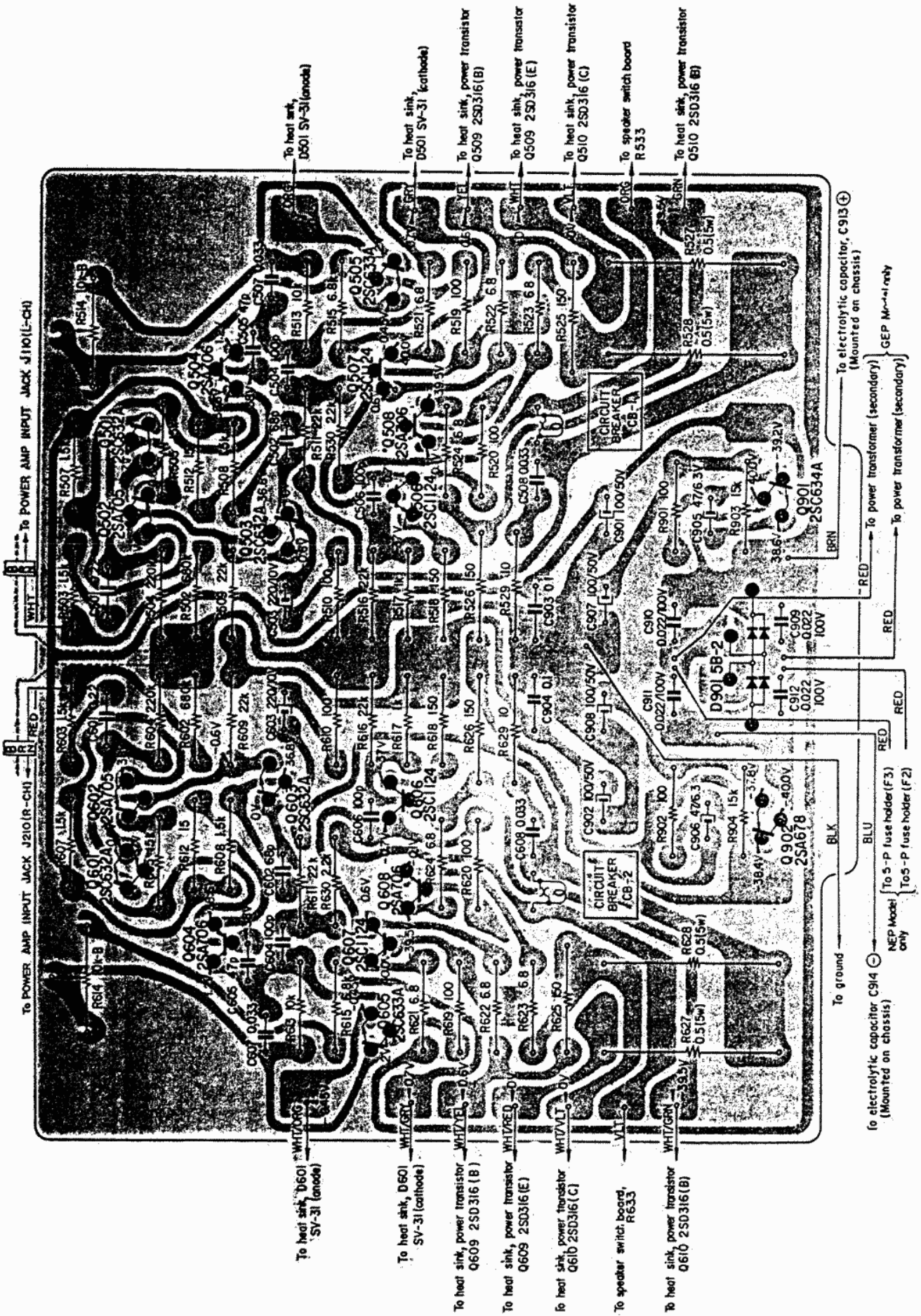


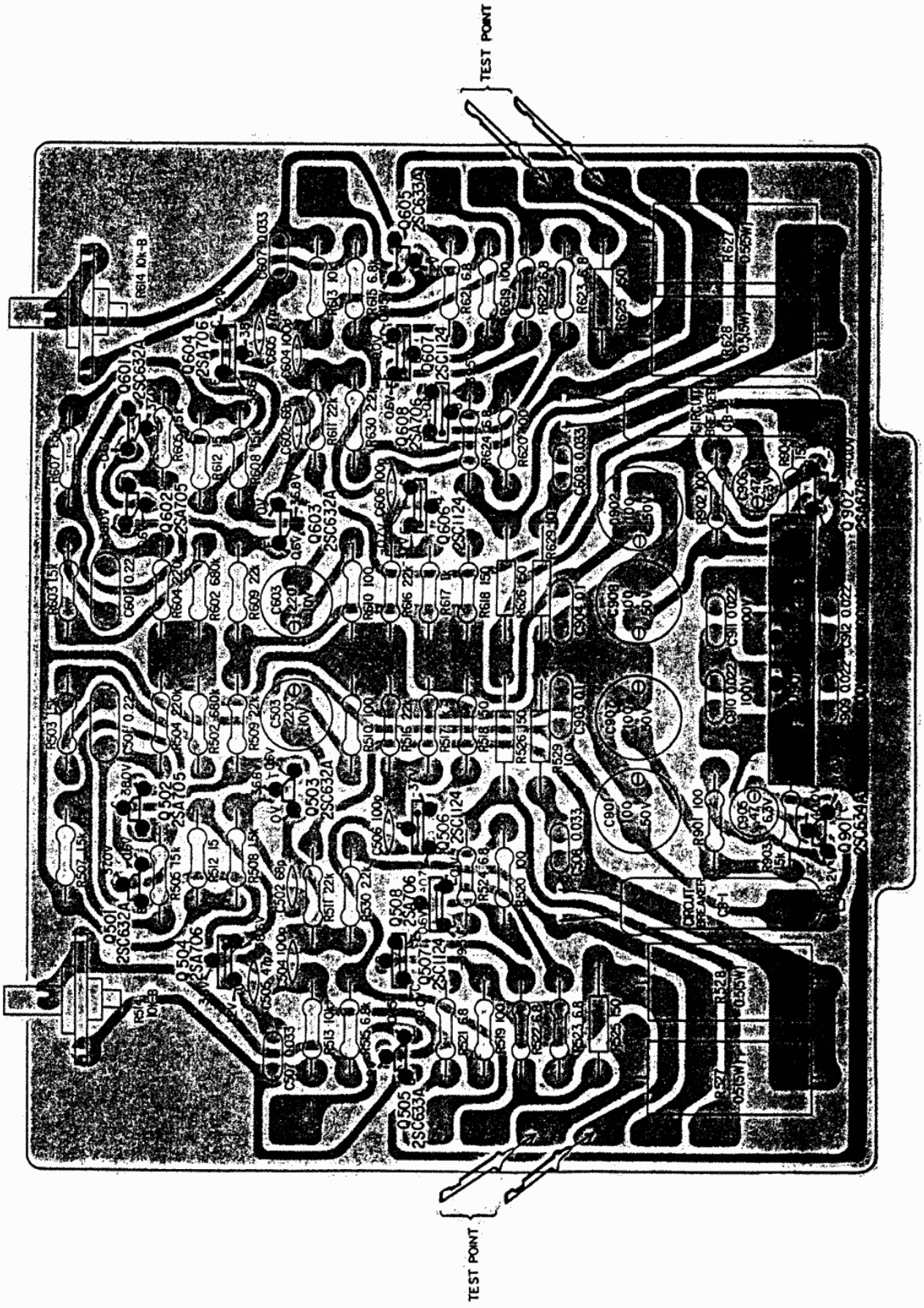
— Component Side —



4-6 MOUNTING DIAGRAM — Power Amplifier/Power Supply Board —

