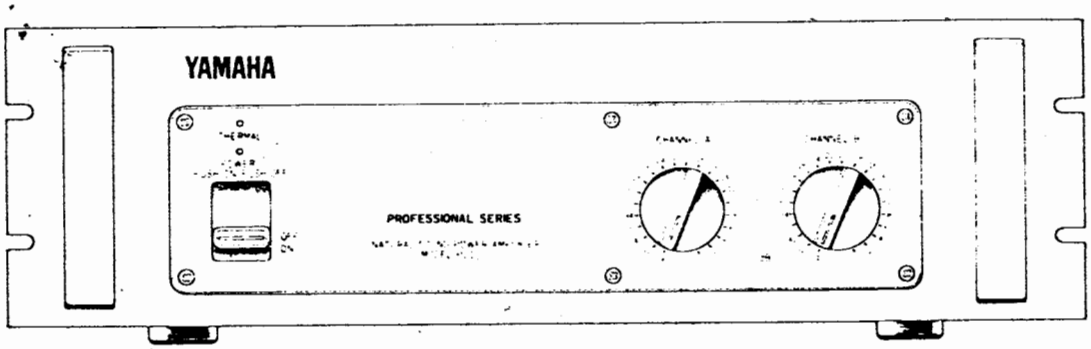
P2100

SERVICE MANUAL

■ FRONT PANEL



■CONTENTS

006368

YAMAHA

Printed in Japan 4.77

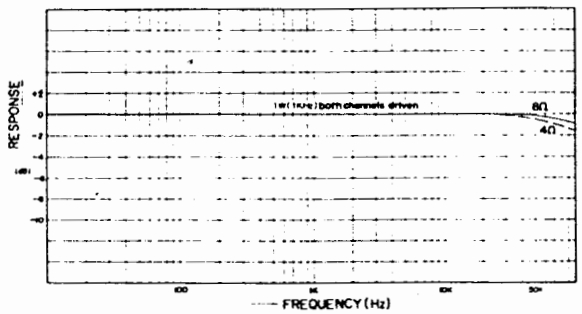
(S/#1001~)

■SPECIFICATIONS

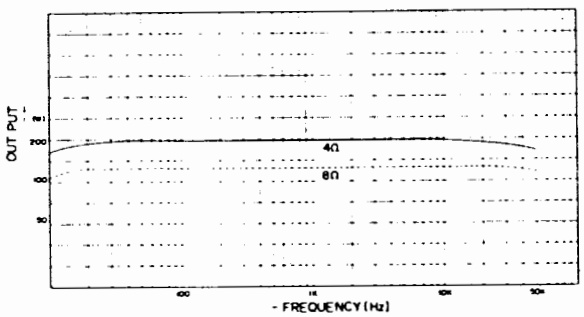
CIRCUIT SYSTEM	ALL STAGE DIRECT COUPLED COMPLEMENTALY PARALLEL PUSH PULL OCL CIRCUIT
POWER OUTPUT (Both channels driven)	85W + 85W (8Ω, 20Hz ~ 20KHz, less than 0.05% THD) 140W + 140W (4Ω, 20Hz ~ 20KHz, less than 0.05% THD) 95W + 95W (8Ω, 1KHz, less than 0.05% THD)
POWER OUTPUT AT CLIPPING (Single channel driven)	160W (4Ω, 1KHz, less than 0.05%) 110W (8Ω, 1KHz, less than 0.05%)
FREQUENCY RESPONSE	20Hz ~ 50KHz, $^{+0}_{-0.5}$dB
TOTAL HARMONIC DISTORTION	Less than 0.02% (8Ω, @50W, 20Hz ~ 20KHz) Less than 0.01% (8Ω, @50W, 1KHz) Less than 0.03% (4Ω, @75W, 20Hz ~ 20KHz) Less than 0.01% (4Ω, @75W, 1KHz) Less than 0.05% (4Ω, @140W, 20Hz ~ 20KHz)
IM DISTORTION	Less than 0.03% (75W/8Ω, 70Hz : 7KHz = 4 : 1)
INPUT SENSITIVITY	0dB ± 0.5dB (8Ω, 100W, INPUT VOLUME → MAX)
INPUT IMPEDANCE	25KΩ (UNBALANCE) INPUT VOLUME → MAX)
DAMPING FACTOR (4Ω load)	Greater than 100 (20Hz ~ 5KHz) Greater than 70 (20Hz ~ 20KHz)
OUTPUT IMPEDANCE	Less than 0.04Ω (20Hz ~ 5KHz)
HUM & NOISE	110dB (20Hz ~ 20KHz)
SLEW RATE	30V/μsec (100W/8Ω, 10KHz square-ware input)
CROSS TORK	82dB, 1KHz 70dB, 20KHz
PHASE SHIFT	20Hz ~ 20KHz ± 10°
POWER REQUIREMENTS	Canadian 120V 210W 50/60 Hz 270VA N.EUROPEAN 220/240V 700W 50/60 Hz GENERAL 220V 700W 50/60 Hz AUSTRALIAN S.AFRICAN 240V 700W 50/60 Hz BS 240V 700W 50/60 Hz US 120V 370W 50/60 Hz 480VA
DIMENTIONS (WxHxD)	480 (19") x 140.5 (5-1/2") x 337 mm (13-1/4")
PANEL SIZE (WxH)	480 (19") x 132 mm (5-1/4")
RACK SIZE	Mounts in a standard 19 inch (48cm) rack
WEIGHT	14 kg (30.9 lbs)

