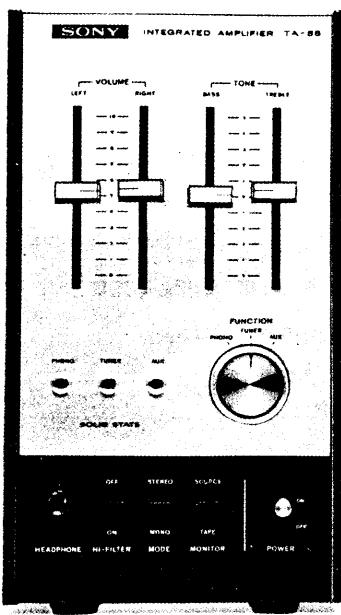


TA-88



Set using ISO screws

UK and AEP Model



SPECIFICATIONS

POWER AMPLIFIER SECTION

Dynamic power: 60 watts, both channels operating; 4 ohms.
40 watts, both channels operating; 8 ohms.

RMS power: 18 watts, per channel, both channels operating; 4 ohms.
13 watts, per channel, both channels operating; 8 ohms.

Rated output: 11 watts per channel, both channels operating; 8 ohms.

Power band width: 20 Hz to 20 kHz, IHF

Harmonic distortion: Less than 1.0% at rated output (at 1 kHz)

IM distortion: Less than 1.0% at rated output

PREAMPLIFIER SECTION

Frequency response: PHONO: RIAA curve ± 1.0 dB
TUNER, AUX } 15 Hz to 15 kHz
TAPE } ± 3 dB
REC/PB (input)

Input sensitivity and impedance: PHONO: 3 mV 50 k ohms
TUNER, AUX } 250 mV
TAPE } 50 k ohms
REC/PB (input)

Signal output and output impedance: REC OUT: 250 mV 10 k ohms
HEADPHONE OUT: 280 mV 270 ohms
REC/PB (output): 30 mV 80 k ohms

GENERAL

Power consumption: 80 watts
Power requirement: 110, 127, 220, 240 V 50/60 Hz, ac

Dimensions: 130 mm (width) x 230 mm (height) x 165 mm (depth)

Net weight: 3.2 kg (7 lb 1 oz)
Shipping weight: 3.8 kg (8 lb 6 oz)

SONY®
SERVICE MANUAL

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SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-88 are listed in Table 1-1.

TABLE 1-1.
TA-88 TECHNICAL SPECIFICATIONS

Power Amplifier Section

Dynamic power:	60 watts, both channels operating; 4 ohms. 40 watts, both channels operating; 8 ohms.
RMS power:	18 watts, per channel, both channels operating; 4 ohms. 13 watts, per channel, both channels operating; 8 ohms.
Rated output:	11 watts, per channel, both channels operating; 8 ohms.
Power band width:	20 Hz to 20 kHz, IHF
Harmonic distortion:	Less than 1.0% at rated output (at 1 kHz)
IM distortion:	Less than 1.0% at rated output
Residual noise:	Less than 1.5 μ W (8 ohms)

Preamplifier Section

Frequency response:	PHONO: RIAA curve \pm 1.0 dB TUNER, AUX } 15 Hz to TAPE } 50 kHz REC/PB (input) } \pm 3 dB
---------------------	---

Input sensitivity and impedance:	PHONO: 3 mV 50 k ohms TUNER, AUX } 250 mV TAPE } 50 k ohms REC/PB (input)
Signal output and output impedance:	REC OUT: 250 mV 10 k ohms HEADPHONE OUT: 280 mV 270 ohms
Signal-to-noise ratio:	REC/PB (output): 30 mV 80 k ohms PHONO: greater than 60 dB (weighting network "B") TUNER, AUX } greater than TAPE } 80 dB REC/PB } (weighting (input) } network "A")
Tone controls:	BASS: \pm 10 dB at 100 Hz TREBLE: \pm 10 dB at 1 kHz
Filters:	HIGH: 6 dB/oct, above 5 kHz
	General
Power consumption:	80 watts
Power requirement:	110, 127, 220, 240 V 50/60 Hz, ac
Dimensions:	130 mm (width) \times 230 mm (height) \times 165 mm (depth)
Net weight:	3.2 kg (7 lb 1 oz)
Shipping weight:	3.8 kg (8 lb 6 oz)

1-2. CIRCUIT DESCRIPTION DIGEST

Preamplifier Section

Equalizer Amplifier Q101, Q102 This direct-coupled two stage amplifier amplifies the small signal produced by the tuner, phono cartridge, tape recorder, or signal applied to the AUX input jacks, to the level required at the input of the following buffer amplifier.

VOLUME control RV101 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 RV101 shown in Fig. 1-1.

Buffer Amplifier (Emitter follower); Q103 This isolates the volume control and tone control to eliminate mutual interference shown in Fig. 1-1.

The tone control circuit employed is a modified negative-

feedback type utilizing the power amplifier itself.

Note that the output of power amplifier is fed back to the RV102 through R202 shown in Fig. 1-1.

The high-cut off filter (R117 and C109) eliminates unwanted high frequency components (5 kHz and higher) from the input signal when this switch is ON, shown in Fig. 1-1.

Power Amplifier Section

Preamplifier Q201, Q202

Q201 and Q202 form a para-phase amplifier but signal output is extracted from the collector circuit of Q202. This circuit has a various advantages in direct coupling systems.

One is high stability despite temperature variations and another is high input impedance without reducing the amplifier's gain.

The ac output appears across

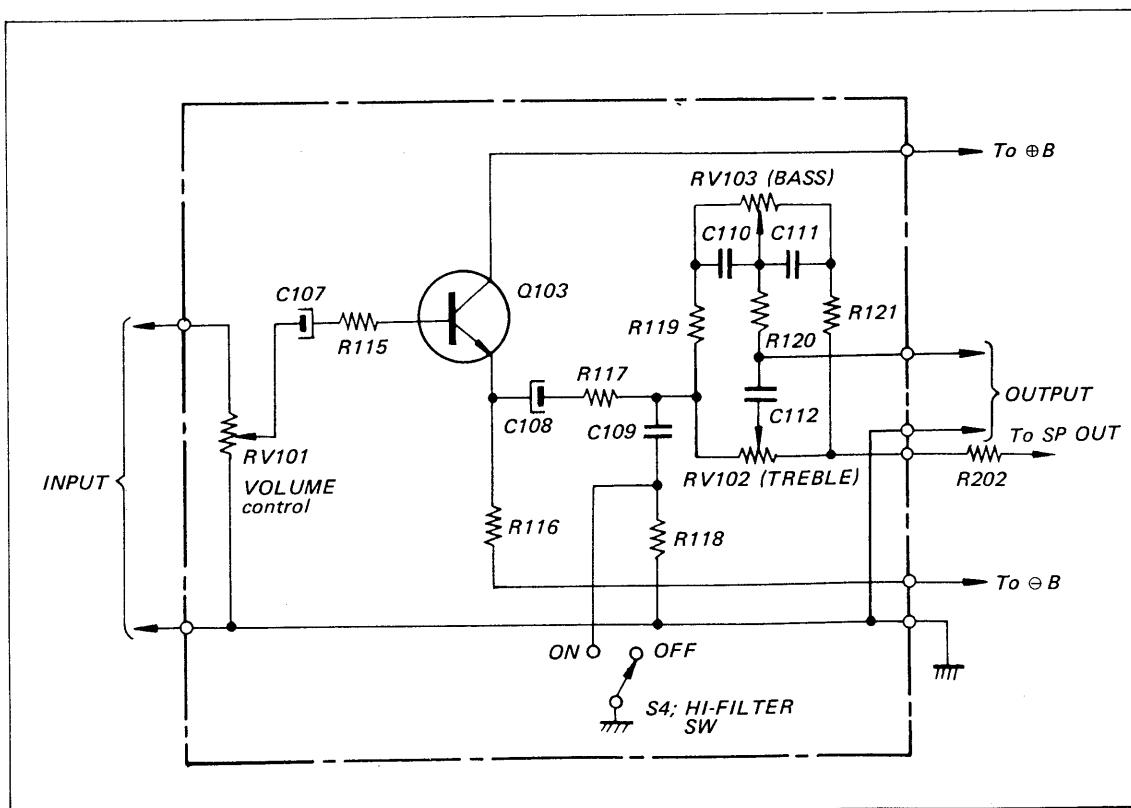
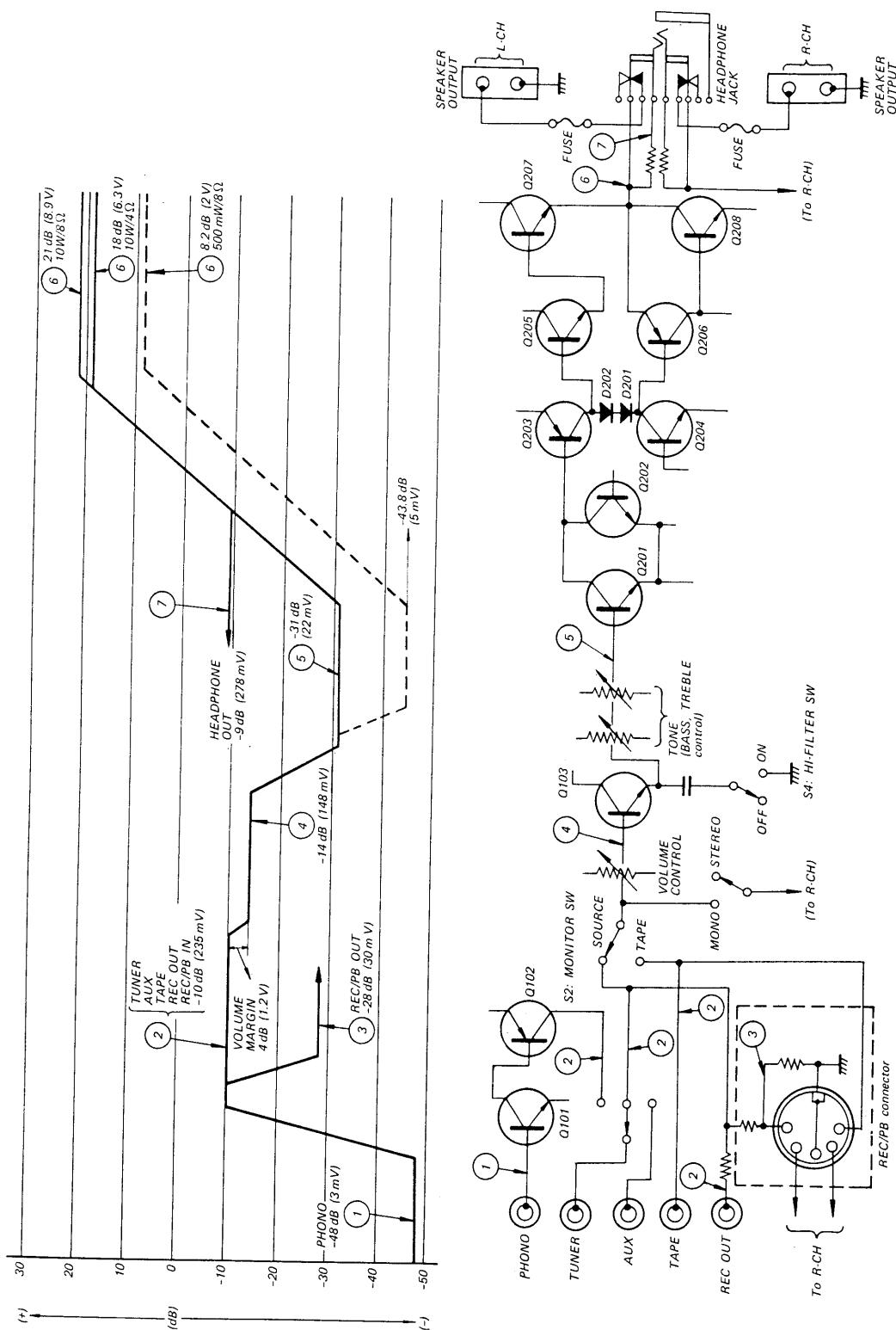


