

TA-8650

1340
US Model
UK Model
AEP Model
E Model



INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

GENERAL

System: Power Amplifier Section
Direct-coupling V-FET pure complementary symmetry circuit
Preamplifier Section
Direct-coupling module unit amp

Power requirements: 120V ac, 60 Hz (USA Model)
100, 120, 220 or 240V ac adjustable,
50/60 Hz (AEP, UK, E Model)

Power consumption: 260 watts (USA Model)
800 watts (AEP, E Model)
600 watts (UK Model)

Ac outlets: 2 switched 200 watts, 1 unswitched
400 watts (USA, E Model)

Dimensions: 440 (w) x 170 (h) x 425 (d) mm
17³/₈ (w) x 6³/₄ (h) x 16³/₄ (d) inches

Weight: 20.8 kg (46 lb), net
24.5 kg (54 lb), in shipping carton

Frequency response: 5 Hz — 100 kHz ⁺⁰/_{-1.5} dB at 1 watt output
20 Hz — 20 kHz ± 0.1 dB at rated output

Residual noise: Less than 1 μ watt

S/N: More than 100 dB (network A, short-circuited)

Damping factor: More than 200/8 ohms (at 1 kHz, Speaker DIRECT)

Inputs: POWER AMP INPUT; sensitivity 1 volt (for rated output), impedance 50 kohms

Outputs: SPEAKER terminals — A, B, DIRECT; accept 4 ohms or more speakers.
HEADPHONE jack; accepts low and high-impedance stereo headphones

POWER AMPLIFIER SECTION

Continuous RMS power output: At 20 Hz — 20 kHz
(less than 0.1 % THD, both channels driven simultaneously)
80 watts per channel (8 ohms)

Power bandwidth: 5 Hz — 50 kHz (IHF)

Harmonic distortion: Less than 0.05 % at 1 watt output (20 Hz — 20 kHz)
Less than 0.1 % at rated output

IM distortion: Less than 0.05 % at 1 watt output (60 Hz : 7 kHz = 4 : 1)
Less than 0.1 % at rated output

PREAMPLIFIER SECTION

Harmonic distortion: Less than 0.03 % at rated output, 1 kHz

IM distortion: Less than 0.05 % at rated output (60 Hz : 7 kHz = 4 : 1)

— Continued on page 2 —

SONY®

SERVICE MANUAL

1340 1200

Frequency response: PHONO 1, 2 RIAA equalization ± 0.2 dB
 MIC 20 Hz – 20 kHz ± 0.5 dB
 TUNER
 AUX 1, 2, 3
 TAPE 1, 2
 EXT ADPT (INPUT) } 10 Hz – 100 kHz ± 0.5 dB

Tone controls: BASS control
 ± 10 dB at 50 Hz (TURNOVER
 FREQ 250 Hz)
 ± 10 dB at 100 Hz (TURNOVER
 FREQ 500 Hz)
 TREBLE control
 ± 10 dB at 10 kHz (TURNOVER
 FREQ 2.5 kHz)
 ± 10 dB at 20 kHz (TURNOVER
 FREQ 5 kHz)

Filters: LOW 12 dB/octave attenuation below
 10 Hz or 40 Hz
 HIGH 12 dB/octave attenuation above
 9 kHz or 20 kHz

Acoustic compensator: LOW 1 +10 dB at 20 Hz
 +6 dB at 50 Hz
 +3 dB at 100 Hz
 LOW 2 +11 dB at 20 Hz
 +9 dB at 50 Hz
 +6 dB at 100 Hz
 PRESENCE +3 dB at 1 kHz
 LOUDNESS +10 dB at 50 Hz
 +3 dB at 10 kHz

Inputs:

Inputs	Sensitivity*1	Maximum input capability*2	Impedance	S/N (weighting network, input level)
PHONO 1	2.5 mV	175 mV	50 k Ω	70 dB (A, 2.5 mV)
PHONO 2 L			50 k Ω /100 k Ω	75 dB (A, 4.5 mV)
H	4.5 mV	310 mV		
HEAD AMP	0.1 mV	7 mV	30 Ω	55 dB (A, 0.1 mV)
MIC	0.2 mV	2 V	50 k Ω	40 dB (B, 0.2 mV)
TUNER	150 mV	—	100 k Ω	85 dB (A, 150 mV)
AUX 1, 2, 3				
TAPE 1, 2				
EXT ADPT				

*1 The sensitivities of AUX 1, TAPE 1, TAPE 2 and MIC are adjustable.

*2 The maximum input capabilities are measured at a 0.1 % THD.

Outputs:

Outputs	Output voltage	Impedance
REC OUT 1, 2	150 mV (max. 10 V)	600 Ω
PREAMP OUTPUT	1 V (max. 10 V)	
EXT ADPT	150 mV (max. 10 V)	10 k Ω

Voltage amplification (at 1 kHz):

Input \ Output	REC OUT	EXT ADPT	PREAMP OUTPUT
PHONO 1	35 dB		52 dB
PHONO 2 L			47 dB
H	30 dB		
HEAD AMP	63 dB		80 dB
MIC	57.5 dB		74.5 dB
TUNER	0 dB		17 dB
AUX 1, 2, 3			
TAPE 1, 2			
EXT ADPT			

Specification Label:

USA model

SONY®	INTEGRATED STEREO AMPLIFIER		
	MODEL NO. TA-8650		
	AC 120V	60Hz	260W
	SERIAL NO.		MADE IN JAPAN

AEP, E model

SONY®	INTEGRATED STEREO AMPLIFIER		
	MODEL NO. TA - 8650		
	AC 100.120.220.240V 50/60Hz 800W		
	SERIAL NO.		MADE IN JAPAN

UK model

SONY®	INTEGRATED STEREO AMPLIFIER		
	MODEL NO. TA-8650		
	AC 100.120.220.240V 50/60Hz 600W		
	SERIAL NO.		MADE IN JAPAN

SERVICING NOTES

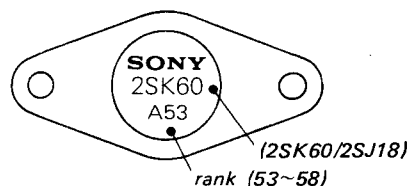
1. Apply the rated ac line voltage to the set directly. Do not increase the voltage gradually by using a variable transformer or other such instrument: this will cause a V-FET failure.

2. Replacing V-FET

TA-8650 uses six V-FETs (2SK60...3 pcs, 2SJ18...3 pcs) in each channel of its power amplifier. Both 2SK60 and 2SJ18 are divided into six ranks according to their V_{gs0} (gate-source voltage) and V_p (cut-off voltage). The bias resistors of the V-FET differ from a rank to a rank, and it is necessary to use the same rank of V-FETs in the same channel.

If you cannot obtain the same rank of V-FET replacement as the one used in the repairing set, replace all six V-FETs. At the same time, replace the bias resistors according to the table given at right.