■ CHARACTERISTIC CHART

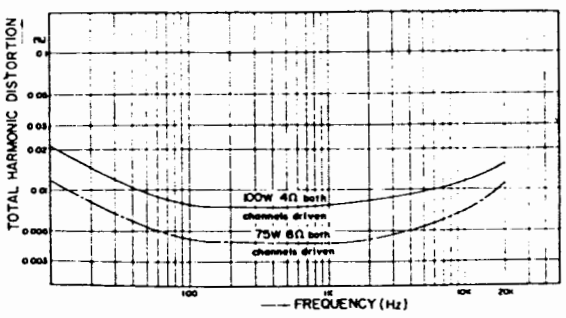
- FREQUENCY RESPONSE



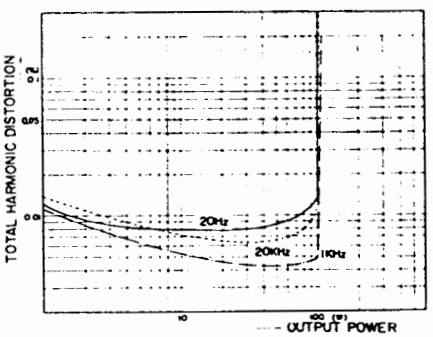
- POWER BANDWIDTH



- FREQUENCY : TOTAL HARMONIC DISTORTION



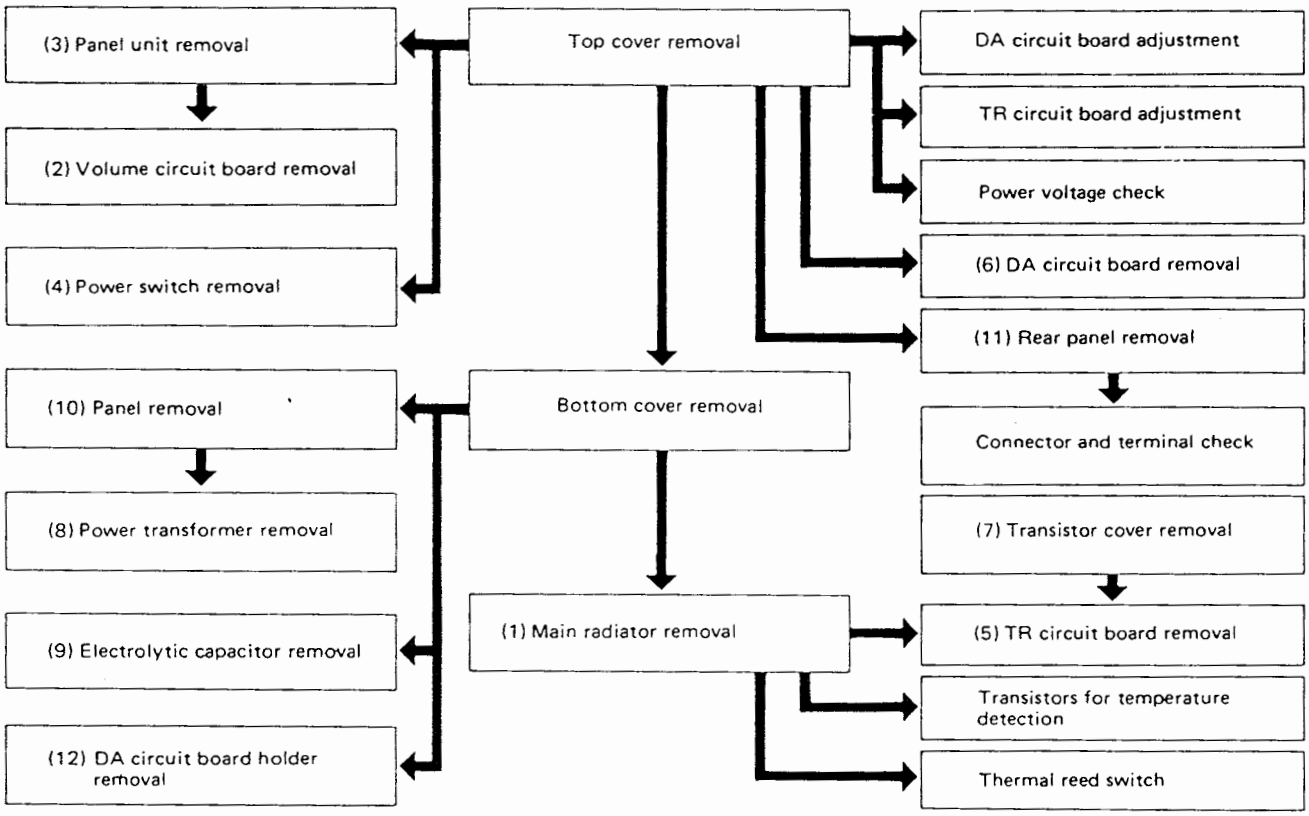
- OUTPUT : TOTAL HARMONIC DISTORTION



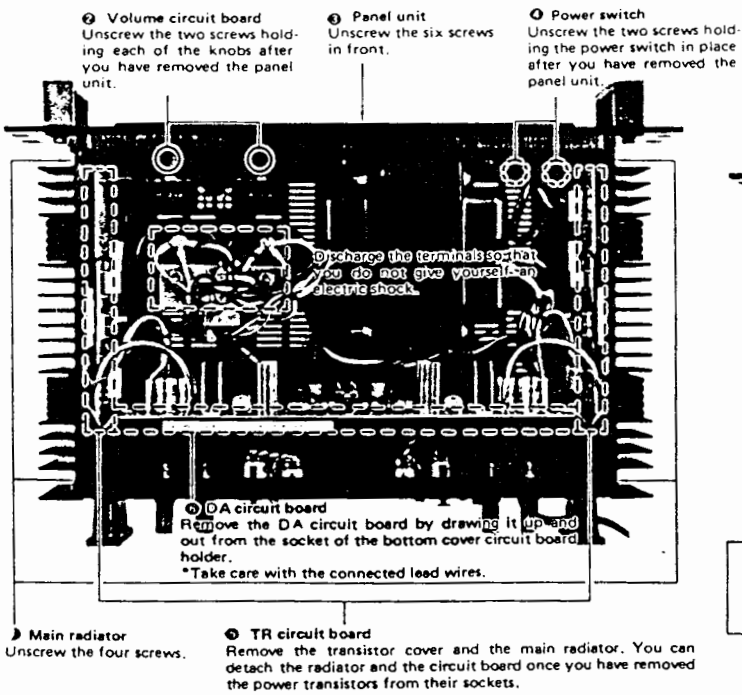
■PARTIAL DISASSEMBLY

• FLOW CHART

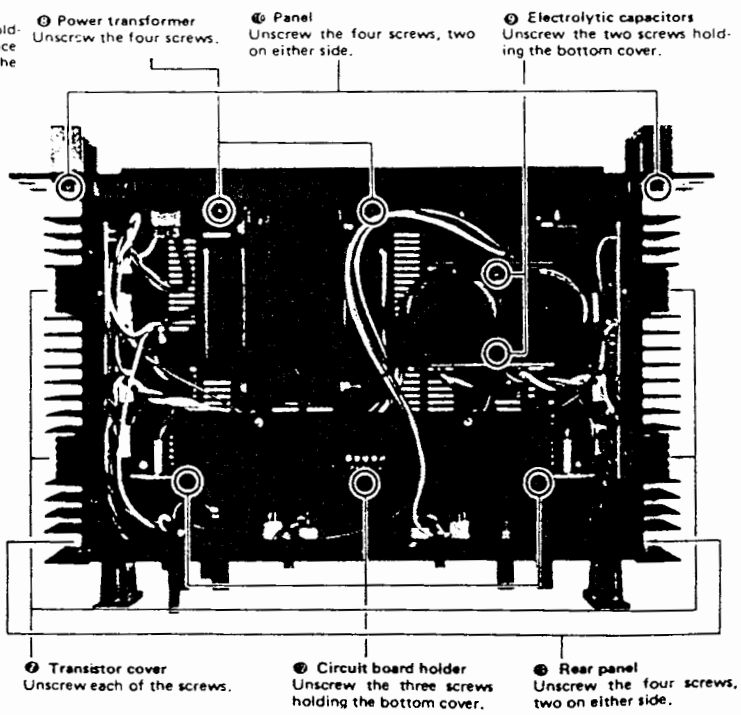
1. Discharge the electrolytic capacitor terminals.
2. Do not mix up the lead wires connecting the printed circuit boards when removing the boards.
3. The circled numbers in the flow chart indicate the explanation numbers in the photos below.



• TOP VIEW



• BOTTOM VIEW



(S/# 1001~)

■ADJUSTMENT AND INSPECTIONS

- The output impedance of the low-frequency signal generator should be less than 600Ω, and the distortion should be less than 0.005%.
- Use an syncroscope, level meter, distortion meter or other instruments with an input impedance of over 100KΩ.
- Discharge the electrolytic capacitors in the power rectifier circuit when the top cover has been removed.
- Turn the semi-fixed variable resistor (1KΩ) on the DA circuit board to its leftmost position (min.) before switching the power on.

1. Idling current adjustment

a. Switch the power on, turn the semi-fixed resistor (1KΩ) on the DA circuit board so that the voltage across the TR circuit board test points PE and E is 13mV ± 1mV within 30 seconds, and set. (Fig. 1)

b. Perform the same adjustment for the other channel.

c. The voltage across test points PE and E fluctuates with ageing (see Table 1) and so check that the voltage across these test points after the tests is 22mV ± 5mV (45mA). (When the ambient temperature is 10°C – 30°C, and the temperature of the Heat Sink is 20°C – 40°C.)