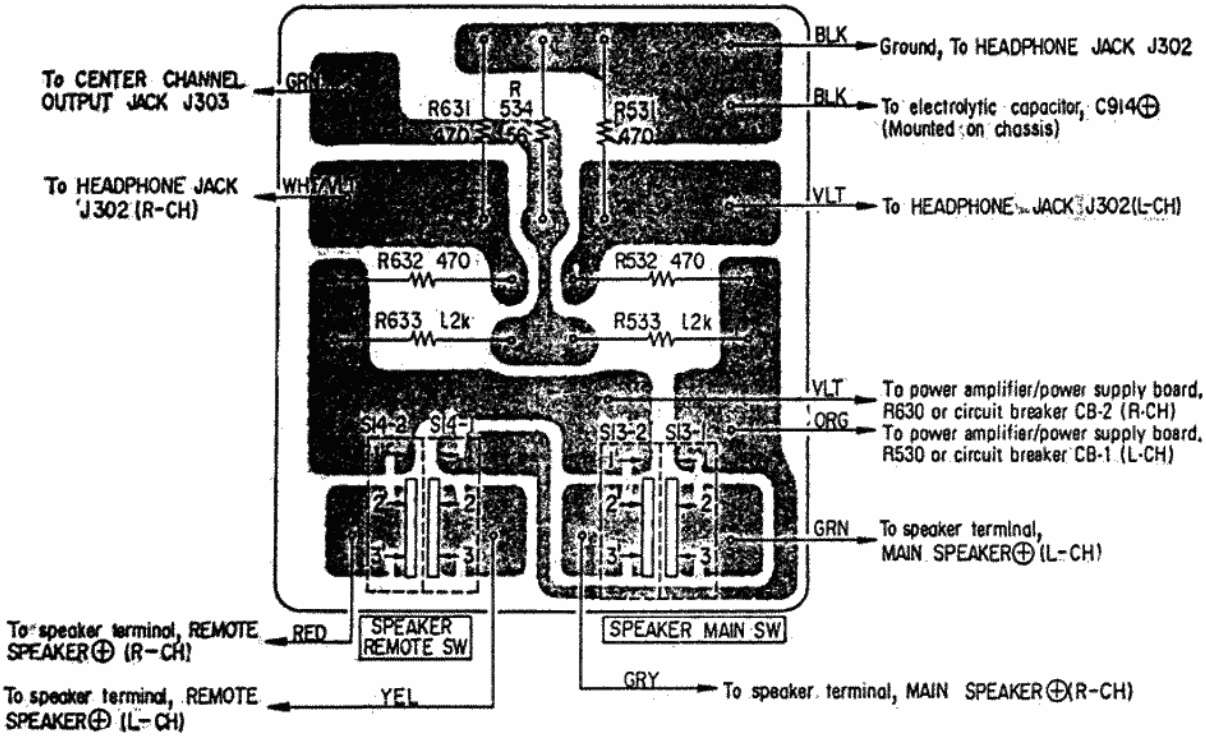
— Conductor Side —



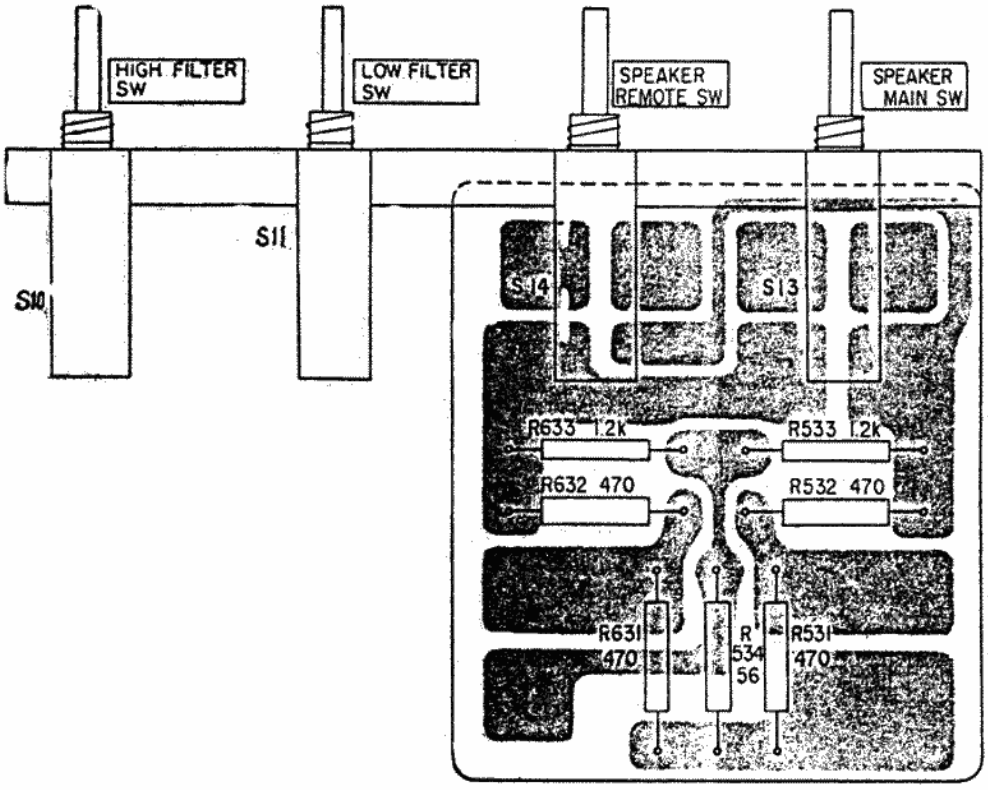

TEST POINT
TEST POINT

