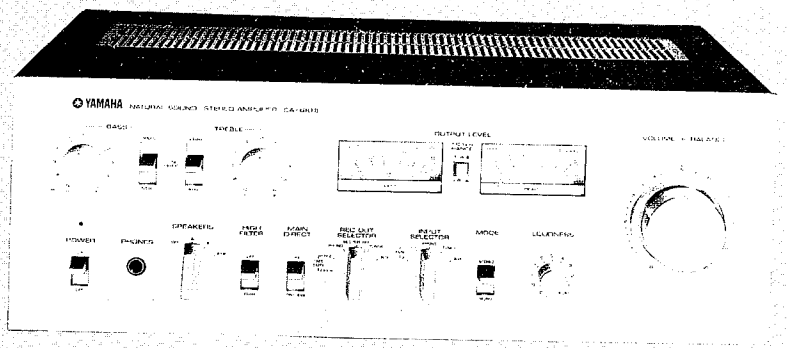
21

SERVICE MANUAL

CA-610 II

STEREO AMPLIFIER



SINCE 1887 YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

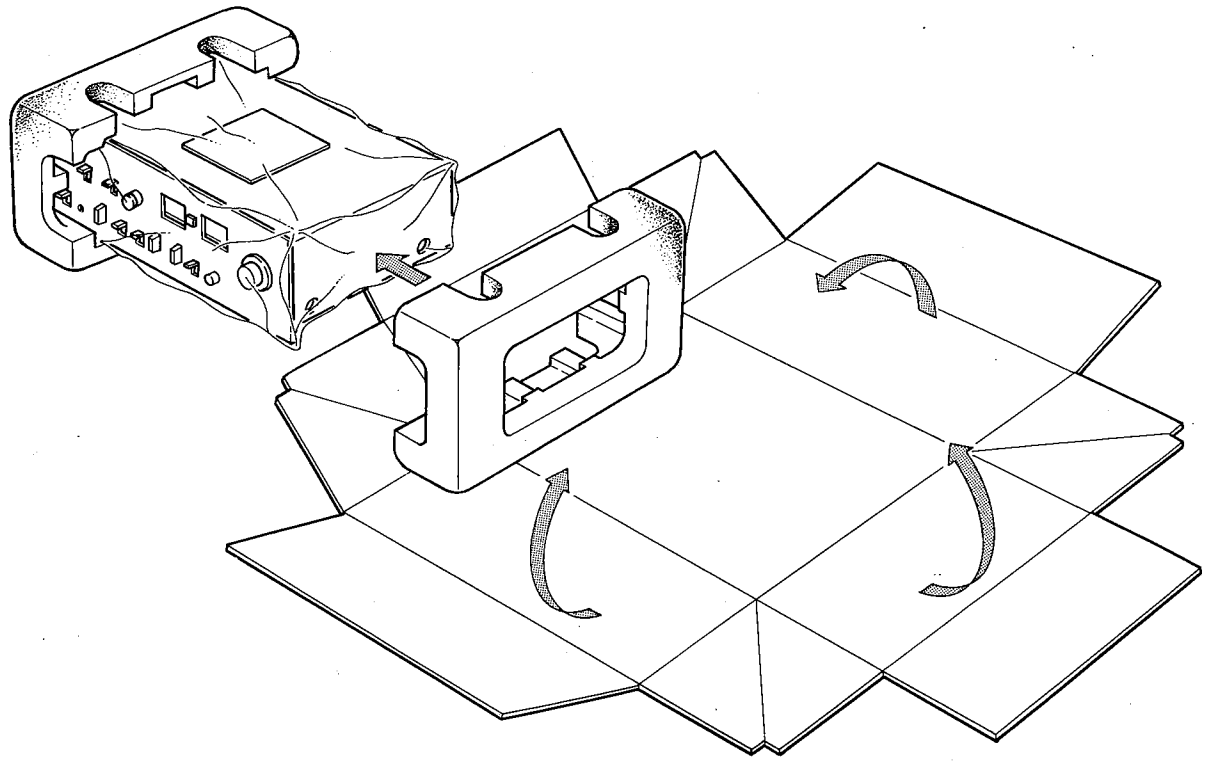
004337

August. 77 2K #101001~

■CONTENTS

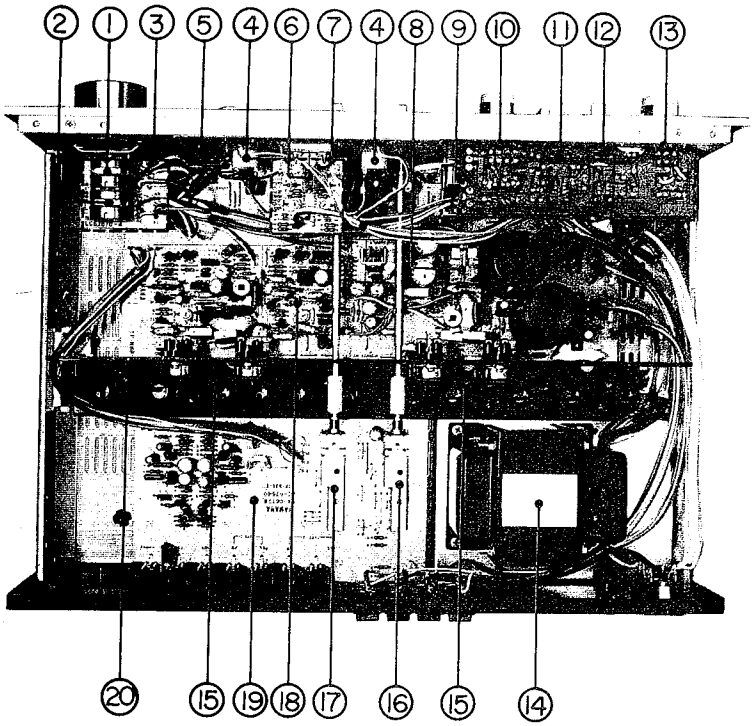
- PACKAGE INSTRUCTION 1
- EXTERNAL VIEW 2
- PANEL OPERATION
  - FRONT PANEL 3
  - REAR PANEL 3
- DISASSEMBLY PROCEDURES 5
- BLOCK DIAGRAM 7
- LEVEL DIAGRAM 7
- ADJUSTMENT
  - MAIN AMPLIFIER 8
  - LEVEL METER 8
- PATTERN DIAGRAM
  - FANCTION C, BOARD 9
  - MAIN C, BOARD (1 ~ 4) 10
- SCHMATIC DIAGRAM 11
- SPECIFICATIONS 11
- WIRING 12
- PARTS LIST 13

■PACKAGE INSTRUCTION

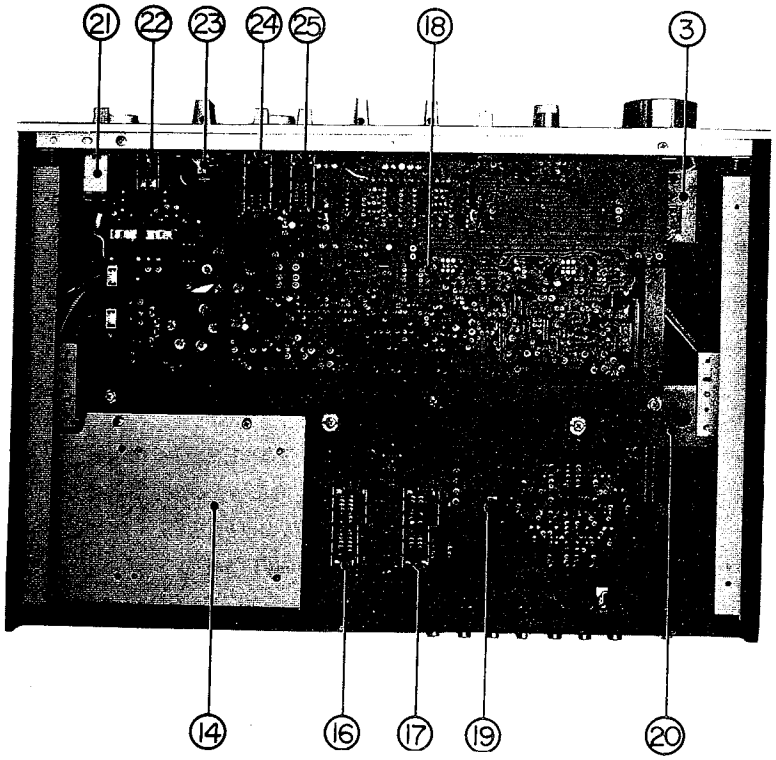


■EXTERNAL VIEW

TOP VIEW



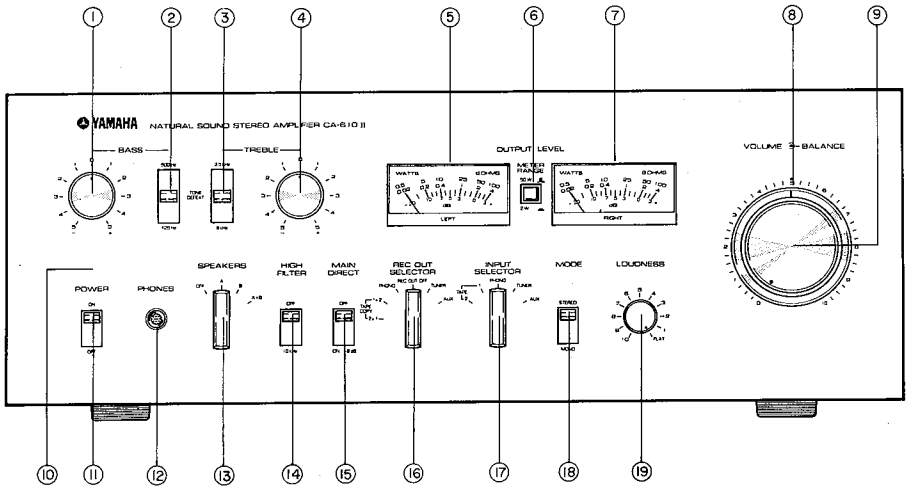
BOTTOM VIEW



1. Balance VR
2. Level Control
3. Main C, Board 2 (Volume)
4. Level Meter
5. Loudness Control VR
6. Meter Range SW
7. Main C, Board 4 (Meter Drive)
8. Protector Relay
9. Main C, Board 3 (Tone Control)
10. Treble Control
11. Turnover Selector/Tone Defeat SW (TREBLE)
12. Turnover Selector/Tone Defeat SW (BASS)
13. Bass Control
14. Power Transformer
15. Power Transistor
16. Recording Output Selector
17. Input Selector
18. Main C, Board 1 (Power Supply, Main Amplifier)
19. Fanction C, Board
20. Heat-sink
21. Power SW
22. Head-phone Jack
23. Speaker Selector
24. High Filter
25. Main-Direct SW