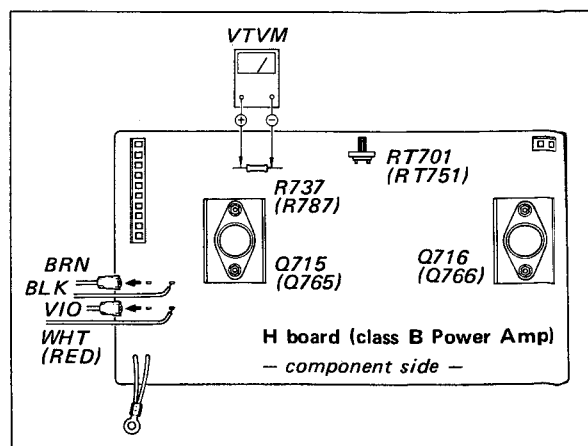
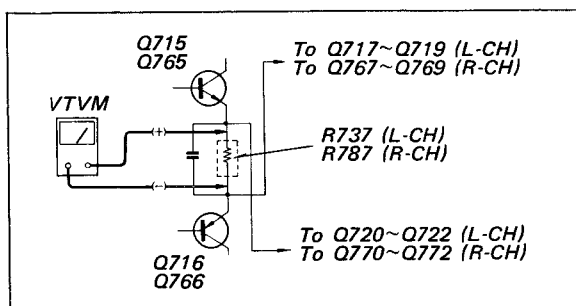
Rank of 2SK60 2SJ18	Bias Resistors	
	R725, R775	R731, R781 R732, R782
53	33 k Ω	1.8 k Ω
54	33 k Ω	1.5 k Ω
55	33 k Ω	1.2 k Ω
56	30 k Ω	1.0 k Ω
57	30 k Ω	1.0 k Ω
58	30 k Ω	820 Ω



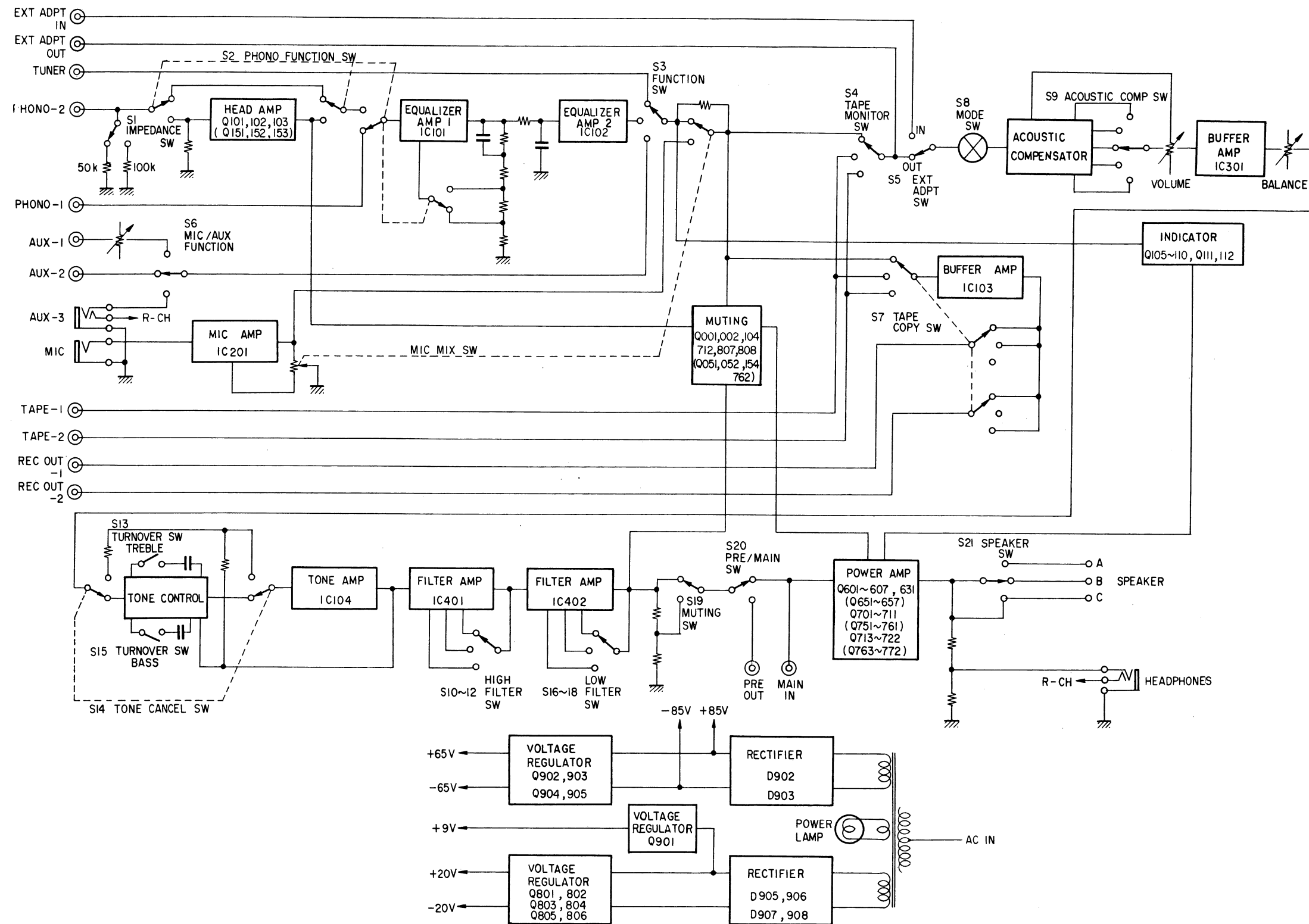
3. After the replacement of V-FET, carry out the following check to avoid further occurrence of V-FET failure.

- 1) Turn off the power of TA-8650.
- 2) Remove the heat sink duct.
- 3) Disconnect the brown and the violet lead wires from the pins on H Board (CLASS B POWER AMP BOARD). See the figure at bottom right.
- 4) Turn on the power and check the voltage across R737 (L-CH)/R787 (R-CH). If the reading does not agree with the value given in the table at right, try adjusting RT701 (L-CH)/RT751 (R-CH).
- 5) If adjusting RT701/RT751 still does not give correct reading, check Q713~Q716 (L-CH)/Q763~Q766 (R-CH). Failure of these transistors will cause V-FET failure.
- 6) After the check, turn off the power of the set and put back the two lead wires mentioned in step 2.