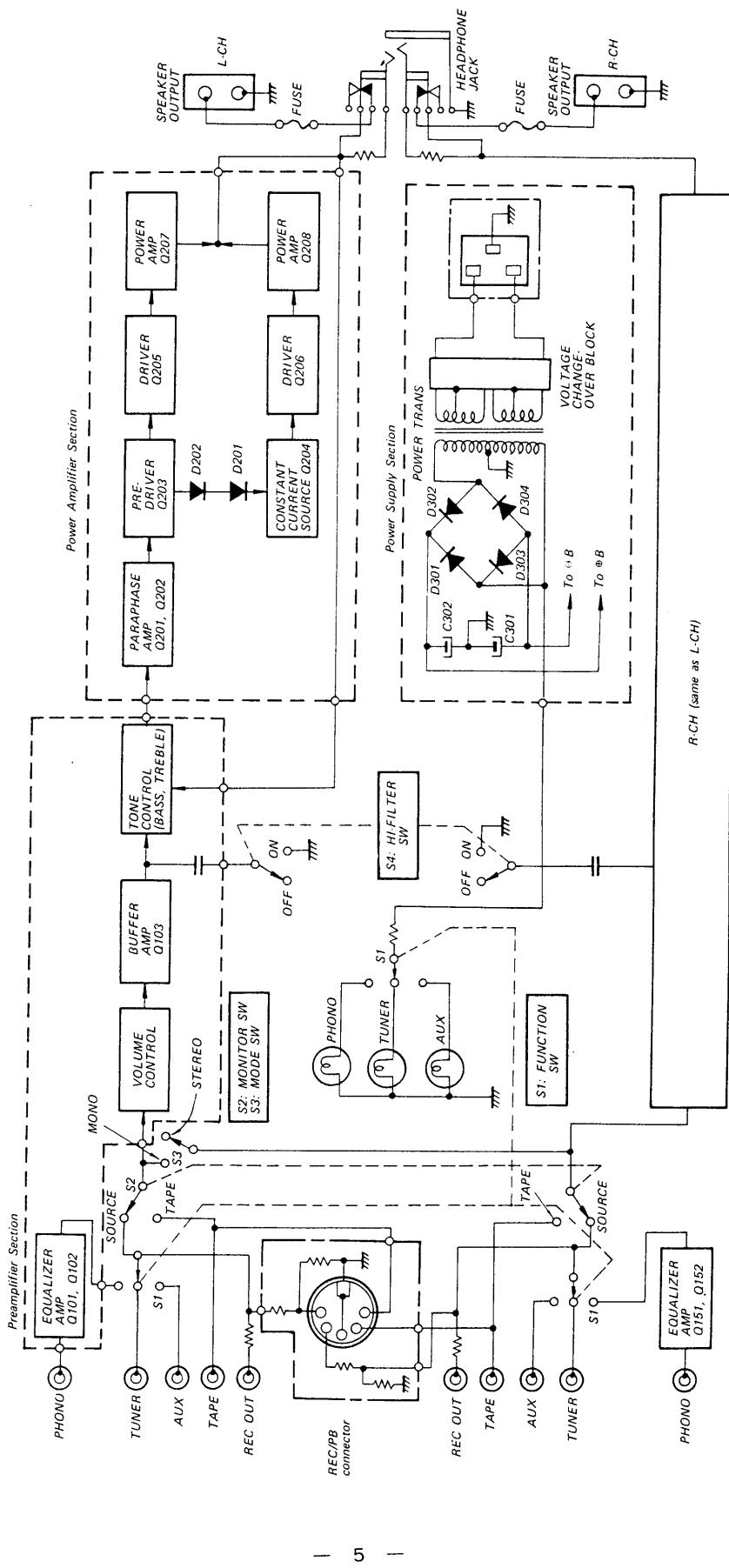
Fig. 1-1. Partial schematic diagram of tone control circuit

	load resistor R208 (1.2 k) in the collector circuit of Q202. An emitter decoupling circuit is formed by the emitter-base resistance of Q202, R209 in the base circuit of Q202.	Driver Q205, Q206	These transistor operate as emitter-followers to provide the current swings demanded of the output stages and also provide the necessary phase inversion. Phase inversion is performed by using PNP and NPN type transistor.
Predriver Q203	Common emitter resistor R206 keeps the dc current flow constant in the Q201 and Q202, thus increasing dc stability.	Power transistor Q207, Q208	The output transistors (Q207 and Q208) are connected directly to a power supply of about ± 23 V. Q207 supplies power to the load during the positive half cycle and Q208 operates during the negative half cycle. 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.
Constant current source Q204	This stage is a conventional flat amplifier, it determines the output voltage swings because the following stages are basically in the emitter-follower configuration.		
Thermal compensator for dc bias current D201, D202	The ac load resistor for this stage is collector-emitter impedance of Q204.		
	The negative temperature coefficient of D201 and D202 provide thermal compensation for the complementary and power transistor circuits. D202 is attached to the power transistor's heat sink to detect temperature increases in the power transistor.		

1-3. LEVEL DIAGRAM



1-4. BLOCK DIAGRAM



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SECTION 2

DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

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

2-1. 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 an identification mark on their heads as shown in Fig. 2-1.

All screws in this service manual are phillips type (cross recess type) unless otherwise indicated.
(-); slotted head

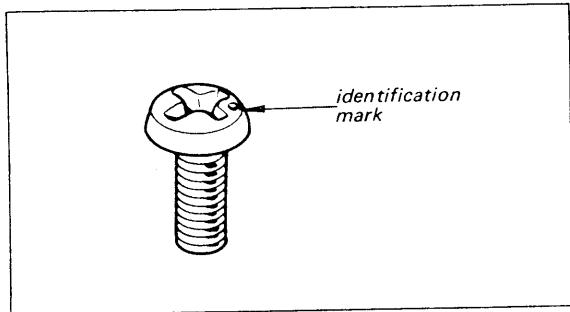
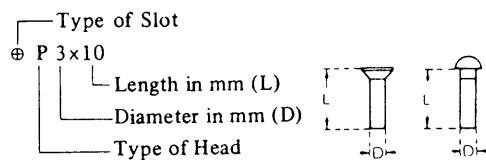


Fig. 2-1. ISO screw

- 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 -

2-2. WOODEN CASE REMOVAL

1. Remove the four screws securing the wooden case to the chassis with rubber foot.
2. Remove the four screws at the rear panel shown in Fig. 2-2.
3. Push the chassis out carefully and place it on a soft protective pad, otherwise the bottom of the front panel will be scratched.

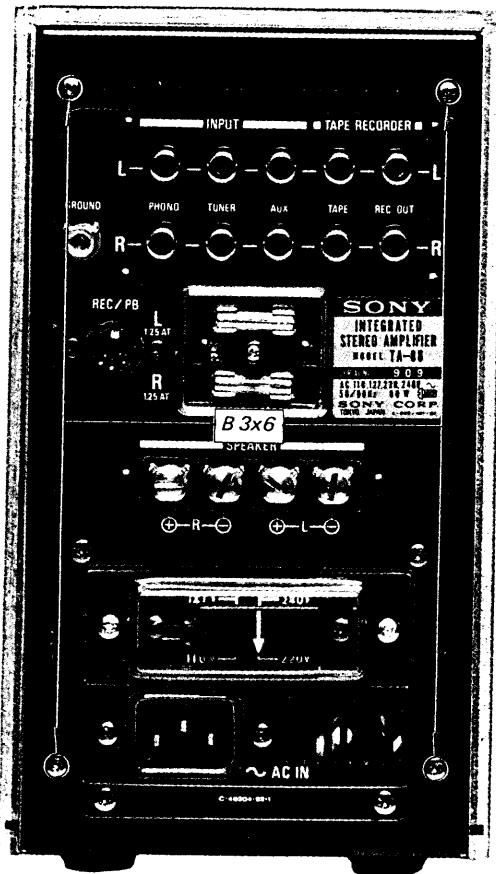


Fig. 2-2. Wooden case removal

2-3. FRONT PANEL REMOVAL

1. Remove the wooden case as described in Procedure 2-2.
2. Remove the FUNCTION switch and VOLUME, TONE control knobs by pulling them off.
3. Remove the four screws behind top and bottom edge of the front subchassis shown in Fig. 2-3.

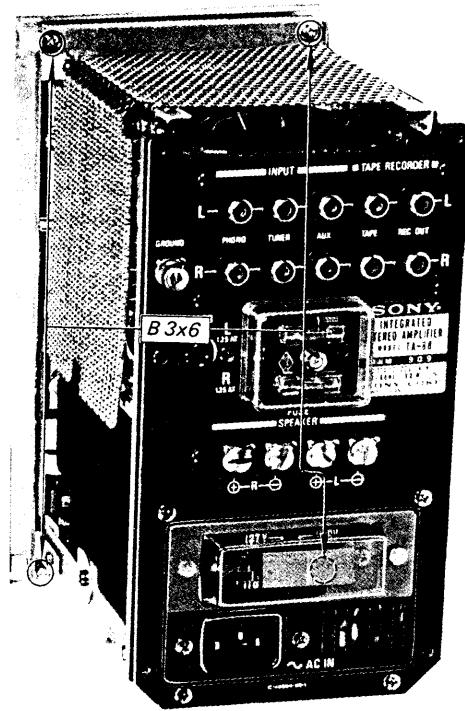


Fig. 2-3. Front panel removal

2-4. FRONT SUBCHASSIS REMOVAL

1. Remove the front panel as described in Procedure 2-3.
2. Remove the five screws shown in Fig. 2-4.

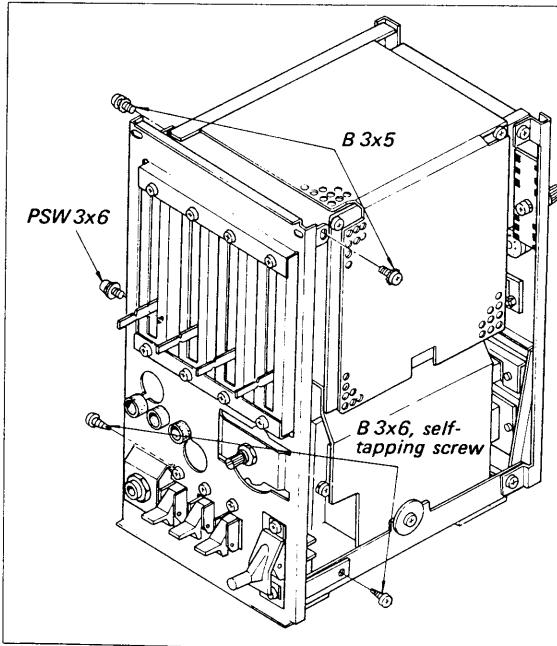


Fig. 2-4. Front subchassis removal

2-5. CONTROL AND SWITCH REPLACEMENT

1. Remove the front panel and front subchassis as described in Procedures 2-3 and 2-4.
2. Remove the screws and nuts securing the switches and controls to the front subchassis (See Fig. 2-5), and then install a new one.

2-6. POWER AMPLIFIER/POWER SUPPLY BOARD REMOVAL

1. Remove the wooden case as described in Procedure 2-2.
2. Loosen the two screws securing the preamplifier board to its bracket shown in Fig. 2-6.
3. Remove the shield plate. This permit the power transistor removal shown in Fig. 2-6.
4. Remove the four screws securing the power transistor to the heat sink shown in Fig. 2-7.
5. Remove the four screws shown in Fig. 2-8.
6. This frees power amplifier/power supply board.