4-7 MOUNTING DIAGRAM — Speaker Switch Board —

Conductor Side —

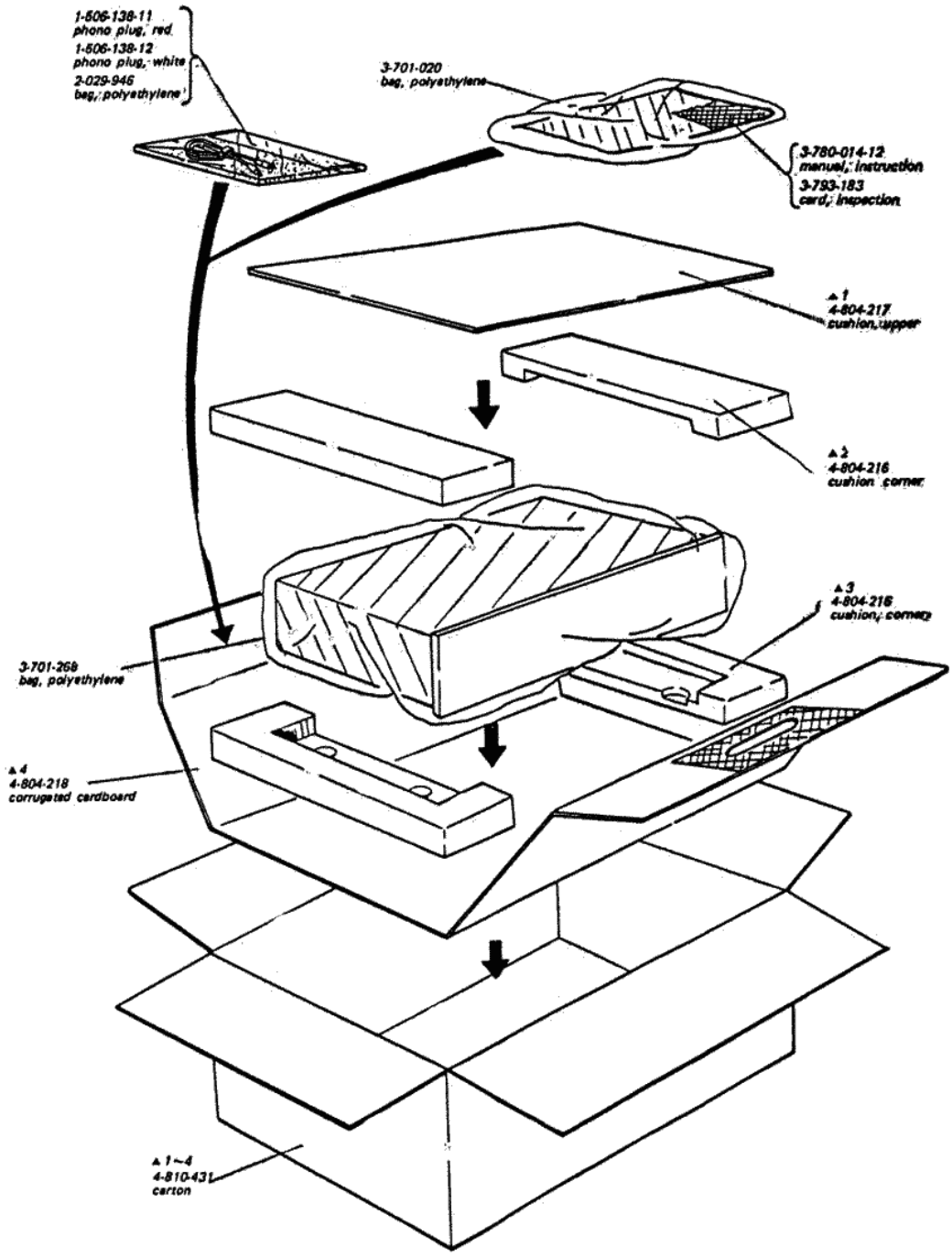


Component Side



SECTION 5
REPACKING

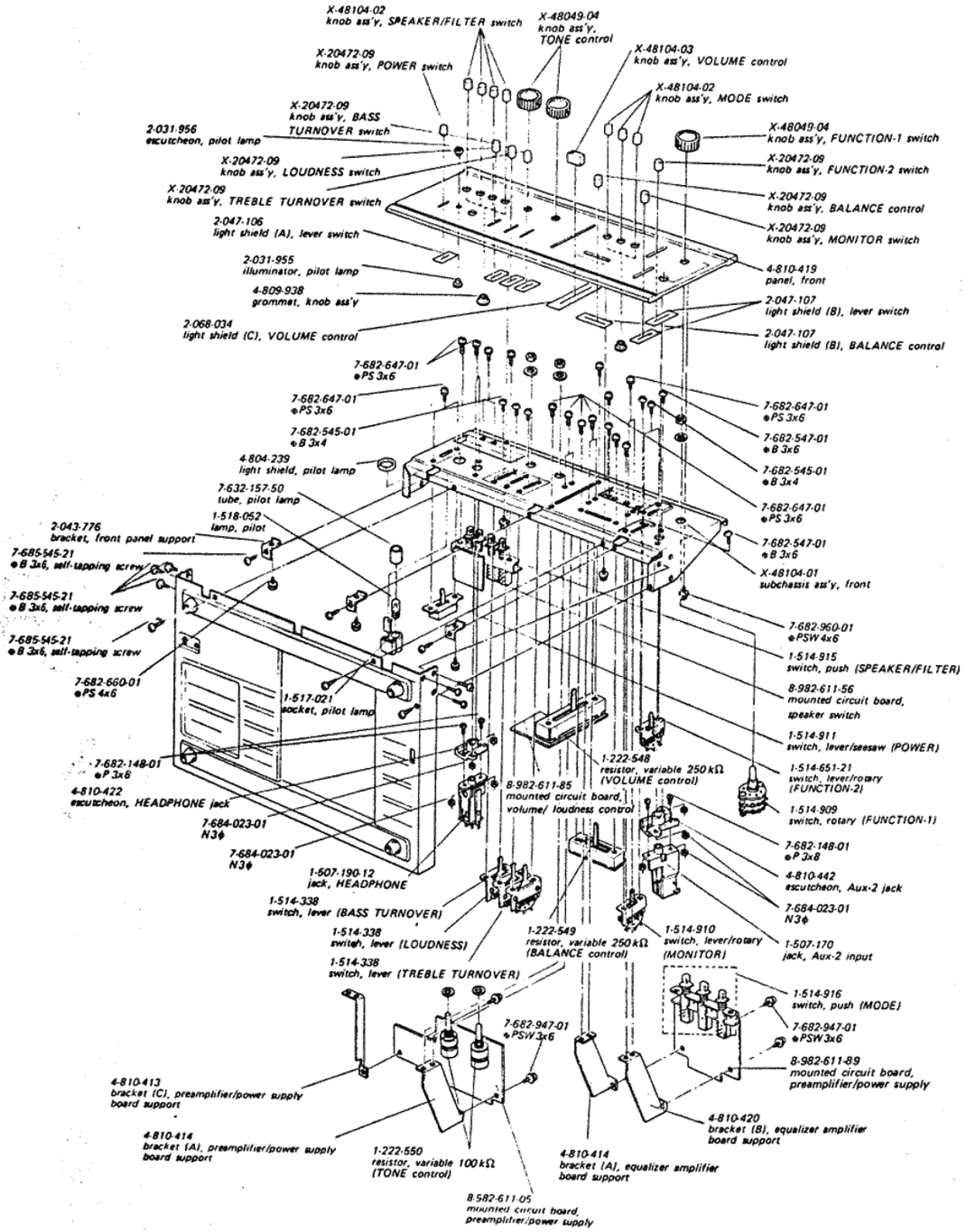
The TA-1140's original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the TA-1140 must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 5-1.