■PANEL OPERATION

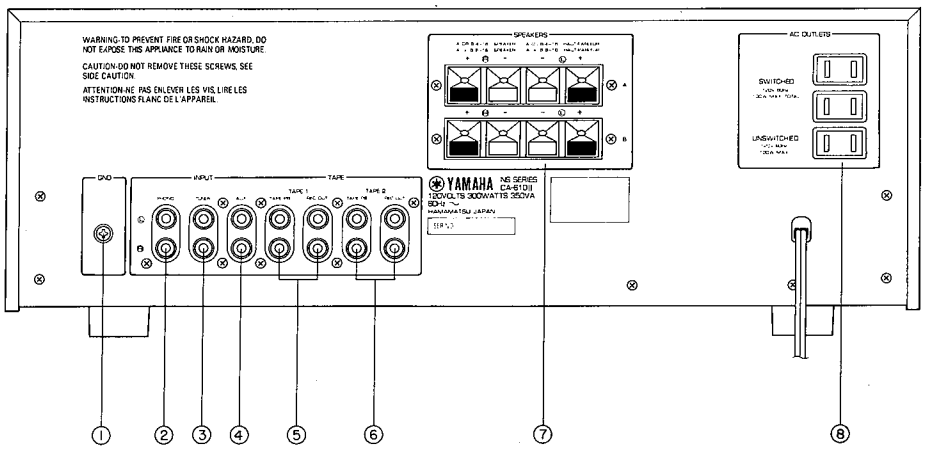
FRONT PANEL



1. BASS Control
2. Turnover TONE DEFEAT (BASS)
3. Turnover TONE DEFEAT (TREBLE)
4. TREBLE Control
5. OUTPUT LEVEL Meter (LEFT)
6. METER RANGE Switch
7. OUTPUT LEVEL Meter (RIGHT)
8. BALANCE Control
9. VOLUME Control
10. POWER Indicator
11. POWER Switch
12. Head Phone Jack
13. SPEAKERS Selector
14. HIGH FILTER Switch
15. MAIN DIRECT Switch
16. REC OUT SELECTOR
17. INPUT SELECTOR
18. MODE Switch
19. LOUDNESS Control

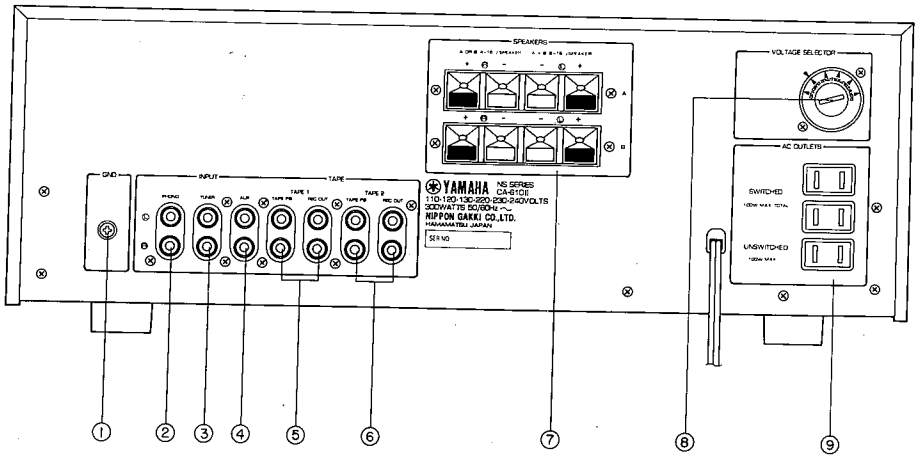
REAR PANEL

U.S.A. & Canadian Model



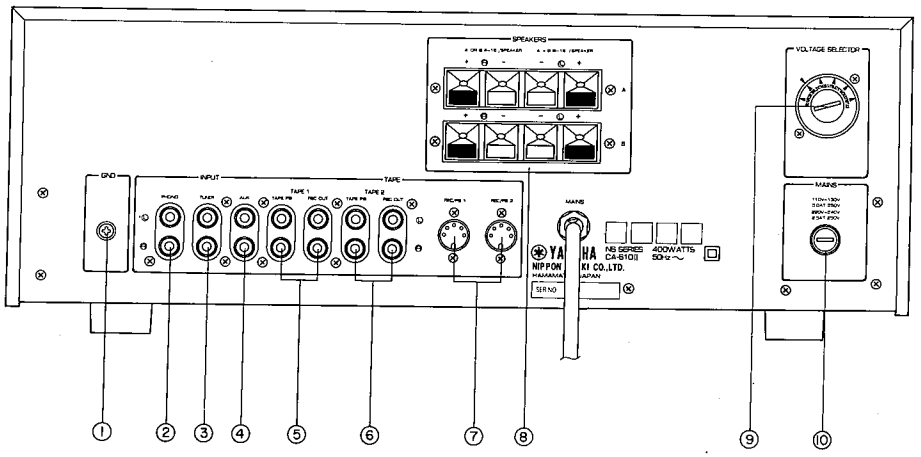
1. GND Terminal
2. PHONO Input
3. TUNER Input
4. AUX Input
5. TAPE 1 (REC Out, TAPE PB)
6. TAPE 2 (REC Out, TAPE PB)
7. SPEAKERS Terminal A, B
8. AC OUTLETS (SWITCHED, UNSWITCHED)

General Export Model



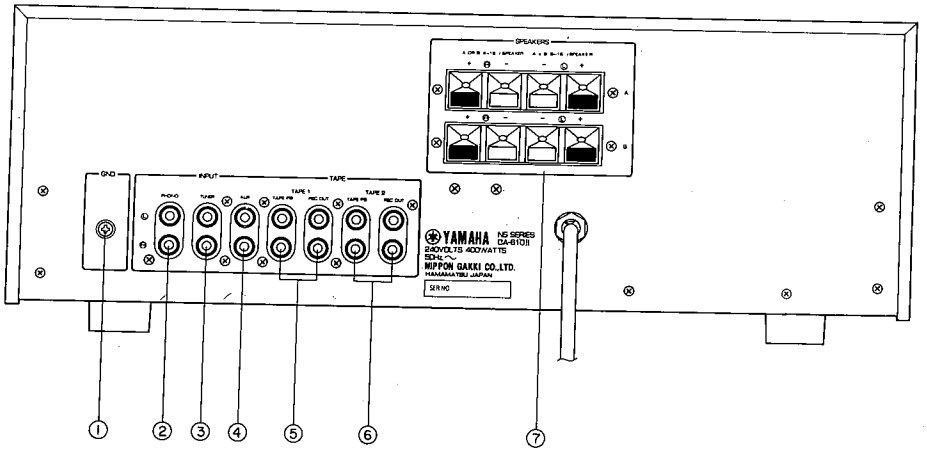
① GND Terminal
② PHONO Input
③ TUNER Input
④ AUX Input
⑤ TAPE 1 (REC Out, TAPE PB)
⑥ TAPE 2 (REC Out, TAPE PB)
⑦ SPEAKERS Terminal A, B
⑧ VOLTAGE SELECTOR
⑨ AC OUTLETS (SWITCHED, UNSWITCHED)

British & European Model



① GND Terminal
② PHONO Input
③ TUNER Input
④ AUX Input
⑤ TAPE 1 (REC Out, TAPE PB)
⑥ TAPE 2 (REC Out, TAPE PB)
⑦ REC/PB 1, 2
⑧ SPEAKERS Terminal A, B
⑨ VOLTAGE SELECTOR
⑩ Fuse Holder (MAINS)

Australian Model



① GND Terminal
② PHONO Input
③ TUNER Input
④ AUX Input
⑤ TAPE 1 (REC Out, TAPE PB)
⑥ TAPE 2 (REC Out, TAPE PB)
⑦ SPEAKER Terminal A, B

■DISASSEMBLY PROCEDURES

1. Cabinet Removal

Remove four screws from both sides of the cabinet and remove the cabinet by pulling it backward. Do not lift the cabinet.

Note: In this condition, fuses, meter lamps, etc. can be replaced.

2. Bottom Cover Removal

Turn the unit upside down and remove five screws on the bottom cover.

Note: In this condition, at each PCB, parts not directly secured to the sub-panel can be checked and replaced.

3. Front Panel Removal

3.1 Remove the control knobs on the front panel.

a. Pull off the level control VR knob, tone control knobs and LOUDNESS control knob.

b. Remove the selector knobs and BALANCE VR knob after loosening set screws with a hexagonal wrench. For the BALANCE VR knob, insert the wrench between the front panel and sub-panel in arrow direction, and loosen two screws. (See Photo 1)

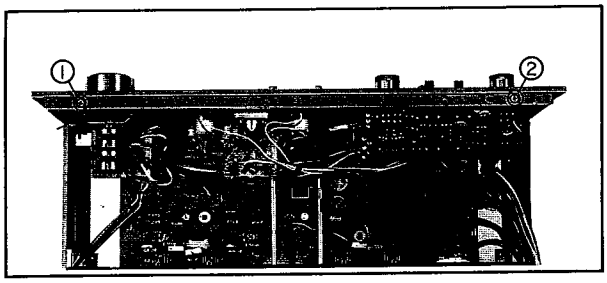


Photo. 1

3.2 Pull out the socket from the POWER IND. LED as shown in Photo 2.

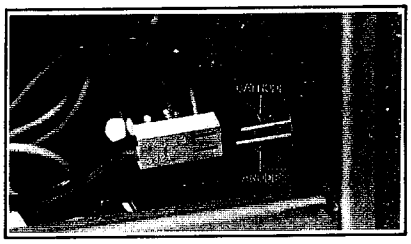


Photo. 2

3.3 Remove the screws ① and ② in Photo 1 as well as two front-panel-securing screws on the bottom side of the unit and remove the panel.

Note: Photo 3 shows the unit without the front panel and level meters.

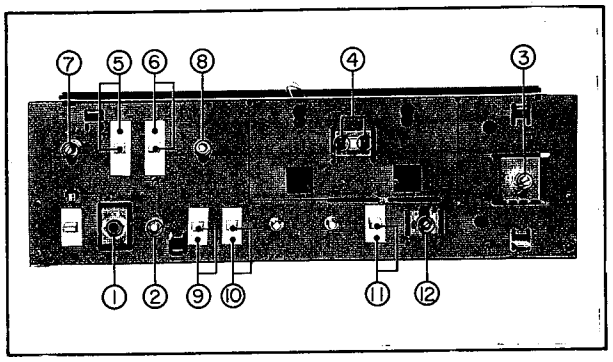


Photo. 3

In this condition, parts secured to the sub-panel can be replaced after removing the hexagon nuts ① to ④ and screws. For the switches whose bases are directly soldered to the PCB, unsolder them for removal with a soldering iron.

a. Headphone jack . . . . . Nut ①
b. Speaker selector switch . . . . . Nut ②
c. Main circuit board 4 (level control and balance control section) . . . . . Nut ③
d. Main circuit board 2 (meter drive section) . . . . . Screw ④

The selector switch is directly soldered to the PCB.

Note: The level meters can be removed merely by removing lead wires. At this time, be careful not to tear the protection tape.

4. Main Circuit Board 3 (Tone Control Section) Removal

To remove the main circuit board 3, withdraw ⑤ and ⑥ shown in Photo 3, then unscrew hexagon nuts ⑦ and ⑧ in Photo 3 as well as screws ① and ② in Photo 5.

5. Main Circuit Board 1 (Main Amp Section) Removal

5.1 Remove screws ① and ② in Photo 4, then withdraw the power transistors from the sockets. (Condition (B))

5.2 Withdraw ⑨ to ⑪ and unscrew hexagon nut ⑫ shown in Photo 3, then remove screws ③ to ⑤ in Photo 5.

5.3 Remove screws ① to ③ shown in Photo 6.

Note: Replace the selector switches by removing the hexagon nuts according to Item 5.2, skipping the step 5.1.