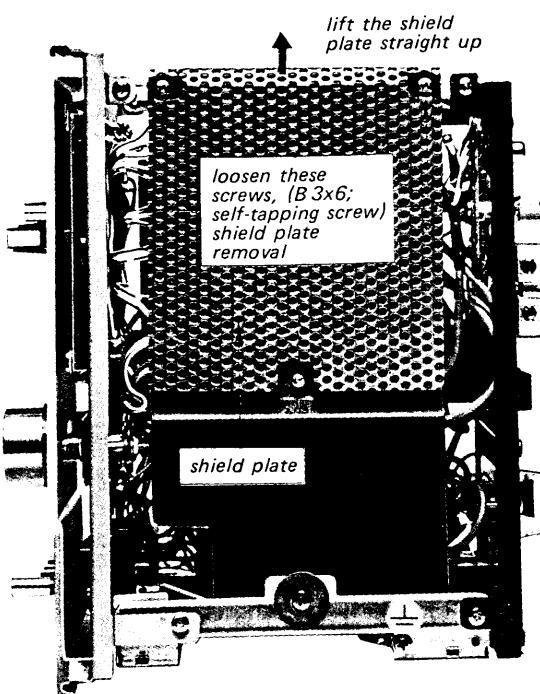


Fig. 2-6. Shield plate removal

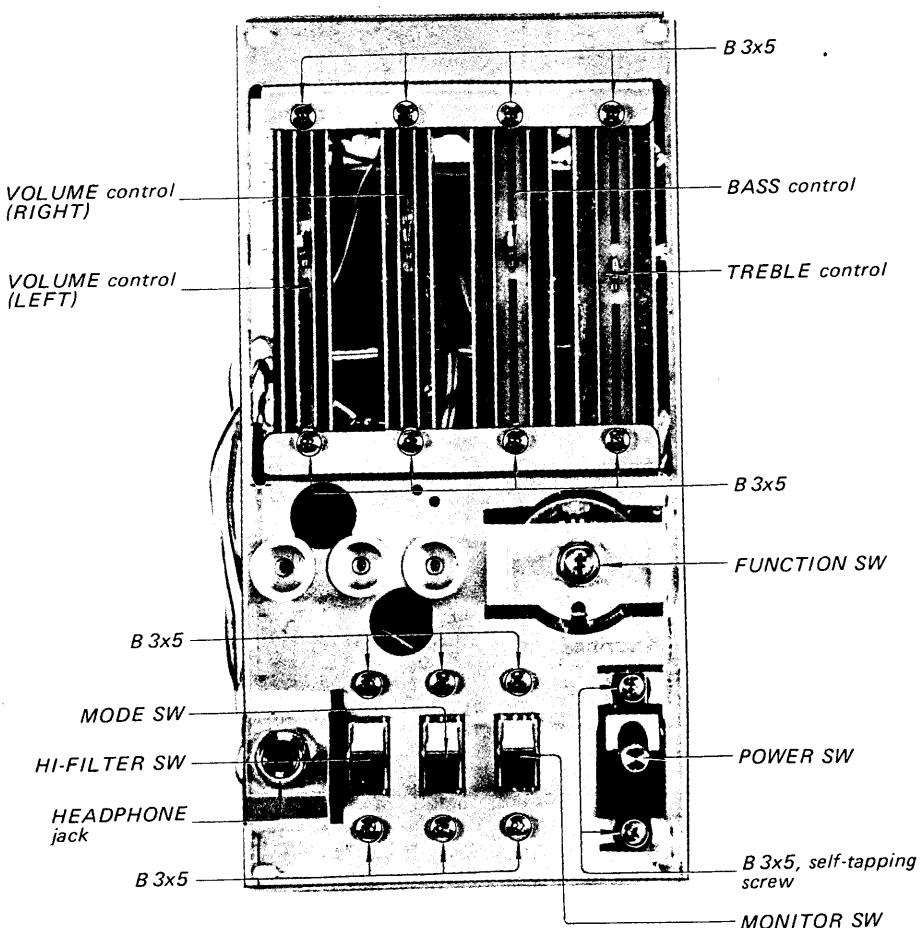


Fig. 2-5. Switch and control replacement

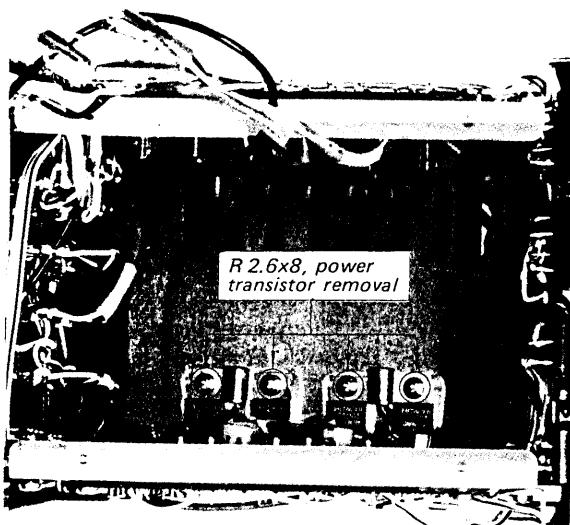


Fig. 2-7. Power transistor removal

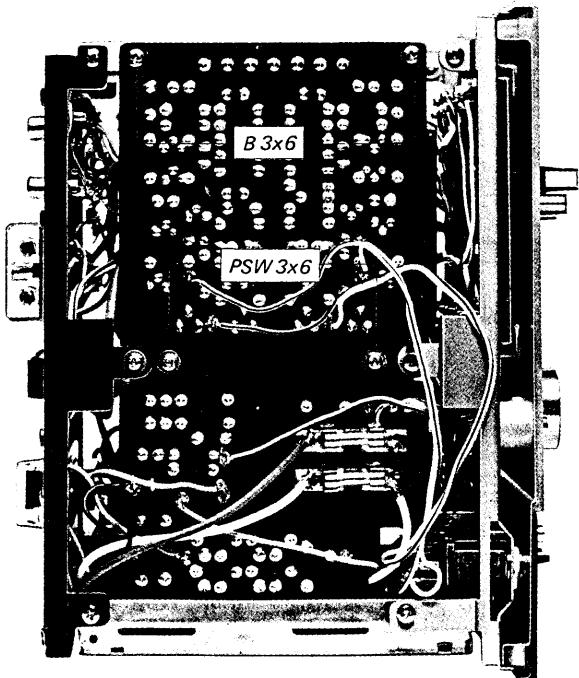


Fig. 2-8. Power amplifier/power supply board removal

2-7. POWER TRANSISTOR REPLACEMENT

1. Remove the power amplifier/power supply board as described in Procedure 2-6.
2. Unsolder the leads of power transistor, and then install a new one.

3. When replacing the power transistor, apply a coating of a heat-transferring grease to both sides of insulation mica spacer to the indicated portion as shown in Fig. 2-9. 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.

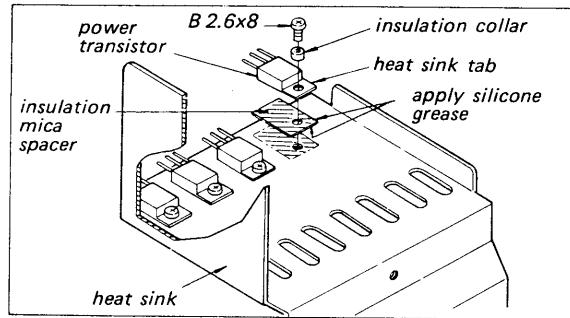


Fig. 2-9. Power transistor replacement

2-8. REAR PANEL REMOVAL

1. Remove the wooden case as described in Procedure 2-2.
2. Remove the five screws shown in Fig. 2-10.

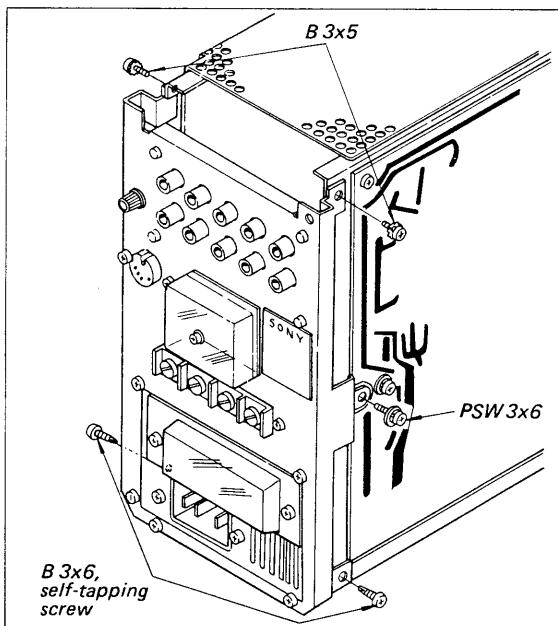


Fig. 2-10. Rear panel removal

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

1. Remove the nylon rivets securing the defective component by pushing its end with a tweezers shown in Fig. 2-11.
2. Remove the defective component and then install a new one.
3. To reinstall the rivet, insert the flared part into the opening first, and then push the head as far as it will go, shown in Fig. 2-12.

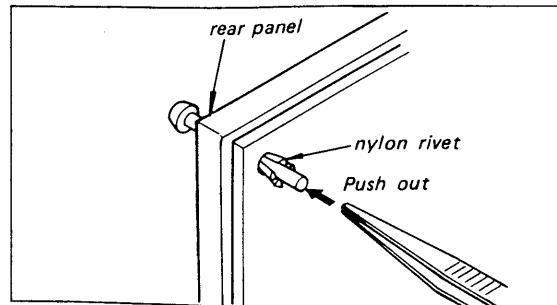


Fig. 2-11. Nylon rivet removal

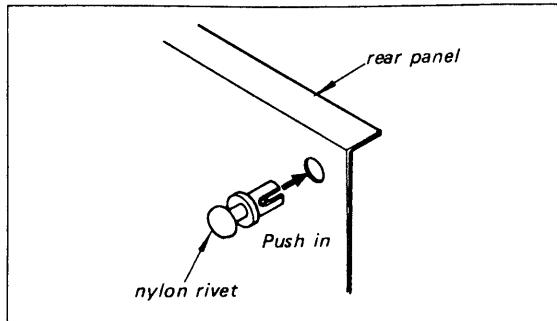
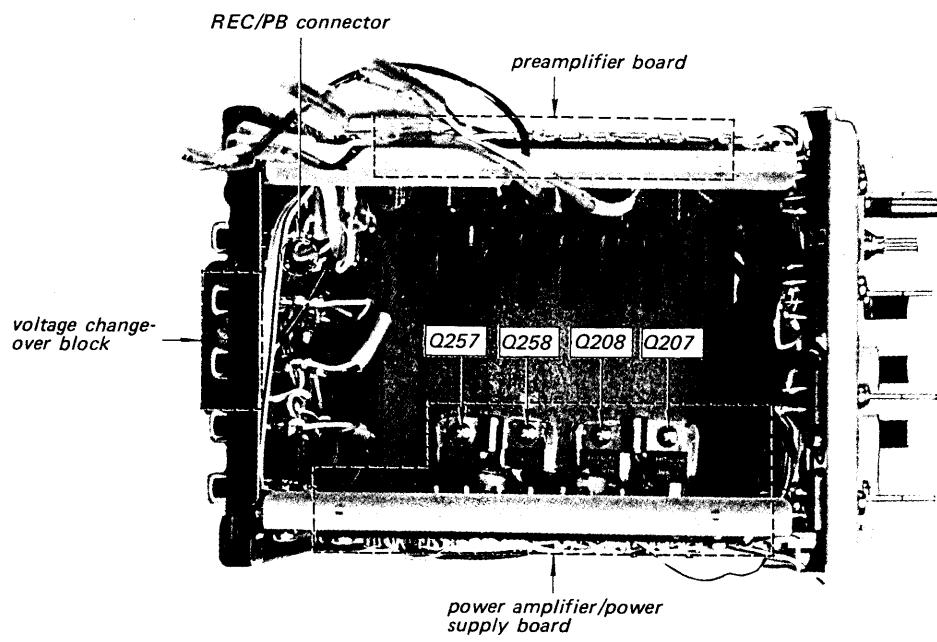


Fig. 2-12. Nylon rivet installation

2-10. CHASSIS LAYOUT



SECTION 3 REPACKING

The original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the

set must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 3-1.