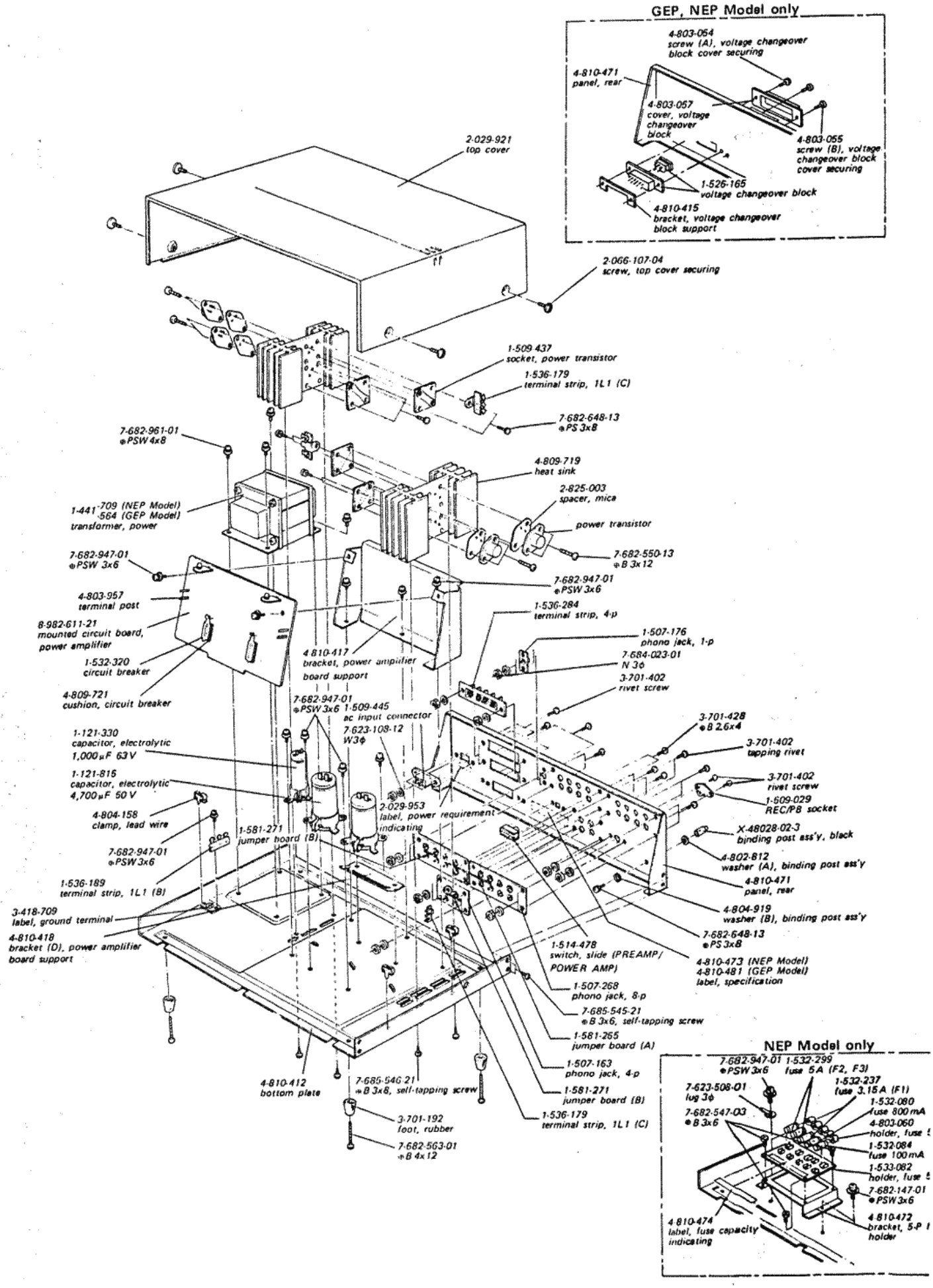


Note: ▲1~4 carton ass'y (X-48104-11) includes all the parts marked ▲.