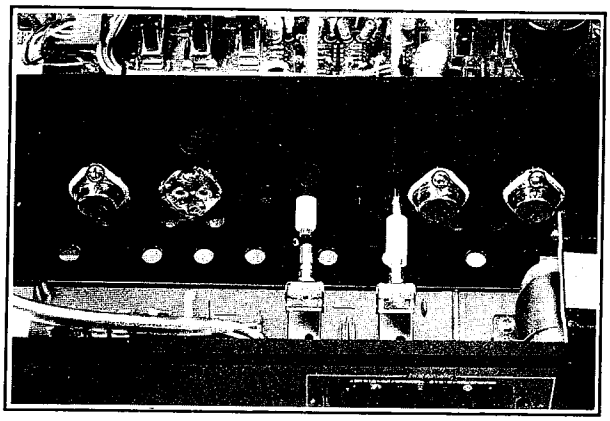


Photo. 4

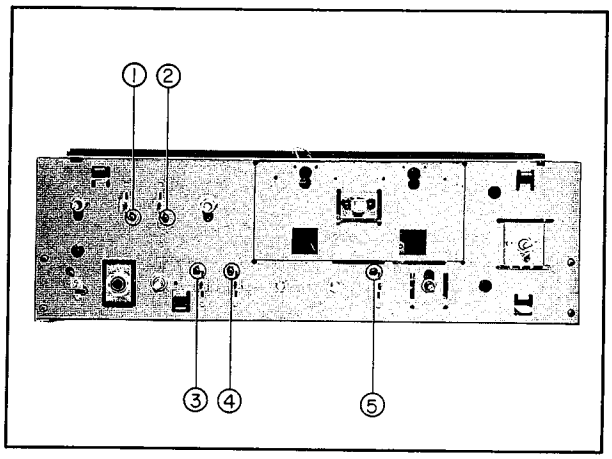


Photo. 5

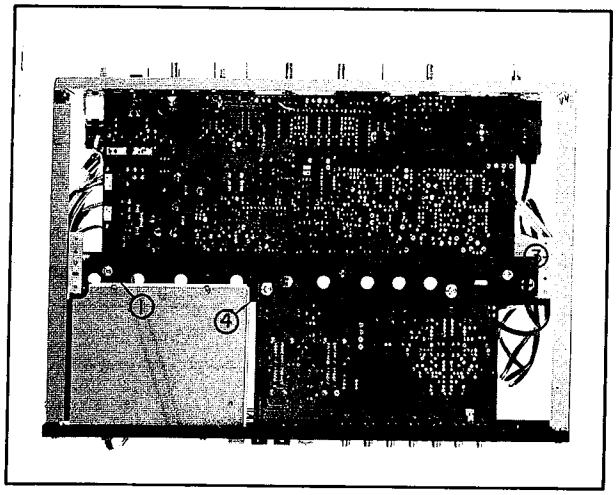


Photo. 6

Photo 7 shows TR490 (right) and TR489 (left) which are temperature-compensating transistors being heat-coupled with the heat sink. When assembling the main circuit board as well as the power transistors, be sure to closely fit the joint surfaces.

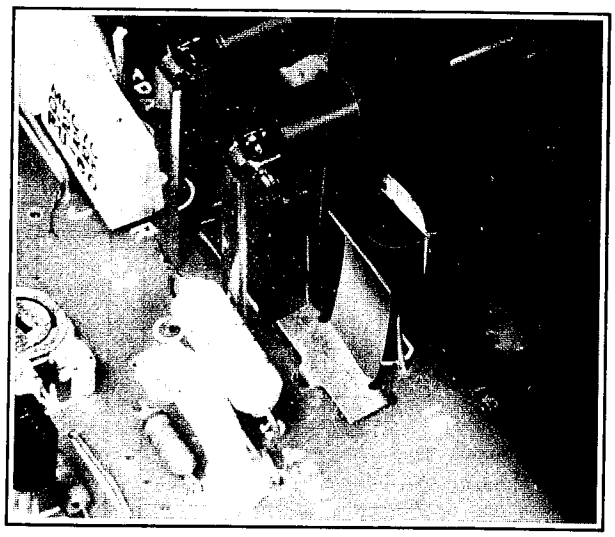


Photo. 7

6. Function Circuit Board Removal

6.1 To disengage the shaft, shift the joint in arrow direction like Ⓐ shown in Photo 4.

6.2 Remove eight screws shown in Photo 8.

6.3 Remove screws ④ and ⑤ shown in Photo 6.

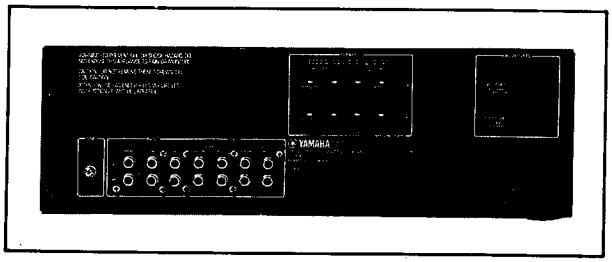
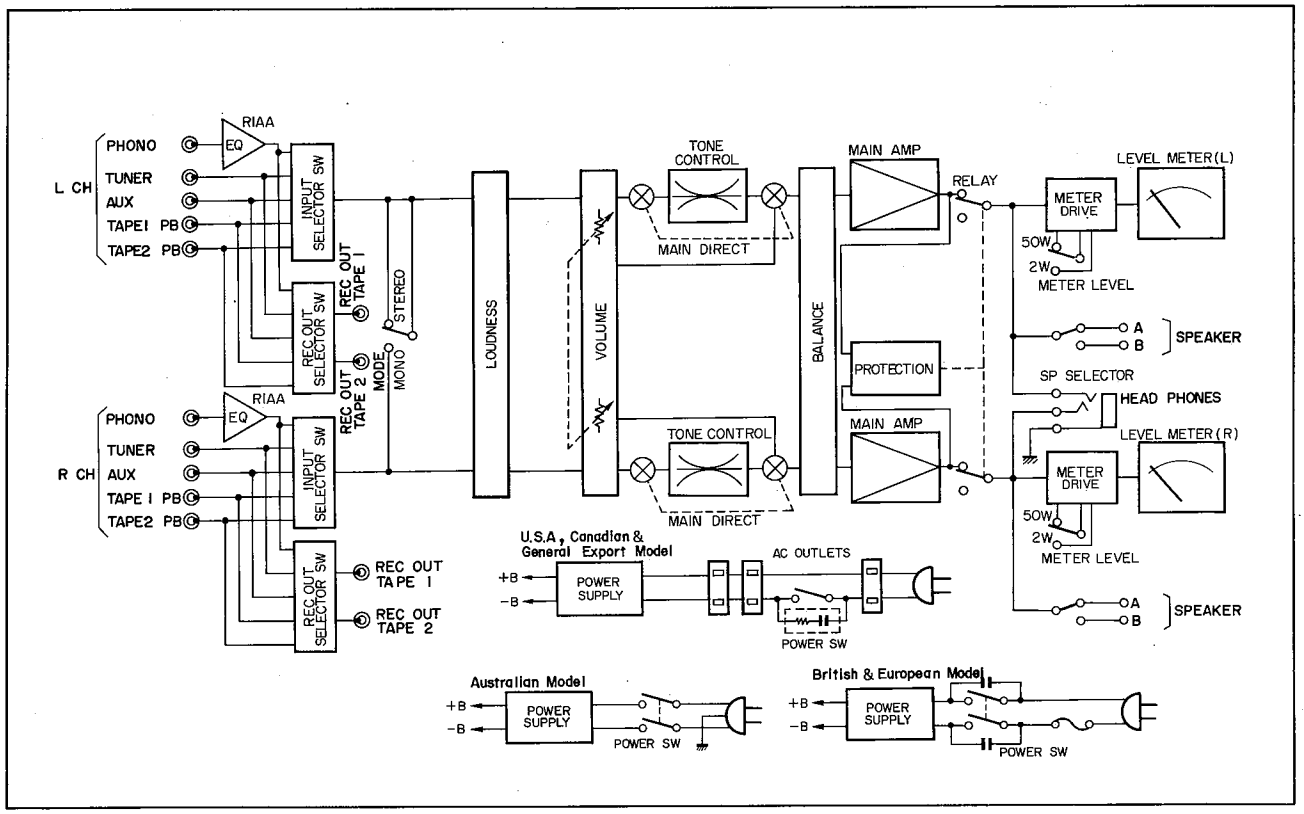


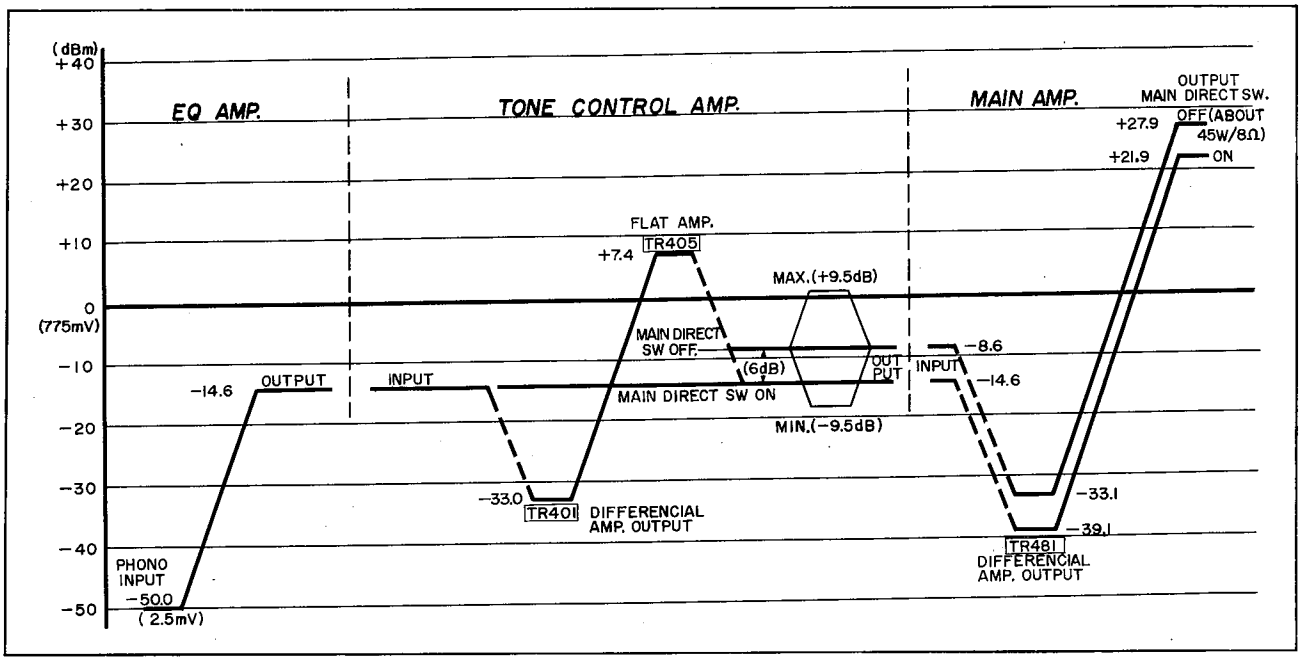
Photo. 8

Note: The photos depict the U.S.A. model.

■BLOCK DIAGRAM



■LEVEL DIAGRAM



■ADJUSTMENT

1. Main Amplifier

Adjusting Preparations

* For adjustment, wait three to four minutes after the POWER switch is turned on.
* Connect a dummy load of 8Ω (50W or more) to the speaker terminal).
* Set the level control volume to minimum.

1.1 Idling Current Adjustment

- Left channel: By turning VR481, adjust the voltage between TP1 and TP2 to 10 ± 3mV.
- Right channel: By turning VR482, adjust the voltage between TP3 and TP4 to 10 ± 3mV.