1-532-285-00
fuse, 1.25AT
3-701-020-00
bag, polyethylene
3-701-389-00
tack label(UK Model Only)
3-780-139-11
manual, instruction(AEP Model)
3-780-139-81
manual, instruction(UK Model)
3-793-183-00
card, inspection
3-793-520-82
card, warranty(UK Model Only)

4-820-425-00
cushion, side (left)

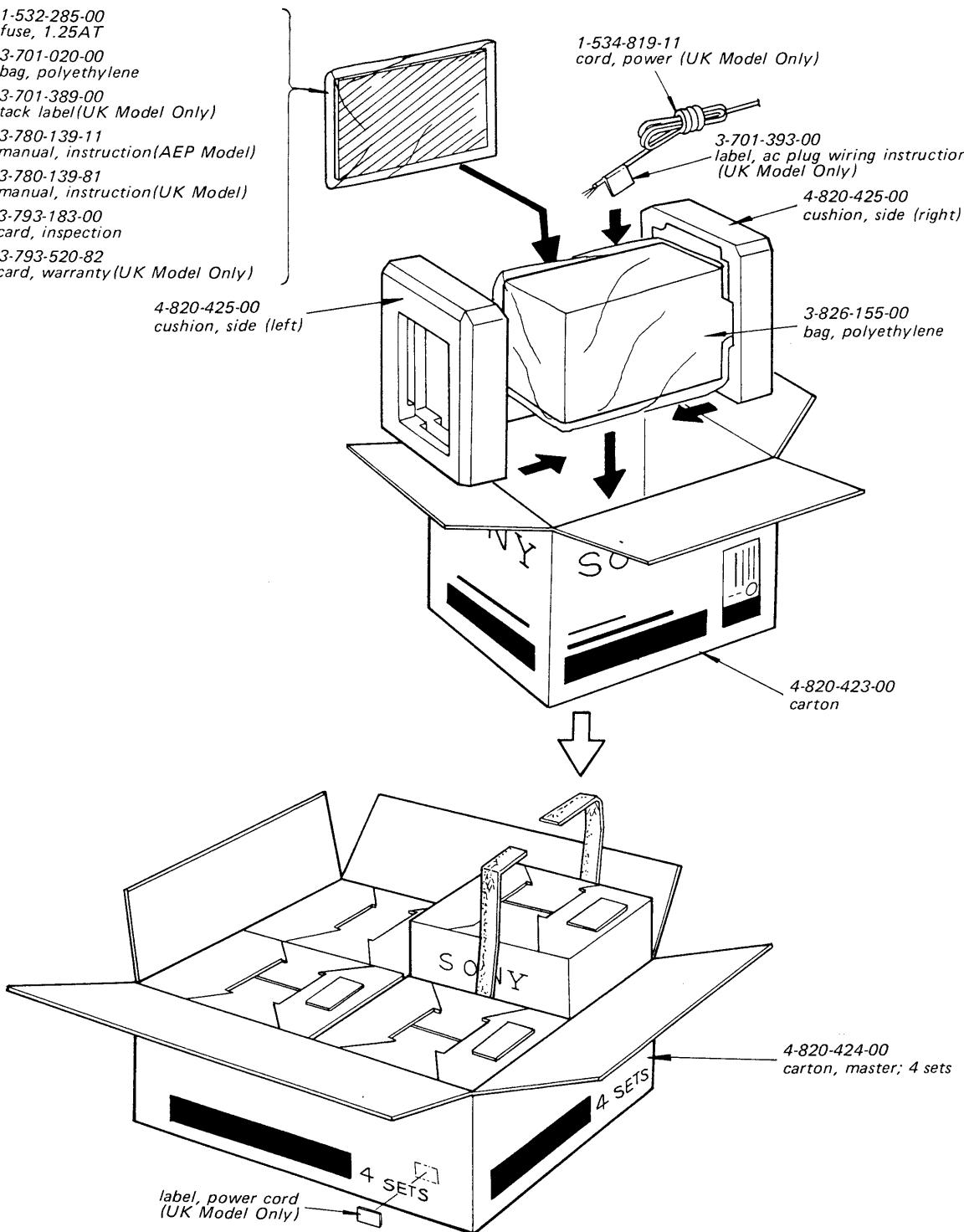
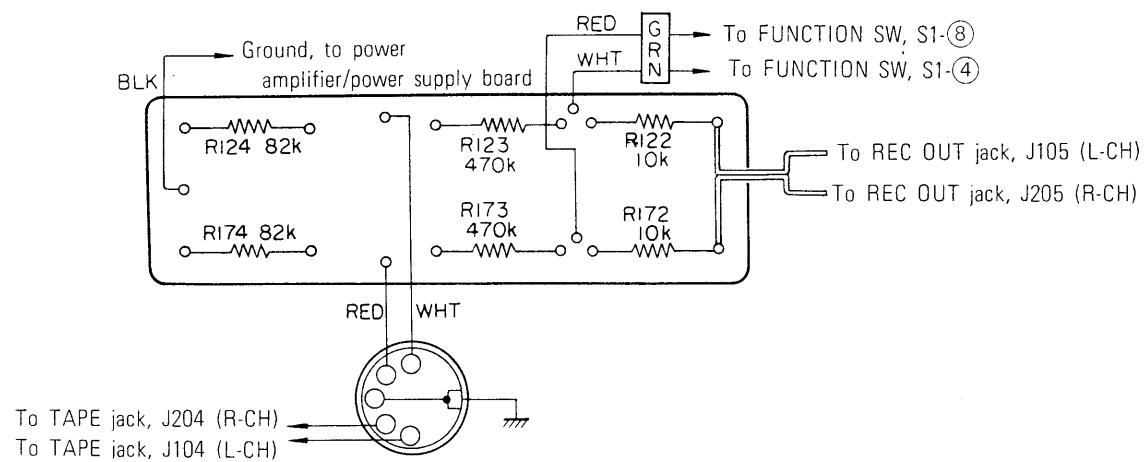


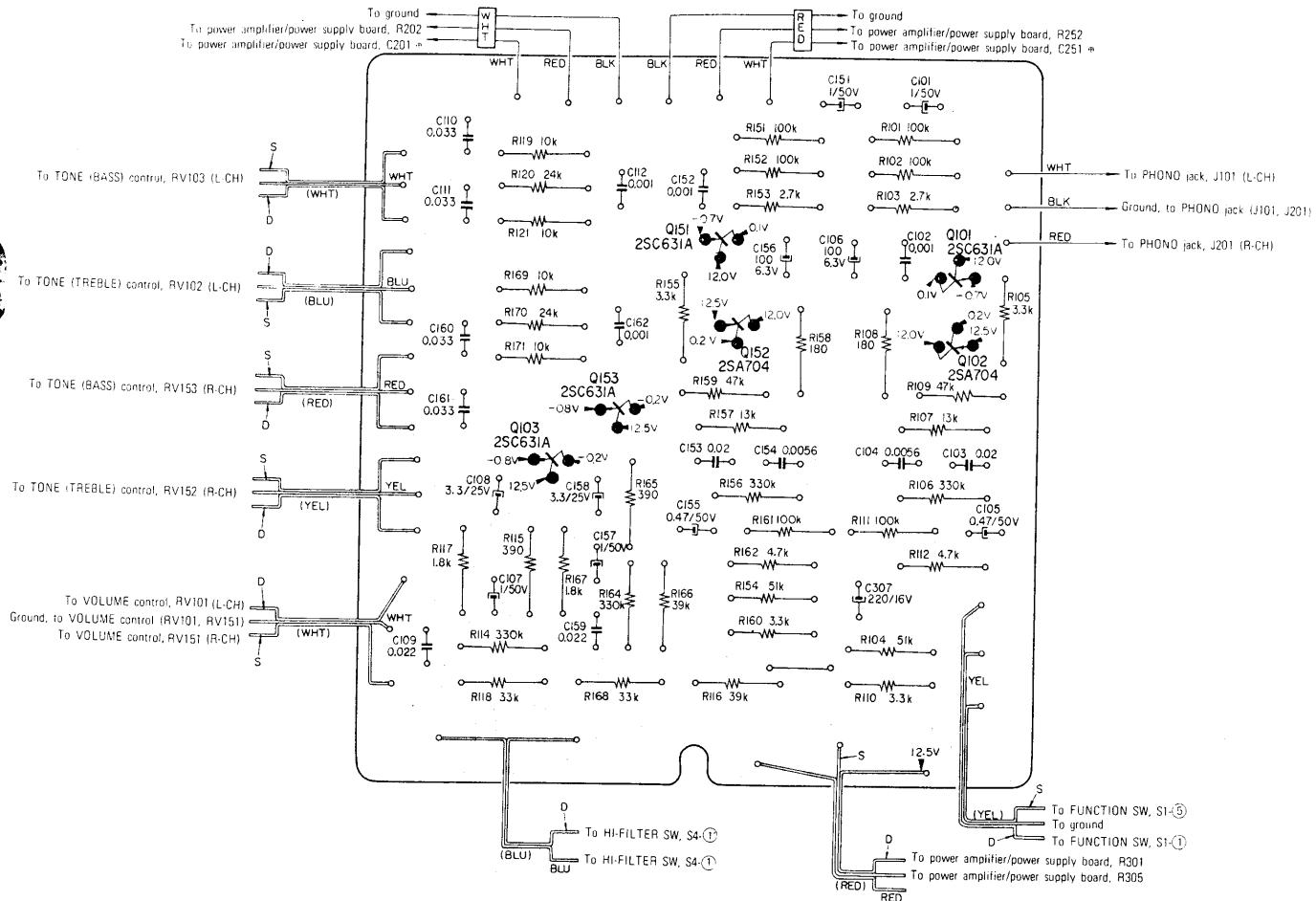
Fig. 3-1. Repacking

SECTION 4 DIAGRAMS

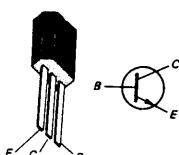
4-1. MOUNTING DIAGRAM – Attenuator Board –



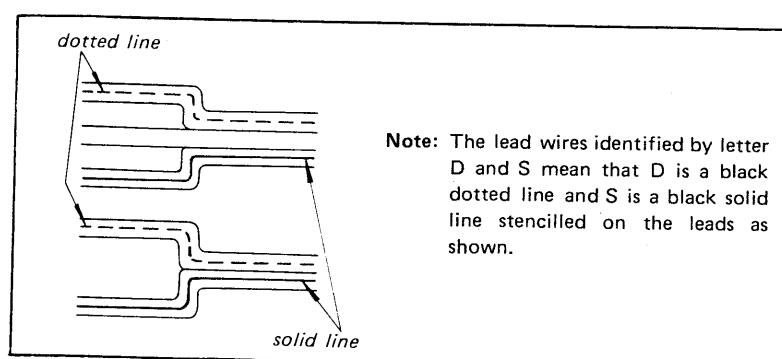
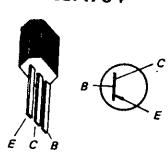
4-2. MOUNTING DIAGRAM — Preamplifier Board —



2SC631A

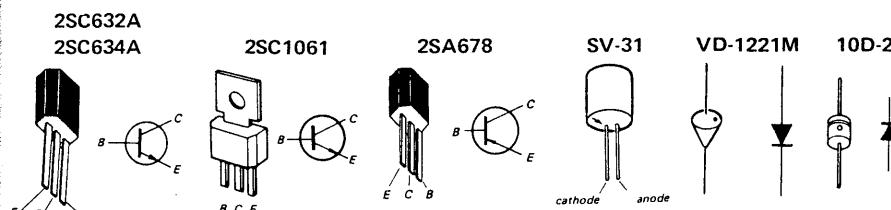
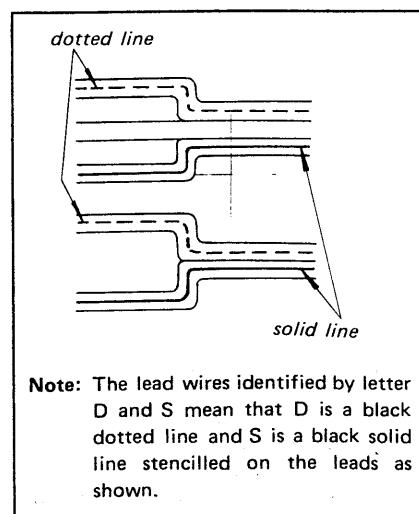
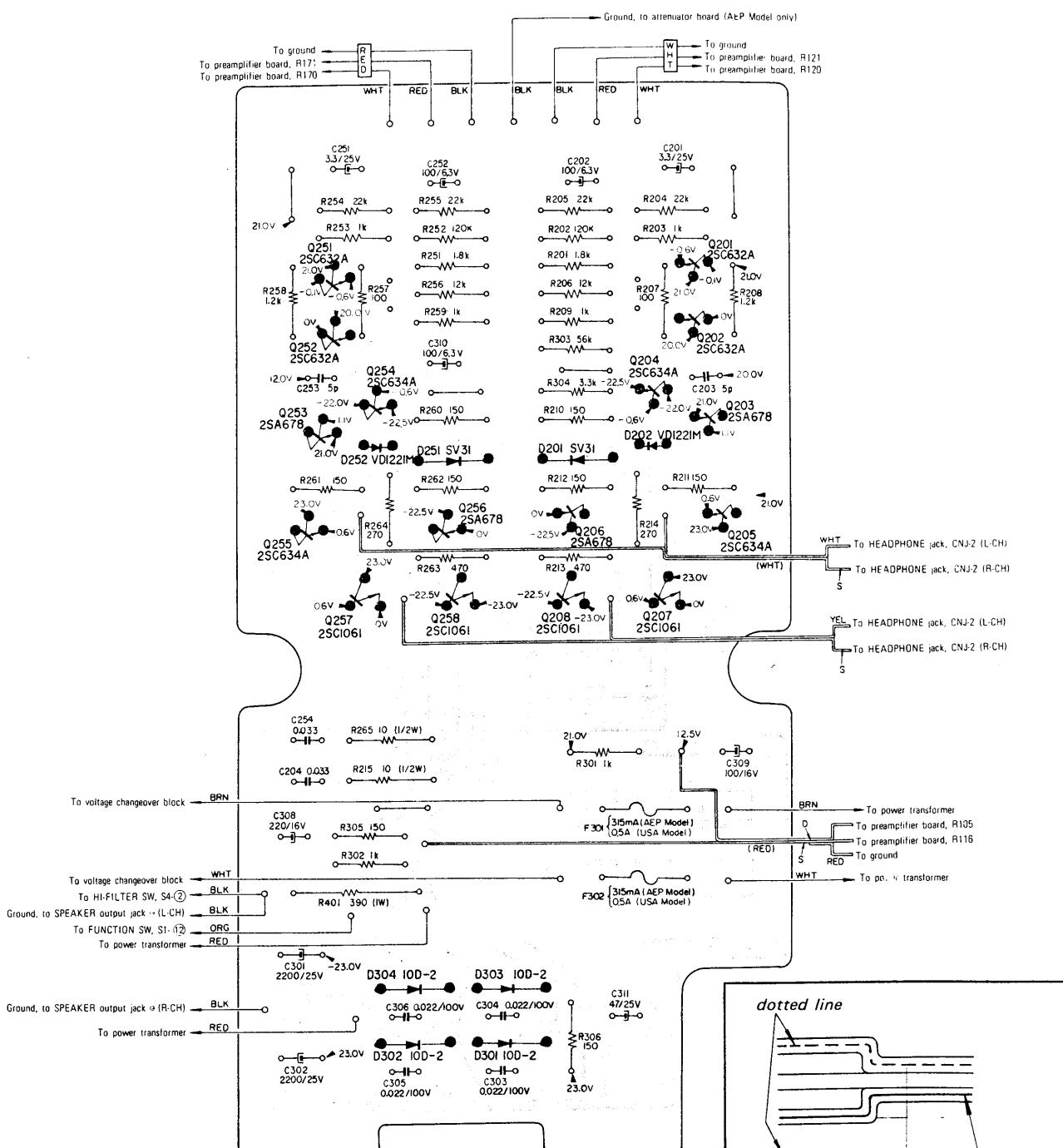