Fig. 5-1. Repacking

SECTION 6
EXPLODED VIEWS




GEP, NEP Model only
4-803-054 screw (A), voltage changeover block cover securing
4-810-471 panel, rear
4-803-057 cover, voltage changeover block
4-803-055 screw (B), voltage changeover block cover securing
1-526-165 voltage changeover block
4-810-415 bracket, voltage changeover block support
2-029-921 top cover
2-066-107-04 screw, top cover securing
1-509-437 socket, power transistor
1-536-179 terminal strip, 1L1 (C)
7-682-648-13 ⊕PS 3x8
7-682-961-01 ⊕PSW 4x8
4-809-719 heat sink
2-825-003 spacer, mica
power transistor
1-441-709 (NEP Model) 564 (GEP Model) transformer, power
7-682-550-13 ⊕B 3x12
7-682-947-01 ⊕PSW 3x6
4-803-957 terminal post
8-982-611-21 mounted circuit board, power amplifier
1-532-320 circuit breaker
4-809-721 cushion, circuit breaker
4-810-417 bracket, power amplifier board support
1-536-284 terminal strip, 4-p
1-507-176 phono jack, 1-p
7-684-023-01 N 3φ
3-701-402 rivet screw
7-682-947-01 ⊕PSW 3x6
1-509-445 ac input connector
7-623-108-12 W3φ
3-701-428 ⊕B 2.6x4
3-701-402 tapping rivet
3-701-402 rivet screw
1-509-029 REC/PB socket
X-48028-02-3 binding post ass'y, black
4-802-812 washer (A), binding post ass'y
4-810-471 panel, rear
4-804-919 washer (B), binding post ass'y
7-682-648-13 ⊕PS 3x8
1-121-330 capacitor, electrolytic 1,000μF 63V
1-121-815 capacitor, electrolytic 4,700μF 50V
4-804-158 clamp, lead wire
1-581-271 jumper board (B)
2-029-953 label, power requirement indicating
7-682-947-01 ⊕PSW 3x6
1-536-189 terminal strip, 1L1 (B)
3-418-709 label, ground terminal
4-810-418 bracket (D), power amplifier board support
1-514-478 switch, slide (PREAMP/ POWER AMP)
4-810-473 (NEP Model) 4-810-481 (GEP Model) label, specification
1-507-268 phono jack, 8-p
7-685-545-21 ⊕B 3x6, self-tapping screw
1-581-265 jumper board (A)
1-507-163 phono jack, 4-p
1-581-271 jumper board (B)
1-536-179 terminal strip, 1L1 (C)
4-810-412 bottom plate
7-685-546-21 ⊕B 3x8, self-tapping screw
3-701-192 foot, rubber
7-682-563-01 ⊕B 4x12
NEP Model only
7-682-947-01 ⊕PSW 3x6
1-532-299 fuse 5A (F2, F3)
1-532-237 (fuse 3.15A (F1)
7-623-508-01 lug 3φ
1-532-080 fuse 800mA
7-682-547-03 ⊕B 3x6
4-803-060 holder, fuse
1-532-084 fuse 100mA
1-533-082 holder, fuse
7-682-147-01 ⊕PSW 3x6
4-810-474 label, fuse capacity indicating
4-810-472 bracket, 5-P holder

SECTION 7
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	MOUNTED CIRCUIT BOARDS	
	8-982-611-05	preamplifier/power supply circuit board
	8-982-611-21	power amplifier/power supply circuit board
	8-982-611-56	speaker switch circuit board
	8-982-611-85	volume/loudness control circuit board
	8-982-611-89	equalizer amplifier circuit board
	SEMICONDUCTORS	
D501 (D601)		varistor SV-31
D901		diode 5B-2
D902		diode 10D-2
Q101 (Q201)		transistor 2SC632A
Q102 (Q202)		transistor 2SA705
Q301 (Q401)		transistor 2SC632A
Q302 (Q402)		transistor 2SA705
Q303 (Q403)		transistor 2SC632A
Q501 (Q601)		transistor 2SC632A
Q502 (Q602)		transistor 2SA705
Q503 (Q603)		transistor 2SC632A
Q504 (Q604)		transistor 2SA706
Q505 (Q605)		transistor 2SC633A
Q506 (Q606)		transistor 2SC1124
Q507 (Q607)		transistor 2SC1124
Q508 (Q608)		transistor 2SA706
Q509 (Q609)		transistor 2SD316
Q510 (Q610)		transistor 2SD316
Q901		transistor 2SC634A
Q902		transistor 2SA678
Q903		transistor 2SC634A
	TRANSFORMER	
T	1-441-564	transformer, power (GEP Model)
	1-441-709	transformer, power (NEP Model)