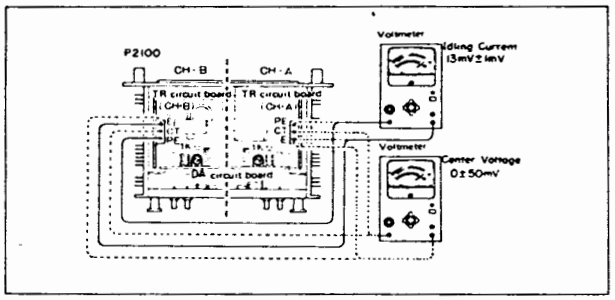


Fig. 1

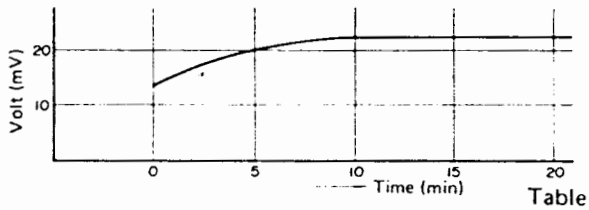


Table 1

2. Center voltage adjustment

Check that the voltage across TR circuit board CT and E terminals and across the speaker output terminals is within 0 ± 50mV. (Fig. 1)

3. Amplifying characteristics (stereo)

3-1. Conditions

Input terminal	XLR-3-31
Output terminal	Connect a 4Ω load impedance
Volume	Maximum
DR circuit board MONO switch	Set to stereo (ST)

3-2. Gain

a. Connect the equipment as shown in Fig. 2.

b. Check that the output at both ends of the load impedance is +26.5 ± 1dBm when a –5dBm 1KHz signal is applied to the input terminal.

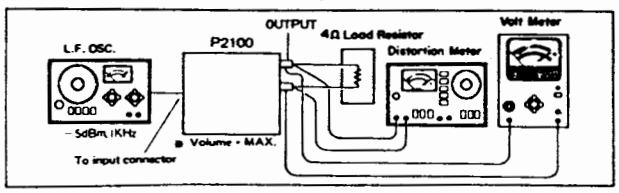


Fig. 2

3-3. Distortion

a. Connections are the same as those in Fig. 2, but in addition, connect a distortion meter to the output terminals.

b. Check that the distortion is less than 0.03% when 20Hz, 1KHz and 20KHz signals are applied to the input and when an output is provided of ≒67W (+26.5dBm).

3-4. Frequency response

a. The connections are the same as those in Fig. 2 but the waveform can be observed when an sincroscope is connected.

b. Apply 10Hz, 50KHz signals to the input, and based on 1KHz across the output terminals, check that the frequency response is within 10Hz $^{+0}_{-0.5}$dB, 50KHz $^{+0}_{-0.5}$dB.

3-5. maximum output

a. The connections are the same as those shown in Fig. 2. In addition, connect a distortion meter to the output terminals.

b. Apply 20Hz ~ 20KHz signals to the input and check that the 140W/4Ω (+29.7dBm) output is provided at the output terminals at a distortion of less than 0.05%. Furthermore, connect an 8Ω resistor to the load and check that an 85W (+30.5 dBm) output is obtained at a distortion of less than 0.02%. (Single channel drive for this test).

3-6. Noise level and residual noise

a. The connections are the same as those in Fig. 2.

b. Check that the noise level is less than –67dBm when the input terminals are shorted with a 600Ω resistance.

c. Check that the residual noise is less than –70dBm when the volume is set to its leftmost (min.) position.

3-7. Crosstalk

Check that the output of one channel to the output terminalsof the other channel is less than –44dBm when a –5dBm, 20KHz signal is applied to the input terminal. Connect a 600Ω resistance to the input terminal to which the signal is not applied, and set the volume to maximum.

4. Stability

4-1. The P2100 should operate stably even if the power voltage is fluctuated as much as ±10% of its specified value.

4-2. There should be no abnormal oscillation under the conditions listed below when the input terminals are open or shorted with a 600Ω resistance.

a. 4 – 100Ω impedance load

b. 100pF – 0.47μF capacitive load

c. 10μH – 1H L load

4-3. Check that the overshoot is less than 0.7 under the conditions listed below with a 10KHz square wave signal and a 40Vp-p output.