2SA704

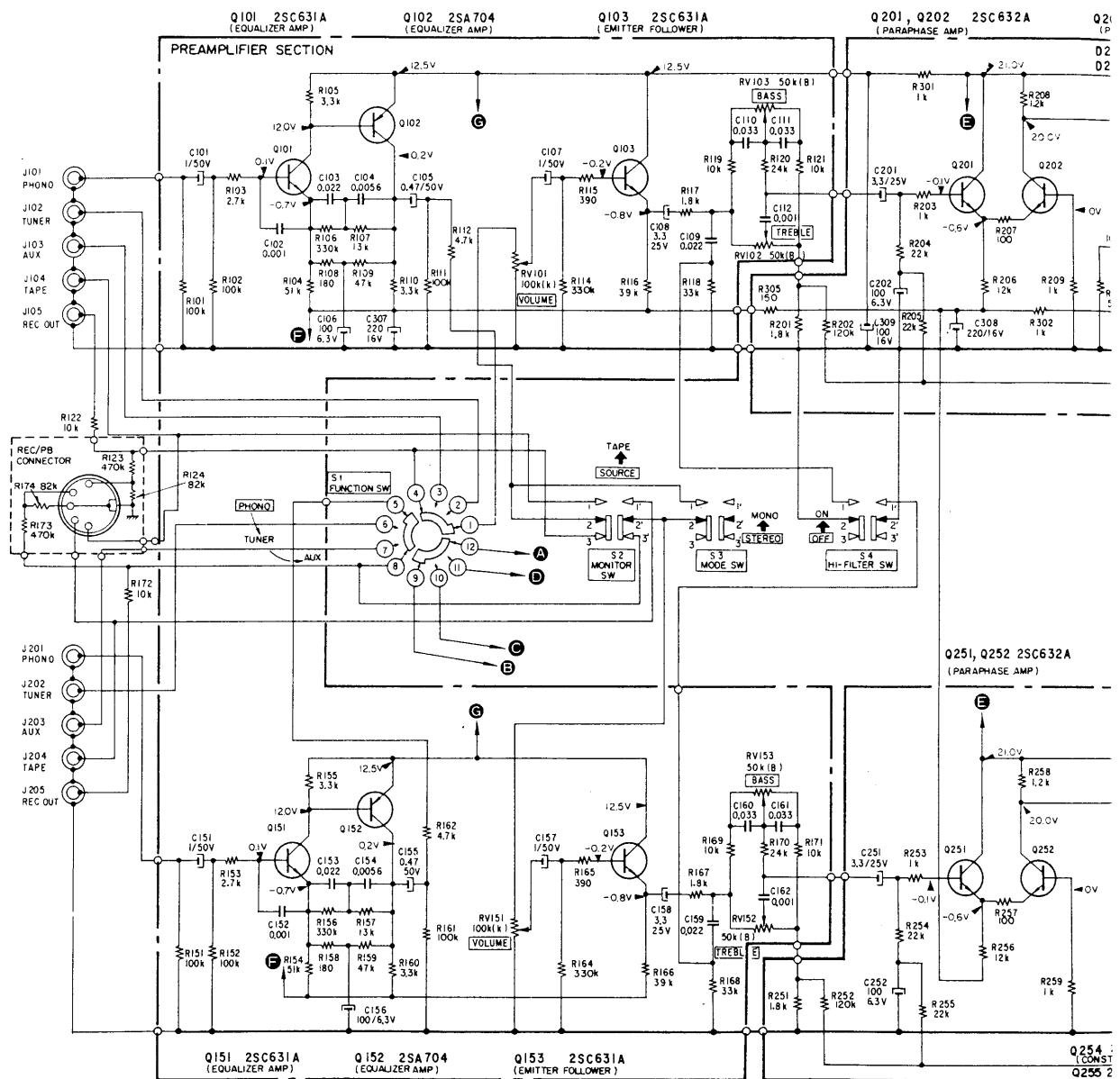


Note: The lead wires identified by letter D and S mean that D is a black dotted line and S is a black solid line stencilled on the leads as shown.

4-3. MOUNTING DIAGRAM — Power Amplifier/Power Supply Board —

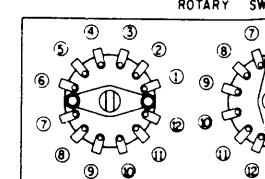


4-4. SCHEMATIC DIAGRAM

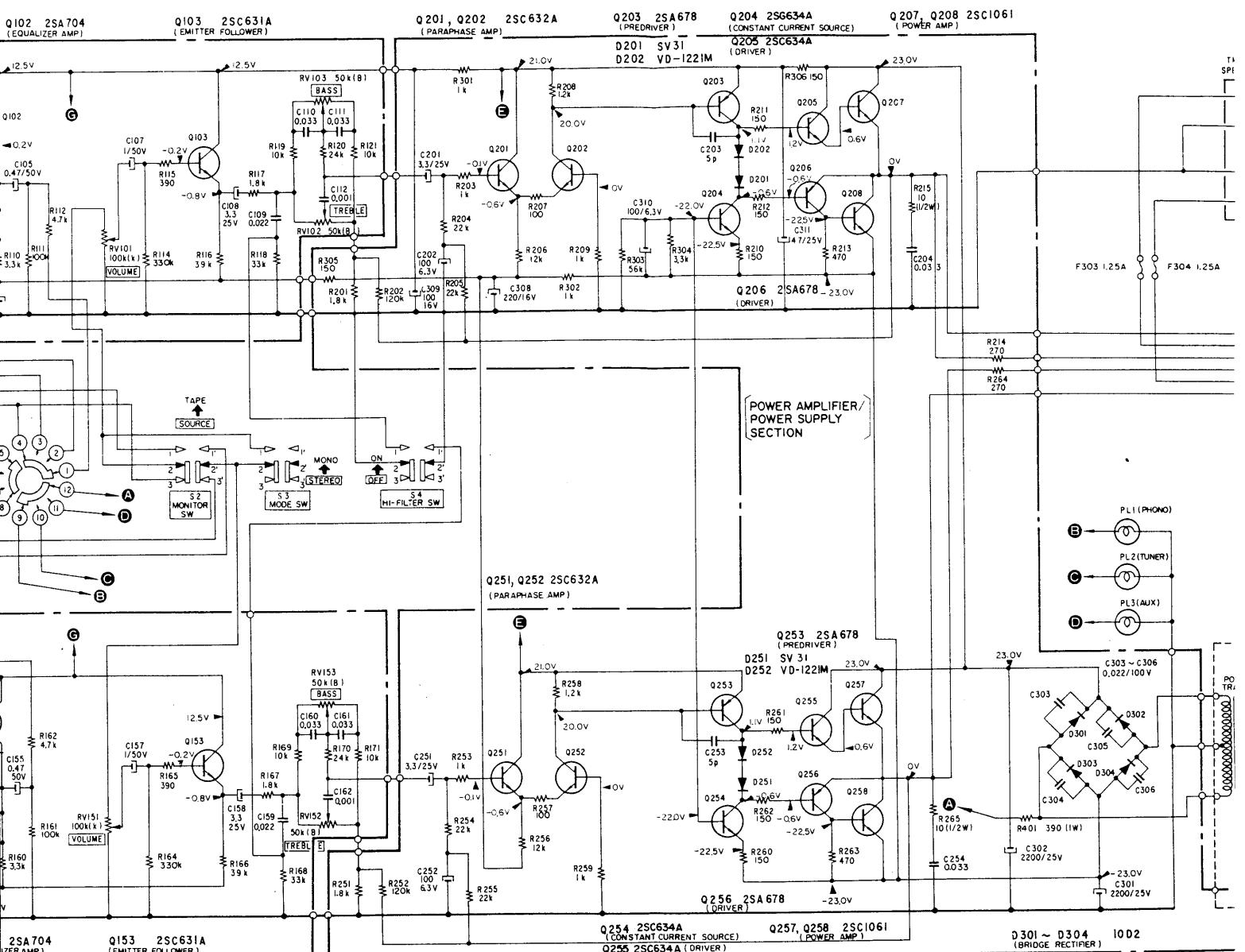


Ref. No.	Description	Position
S1	FUNCTION SW (PHONO-TUNER-AUX)	PHONO
S2	MONITOR SW (SOURCE-TAPE)	SOURCE
S3	MODE SW (STEREO-MONO)	STEREO

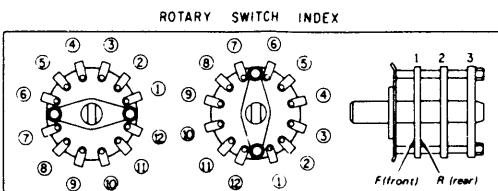
Ref. No.	Description	Position
S4	HI-FILTER SW (ON-OFF)	OFF
S5	POWER SW (ON-OFF)	OFF



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Ref. No.	Description	Position
S4	HI-FILTER SW (ON-OFF)	OFF
S5	POWER SW (ON-OFF)	OFF