Rank of 2SK60 2SJ18 used in the set	Voltage drop across R737 (L-CH) R787 (R-CH)
53	20.0 V ~ 25.0 V
54	25.0 V ~ 30.0 V
55	30.0 V ~ 35.0 V
56	35.0 V ~ 40.0 V
57	40.0 V ~ 45.0 V
58	45.0 V ~ 50.0 V



SECTION 1 BLOCK DIAGRAM



SECTION 2

DISASSEMBLY AND REPLACEMENT

2-1. CHASSIS LAYOUT

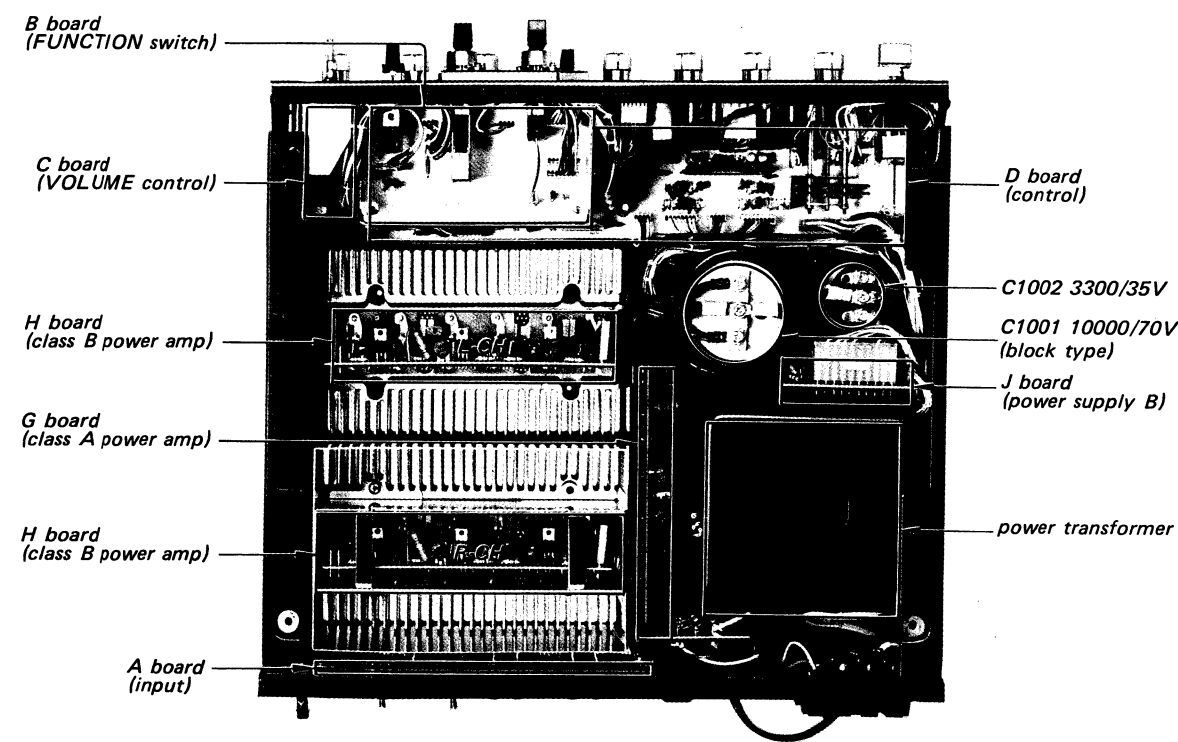


Fig. 2-1. Chassis top view

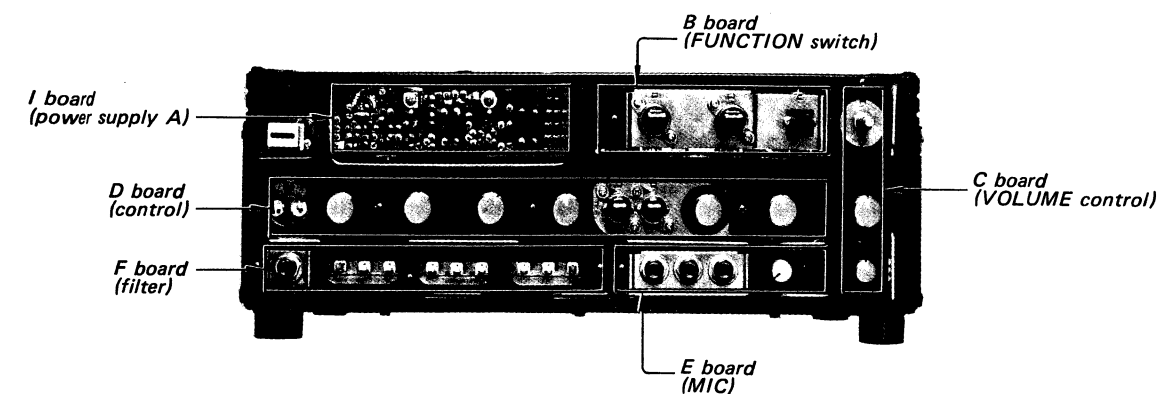


Fig. 2-2. Chassis front view

2-2. PANELS AND KNOBS REMOVAL

- Front Panel

Remove ① , ② , ③ , ④ , and ⑤ .
- Control Panel

Remove the front panel.
Remove ⑥
- Front Subchassis

Remove the front panel.
Remove ⑦ .
- Rear Panel

Remove ⑧ .

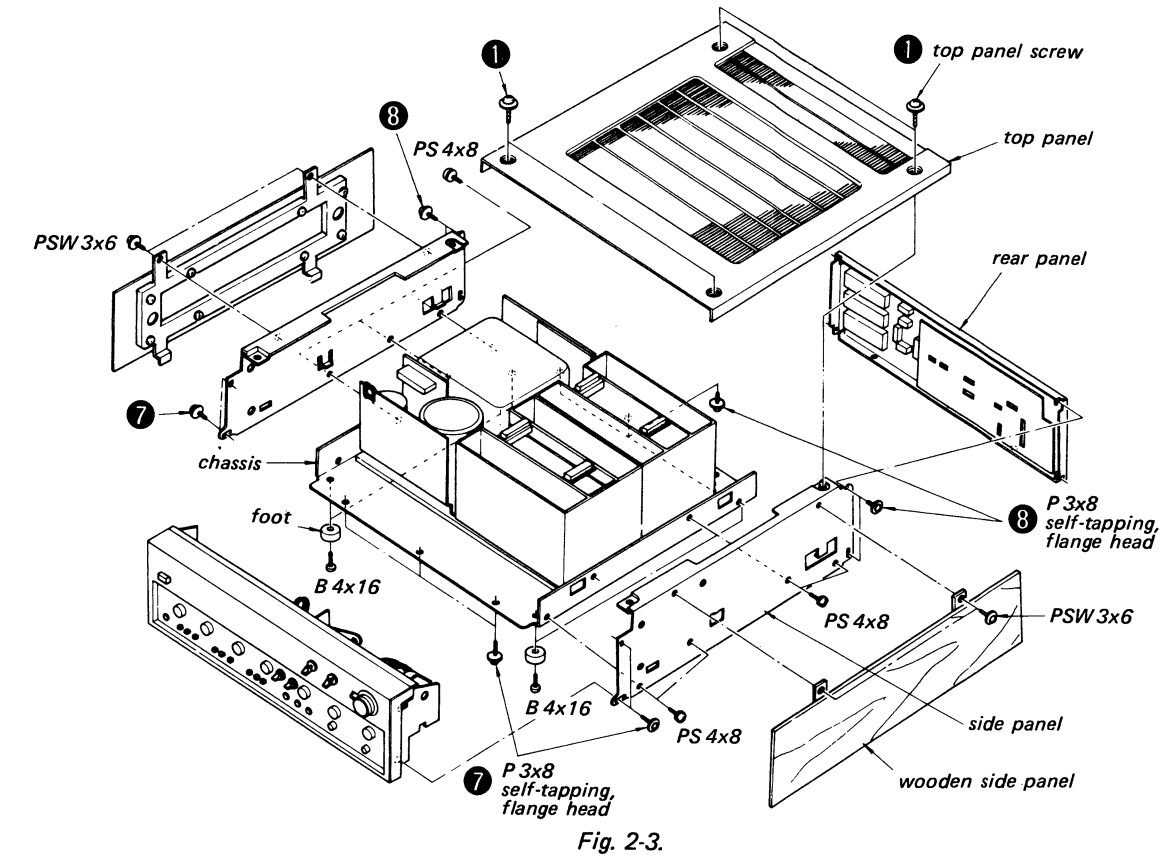


Fig. 2-3.