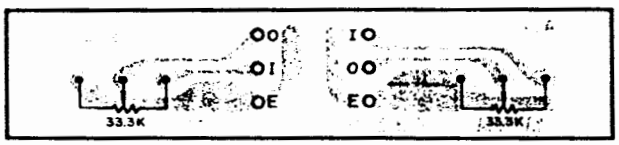
a. 10μH – 1H L load

b. 100pF – 0.47μF capacitive load

* Disassembly Procedure

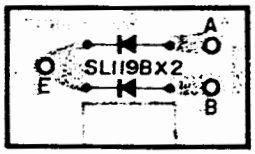
■PRINTED CIRCUIT BOARD 各シート図

VOL CIRCUIT BOARD : NA80250



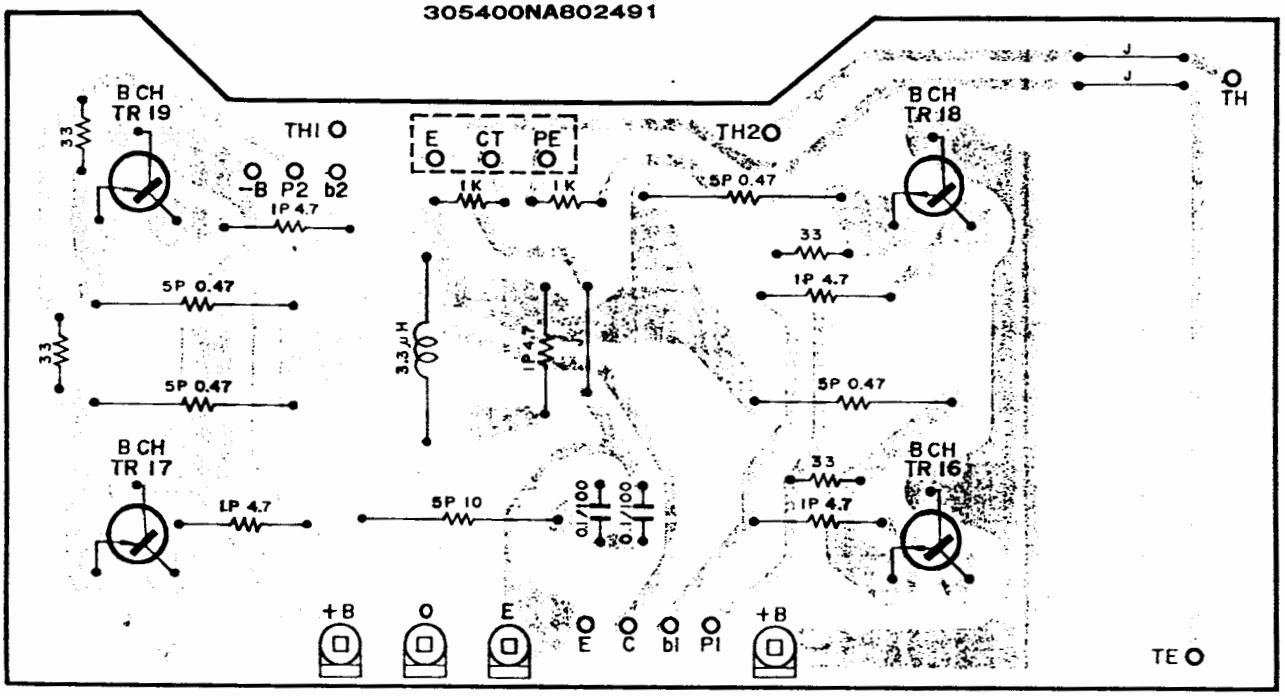
LED CIRCUIT BOARD : NA80249⅓

305400NA802493



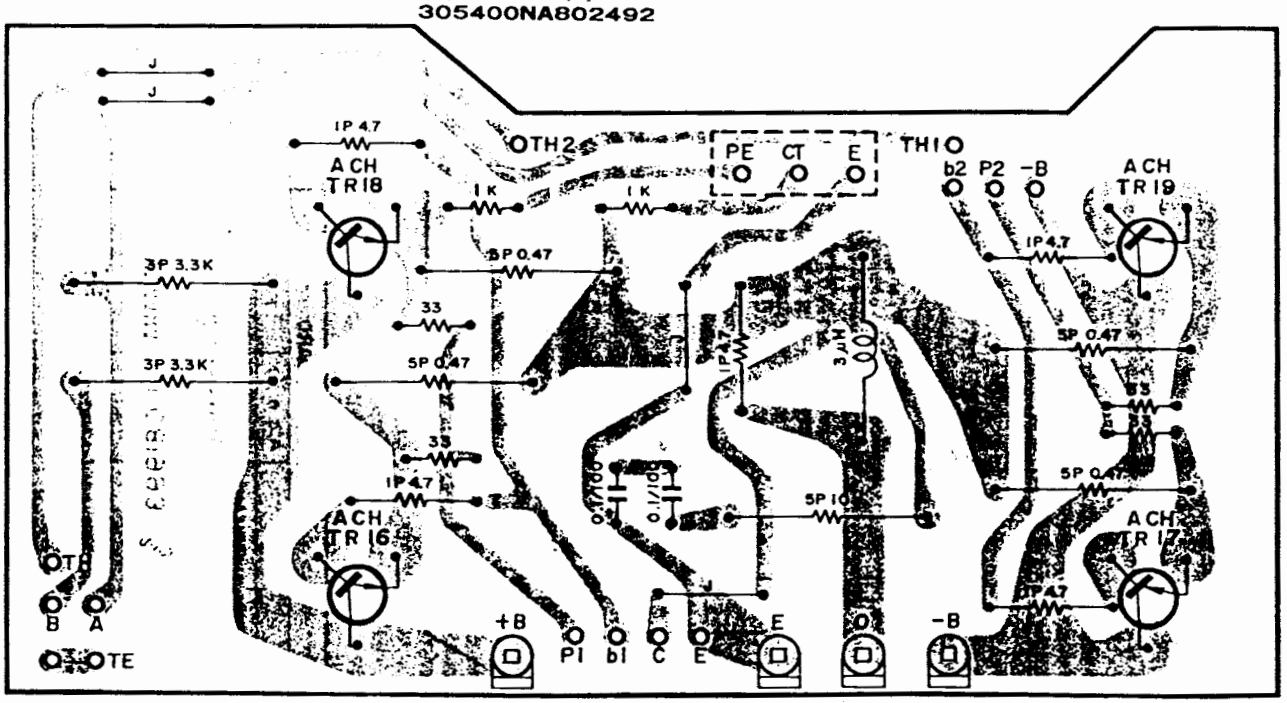
TR CIRCUIT BOARD(CHB) : NA80249⅓

305400NA802491

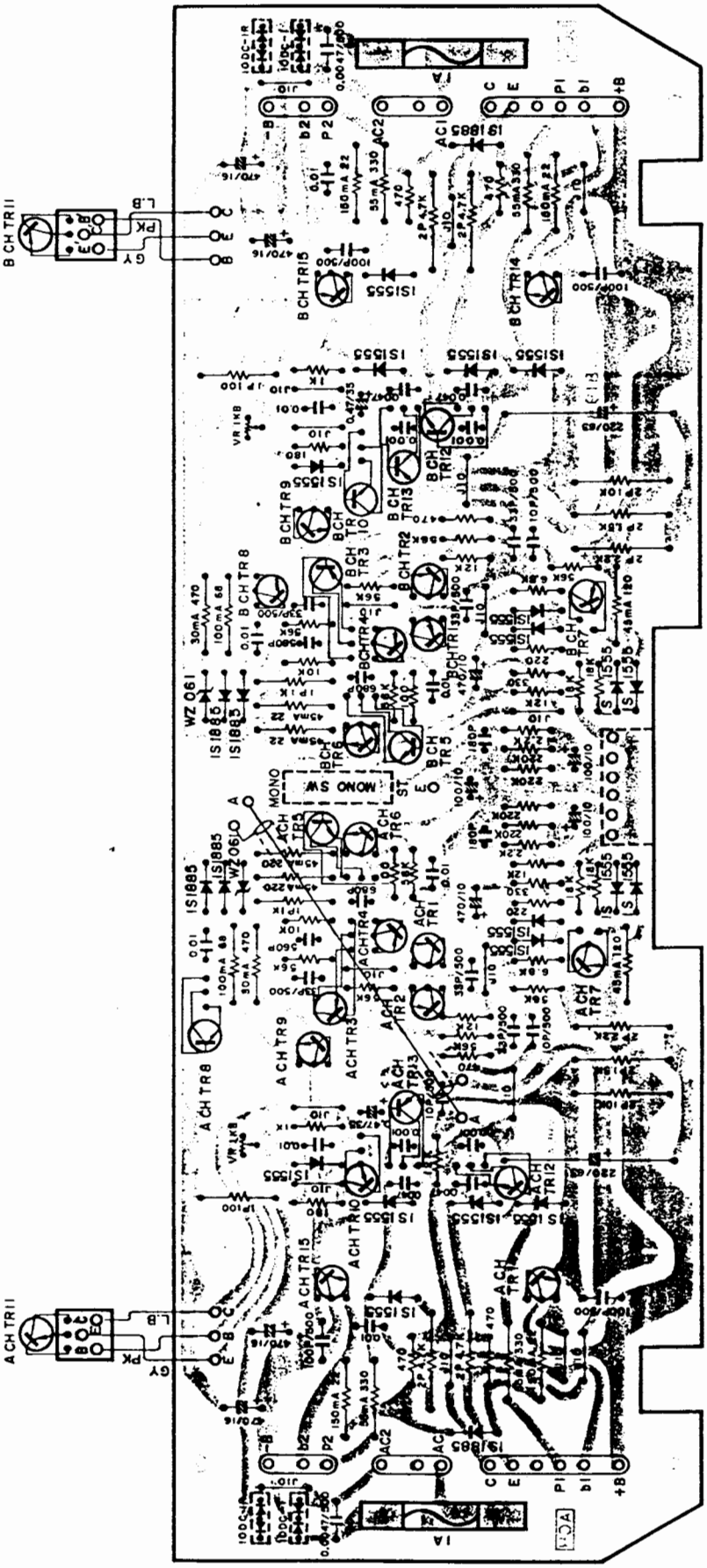


TR CIRCUIT BOARD(CHA) : NA80249⅔

305400NA802492

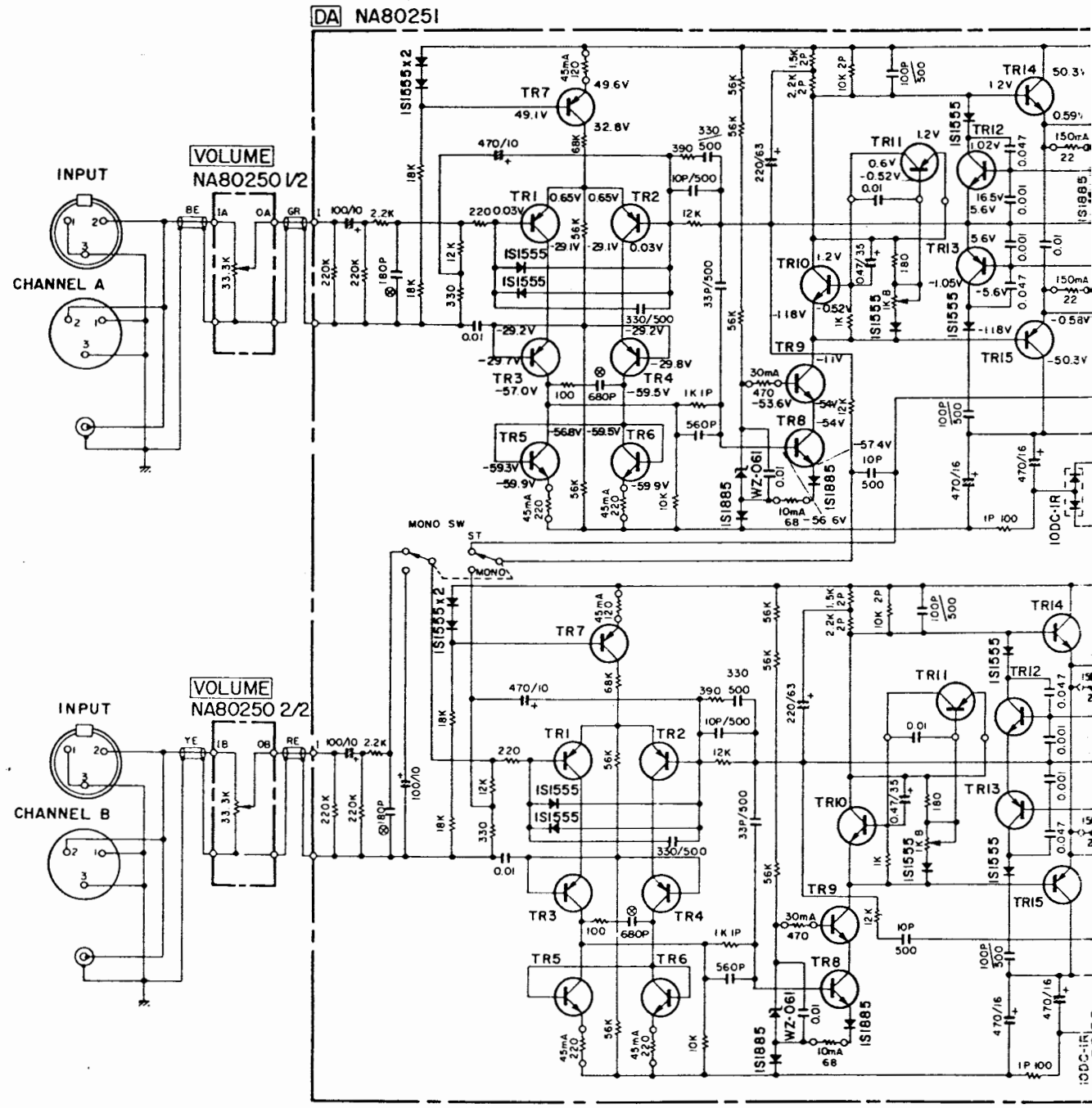