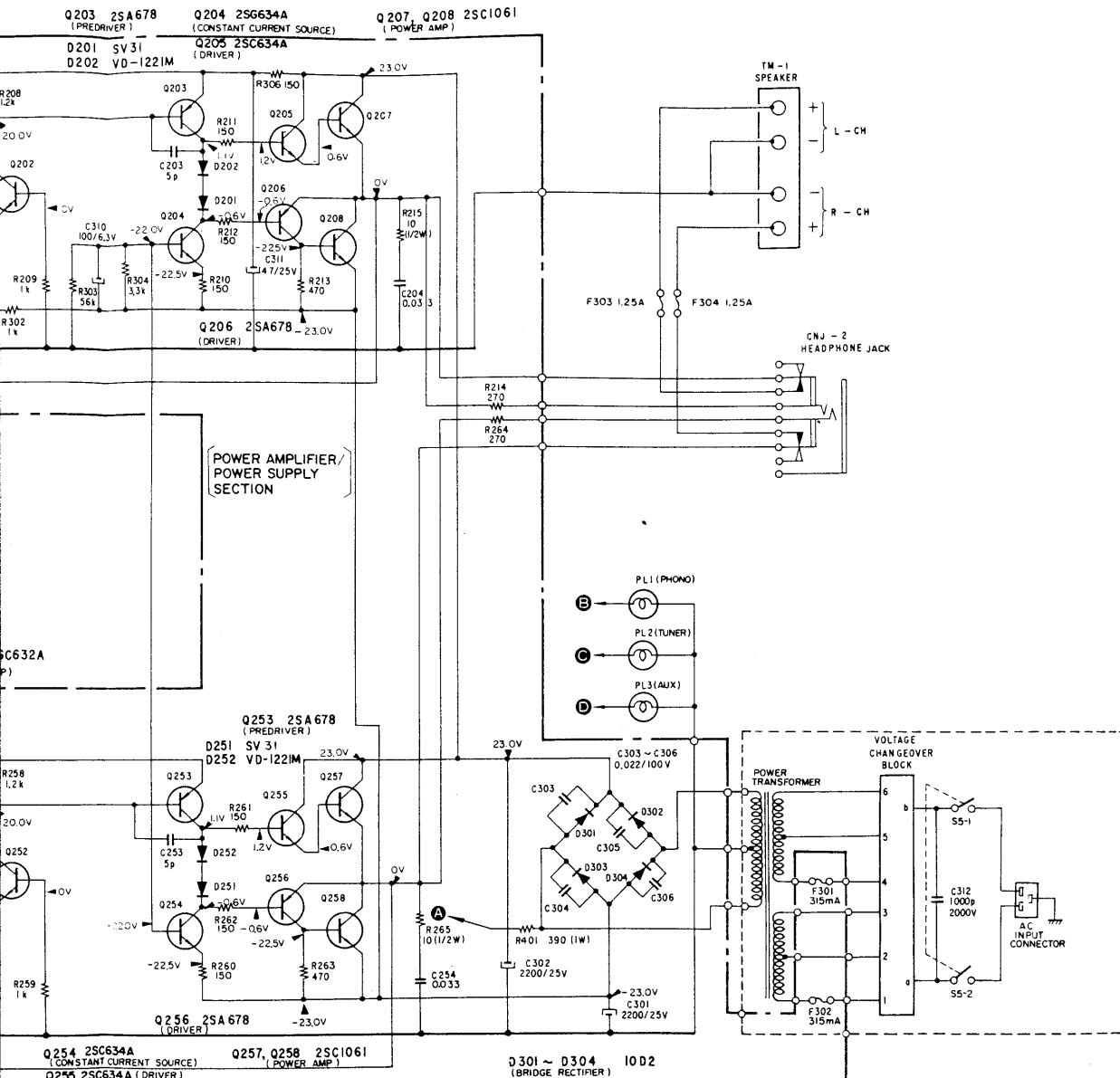
**Note:**

All resistance values are in ohms. k = 1,000
All capacitance values are in μF except as indicated which means $\mu\mu\text{F}$.

All voltages represent an average value and within $\pm 20\%$.

All voltages are dc measured with a VOM input impedance of 20 kohms/volt. No signal

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**Note:**

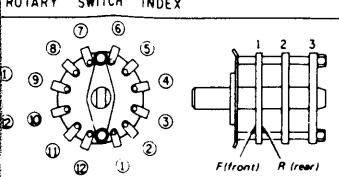
All resistance values are in ohms. k = 1,000, M = 1,000 k
 All capacitance values are in μF except as indicated with p,
 which means $\mu\mu\text{F}$.

All voltages represent an average value and should hold
 within $\pm 20\%$.

All voltages are dc measured with a VOM which has an
 input impedance of 20 kohms/volt. No signal in.

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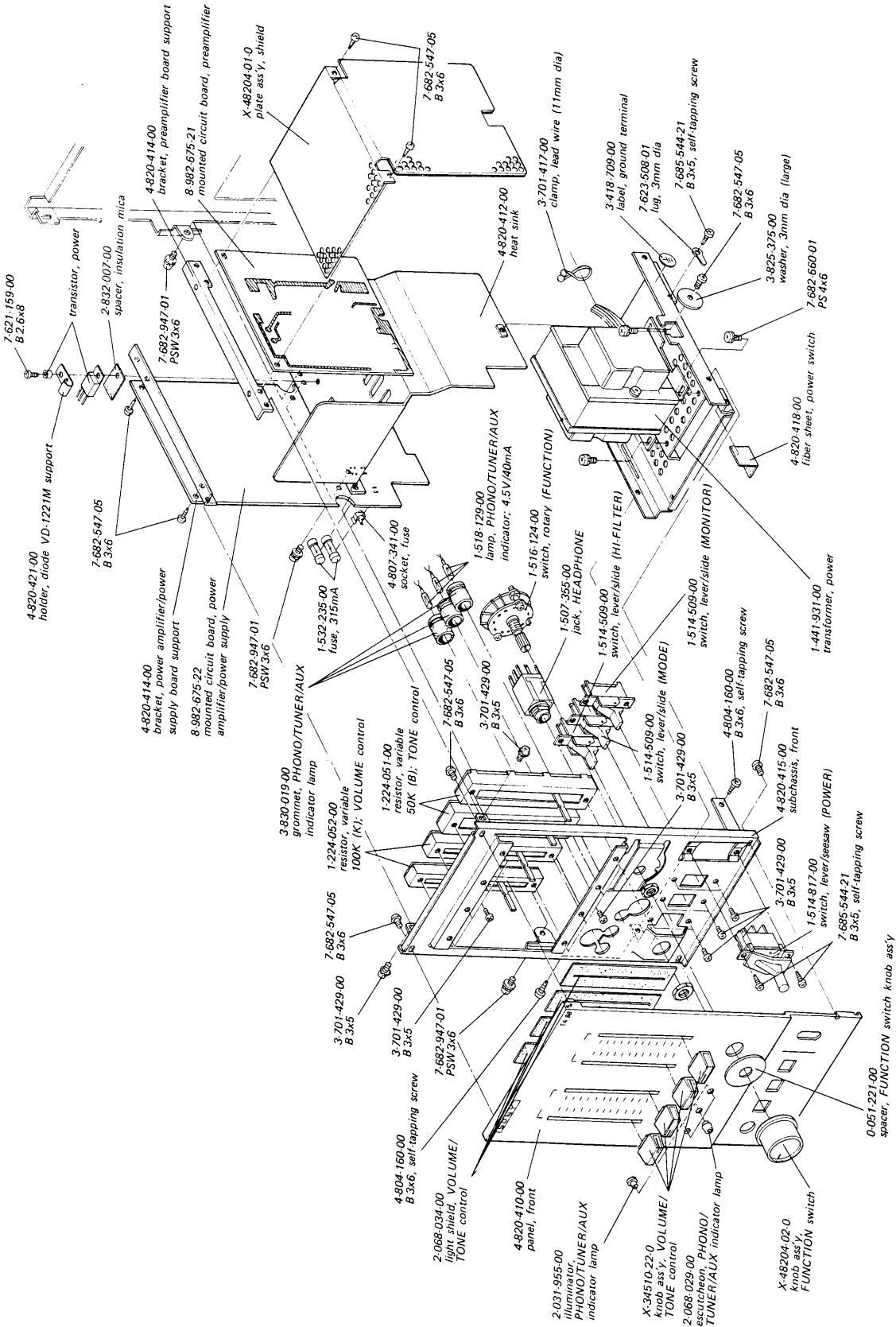
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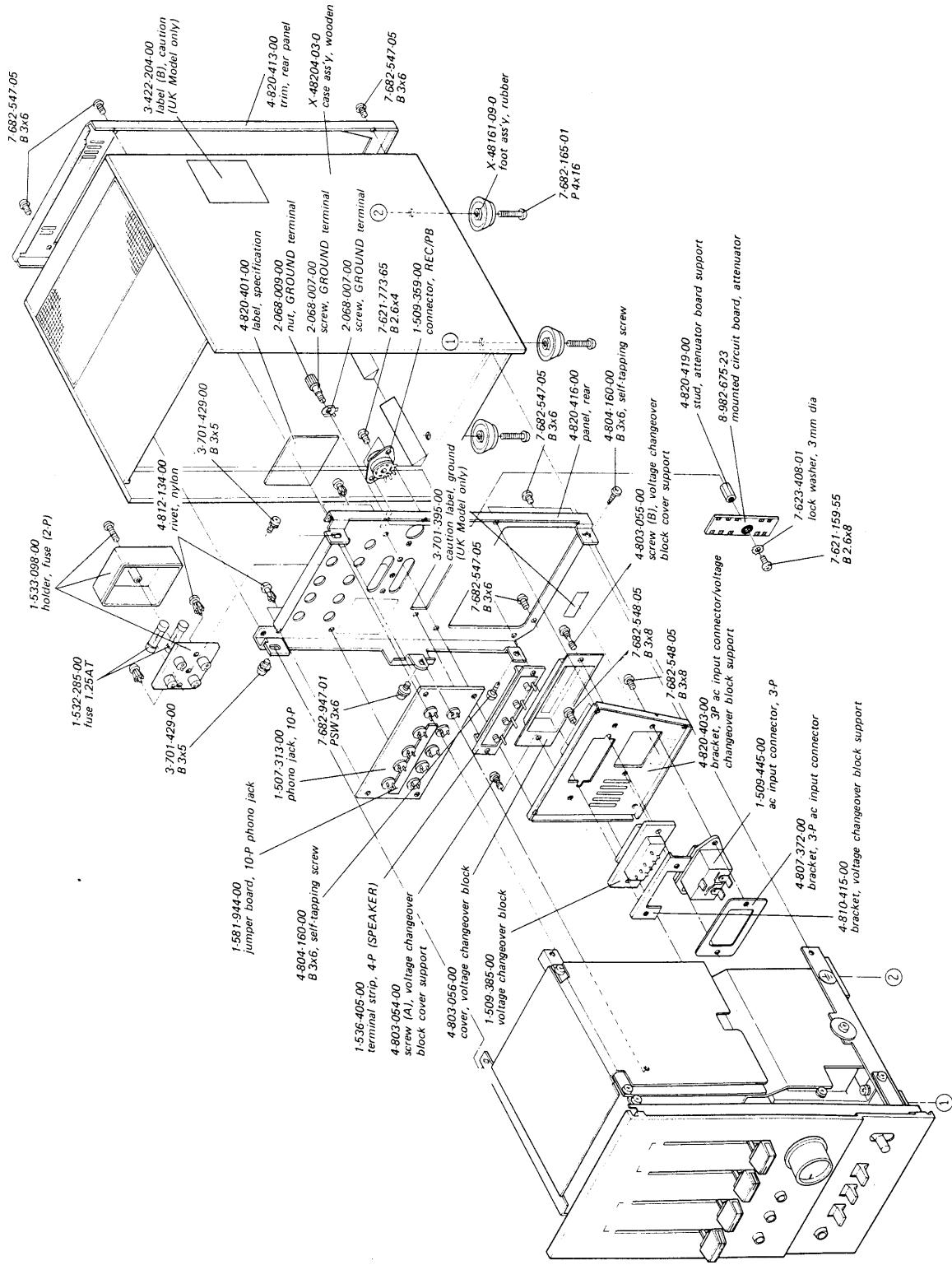


SECTION 5 EXPLODED VIEW

(I)

Note: All screws are phillips type (cross recess type) unless otherwise indicated. (-): slotted head.