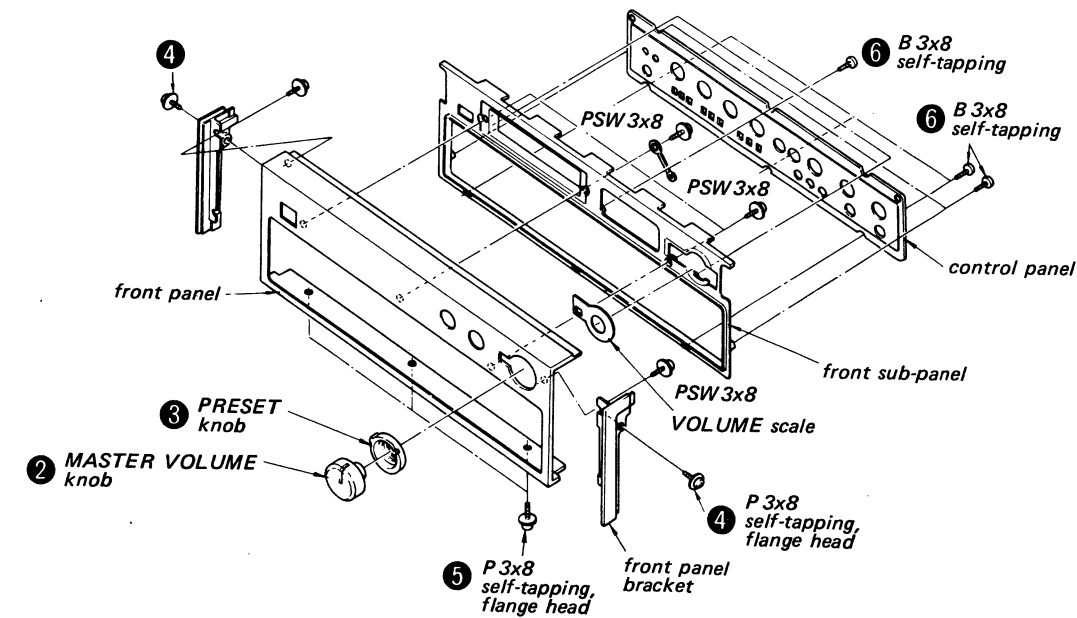


Fig. 2-4.

Knobs Removal

MASTER VOLUME knob } loosen the set screw.
 PRESET knob }
 POWER switch knob remove the front panel and pull out the knob from switch.

Pushbuttons remove the front panel and push out the knobs.
 Other knobs pull out the knobs

2-3. CIRCUIT BOARD REMOVAL AND V-FET REPLACEMENT

Note: Be careful with the position and the direction of the connectors when reinstalling them to the circuit boards. See Fig. 2-5.

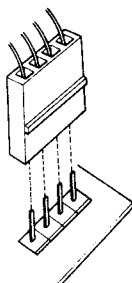


Fig. 2-5.

< G board >

Remove ⑪
 Pull up the board.

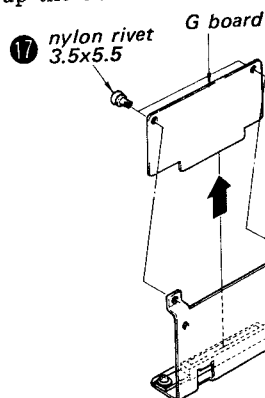


Fig. 2-6.

< A board >

Remove the rear panel.

Remove ⑨, ⑩, and ⑪

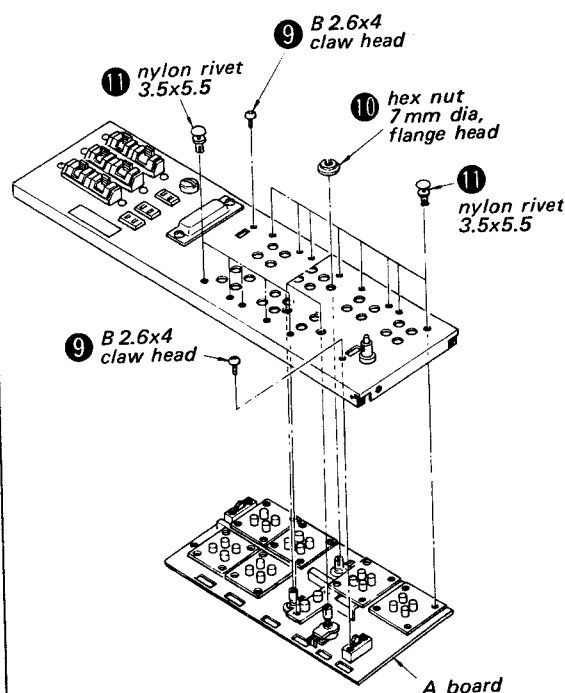


Fig. 2-8.

< B, C, D, E, and F boards >

Remove the front sub-panel.

Remove ⑫ ~ ⑯

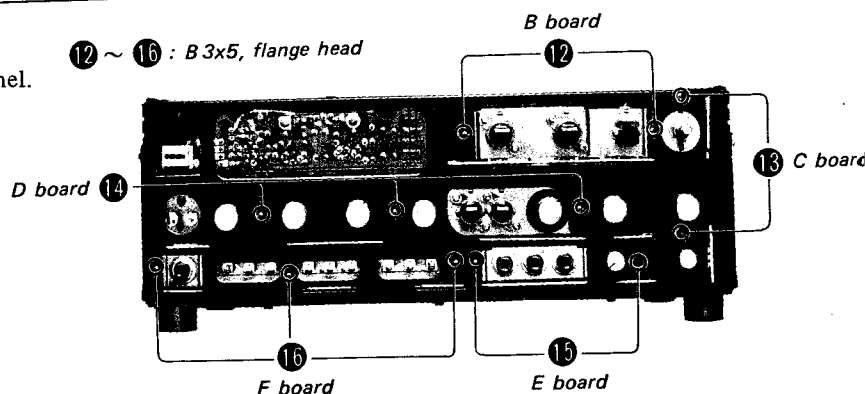


Fig. 2-7.

<H board>

Remove the heat sink duct (remove 18).