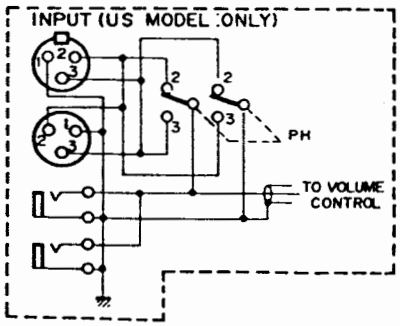
DA CIRCUIT BOARD : NA80251



DA CIRCUIT BOARD		
	P. C. B. NO.	FUSE
JAPAN, S-AFRICAN, GENERAL, CANADIAN, AUSTRALIAN MODELS	NA80251	250V, 1A
US MODEL	NA80252	SS-2, 250V, 1A
N-EUROPEAN, BRITISH MODELS	NA80253	Ⓢ MINI 250V, 1AT

■SCHEMATIC DIAGRAM 総回路図



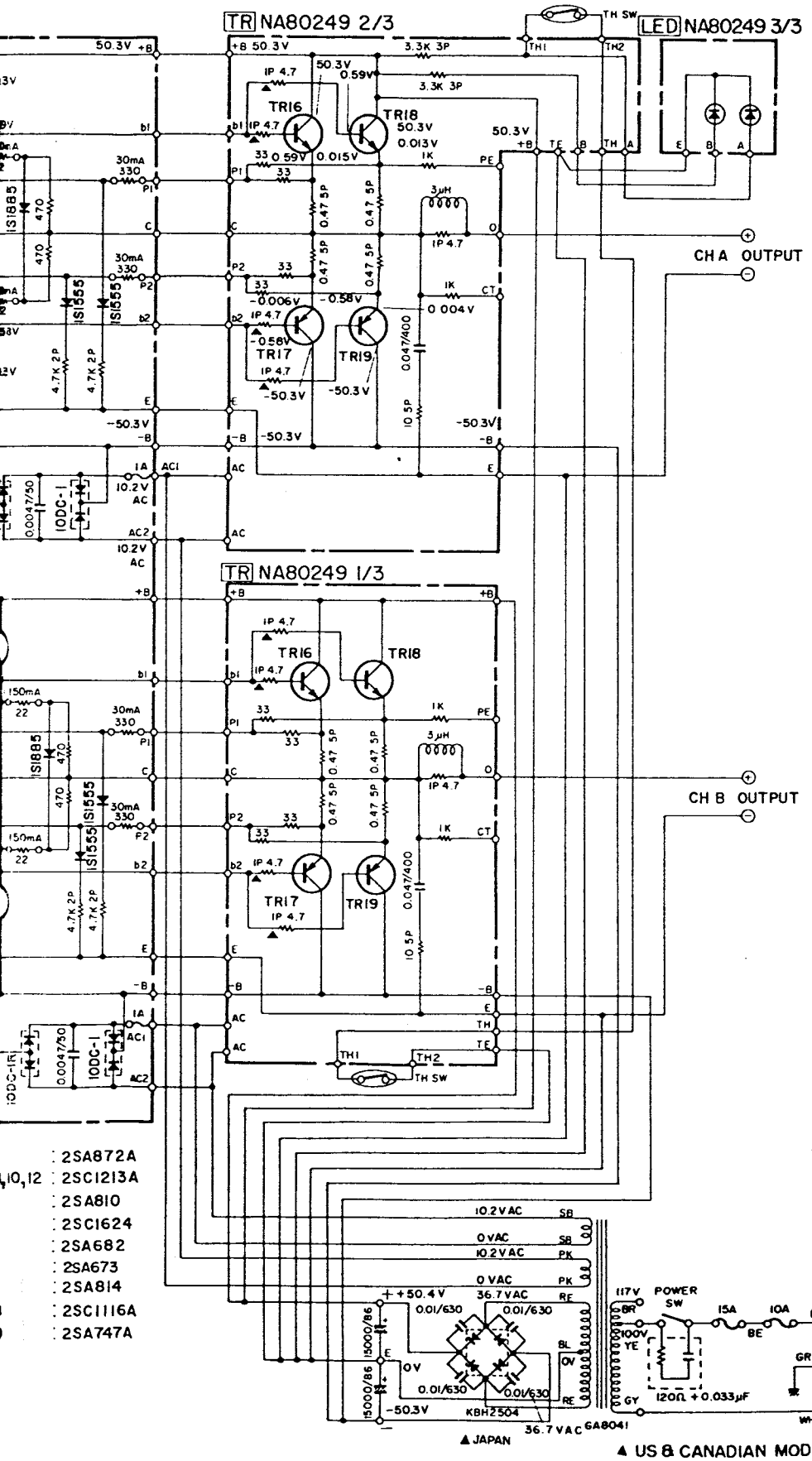


• WIRE COLOR ABBREVIATIONS

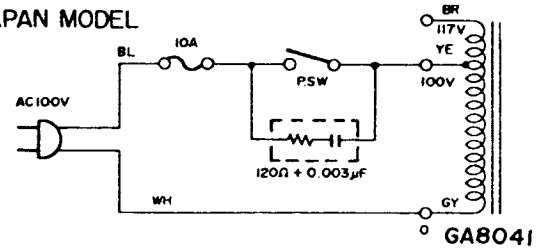
BL ▶ Black		VI ▶ Violet	
BR ▶ Brown		GY ▶ Gray	
RE ▶ Red		WH ▶ White	
OR ▶ Orange		GG ▶ Light Green	
YE ▶ Yellow		SB ▶ Light Blue	
GR ▶ Green		PK ▶ Pink	
BE ▶ Blue			