CAPACITORS

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

Ref. No.	Part No.				
C101 (C201)	1-131-134	1	$\pm^{40}_{20}$%	25V	tantalum
C102 (C202)	1-121-469	10	$\pm^{100}_{10}$%	10V	electrolytic
C103 (C203)	1-105-661-12	0.001	±10%	50V	mylar
C104 (C204)	1-121-927	47	$\pm^{100}_{10}$%	6.3V	electrolytic
C105 (C205)	1-106-022-12	0.0075	±5%	50V	mylar
C106 (C206)	1-106-009-12	0.0022	±5%	50V	mylar
C107 (C207)	1-121-425	470	$\pm^{100}_{10}$%	10V	electrolytic
C108 (C208)	1-105-689-12	0.22	±10%	50V	mylar
C301 (C401)	1-101-888	68p	±5%	50V	ceramic
C302 (C402)	1-105-679-12	0.033	±10%	50V	mylar
C303 (C403)	1-105-689-12	0.22	±10%	50V	mylar
C304 (C404)	1-121-927	47	$\pm^{100}_{10}$%	6.3V	electrolytic
C305 (C405)	1-102-973	100p	±5%	50V	ceramic
C306 (C406)	1-121-748	10	$\pm^{100}_{10}$%	25V	electrolytic
C307 (C407)	1-105-679-12	0.033	±10%	50V	mylar
C308 (C408)	1-105-679-12	0.033	±10%	50V	mylar
C309 (C409)	1-105-679-12	0.033	±10%	50V	mylar
C310 (C410)	1-105-661-12	0.001	±10%	50V	mylar
C311 (C411)	1-105-661-12	0.001	±10%	50V	mylar
C312 (C412)	1-121-913	3.3	$\pm^{150}_{10}$%	25V	electrolytic
C313 (C413)	1-102-963	33p	±5%	50V	ceramic
C314 (C414)	1-121-748	10	$\pm^{100}_{10}$%	25V	electrolytic
C315 (C415)	1-105-689-12	0.22	±10%	50V	mylar
C316 (C416)	1-121-391	1	$\pm^{150}_{10}$%	50V	electrolytic
C317 (C417)	1-105-677-12	0.022	±10%	50V	mylar
C318 (C418)	1-105-685-12	0.1	±10%	50V	mylar
C319 (C419)	1-105-685-12	0.1	±10%	50V	mylar
C501 (C601)	1-105-689-12	0.22	±10%	50V	mylar
C502 (C602)	1-101-888	68p	±5%	50V	ceramic
C503 (C603)	1-121-420	220	$\pm^{100}_{10}$%	10V	electrolytic
C504 (C604)	1-102-973	100p	±5%	50V	ceramic
C505 (C605)	1-101-880	47p	±5%	50V	ceramic
C506 (C606)	1-102-973	100p	±5%	50V	ceramic
C507 (C607)	1-105-679-12	0.033	±10%	50V	mylar
C508 (C608)	1-105-679-12	0.033	±10%	50V	mylar
C901 (C902)	1-121-417	100	$\pm^{100}_{10}$%	50V	electrolytic
C903 (C904)	1-105-685-12	0.1	±10%	50V	mylar
C905 (C906)	1-121-407	47	$\pm^{100}_{10}$%	6.3V	electrolytic
C907 (C908)	1-121-417	100	$\pm^{100}_{10}$%	50V	electrolytic
C909 (C910)	1-105-717-12	0.022	±10%	100V	mylar
C911 (C912)	1-105-717-12	0.022	±10%	100V	mylar
C913	1-121-815	4,700	$\pm^{100}_{10}$%	50V	electrolytic
C914	1-121-815	4,700	$\pm^{100}_{10}$%	50V	electrolytic
C915	1-105-717-12	0.022	±10%	100V	mylar
C916	1-121-261	220 (GEP Model)	$\pm^{100}_{10}$%	35V	electrolytic
	1-121-559	50 (NEP Model)	$\pm^{100}_{10}$%	100V	electrolytic
C917	1-121-330	1,000	$\pm^{100}_{10}$%	63V	electrolytic
C918	1-105-679-12	0.033	±10%	50V	mylar
C919	1-121-411	47	$\pm^{100}_{10}$%	50V	electrolytic
C920	1-121-413	100	$\pm^{100}_{10}$%	6.3V	electrolytic

Ref. No.	Part No.	Description			
C921	1-105-685-12	0.1	±10%	50V	mylar
C922	1-121-417	100	$\pm^{100}_{10}$%	50V	electrolytic
C923	1-105-685-12	0.1	±10%	50V	mylar
C924	1-121-361	470	$\pm^{100}_{10}$%	35V	electrolytic

RESISTORS

All resistors are in ohms, ±5%, ¼W and carbon type unless otherwise indicated.