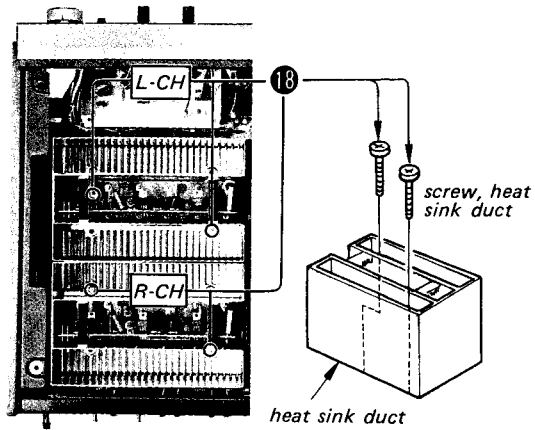


Fig. 2-9.

Remove 19 and take out the heat sink with the circuit board.

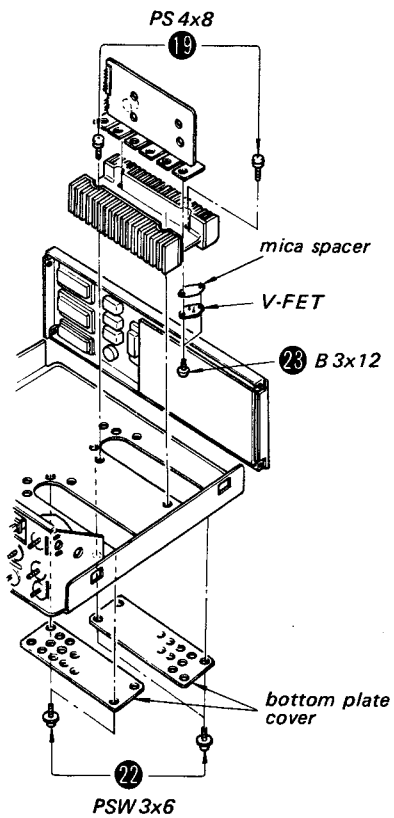


Fig. 2-10.

<I board>

Remove 20

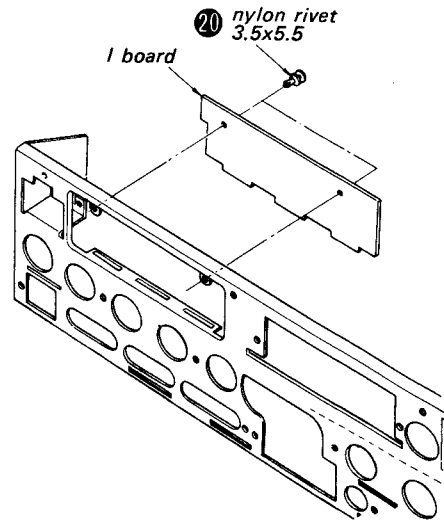


Fig. 2-11.

<J board>

Remove 21

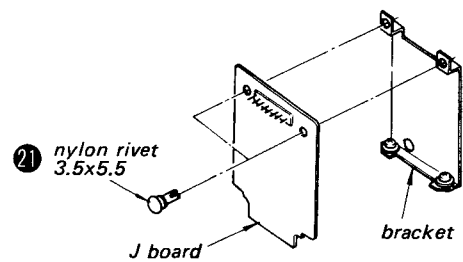


Fig. 2-12.

<V-FET Replacement>

Remove 22 and 23 (Fig. 2-10).

MEMO

SECTION 3

DC BALANCE AND BIAS ADJUSTMENTS

Note 1. Apply the rated ac line voltage to the set directly. Do not increase the voltage gradually by using a variable transformer or other such instruments: this will cause a V-FET failure.