CAPACITOR —‖—		RESISTOR —∿—	
⊗	POLYSTYRENE	▲	FIRE PROOFING
△	TANTALUM	∿∿	FUSE RESISTOR

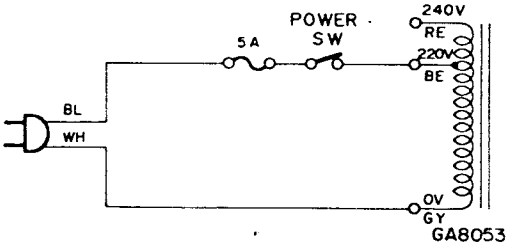
TR1~4
TR5,6,8,10
TR7
TR9,14
TR11
TR13
TR15
TR16,18
TR17,19



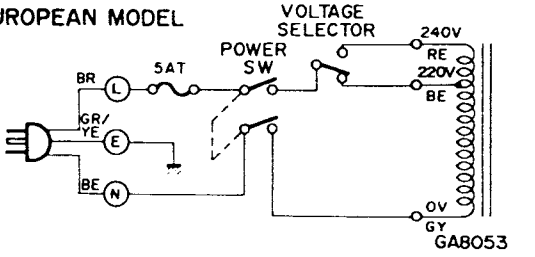
▼ JAPAN MODEL



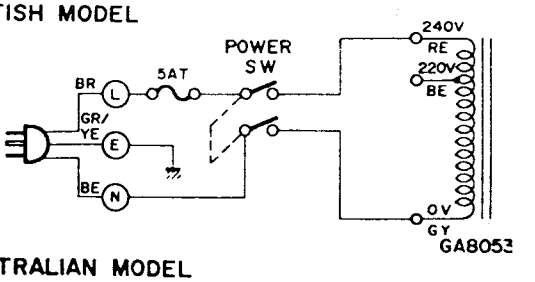
▼ GENERAL MODEL



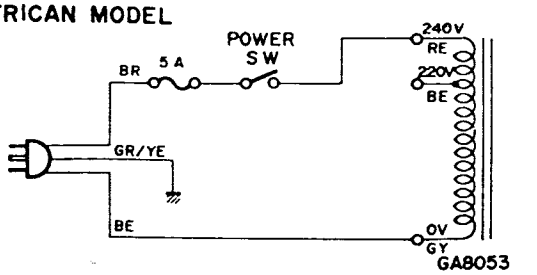
▼ N.EUROPEAN MODEL



▼ BRITISH MODEL



▼ AUSTRALIAN MODEL
S.AFRICAN MODEL

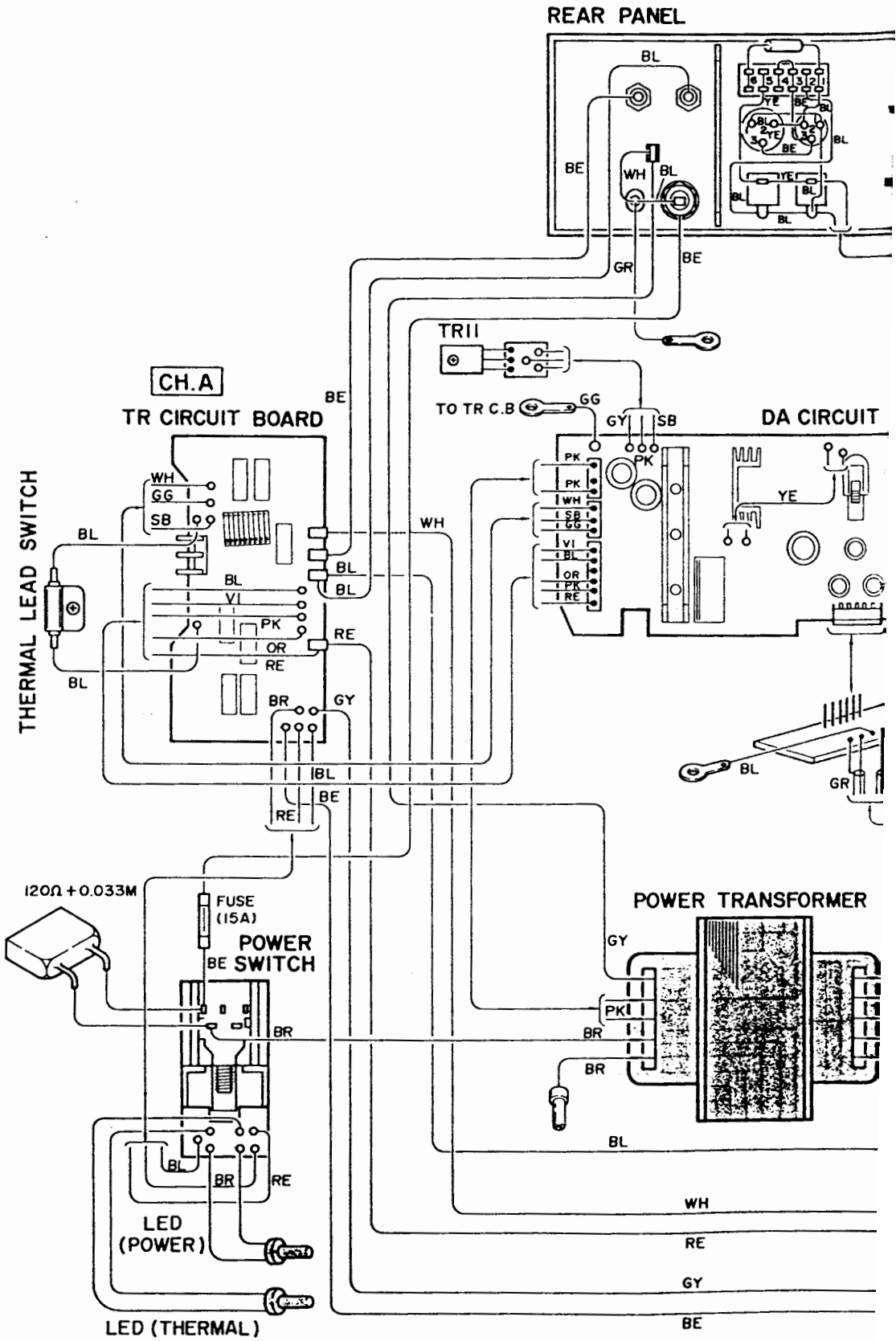


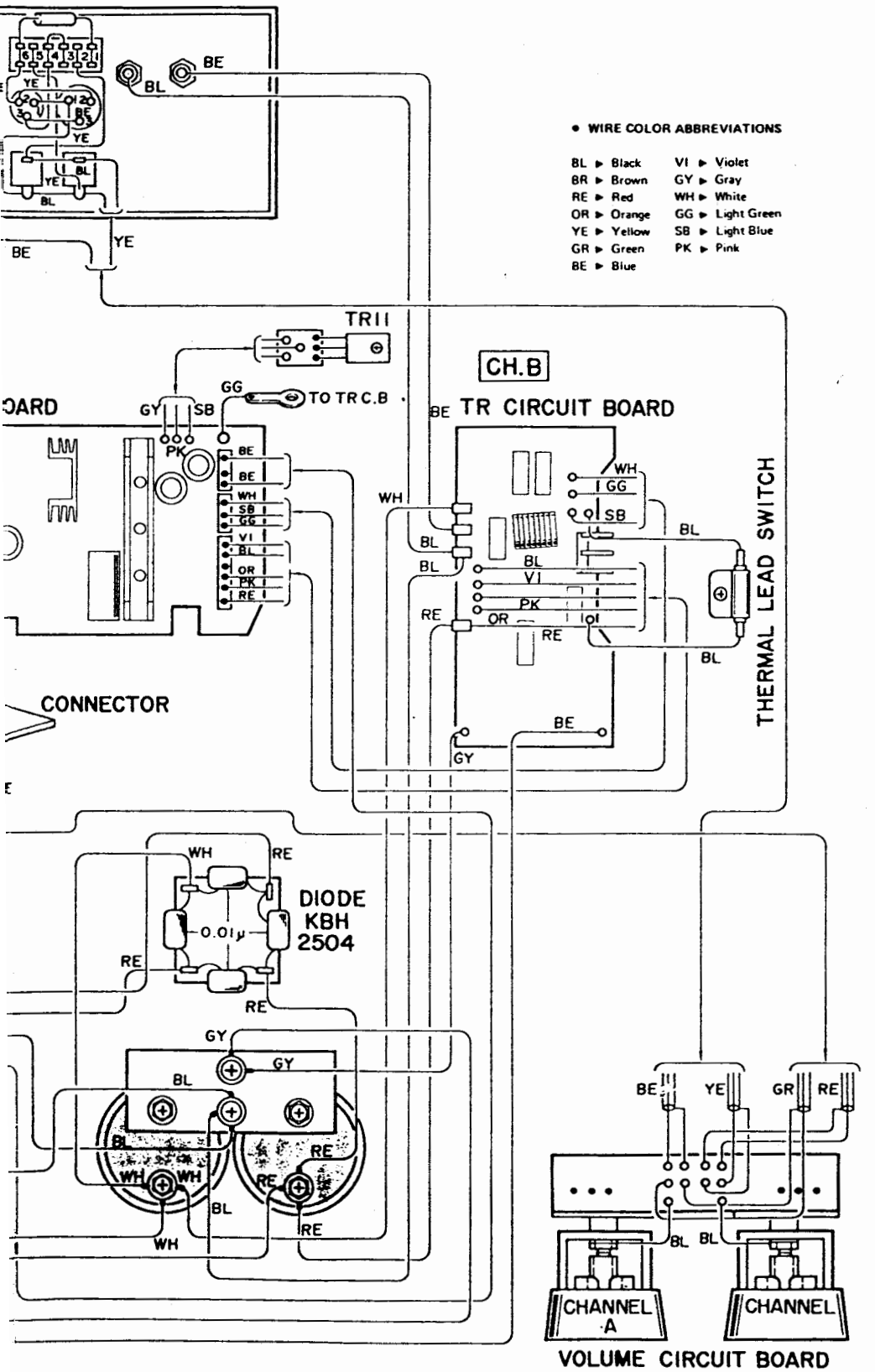