Ref. No.	Part No.	Description
R101 (R201)	1-242-721	100 k
R102 (R202)	1-242-687	3.9 k
R103 (R203)	1-242-721-09	100 k, low noise
R104 (R204)	1-242-721	100 k
R105 (R205)	1-242-695	8.2 k
R106 (R206)	1-242-713	47 k
R107 (R207)	1-244-661	330
R108 (R208)	1-242-713	47 k
R109 (R209)	1-242-713-09	47 k, low noise
R110 (R210)	1-242-745	1 M
R111 (R211)	1-242-709	33 k
R112 (R212)	1-242-649	100
R113 (R213)	1-242-693-09	6.8 k, low noise
R114 (R214)	1-242-673	1 k
R115 (R215)	1-242-727	180 k
R116 (R216)	1-242-693	6.8 k
R301 (R401)	1-222-549	250 k (N)/250 k (M), variable (BALANCE control)
R302 (R402)	1-222-548	250 k/250 k, variable (VOLUME control)
R303 (R403)	1-244-717	68 k
R304 (R404)	1-244-697	10 k
R305 (R405)	1-242-687	3.9 k
R306 (R406)	1-242-745-09	1 M, low noise
R307 (R407)	1-242-699	12 k
R308 (R408)	1-242-721-09	100 k, low noise
R309 (R409)	1-242-669-09	680, low noise
R310 (R410)	1-242-705-09	22 k, low noise
R311 (R411)	1-242-689-09	4.7 k, low noise
R312 (R412)	1-242-649	100
R313 R413)	1-242-697	10 k
R314 (R414)	1-242-697	10 k
R315 (R415)	1-242-689	4.7 k
R316 (R416)	1-242-697	10 k
R317 (R417)	1-222-550-12	100 k (B), variable (TREBLE control)
R318 (R418)	1-222-550-21	100 k (B), variable (BASS control)
R319 (R419)	1-210-815	1.2 M ±1% ½W composition
R320 (R420)	1-242-691-09	5.6 k, low noise
R321 (R421)	1-242-713	47 k
R322 (R422)	1-242-677	1.5 k
R323 (R423)	1-242-721	100 k
R324 (R424)	1-242-701	15 k
R502 (R602)	1-244-741	680 k
R503 (R603)	1-244-677	1.5 k
R504 (R604)	1-244-729	220 k
R505 (R605)	1-244-701	15 k
R506 (R606)		– discarded –
R507 (R607)	1-244-677	1.5 k
R508 R608)	1-244-677	1.5 k
R509 (R609)	1-244-705	22 k
R510 (R610)	1-244-649	100
R511 (R611)	1-244-705	22 k
R512 (R612)	1-244-629	15
R513 (R613)	1-244-697	10 k
R514 (R614)	1-221-967	10 k (B), semi-fixed
R515 (R615)	1-244-693	6.8 k
R516 (R616)	1-244-705	22 k
R517 (R617)	1-244-673	1 k
R518 (R618)	1-244-653	150
R519 (R619)	1-242-649	100
R520 (R620)	1-244-649	100
R521 (R621)	1-244-621	6.8
R522 (R622)	1-244-621	6.8
R523 (R623)	1-244-621	6.8
R524 (R624)	1-244-621	6.8
R525 (R625)	1-202-553	150 ±10% ½W compos
R526 (R626)	1-202-553	150 ±10% ½W compos
R527 (R627)	1-205-803	0.5 ±10% 5W wire-wo
R528 (R628)	1-205-803	0.5 ±10% 5W wire-wo
R529 (R629)	1-202-525	10 ±10% ½W compos
R530 (R630)	1-244-681	2.2 k
R531 (R631)	1-202-565	470 ±10% ½W compos
R532 (R632)	1-202-565	470 ±10% ½W compos
R533 (R633)	1-202-575	1.2 k ±10% ½W compos
R534	1-202-543	56 ±10% ½W compos
R801	1-244-735	390 k
R802	1-244-735	390 k
R803	1-244-719	82 k
R804	1-244-719	82 k
R805	1-244-697	10 k
R806	1-244-697	10 k
R807	1-244-697	10 k
R808	1-244-697	10 k
R901 (R902)	1-244-649	100
R903 (R904)	1-244-701	15 k
R905	1-202-562	360 ±10% ½W compo
R906	1-202-563	390 ±10% ½W compo

Ref. No.	Part No.	Description
R907	1-242-709	33 k
R908	1-202-579	1.8 k ±10% ½W composition
R909	1-202-579	1.8 k ±10% ½W composition
R910	1-206-059	220 ±10% 2W metal oxide (GEP Model)
	1-244-629	15 (NEP Model)

SWITCHES

S1	1-514-90[illegible]	switch, rotary (FUNCTION-1)
S2	1-514-651-21	switch, lever/rotary (FUNCTION-2)
S3	1-514-910	switch, lever/rotary (MONITOR)
S4		
S5	1-514-916-11	combination switch, push (MODE)
S6		
S7	1-513-338	switch, lever (TREBLE TURNOVER)
S8	1-513-338	switch, lever (LOUDNESS)
S9	1-513-338	switch, lever (BASS TURNOVER)
S10	1-514-915	combination switch, push (HIGH FILTER)
S11		(LOW FILTER)
S13		(MAIN SPEAKER)
S14		(REMOTE SPEAKER)
S12	1-514-478	switch, slide (PREAMP/POWER AMP)
S15	1-514-911	switch, lever/seesaw (POWER)

Ref. No.	Part No.	Description
		MISCELLANEOUS
CP	1-231-057	encapsulated component, 120Ω + 0.33μF (GEP Model only)
	1-507-163	phono jack, 4-P
J301	1-507-170	jack, AUX-2
	1-507-176	phono jack, 1-P
J302	1-507-190-12	jack, HEADPHONE
	1-507-268	phono jack, 8-P
CNJ2, 3, 4	1-509-341	ac outlet
	1-509-029	rec/pb connector
	1-509-437	socket, power transistor
	1-517-021	socket, pilot lamp
	1-518-052	lamp, pilot
	1-526-165	voltage changeover block
	1-532-320	circuit breaker (CB-1, CB-2)
	1-534-487	cord, power
	1-536-179	terminal strip, 1L1 (C)
	1-536-189	terminal strip, 1L1 (B) (GEP Model only)
	1-536-284	terminal strip, 4-P
	1-581-265	jumper board (A)
	1-581-271	jumper board (B)
F1, 2	1-532-252	fuse 2.5A (GEP Model only)
F1	1-532-237	fuse 3.15A (NEP Model only)
F2, 3	1-532-299	fuse 5A (NEP Model only)
F4	1-532-084	fuse 100 mA (NEP Model only)
F5	1-532-080	fuse 800 mA (NEP Model only)
	1-509-445	ac input connector
	1-533-082	fuse holder, 5-P

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