2. Turn on the power of the set and wait a few minutes for warm-up.

3. Alternately repeat the two adjustments 2~3 times.

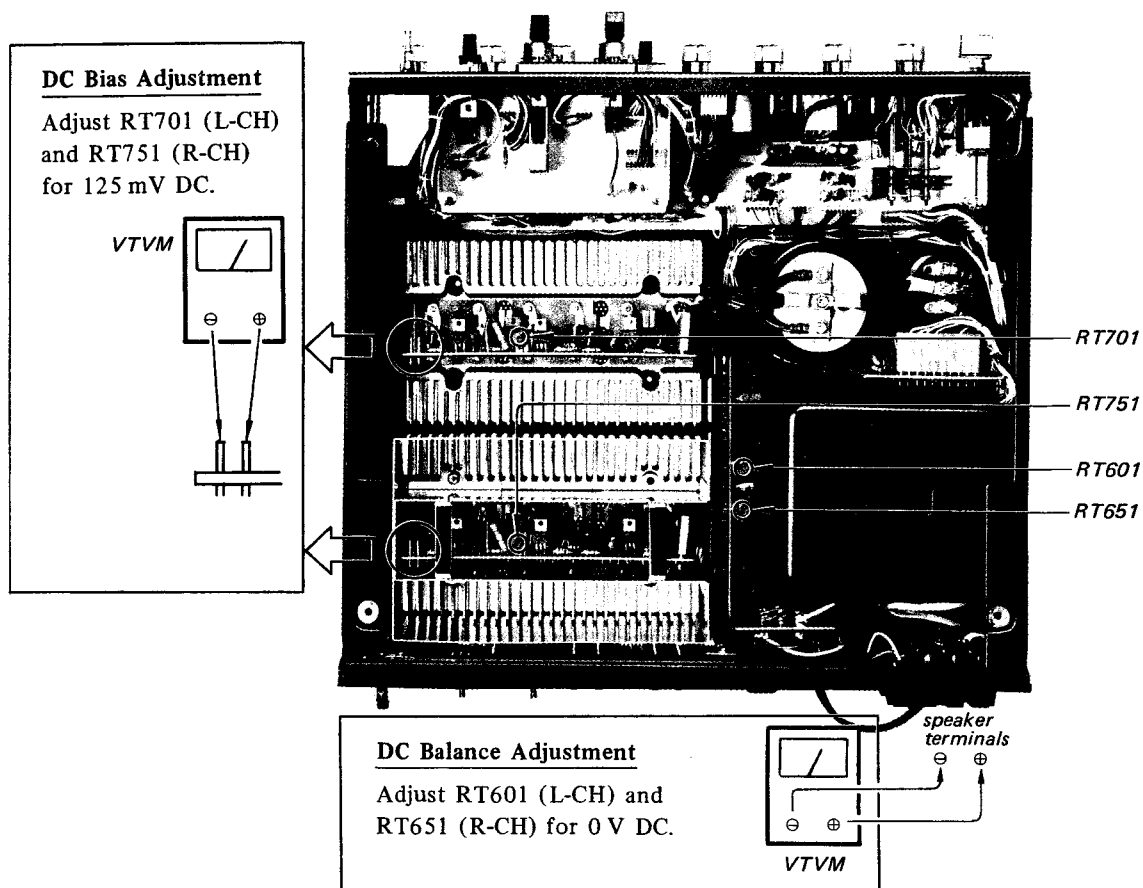
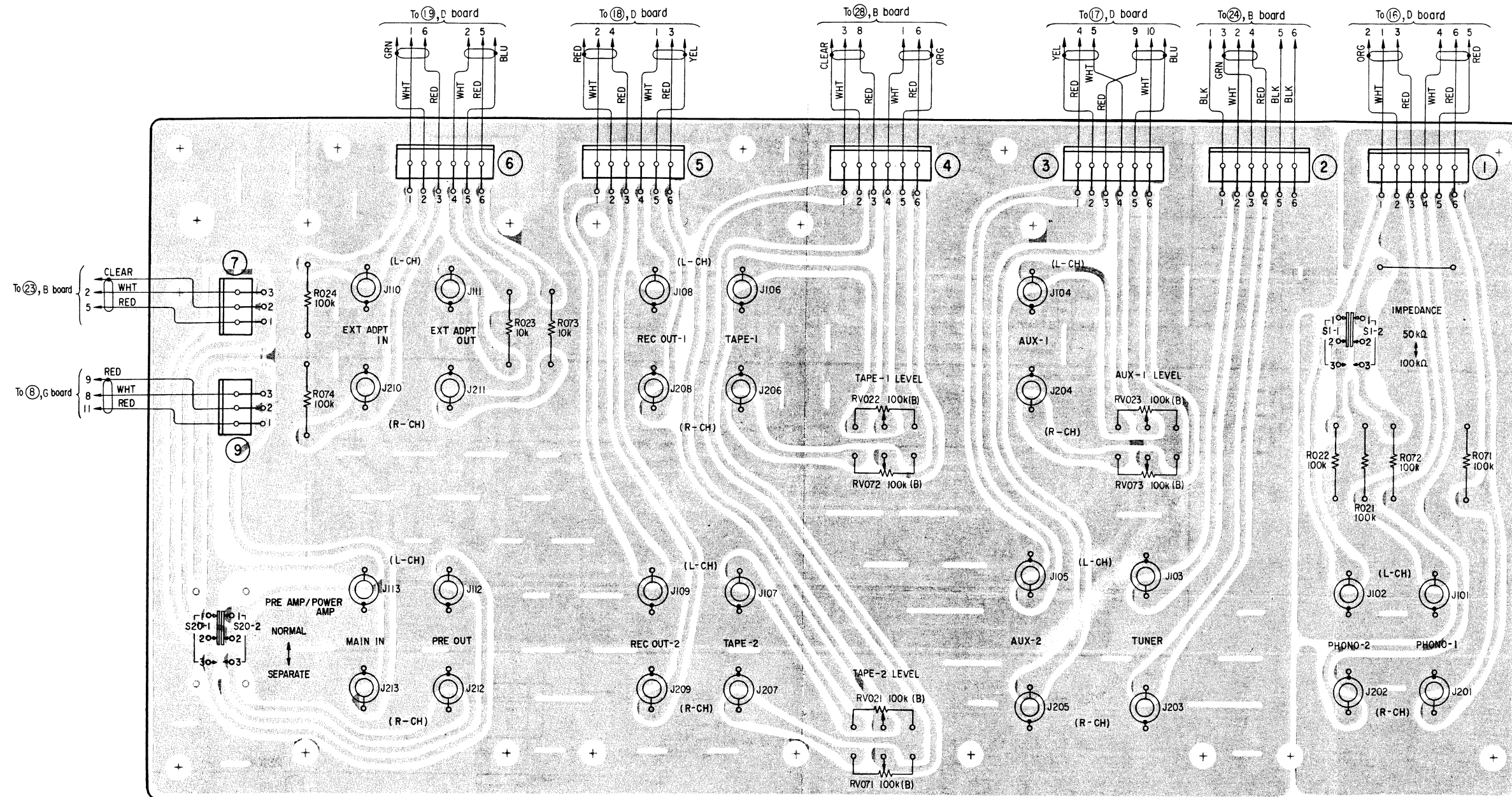


Fig. 3-1.

SECTION 4
DIAGRAMS

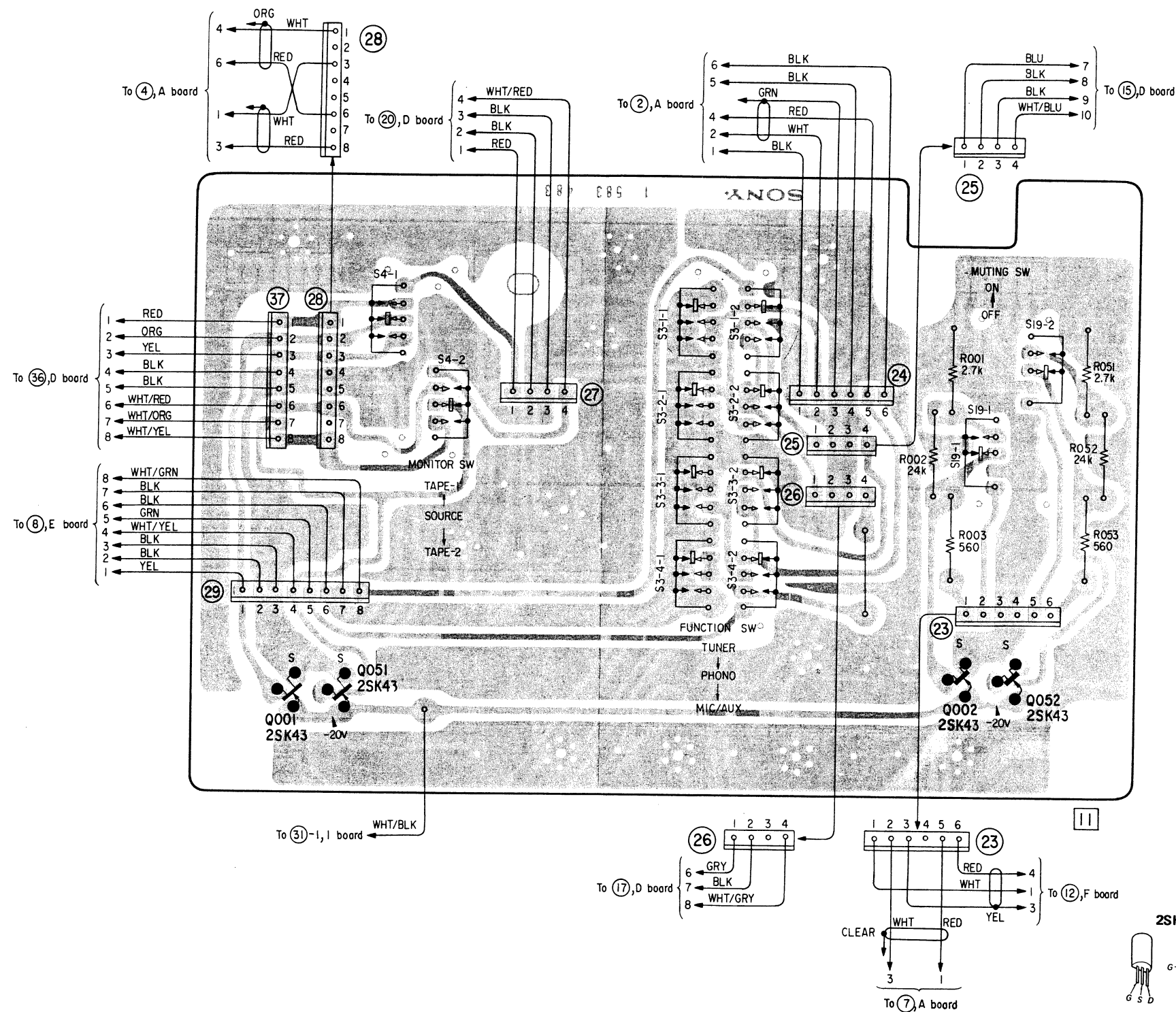
4-1. MOUNTING DIAGRAM — A Board INPUT —

— Conductor Side —

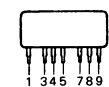


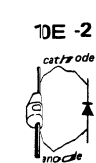
4-2. MOUNTING DIAGRAM — B Board FUNCTION SWITCH —