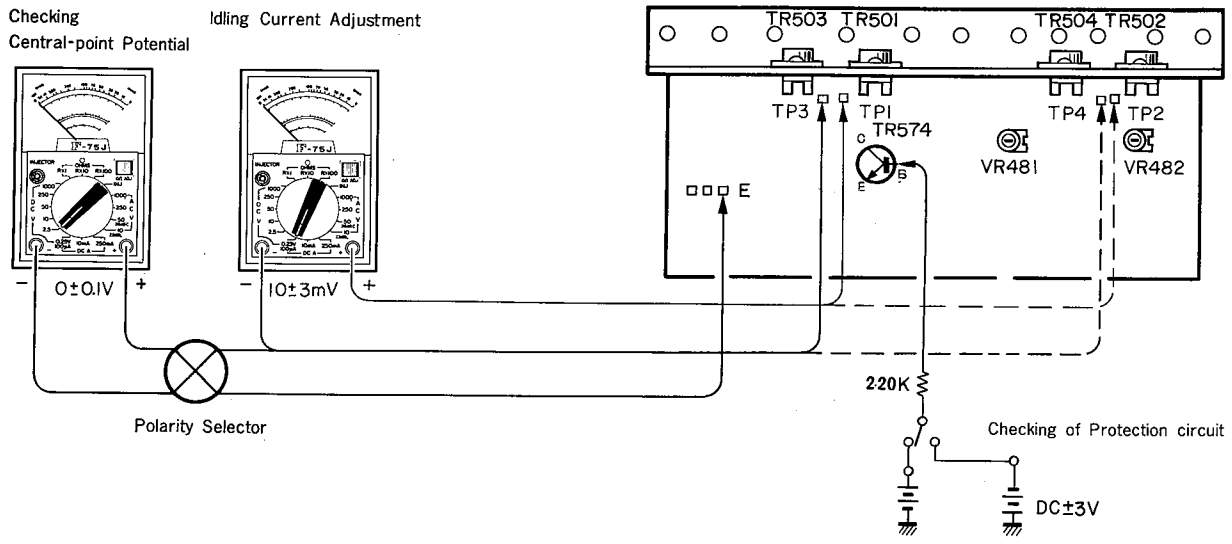
Notes:
- Turn the adjusting volume knob gently.
- Pay attention to the polarity of test points. (TP1 and TP3 are ⊕, and TP2 and TP4 are ⊖.)
- Repeat the above adjustment several times.

1.2 Checking Central-point Potential

- Confirm that potential difference between E and TP2 or TP4 is within 0 ± 0.1V.

1.3 Checking Speaker Protection Circuit

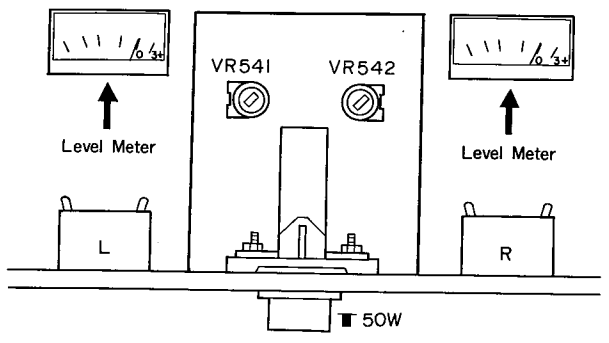
- Confirm that the relay switches to on within 4 ± 1 seconds after the power is supplied.
- Confirm that the relay is switched off within three seconds after DC ± 3V is supplied between TR574 (Base) and Earth as shown below.



2. Level Meters

Adjusting Preparations

* Connect a dummy load of 8Ω (50W or more) and VTVM to the output terminal in parallel.
* Connect an audio signal generator to the AUX input terminal, and supply a sine wave at 1kHz.
* Set the sensitivity selector switch to 50W position.



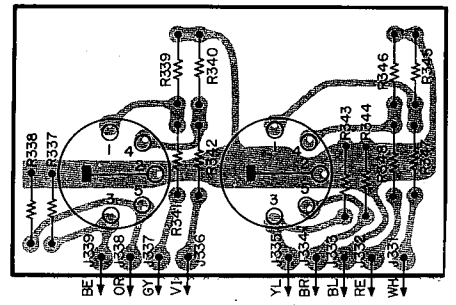
2.1 Meter Indication Adjustment

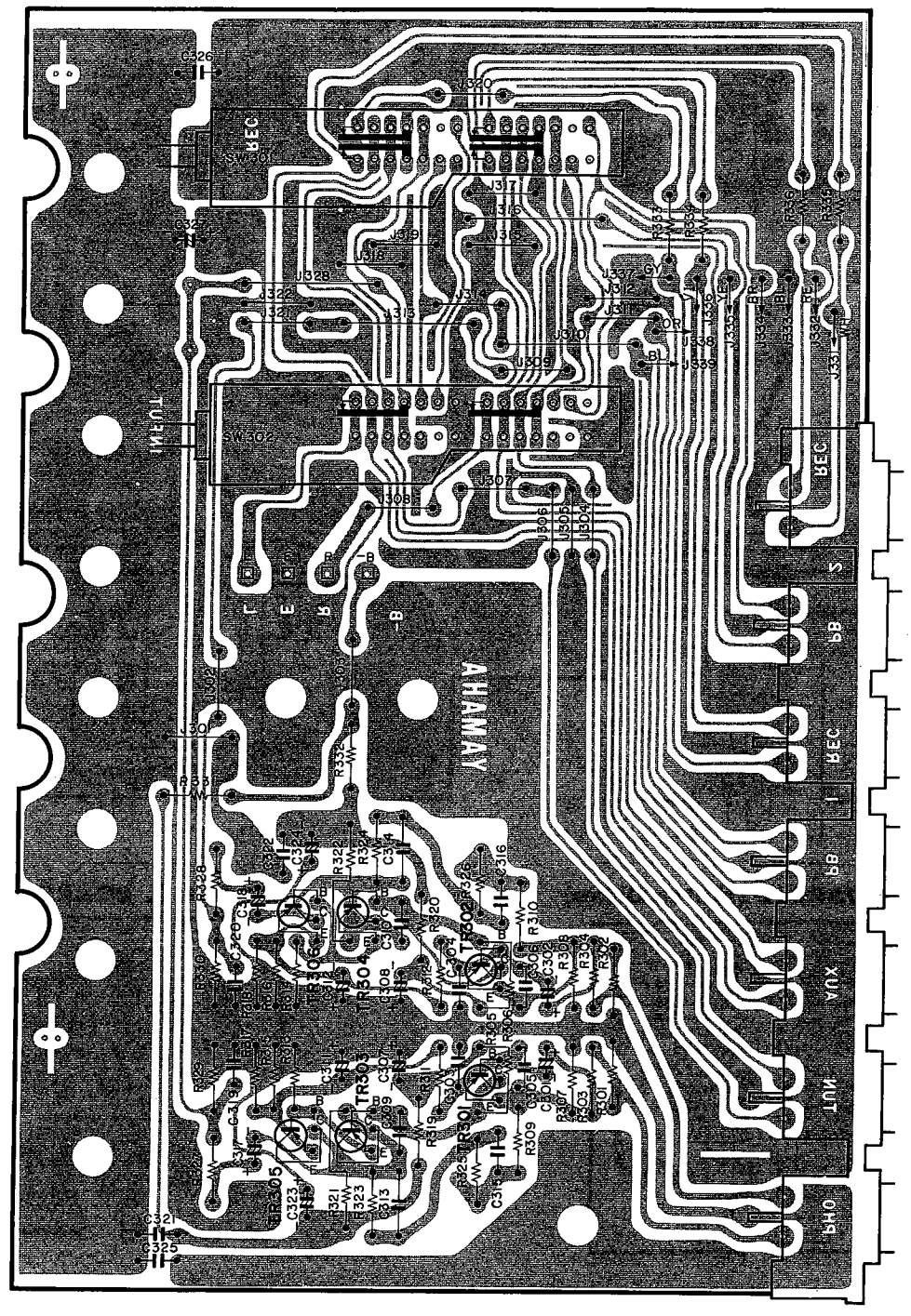
Adjust the meter indication so that the pointer of the meter reads 0dB when the output is 50W (VTVM voltage is 20Vrms) by turning the level control knob as well as VR541 (left channel) and VR542 (right channel).

■PATTERN DIAGRAM

■FUNCTION C. BOARD (Function, EQ) NA06937 (R,A,C), NA06938 (U), NA06939 (E,B)

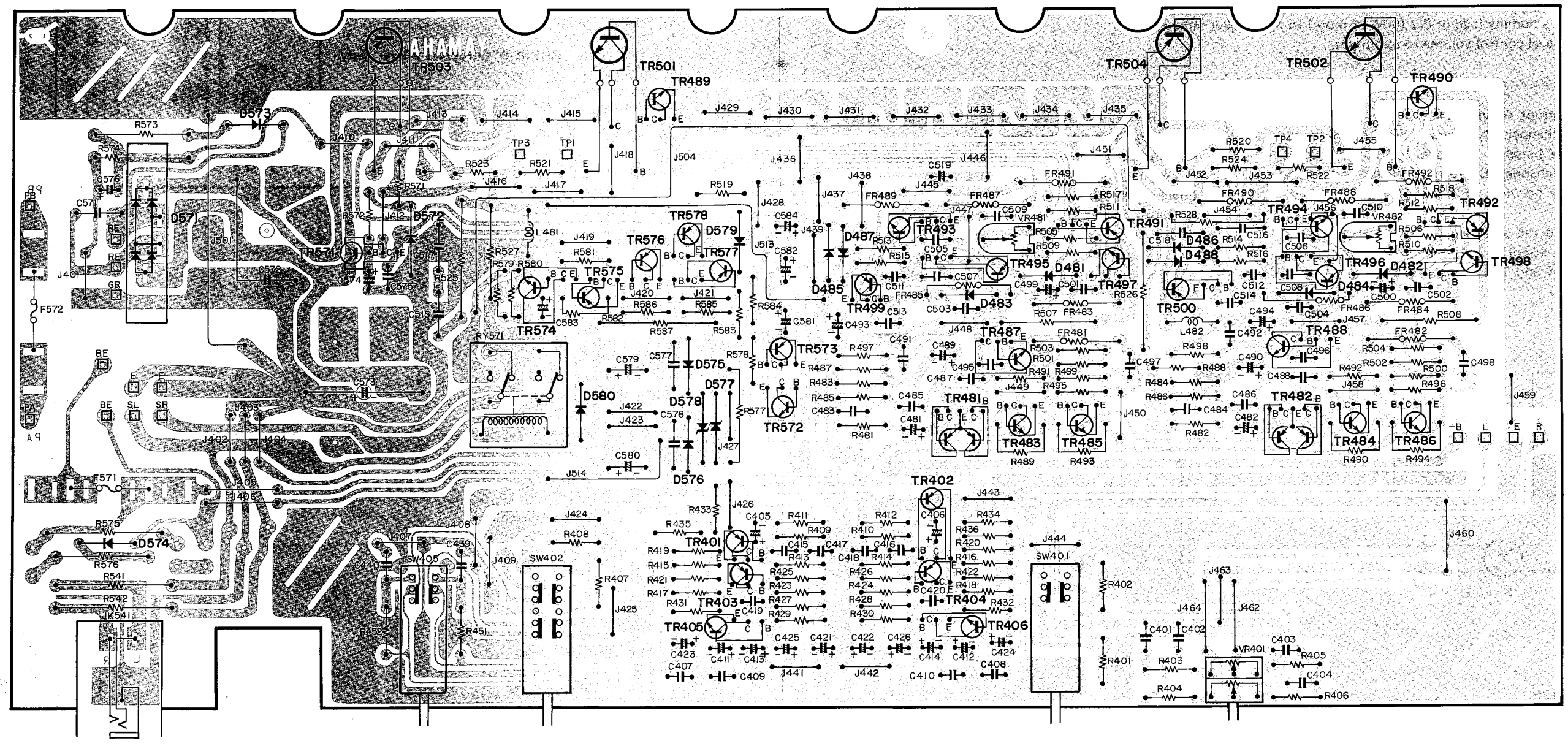
British & European Model Only.