: 2SA872A
: 2SC1213A
: 2SA810
: 2SC1624
: 2SA682
: 2SA673
: 2SA814
: 2SC1116A
: 2SA747A

(S／#1001～)

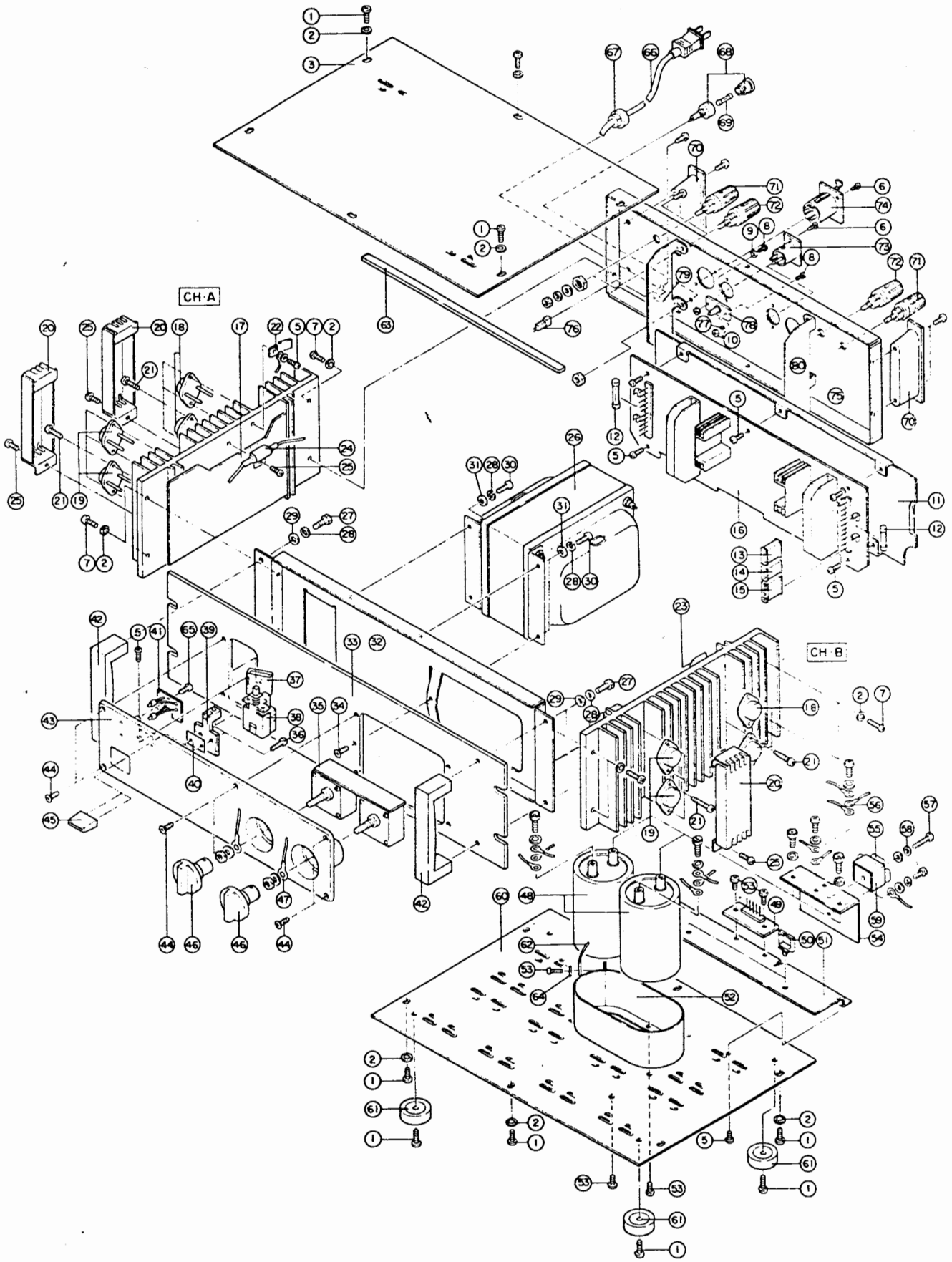
■WIRING　ワイヤリング

US Model




• WIRE COLOR ABBREVIATIONS
BL ▶ Black
BR ▶ Brown
RE ▶ Red
OR ▶ Orange
YE ▶ Yellow
GR ▶ Green
BE ▶ Blue
VI ▶ Violet
GY ▶ Gray
WH ▶ White
GG ▶ Light Green
SB ▶ Light Blue
PK ▶ Pink
TR11
CH.B
TR CIRCUIT BOARD
TO TR C.B
CONNECTOR
THERMAL LEAD SWITCH
DIODE
KBH
2504
0.01μ
CHANNEL
A
CHANNEL
VOLUME CIRCUIT BOARD