— Conductor Side —

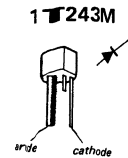
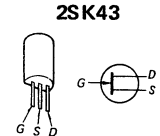
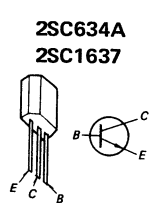
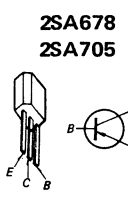
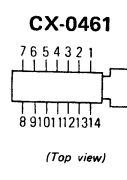
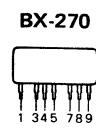
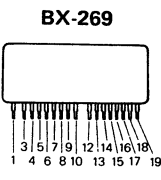
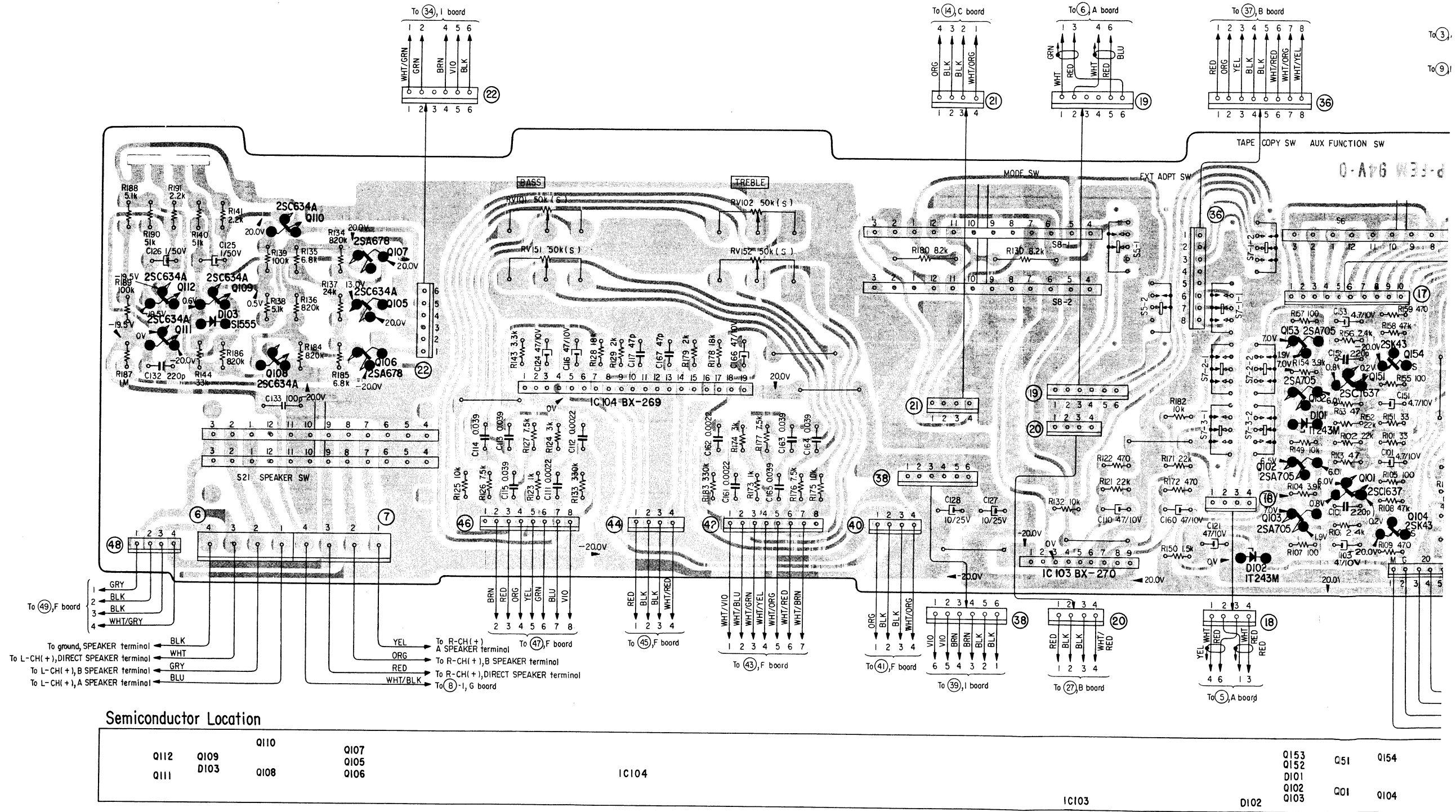