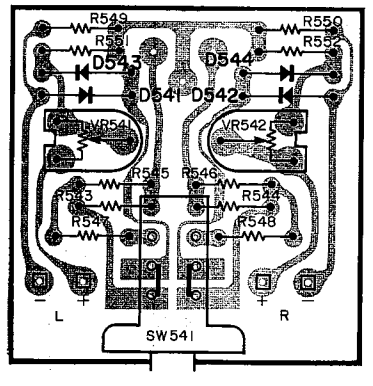


■PATTERN DIAGRAM

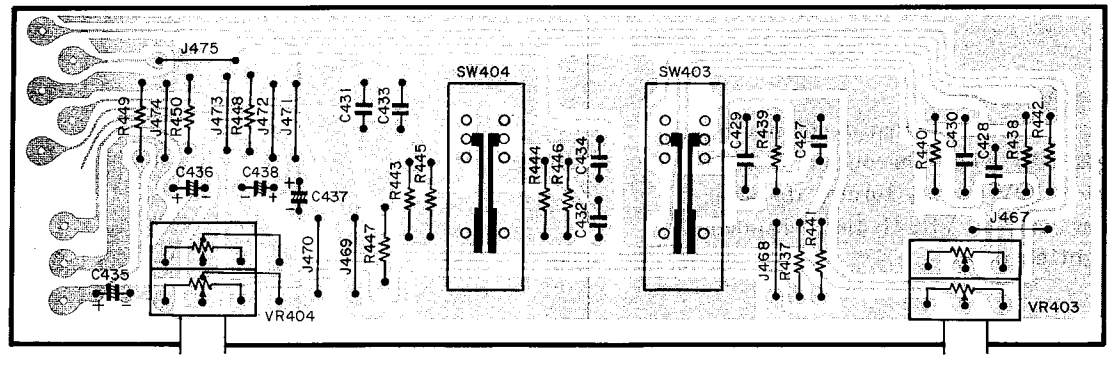
■MAIN C. BOARD 1 (Main Amplifier, Power) NA06941 (U) NA06942 (C) NA06943 (R,A) NA06944 (E,B)



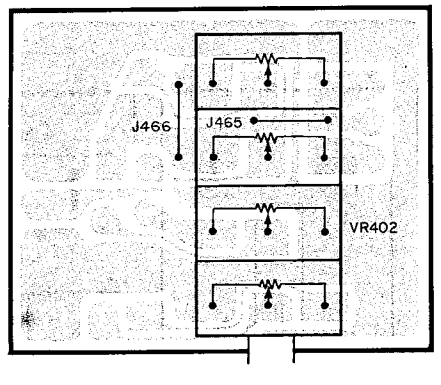
■MAIN C. BOARD 2 (Meter Drive)



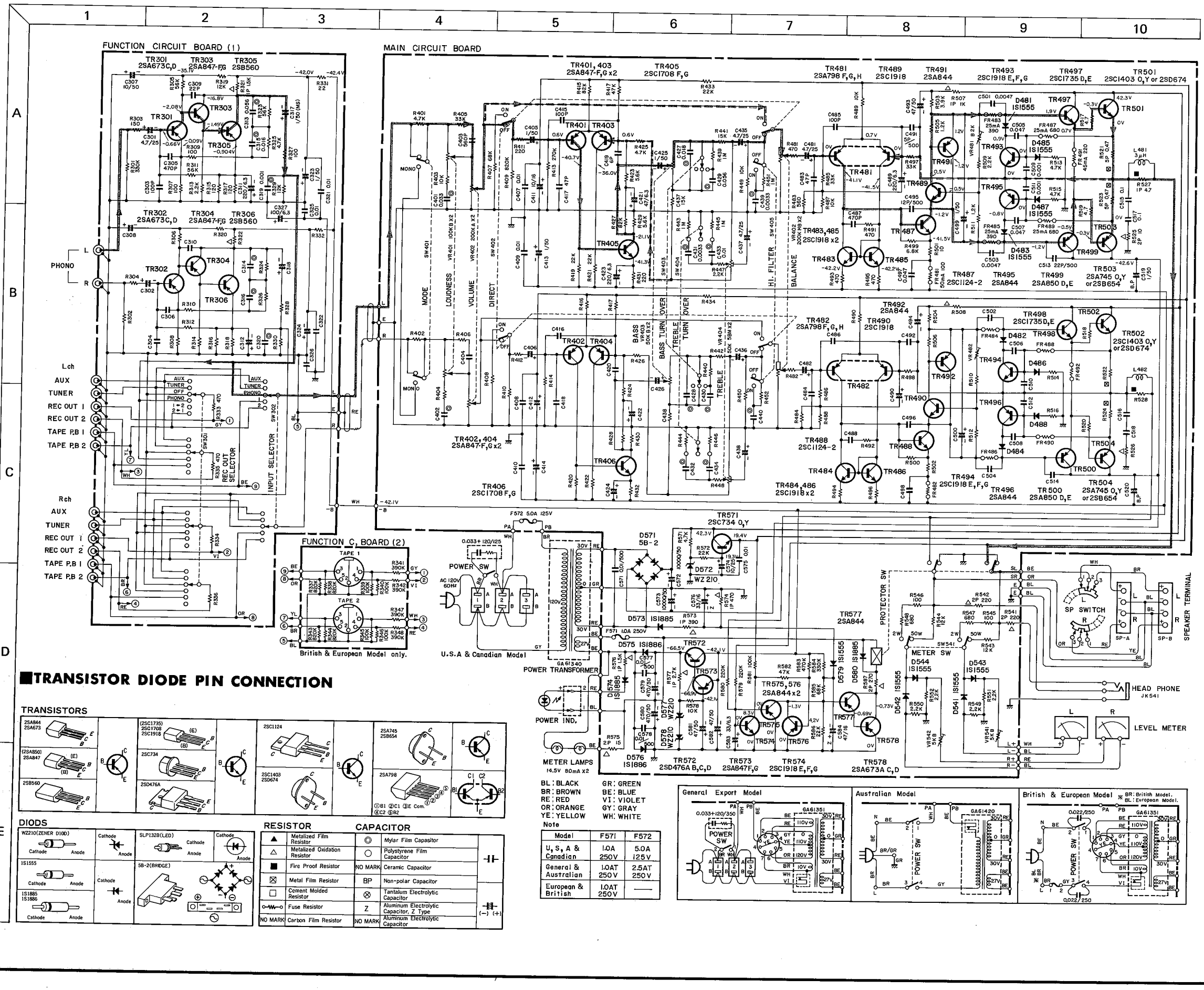
■MAIN C. BOARD 3 (Tone Control)



■MAIN C. BOARD 4 (Balance VR)



■SCHEMATIC DIAGRAM



■TRANSISTOR DIODE PIN CONNECTION

TRANSISTORS

DIODES

▲	Metalized Film Resistor	◎	Mylar Film Capasitor
△	Metalized Oxidation Resistor	○	Polystyrene Film Capacitor
■	Fire Proof Resistor	NO MARK	Ceramic Capacitor
⊠	Metal Film Resistor	BP	Non-polar Capacitor
□	Cement Molded Resistor	⊗	Tantalum Electrolytic Capacitor
⊶⊷⊶	Fuse Resistor	Z	Aluminum Electrolytic Capacitor, Z Type
NO MARK	Carbon Film Resistor	NO MARK	Aluminum Electrolytic Capacitor

RESISTOR CAPACITOR

■SPECIFICATIONS

Input Sensitivity/Impedance
- PHONO 2.5mV/47kΩ
- TUNER, AUX, TAPE PB 150mV/47kΩ

Maximum Input Level
- PHONO ..... Better than 150mV

Output Level/Impedance
- REC, OUT 150mV/600Ω

Rated Power Output
- 8Ω, 0.05% 20 to 20kHz ..... 45 + 45W
- 1kHz ..... 50 + 50W
- 4Ω, 0.1% 20 to 20kHz ..... 50 + 50W
- 1kHz ..... 65 + 65W

Power Band Width
- 8Ω, 0.05% 22.5W ..... 10 to 50kHz

Damping Factor (8Ω, 1kHz).. Better than 50

Channel Separation (1kHz)
- PHONO, TUNER → SP OUT ... Better than 65dB

Total Harmonics Distortion
- PHONO → EEC OUT ..... Less than 0.01% (20 to 20kHz, 1V)
- TUNER, AUX, TAPE PB → SP OUT (8Ω, 22.5W)
  - Main Direct OFF ..... Less than 0.02%
  - Main Direct ON ..... Less than 0.01%

Intermodulation Distortion
- TUNER, AUX, TAPE PB → SP OUT (8Ω, 22.5W)
  - Main Direct OFF ..... Less than 0.02%
  - Main Direct ON ..... Less than 0.01%

N.D.C.R (VOL. −20dB)

PHONO → SP OUT 1kHz, 0.1% THD
- Main Direct ON ..... 10mW ~ 45W
- Main Direct OFF ..... 0.1W ~ 45W

Frequency Response
- PHONO → REC OUT...30 to 15kHz, ±0.3dB
- TUNER, AUX, ... 10 to 100kHz,
- TAPE PB → SP OUT (8Ω) 0^{+1}_{-2}dB

S/N (Input Short, IHF, A Network)
- PHONO ..... 85dB (2.5mV Input)
- 97dB (10mV Input)
- TUNER, AUX, TAPE PB 100dB

Residual Noise Level ..... 160μV (IHF, A Network)

Tone Control
- BASS (Turnover Frequency ... 20Hz±10dB 500Hz, 125Hz)
- TREBLE (Turnover ..... 20kHz±10dB Frequency 2.5kHz, 8kHz)

Filter (High Cut) ..... fc=10kHz, −6dB/oct

Loudness (VOL. −30dB) 50Hz ..... +6dB
20kHz ..... +3dB

Muting ..... −20dB

When Main Direct ON
- Gain TUNER, AUX, ... −6dB
- TAPE PB → SP OUT
- Residual Noise ..... 70μV (VOL.min, IHF, A Network)

Speaker Load Impedance
- SP Switch A. B ..... 4 to 16Ω
- A + B ..... each 8 to 16Ω

Headphone Rated Power Output
- 8Ω, 2o to 20kHz 55mW

Dimensions (WxHxD) .... 435x160x335mm (17-1/8"x6-3/10"x13-3/16")

Weight 10kg

Power Supplies
- U.S.A & Canadian Model; 120V, 60Hz
- European & British Model; 110 to 240V, 50Hz
- Australian Model; 240V, 50Hz
- General Model; 110 to 240V, 60Hz