SECTION 6

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MOUNTED CIRCUIT BOARDS					
8-982-675-21	mounted circuit board, preamplifier		C104 (C154)	1-105-510-12	0.0056 $\pm 5\%$ 50 V mylar
8-982-675-22	mounted circuit board, power amplifier/ power supply		C105 (C155)	1-121-911-00	0.47 $\pm 100\%$ 50 V electrolytic
8-982-675-23	mounted circuit board, attenuator		C106 (C156)	1-121-413-00	100 $\pm 50\%$ 6.3 V electrolytic
			C107 (C157)	1-121-912-00	1 $\pm 100\%$ 50 V electrolytic
			C108 (C158)	1-121-913-00	3.3 $\pm 100\%$ 25 V electrolytic
			C109 (C159)	1-105-517-12	0.022 $\pm 5\%$ 50 V mylar
			C110 (C160)	1-105-519-12	0.033 $\pm 5\%$ 50 V mylar
			C111 (C161)	1-105-519-12	0.033 $\pm 5\%$ 50 V mylar
			C112 (C162)	1-105-501-12	0.001 $\pm 5\%$ 50 V mylar
SEMICONDUCTORS					
D201 (D251)	diode	SV-31	C201 (C251)	1-121-392-00	3.3 $\pm 75\%$ 25 V electrolytic
D202 (D252)	diode	VD-1221M	C202 (C252)	1-121-413-00	100 $\pm 50\%$ 6.3 V electrolytic
D301	diode	10D-2	C203 (C253)	1-101-955-00	5p $\pm 5\%$ 50 V ceramic
D302	diode	10D-2	C204 (C254)	1-105-679-12	0.033 $\pm 10\%$ 50 V mylar
D303	diode	10D-2			
D304	diode	10D-2	C301	1-123-047-00	2,200 $\pm 100\%$ 25 V electrolytic
Q101 (Q151)	transistor	2SC631A	C302	1-123-047-00	2,200 $\pm 100\%$ 25 V electrolytic
Q102 (Q152)	transistor	2SA704	C303	1-105-877-12	0.022 $\pm 20\%$ 100 V mylar
Q103 (Q153)	transistor	2SC631A	C304	1-105-877-12	0.022 $\pm 20\%$ 100 V mylar
Q201 (Q251)	transistor	2SC632A	C305	1-105-877-12	0.022 $\pm 20\%$ 100 V mylar
Q202 (Q252)	transistor	2SC632A	C306	1-105-877-12	0.022 $\pm 20\%$ 100 V mylar
Q203 (Q253)	transistor	2SA678	C307	1-121-421-00	220 $\pm 50\%$ 16 V electrolytic
Q204 (Q254)	transistor	2SC634A	C308	1-121-421-00	220 $\pm 50\%$ 16 V electrolytic
Q205 (Q255)	transistor	2SC634A	C309	1-121-415-00	100 $\pm 50\%$ 16 V electrolytic
Q206 (Q256)	transistor	2SA678	C310	1-121-413-00	100 $\pm 50\%$ 6.3 V electrolytic
Q207 (Q257)	transistor	2SC1061	C311	1-121-410-00	47 $\pm 50\%$ 25 V electrolytic
Q208 (Q258)	transistor	2SC1061	C312	1-102-222-00	1,000p $\pm 20\%$ 250 V ceramic
RESISTORS					
All resistance values are in Ω , $\pm 5\%$, $\frac{1}{4}W$ and carbon type unless otherwise indicated.					
TRANSFORMERS					
PT	1-441-931-00	transformer, power	R101 (R151)	1-244-721-00	100 k
			R102 (R152)	1-244-721-00	100 k
			R103 (R153)	1-244-683-00	2.7 k
			R104 (R154)	1-244-714-00	51 k
			R105 (R155)	1-244-685-00	3.3 k
			R106 (R156)	1-244-733-00	330 k
			R107 (R157)	1-244-700-00	13 k
			R108 (R158)	1-244-655-00	180
			R109 (R159)	1-244-713-00	47 k
			R110 (R160)	1-244-685-00	3.3 k
			R111 (R161)	1-244-721-00	100 k
			R112 (R162)	1-244-689-00	4.7 k
			R113		-----
			R114 (R164)	1-244-733-00	330 k
			R115 (R165)	1-244-663-00	390
CAPACITORS					
All capacitance values are in μF except as indicated with p, which means $\mu\mu F$.					
C101 (C151)	1-121-912-00	1 $\pm 100\%$ 50 V electrolytic	For Service Manuals MAURITRON SERVICES 8 Cherry Tree Road, Chinnor Oxfordshire, OX9 4QY. Tel (01844) 351694 Fax (01844) 352554 email:- sales@mauritron.co.uk		
C102 (C152)	1-105-661-12	0.001 $\pm 10\%$ 50 V mylar			
C103 (C153)	1-106-032-12	0.02 $\pm 5\%$ 50 V mylar			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R116 (R166)	1-244-711-00	39 k	RV101 (RV151)	1-224-052-00	100 kΩ (K), variable (VOLUME control)
R117 (R167)	1-244-679-00	1.8 k	RV102 (RV152)	1-224-051-00	50 kΩ (B)/50 kΩ (B), variable (TREBLE control)
R118 (R168)	1-244-709-00	33 k	RV103 (RV153)	1-224-051-00	50 kΩ (B)/50 kΩ (B), variable (BASS control)
R119 (R169)	1-244-697-00	10 k			
R120 (R170)	1-244-706-00	24 k			
R121 (R171)	1-244-697-00	10 k			
R122 (R172)	1-202-043-00	10 k			
R123 (R173)	1-202-145-00	470 k			
R124 (R174)	1-202-095-00	82 k			
		±5% 1/8W composition			
R201 (R251)	1-244-679-00	1.8 k	S1	1-516-124-00	switch, rotary (FUNCTION)
R202 (R252)	1-244-723-00	120 k	S2	1-514-509-00	switch, lever/slide (MONITOR)
R203 (R253)	1-244-673-00	1 k	S3	1-514-509-00	switch, lever/slide (MODE)
R204 (R254)	1-244-705-00	22 k	S4	1-514-509-00	switch, lever/slide (HI-FILTER)
R205 (R255)	1-244-705-00	22 k	S5	1-514-817-00	switch, lever/seesaw (POWER)
R206 (R256)	1-244-699-00	12 k			
R207 (R257)	1-244-649-00	100			
R208 (R258)	1-244-675-00	1.2 k			
R209 (R259)	1-244-673-00	1 k			
R210 (R260)	1-244-653-00	150			
R211 (R261)	1-244-653-00	150			
R212 (R262)	1-244-653-00	150			
R213 (R263)	1-244-665-00	470			
R214 (R264)	1-244-659-00	270			
R215 (R265)	1-202-525-00	10	J101 ~ 105 (J201 ~ 205)	1-507-313-00	phono jack, 10-P
		±20% 1/2W composition			
R301	1-244-673-00	1 k	PL1	1-518-129-00	lamp, PHONO indicator 4.5 V/40 mA
R302	1-244-673-00	1 k	PL2	1-518-129-00	lamp, TUNER indicator 4.5 V/40 mA
R303	1-244-715-00	56 k	PL3	1-518-129-00	lamp AUX indicator 4.5 V/40 mA
R304	1-244-685-00	3.3 k	TM1	1-536-405-00	terminal strip, 4-P; SPEAKER
R305	1-244-653-00	150	VS	1-509-385-00	voltage changeover block
R306	1-244-653-00	150		1-534-819-11	cord, power (UK Model only)
R401	1-206-654-00	390		1-536-353-00	connection, terminal post
		±10% 2W metal-oxide		1-536-354-00	terminal post
				1-581-944-00	jumper board, 10-P phono jack

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SONY®**TA-88***UK and AEP Model*

SERVICE MANUAL SUPPLEMENT

No. 1
Dec. 1972**Subject: Circuit Modification**

This supplement updates the service manual to include production changes starting with Serial Number 901,001 (AEP Model), 401,001 (UK Model) and later.
File this supplement with the service manual.

1. INTRODUCTION

Some modifications have been performed in Power Amplifier Section.

2. PARTS CHANGED

Ref. No.	Former	New	Applicable Serial No.
R210 (R260)			AEP Model ... (Serial
R211 (R261)	1-244-653-11	1-244-649-00	No. 901,001 and later)
R212 (R262)	150 ±5% ¼W carbon	100 ±5% ¼W carbon	UK Model (Serial
R305, R306			No. 401,001 and later)
F301	1-532-235-11	1-532-273-11	
F302	fuse, 315mA	fuse, 250mA	

3. PARTS ADDED

Ref. No.	Part No.	Description	Applicable Serial No.
C205 (C255)	1-102-940-11	3P ±5% 50V ceramic	AEP Model ... (Serial No. 901,001 and later) UK Model (Serial No. 401,001 and later)

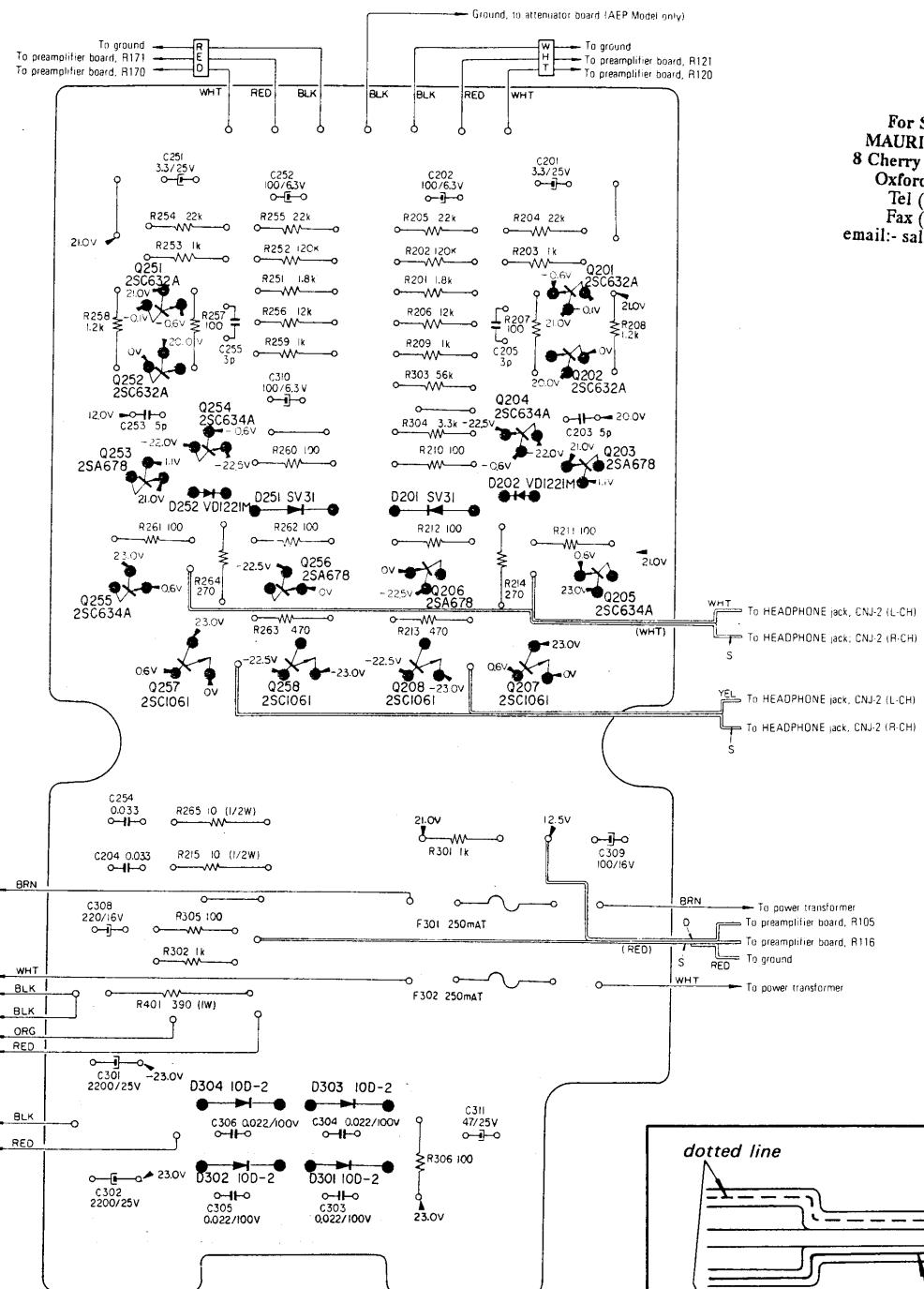
Note: Though two kinds of circuit boards exist for Power Amplifier board, listed part number is for only the latest one since it is interchangeable with old one.