– Conductor Side –



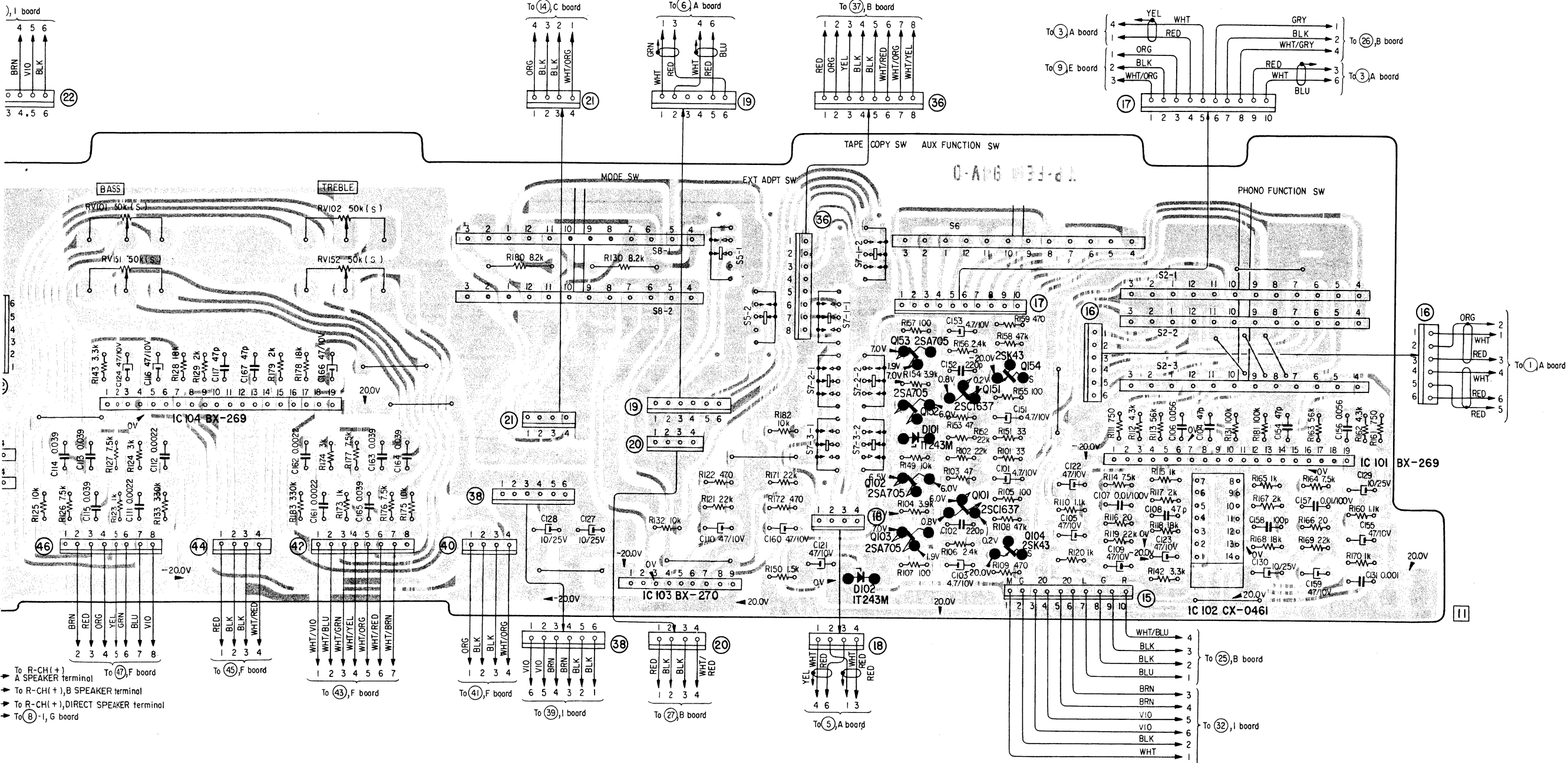


4-5. MOUNTING DIAGRAM — D Board CONTROL —
— Conductor Side —



D

D



IC104

IC103

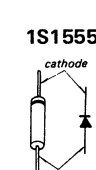
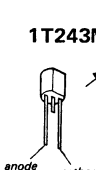
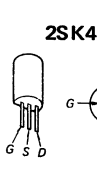
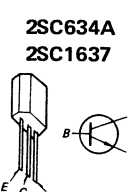
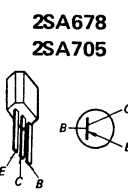
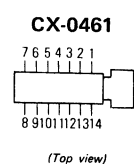
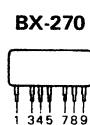
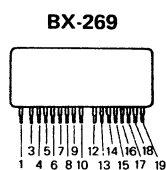
D102

Q153
Q152
D101
Q102
Q103

Q151
Q101
Q104

Q154
Q104

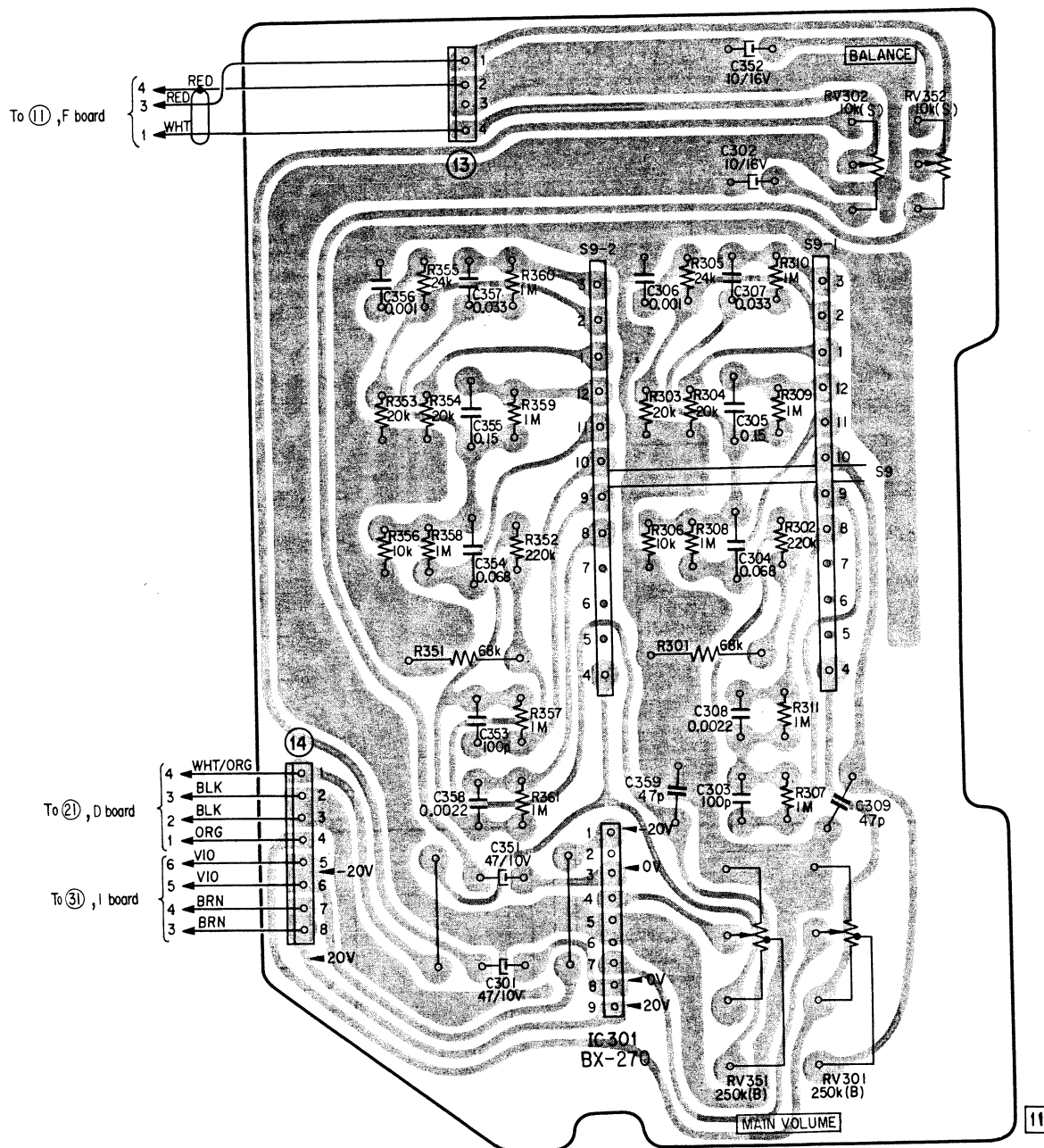
IC101
IC102



* D104 and D105 are mounted on a small printed circuit board which stands on D board at 90°.

4-6. MOUNTING DIAGRAM – C Board **VOLUME CONTROL** –

– Conductor Side –



BX-270