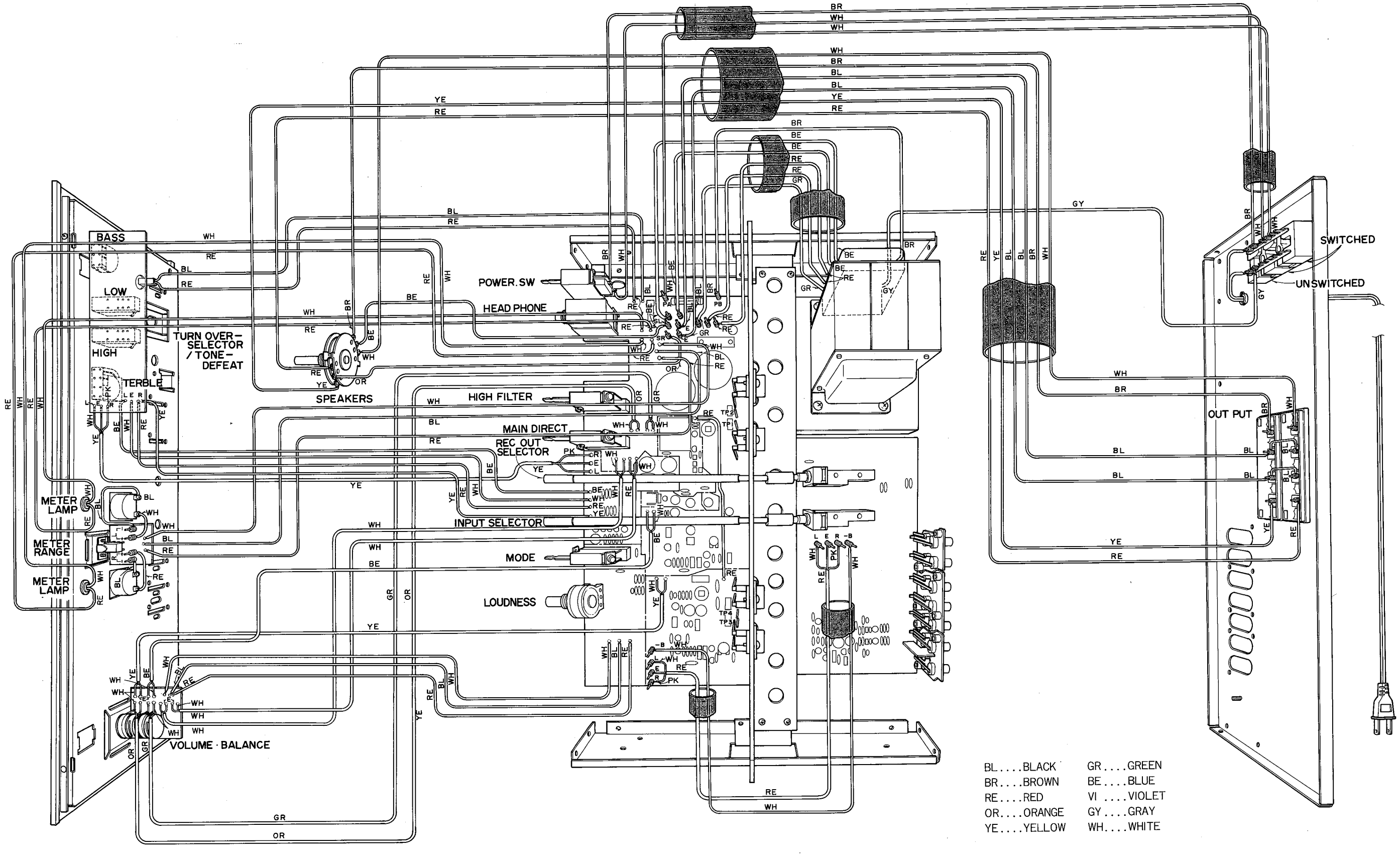
Power Rates Consumption
- U.S.A. & Canadian Model; 300W, 350VA
- Australian, European & British Model; 400W
- General Model; 300W

AC OUTLETS (U.S.A., Canadian & General Model)
- Switched 2
- Unswitched 1

Semiconductors
- Transistor 46
- Diode 25
- LED 1

Design and Specifications are subject to change without notice for improvement.