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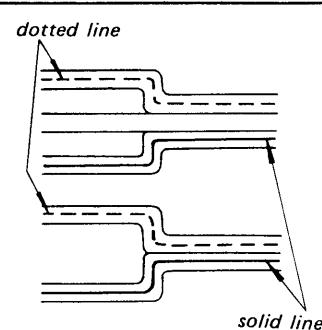
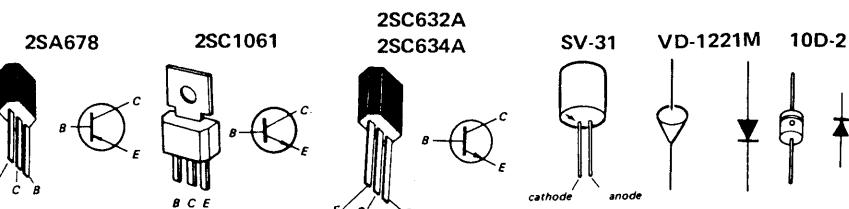
4. MOUNTING DIAGRAM – Power Amplifier Board –

AEP Model Serial No. 901,001 and later

UK Model Serial No. 401,001 and later



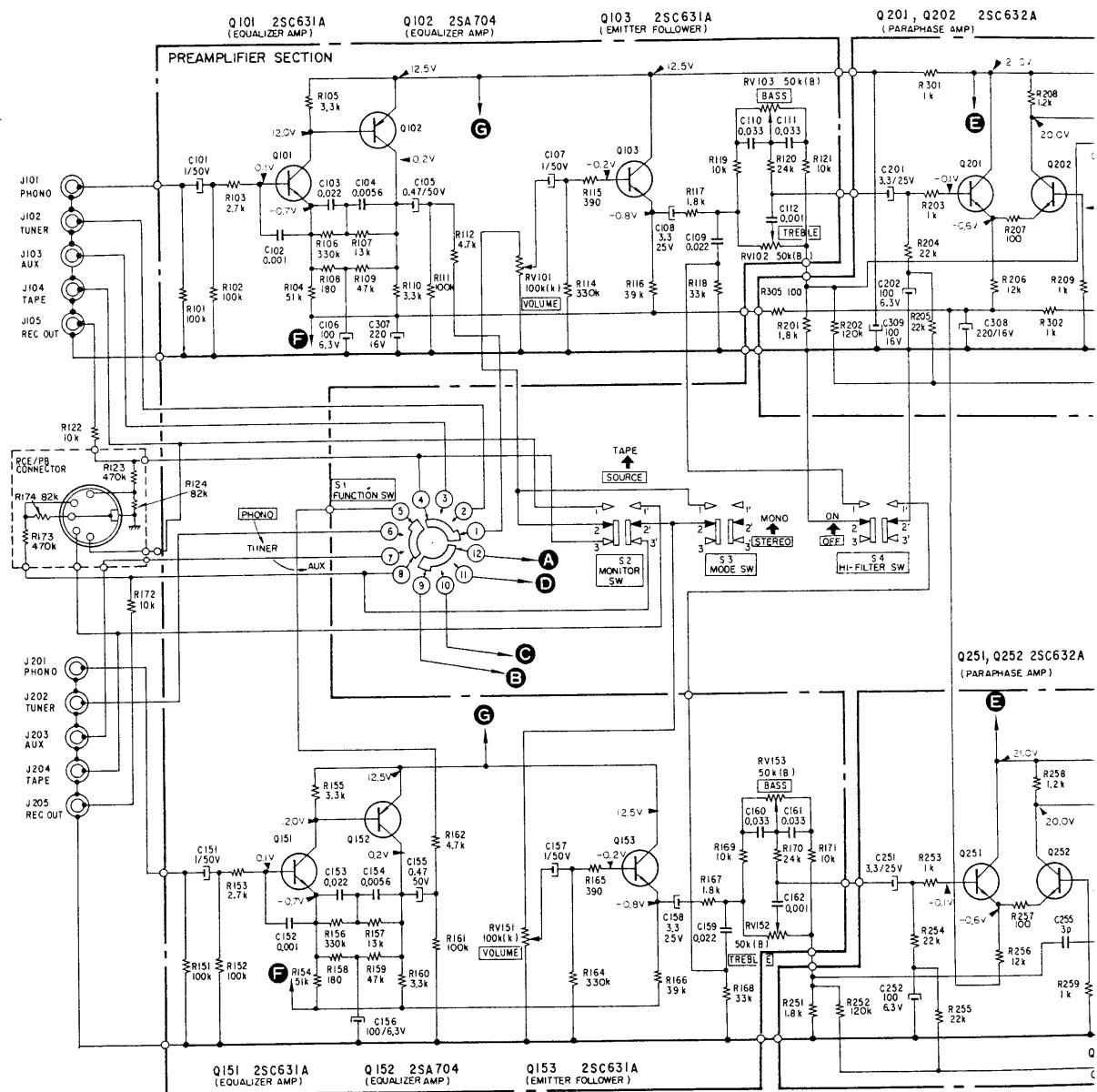
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Note: The lead wires identified by letter D and S mean that D is a black dotted line and S is a black solid line stencilled on the leads as shown.

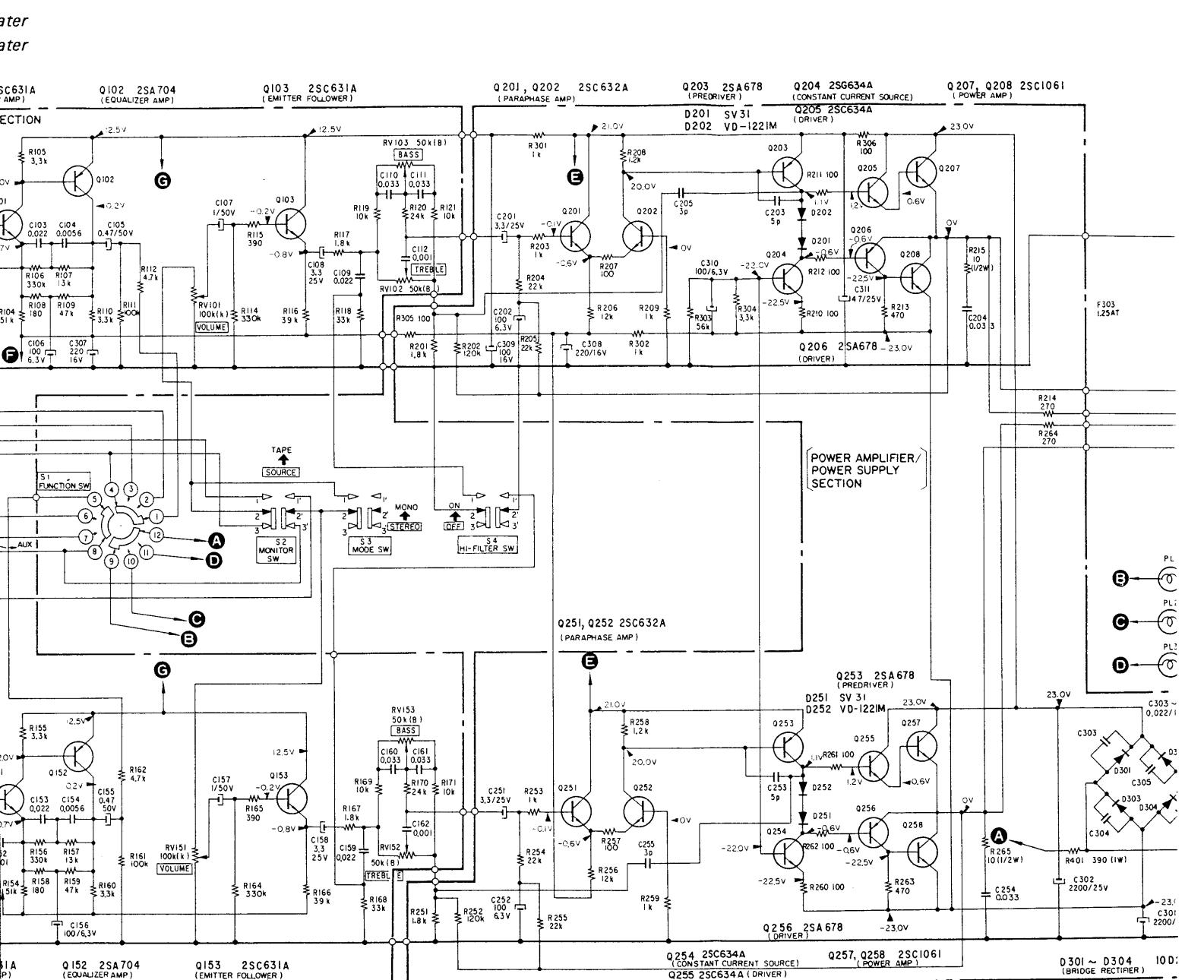
5. SCHEMATIC DIAGRAM

AEP Model..... Serial No. 901,001 and later
 UK Model Serial No. 401,001 and later

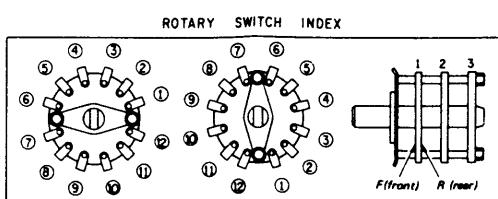


Ref. No.	Description
S1	FUNCTION SW (PHONO-TUNER-AUX)
S2	MONITOR SW (SOURCE-TAPE)
S3	MODE SW (STEREO-MONO)

Ref. No.	Description
S4	HI-FILTER SW (ON-OFF)
S5	POWER SW (ON-OFF)

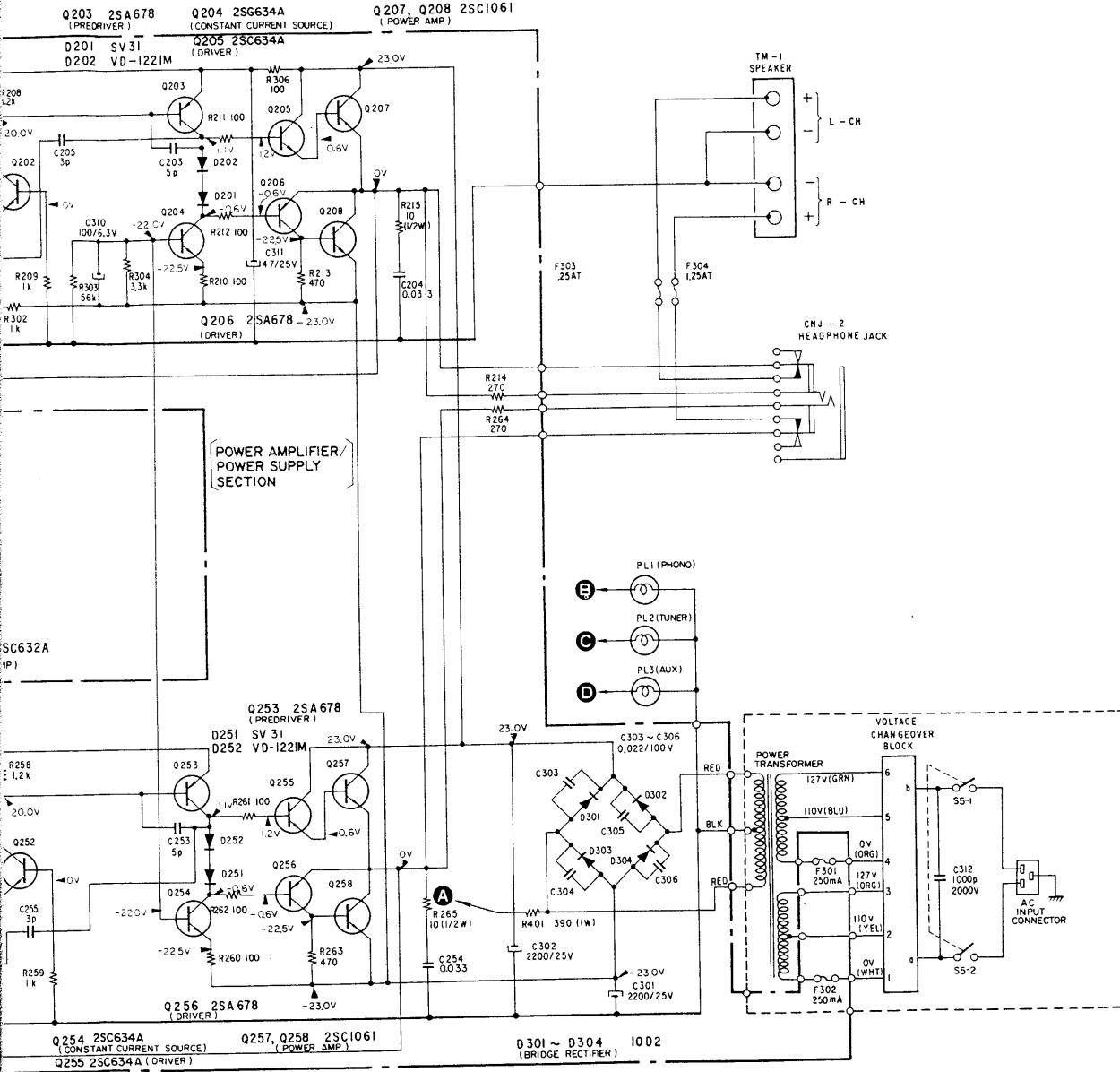


Position	Ref. No.	Description	Position
HONO	S4	HI-FILTER SW (ON-OFF)	OFF
DURCE	S5	POWER SW (ON-OFF)	OFF
TEREO			

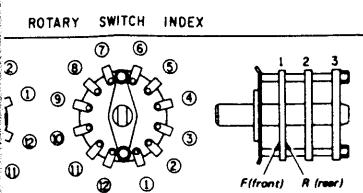


Note:
 All resistance values are in ohms (Ω).
 All capacitance values are in microfarads (μF), which means $\mu\mu\text{F}$.
 All voltages represent an average value within $\pm 20\%$.
 All voltages are dc measured at the input impedance of 20 kohms/ Ω .

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**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 $\mu\mu\text{F}$.
All voltages represent an average value and should hold
within $\pm 20\%$.
All voltages are dc measured with a VOM which has an
input impedance of 20 kohms/volt. No signal in.



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