■WIRING



BL....BLACK
BR....BROWN
RE....RED
OR....ORANGE
YE....YELLOW
GR....GREEN
BE....BLUE
VI....VIOLET
GY....GRAY
WH....WHITE

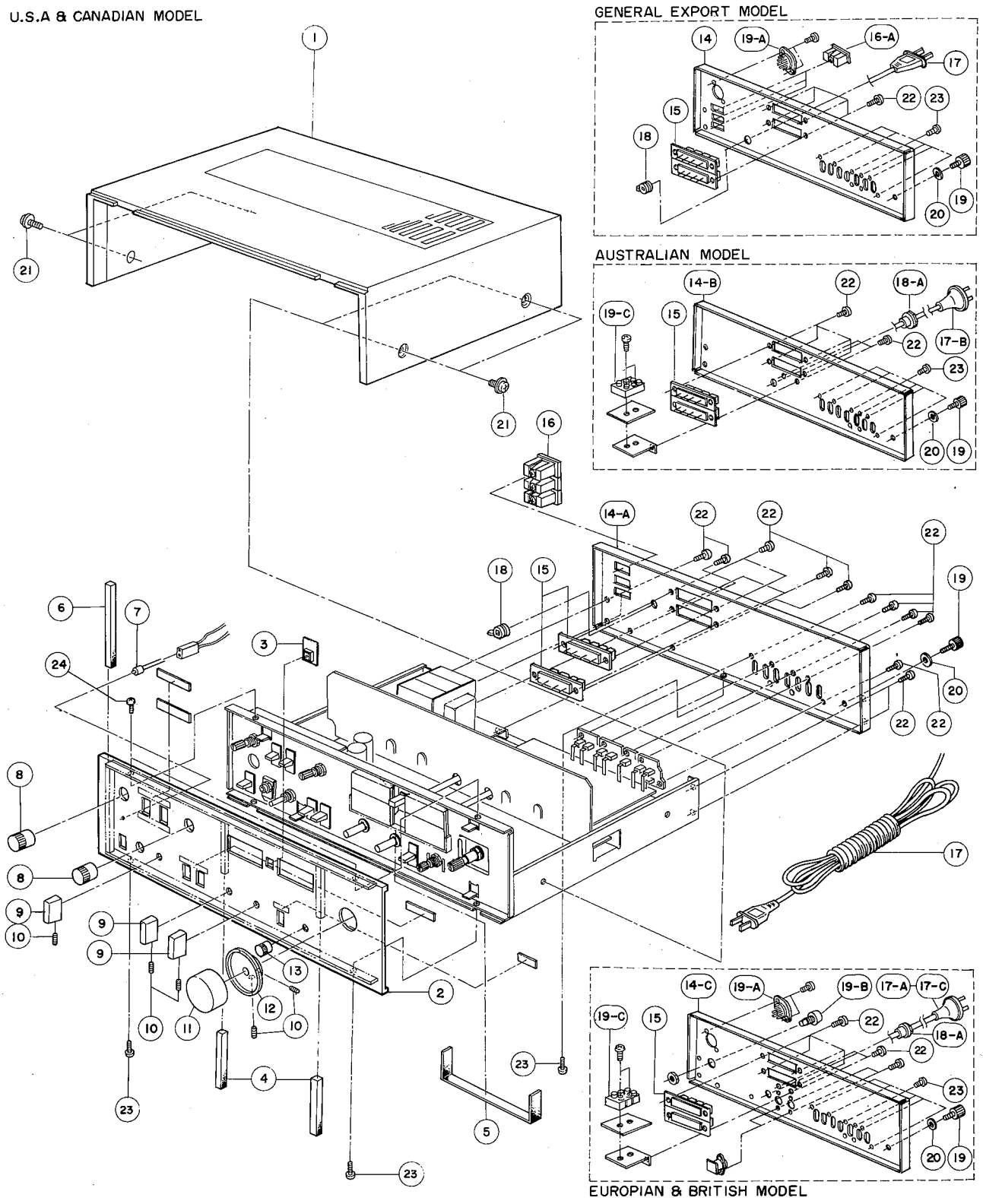
PARTS LIST

CA-610 II

STEREO AMPLIFIER

SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

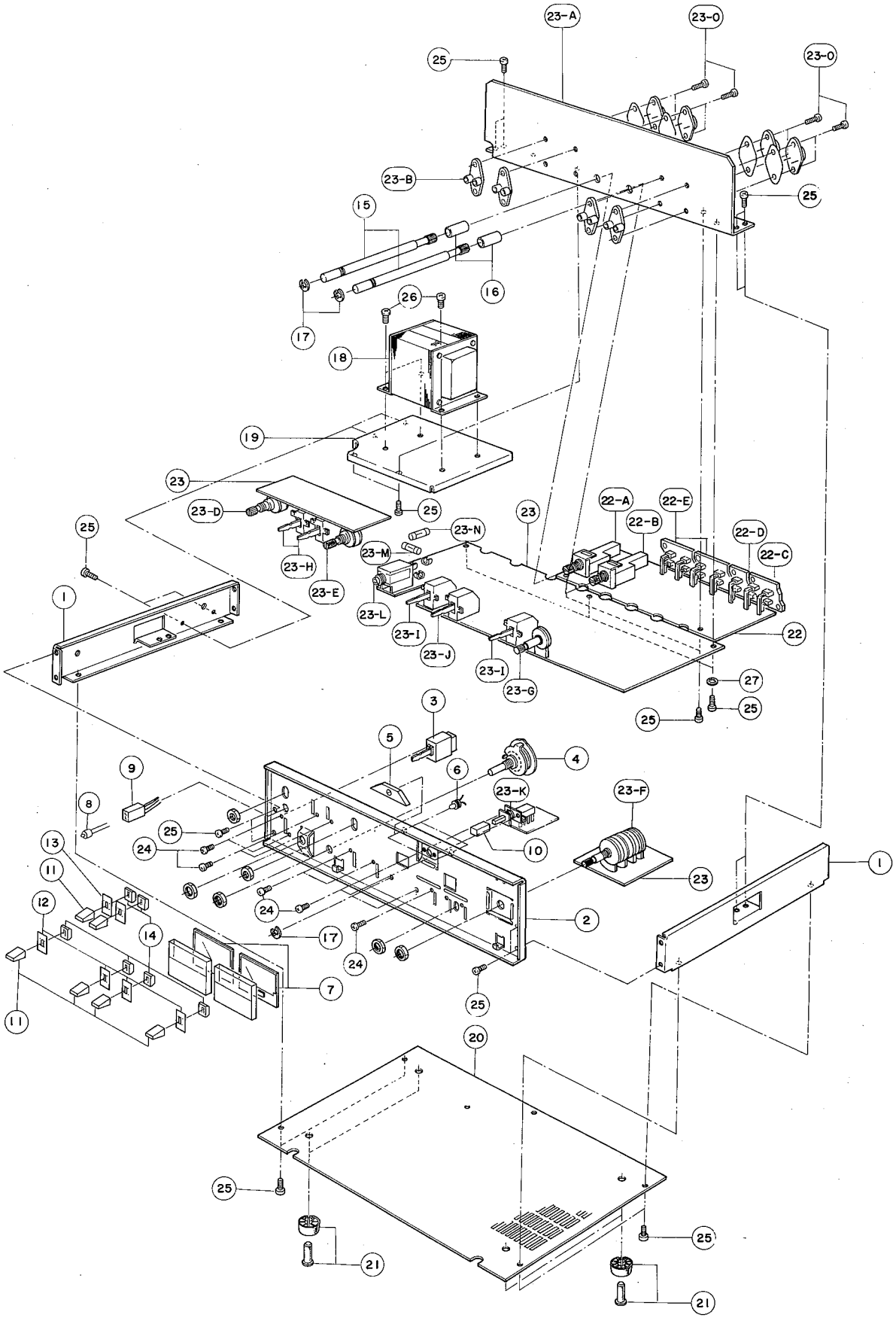
■EXPLODED VIEW



■PARTS LIST

Ref. No.	Part No.	Description	部品名	Remarks	Common Models	卸価	小売価
1	32 00 47 23 61 44 10	Cabinet	外装組立				
2	32 00 00 BA 07 07 50	Front Panel	フロントパネル				
3	32 00 00 CB 08 13 60	Escutcheon	エスカッション				
4	42 00 00 CB 07 90 60	Shade Tape	遮光テープ		CA-R1		
5	42 00 00 CB 08 13 70	—do.—	〃				
6	42 00 00 CB 07 80 30	—do.—	〃		CA-V1 CT-X1		
7	42 00 00 iF 00 06 80	LED SLP-132B	発光ダイオード				
8	32 00 00 BA 06 92 30	Knob, Bass & Treble	ツマミ		CT-R1,810		
9	32 00 00 BA 06 77 90	Knob, Switch	スイッチツマミ		CA-X1		
10	42 00 00 EZ 00 01 90	Screw, Knob Holder 4×5	六角ソケットセットスクリュー				
11	32 00 00 BA 06 95 60	Double Knob	ダブルツマミ		CA-R1,810		
12	32 00 00 BA 06 91 20	—do.—	バランスツマミ		CA-1000III		
13	32 00 00 BA 06 48 90	Knob, Loudness	ツマミ				
14	32 00 00 AA 08 88 00	Rear Panel	リヤパネル	R			
A	32 00 00 AA 08 88 10	—do.—	〃	U,C			
B	32 00 00 AA 08 88 20	—do.—	〃	A			
C	32 00 00 AA 08 88 30	—do.—	〃	B,E			
15	42 00 00 LA 00 18 80	4P Push Terminal XQ-2391	4Pプッシュターミナル				
16	42 00 00 LB 20 07 10	AC Out Lets S-16440	ACアウトレットパネ式	U,C			
A	42 00 00 LB 20 09 10	—do.—	ACアウトレットワンタッチ式	R			
17	42 00 00 MG 00 03 40	AC Cord (Black) 8F	電源コード	R,U,C			
A	42 00 00 MG 00 04 60	—do.— (Gray) VM0077	〃	E			
B	42 00 00 MG 00 05 00	—do.— SA-1	〃	A			
C	42 00 00 MZ 06 78 40	AC Cord Ass'y	BS用電源コードAss'y	B			
18	42 00 00 CB 06 86 30	Cord Stopper SR-3P-4	コードストッパー	R,U,C	CA-1000		
A	42 00 00 CB 07 06 90	—do.— EA-5	〃	A,E,B			
19	32 00 00 AA 08 73 20	Earth Terminal	GNDターミナル				
A	42 00 00 LB 20 02 60	Voltage Selector SWP033-3023	電圧切換器	R,E,B			
B	42 00 00 LB 20 05 90	Fuse Holder FEB031-1401	ヒューズホルダー	E,B	CT-7000		
	42 00 00 KB 00 06 90	Miniature Fuse 2.5AT 250V	ヒューズⓢタイムラグ	—do.—			
C	32 00 00 AA 08 90 00	Terminal Stay	端子ステー	A,E,B			
	42 00 00 LA 00 21 90	Wire Holder	ワイヤーホルダー	—do.—			
	32 00 00 CB 07 64 00	VS Isolation Plate	VS絶縁板	—do.—			
	42 00 00 LA 00 10 40	Board, Terminal 3P	3P中継端子台	A,E,B	CT-7000		
20	42 00 00 EV 90 13 60	Plain Washer (sems) ϕ3.6×10 0.8t FNM3-3g	セムス平座金				
21	42 00 00 EZ 45 00 80	BW Head Screw M5×8S FCM3-Bℓ	BWヘッドスクリュー				
22	42 00 00 Ei 33 00 80	Bind Tapping Screw M3×8 —do.—	ボンディングタッピングネジ				
23	42 00 00 Ei 03 00 80	Bind Head Tapping Screw M3×8S ZMC2-Y	バインドタッピングネジ				

■EXPLODED VIEW



■PARTS LIST

Ref. No.	Part No.	Description	部品名	Remarks	Common Models	卸価	小売価
1	32 00 00 A A 08 74 90	Side Frame	サイドフレーム				
2	32 00 00 A A 08 74 80	Sub Chassis	サブシャーシ				
	42 00 00 K A 20 07 30	Lever Switch SDE-3L TBE	レバースイッチ	A,E,B			
3	42 00 00 K A 20 05 90	—do.— SDA-1L TDU TV-5	〃	R,U,C			
4	42 00 00 K A 50 06 60	Rotary Switch SR-321	ロータリースイッチ				
5	32 00 00 C B 08 13 50	Lens, Lamp	ランプレンズ				
6	42 00 00 J B 00 05 50	Pilot Lamp 14.5V 80mA	パイロットランプリード式	Lead Type			
7	42 00 00 J i 00 06 80	Level Meter	レベルメーター				
8	42 00 00 i F 00 06 80	LED SLP132B	LED				
9	42 00 00 L B 20 07 20	Miniature Connecter 2P	ミニチュアコネクトコンハウジング				
10	32 00 00 C B 08 03 20	Push Button S	プッシュボタン				
11	32 00 00 C B 07 97 80	Knob, Lever	レバーツマミ		CR-2020		
12	42 00 00 C B 07 95 10	Aplon, Switch	SWエプロン		CT-810		
13	42 00 00 C B 07 95 00	—do.—	〃		—do.—		
14	32 00 00 C B 07 97 70	Bush, Switch	SWブッシュ		—do.—		
15	32 00 00 B A 06 95 30	Extension Shaft	延長シャフト		—do.—		
16	32 00 00 C B 07 13 80	Joint 24L	ジョイント		CA-400		
17	42 00 00 E V 50 15 00	E Ring ϕ5	Eリング				
	32 00 00 G A 61 35 10	Power Transformer	電源トランス	R,E,B			
18	32 00 00 G A 61 34 00	—do.—	〃	U,C			
	32 00 00 G A 61 42 00	—do.—	〃	A			
19	32 00 00 A A 08 90 50	Transformer Holder	トランスホルダー				
20	32 00 00 A A 08 75 00	Bottom Cover	ボトムカバー				
21	32 00 00 C B 08 13 90	Leg	脚				
	32 00 00 N A 06 93 70	Function C. Board	ファンクションシート	R,A,C			
22	32 00 00 N A 06 93 80	—do.—	〃	U			
	32 00 00 N A 06 93 90	—do.—	〃	E,B			
A	42 00 00 K A 50 09 20	Rotary Switch SRZ046N	ロータリースイッチ				
B	42 00 00 K A 50 09 10	—do.— SRZ045N	〃				
C	42 00 00 L B 40 03 40	Pin Jack PC4P	ピンジャック				
D	42 00 00 L B 20 10 10	—do.— PC2P	〃	L-Type New	CA-V1		
E	42 00 00 L B 40 03 10	—do.— PC4P	〃	L-Type	—do.—		
	42 00 00 L B 50 00 90	DIN Connector Socket 5P X-i 3306	DINコネクターソケット5P	E,B			
23	32 00 00 N A 06 94 10	Main C. Board	メインシート	U			
	32 00 00 N A 06 94 20	—do.—	〃	C			
	32 00 00 N A 06 94 30	—do.—	〃	R,A			
	32 00 00 N A 06 94 40	—do.—	〃	E,B			
A	42 00 00 B A 06 76 70	Heat Sink	放熱板				
B	42 00 00 L B 30 04 00	Transistor Socket PC M1624	TRソケット		AU Com.		
C	42 00 00 i L 00 02 30	Mica Base	マイカベース				
D	42 00 00 H S 11 01 60	Variable Resistor ϕ16 50KΩ-B(11 clicks)	ボリューム(11クリック)				
E	42 00 00 H S 11 02 10	—do.— ϕ16 50KΩ-5B(—do.)	ボリューム(センタータップ,11クリック)				
F	42 00 00 H S 12 06 30	—do.— ϕ24 200KΩ-A×2	ボリューム(2軸4連)				
G	42 00 00 H S 41 05 80	—do.— ϕ16 100KΩ-B	ボリューム(1軸2連)				
H	42 00 00 K A 20 06 10	Lever Switch 2×3S	レバースイッチ				
I	42 00 00 K A 20 06 00	—do.— 2×2S	〃				
J	42 00 00 K A 20 07 10	—do.— 4×2NS	〃				
K	42 00 00 K A 80 01 90	Push Switch SUE NS 12.5mm	プッシュスイッチ				
L	42 00 00 L B 30 03 90	Phone Jack LJ213-1-2	ホーンジャック				

Ref. No.	Part No.	Description	部品名	Remarks	Common Models	卸価	小売価
	42 00 00 KB 00 03 30	Fuse 1.0AT 250V	ヒューズ タイラッシュ	R,A			
	42 00 00 KB 00 07 30	Miniature Fuse 1.0AT 250V	ヒューズⓈ タイムラグ	E,B			
M	42 00 00 KB 00 10 60	Fuse 1.0A 250V	ヒューズUL,ST-4	U,C			
	42 00 00 KB 00 04 20	—do.— 2.5AT 250V	ヒューズ タイラッシュ	R,A			
N	42 00 00 KB 00 14 20	Fuse U.L 5.0A 125V	ヒューズUL,ST-6	U,C			
O	42 00 00 EZ 00 04 90	BW Head Screw 3×14 FNM3-3m	BWヘッド スクリュー				
24	42 00 00 ED 03 00 60	Bind Head Screw M3×6S ZMC2-Y	バインド小ネジ				
	42 00 00 ED 03 01 60	—do.— M3×16S —do.—	〃	A,E			
25	42 00 00 Ei 03 00 80	Bind Head Tapping Screw 3×8S ZMC2-Y	バインド タッピングネジ				
26	42 00 00 Ei 04 00 80	—do.— M4×8S —do.—	〃				
27	42 00 00 EV 41 00 30	Toothed Lock Washer φ3 —do.—	内歯歯付座金				

Ref. No.	Part No.	Description	部品名	Remarks	Common Models	卸価	小売価
		Function C. Board	ファンクションシート				
	42 00 00 iA 06 73 10	Transistor 2SA673A(C,D)	トランジスター				
	42 00 00 iA 08 47 00	—do.— 2SA847(F,G)	//				
	42 00 00 iA 05 60 00	—do.— 2SB560	//				
	42 00 00 FA 45 31 00	Mylar Capacitor 0.001μF 50V(J)	マイラーコンデンサー				
	42 00 00 FA 15 41 60	—do.— 0.016μF 50V(J)	//				
	42 00 00 FA 45 45 60	—do.— 0.056μF 50V(J)	//				
	42 00 00 HL 41 61 50	Metal Oxide Film Resistor 1P 1.5KΩ	酸金被膜抵抗				
		Main C. Board	メインシート				
	42 00 00 iA 06 73 10	Transistor 2SA673A(C,D)	トランジスター				
	42 00 00 iB 06 54 00	—do.— 2SB654	//				
	42 00 00 iA 07 45 00	—do.— 2SA745(O~Y)	//				
	42 00 00 iA 07 98 00	—do.— 2SA798(F,G,H)	//				
	42 00 00 iA 08 44 00	—do.— 2SA844	//				
	42 00 00 iA 08 47 00	—do.— 2SA847(F,G)	//				
	42 00 00 iA 08 50 00	—do.— 2SA850(D,E)	//				
	42 00 00 iC 07 34 30	—do.— 2SC734(O~Y)	//				
	42 00 00 iC 11 24 20	—do.— 2SC1124(Z)	//				
	42 00 00 iD 06 74 00	—do.— 2SD674	//				
	42 00 00 iC 14 03 00	—do.— 2SC1403(O~Y)	//				
	42 00 00 iC 17 08 00	—do.— 2SC1708(F,G)	//				
	42 00 00 iC 17 35 00	—do.— 2SC1735(D,E)	//				
	42 00 00 iC 19 18 00	—do.— 2SC1918(E,F,G)	//				
	42 00 00 iD 04 76 20	—do.— 2SD476A(B,C,D)	トランジスター (V>70)				
	42 00 00 iF 00 00 40	Diode 1S1555	ダイオード				
	42 00 00 iH 00 01 10	—do.— 5B-2	//				
	42 00 00 iH 00 02 40	—do.— 1S1885	//	Servicing iH000060			
	42 00 00 iH 00 02 50	—do.— 1S1886	//				
	42 00 00 iF 00 02 80	Zener Diode WZ-210	ツェナーダイオード				
	42 00 00 KC 00 04 20	Relay FRL-264	リレー				
	42 00 00 HT 17 00 50	Variable Resistor V8K4-1,B-5KΩ	半固定抵抗				
	42 00 00 HT 17 00 60	—do.— —do.— B-2KΩ	//				
	42 00 00 GD 90 00 50	Coil 3μH	コイル				
	42 00 00 HW 10 52 20	Fuse Resistor 45mA 220Ω	ヒューズ抵抗	R,A,E,C,B			
	42 00 00 HW 20 52 20	—do.— —do.—	//	U			
	42 00 00 HW 10 56 80	—do.— 25mA 680Ω	//	R,A,E,C,B			
	42 00 00 HW 20 56 80	—do.— —do.—	//	U			
	42 00 00 HW 19 51 00	—do.— 50mA 100Ω	//	R,A,E,C,B			
	42 00 00 HW 29 51 00	—do.— —do.—	//	U			
	42 00 00 HW 19 53 90	—do.— 25mA 390Ω	//	R,A,E,C,B			
	42 00 00 HW 29 53 90	—do.— —do.—	//	U			
	42 00 00 HL 41 53 90	Metal Oxide Film Resistor 1W 390Ω	酸金被膜抵抗				
	42 00 00 HL 41 54 70	—do.— 1W 470Ω	//				
	42 00 00 HL 41 61 00	—do.— 1W 1KΩ	//				
	42 00 00 HL 41 61 50	—do.— 1W 1.5KΩ	//				
	42 00 00 HL 41 62 70	—do.— 1W 2.7KΩ	//				
	42 00 00 HL 42 41 00	—do.— 2W 10Ω	//				
	42 00 00 HL 42 41 50	—do.— 2W 15Ω	//				

Ref. No.	Part No.	Description	部品名	Remarks	Common Models	卸価	小売価
	42-00-00-HL-42-52-20	Metal Oxide Film Resistor 2W 220Ω	酸金被膜抵抗				
	42-00-00-HL-42-52-70	—do.— 2W 270Ω	〃				
	42-00-00-HZ-00-02-70	Metal Film Resistor MPC70 5P 0.47Ω	金属板抵抗（フォーミング）				
	42-00-00-HZ-00-07-10	Fire-Proof Resistor 1W 4.7Ω	不燃性抵抗				
	42-00-00-FA-41-33-30	Mylar Capacitor 0.0033μF 50V(K)	マイラーコンデンサー				
	42-00-00-FA-41-41-00	—do.— 0.01μF —do.—	〃				
	42-00-00-FA-41-41-80	—do.— 0.018μF —do.—	〃				
	42-00-00-FA-41-43-30	—do.— 0.033μF —do.—	〃				
	42-00-00-FA-41-45-60	—do.— 0.056μF —do.—	〃				
	42-00-00-FH-61-05-00	Ceramic Capacitor 5PF 500V(CH)	セラミックコンデンサー				
	42-00-00-FH-61-11-20	—do.— 12PF —do.—	〃				
	42-00-00-FH-61-12-20	—do.— 22PF —do.—	〃				
	42-00-00-FH-23-41-00	—do.— 0.01μF YZ(P)	〃				
	42-00-00-FZ-00-10-90	Electrolytic Capacitor 10.000μF 50V	ケミコン（基板型）				
	42-00-00-FM-11-61-00	—do.— 1μF 50V	バイポーラ型ケミコン				
	42-00-00-FM-39-74-70	—do.— 47μF 16V(Z)	ケミコンZ型				
	42-00-00-FM-39-73-30	—do.— 33μF 16V(Z)	〃				
	32-00-00-BA-06-16-10	Heat Sink (MSC Type)	放熱板				
	32-00-00-BB-06-30-80	Transistor-Pusher	トランジスタープッシャー				
	42-00-00-LB-20-09-00	Fuse Holder Pin PC YSH 402P	ヒューズホルダーピン	R.U.C.A			
	42-00-00-LB-20-10-60	—do.— PC	〃	E.B.			
	42-00-00-EJ-03-00-60	Pan Head Tapping Screw 3×6S ZMC2-Y	ナベタッピングネジ				

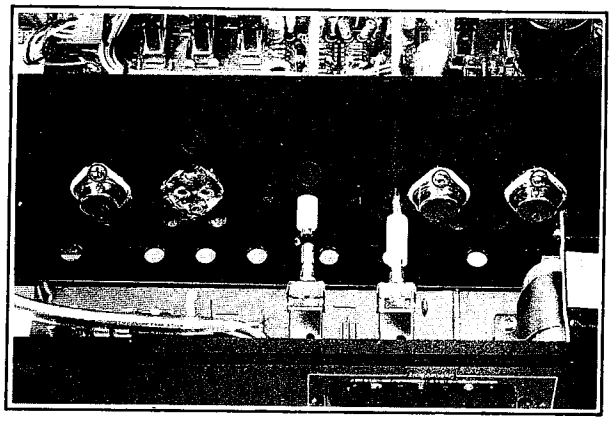


Photo. 4

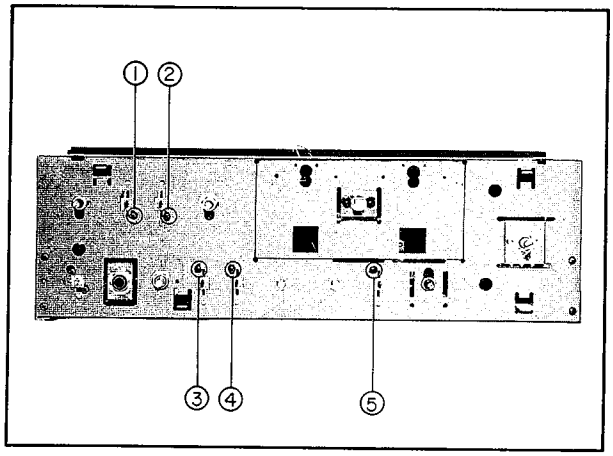


Photo. 5

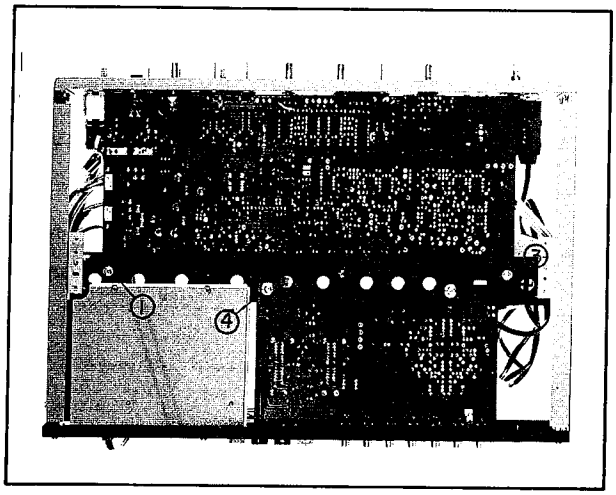


Photo. 6

Photo 7 shows TR490 (right) and TR489 (left) which are temperature-compensating transistors being heat-coupled with the heat sink. When assembling the main circuit board as well as the power transistors, be sure to closely fit the joint surfaces.

Photo. 7

6. Function Circuit Board Removal

6.1 To disengage the shaft, shift the joint in arrow direction like Ⓐ shown in Photo 4.

6.2 Remove eight screws shown in Photo 8.

6.3 Remove screws ④ and ⑤ shown in Photo 6.

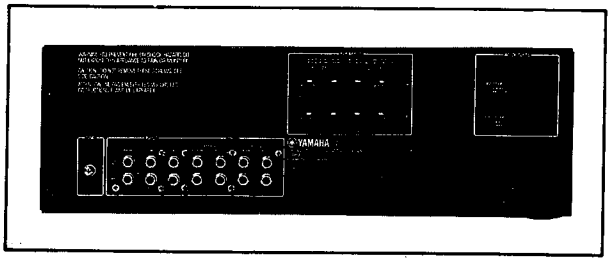
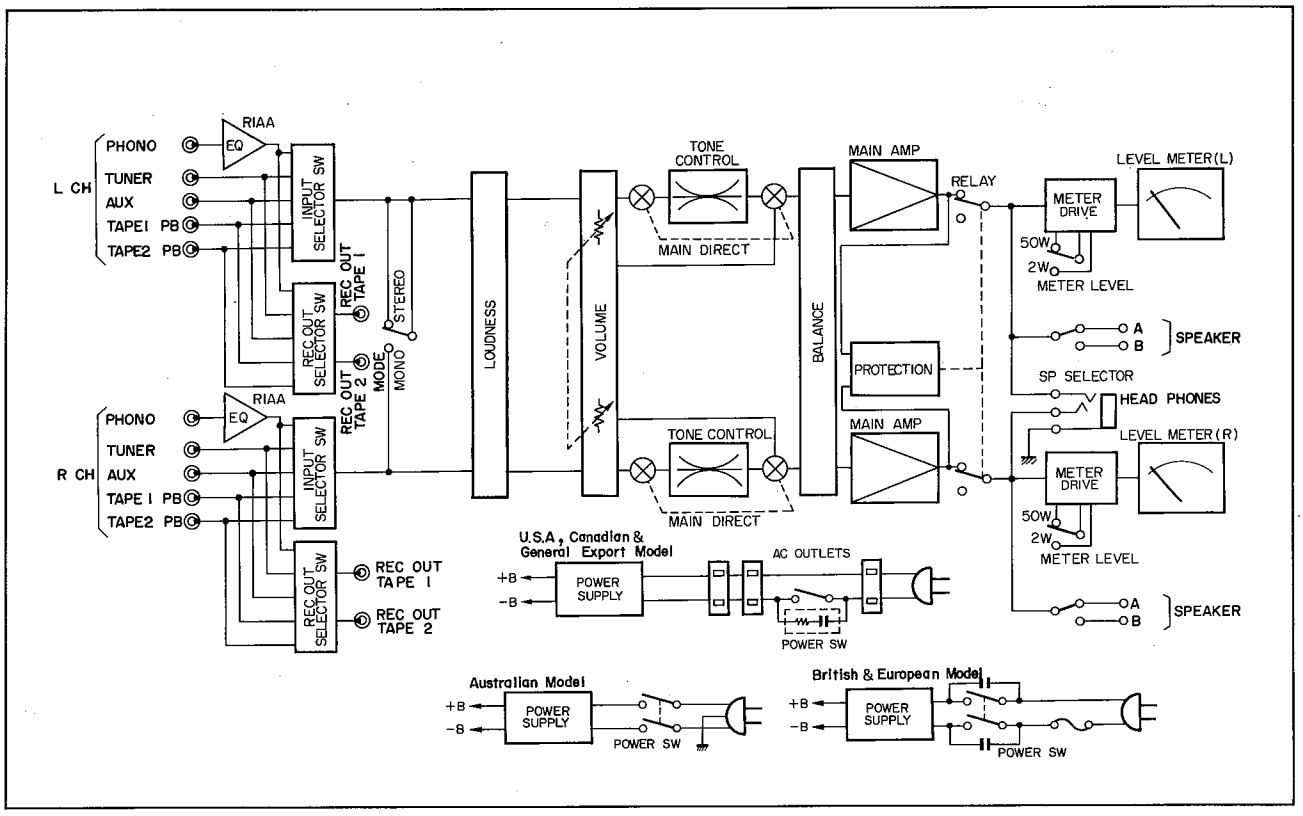


Photo. 8

Note: The photos depict the U.S.A. model.

BLOCK DIAGRAM



LEVEL DIAGRAM