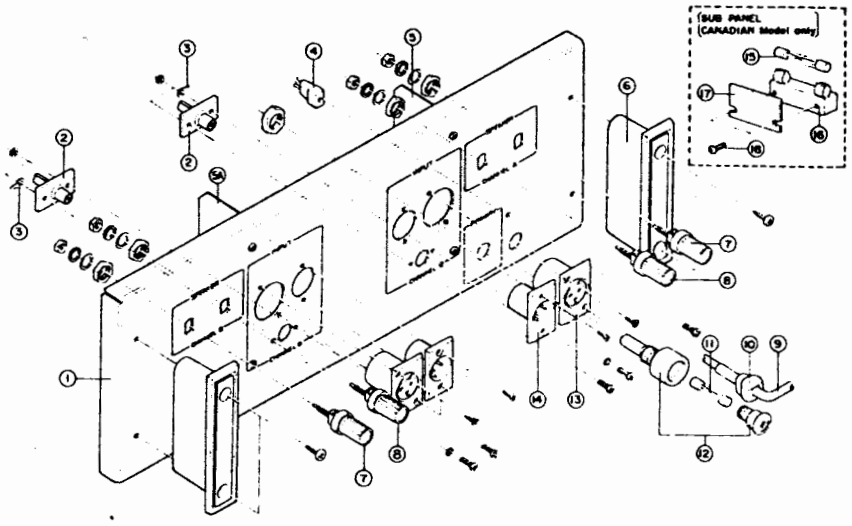
■PARTS LIST



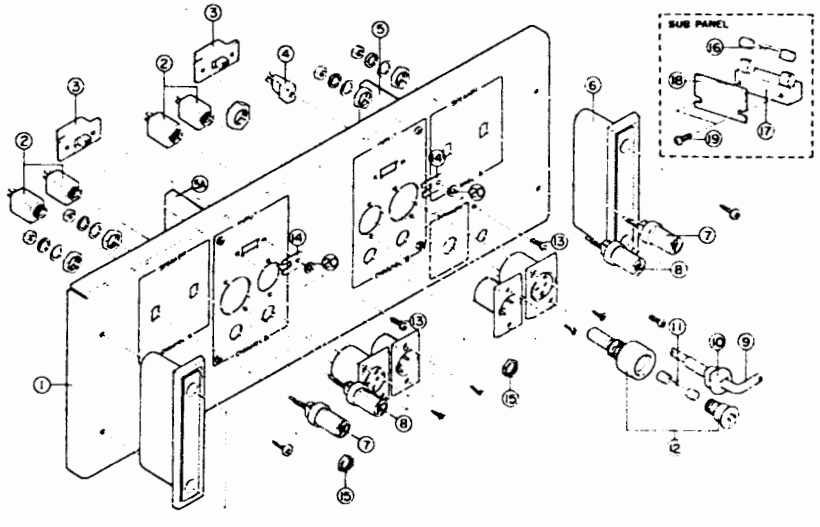
DESTINATION ABBREVIATIONS
G : General NE : North European A : Australian C : Canadian
US : US BS : British SA : South African J : Japan

Ref. No.	Part No.	Description			Remarks
1	40 10 00 EI 44 01 20	Bind head tapping screw	M4 x 12	バインドタッピングネジ	
2	40 10 00 EV 41 44 00	Toothed lock Washer	A4S	歯付座金	
3	30 54 00 BA 80 19 00	Top cover		トップカバー	US, C model
	30 54 00 BA 80 19 10	– do. –		〃	J, G, SA, A, BS, NE. model
5	40 10 00 ED 03 00 60	Bind head screw	M3 x 6	㊉バインド小ネジ	
6	40 10 00 EO 23 00 80	Oval head tapping screw	M3 x 8	㊉丸皿タッピングネジ	
7	40 10 00 ED 44 01 20	Bind head screw	M4 x 12	㊉バインド小ネジ	
8	40 10 00 ED 43 00 50	Bind head screw	M3 x 8	㊉バインド小ネジ	
9	40 10 00 EV 11 50 30	Toothed olck Washer	3S	歯付座金	
10	40 10 00 EV 10 03 00	Hexagonal nut	M3	六角ナット	
11	30 54 00 AA 80 45 00	Shield Platt		シールド板	
12	40 10 00 KB 00 03 30	Fuse	250 V 1A	ヒューズ	J, SA, G, C, A model
	40 10 00 KB 00 10 00	– do. –	SS-2	ULヒューズ	US model
	40 10 00 KB 00 07 10	– do. –	mini 1AT, 250V	ミニヒューズ	NE, BS model
13	30 54 00 MZ 80 29 00	Wire Ass'y (AC)		AC線材Ass'y	
14	30 54 00 MZ 80 29 50	– do. – (–B)		–B線材Ass'y	
15	30 54 00 MZ 80 29 50	– do. – (+B)		+B線材Ass'y	
16	30 54 00 NA 80 [illegible] 10	DA circuit Board		DAシート	J, SA, G, C, A model
	30 54 00 NA 80 [illegible]	– do. –		〃	US model
	30 54 00 NA 80 [illegible]	– do. –		〃	NE, BS model
17	30 54 00 NA 80 [illegible]	TR circuit Board	CH · A	TRシート	
18	30 10 00 TF [illegible]	Power Transistor	2SA747A	パワートランジスター	
19	40 10 00 TF [illegible]	Power Transistor	2SC 1116A	パワートランジスター	
20	30 54 00 AA 80 45 50	TR Cover		TRカバー	
21	40 10 00 EA [illegible]	Pan head Screw	M2 6 x 8	+ナベ小ネジ	
22	40 10 00 TA [illegible]	Transistor	2SA682	トランジスター	
23	30 54 00 NA 80 [illegible]	TR Circuit Board	CH · B	TRシート	
24	40 10 00 KA [illegible]	Thermal lead Relay		サーマルリードリレー	
25	40 10 00 EI [illegible]	Bind head Tapping screw	M3 x 8	+バインドタッピングネジ	
26	[illegible]	Power Transformer		パワートランス	J, US, C model
	40 10 00 GA [illegible]	– do. –		〃	G, SA, A, BS, NE model
27	40 10 00 EA [illegible]	Hexagonal screw	M5 x 15	六角ボルト	
28	40 10 00 EW [illegible]	Spring lock washer	5φ	バネ座金	
29	40 10 00 EV [illegible]	Flat Washer	5S	平座金	
30	40 10 00 ED [illegible] 01 50	Bind head screw	M5 x 15	+バインド小ネジ	
31	40 10 00 EV [illegible]	Flat Washer	5S	平座金	
32	30 54 00 AA 80 [illegible]	Sub Panel		サブパネル	
33	30 54 00 BA 80 12 00	Panel		パネル	
34	40 10 00 EB 04 01 00	Flat head screw	M4 x 10	+皿小ネジ	
35	30 54 00 NA 80 25 00	VOL circuit Board		VOLシート½	
36	40 10 00 EI 43 01 60	Bind head tapping screw	M3 x 16	バインドタッピングネジ	
37	40 10 00 FZ 00 01 10	Spark killer	0·33 μF 120Ω	スパークキラー	
38	40 10 00 KA 80 02 20	Push Switch	125V 10A	プッシュスイッチ	J, G, SA model
	40 10 00 KA 80 02 10	– do. –	240 V 4A	〃	A, BS, NE model
	40 10 00 KA 80 02 00	– do. –		〃	US, C model
39	30 54 00 CB 80 66 80	Slider for Push Switch		パワースイッチスライダー	
40	40 10 00 CB 80 67 10	Tape (Red) for Power Indiator		パワーインジケーターテープ	
41	40 10 00 NA 80 24 00	LED ciruit Board		LEDシート¾	
42	30 54 00 BA 80 19 50	Handle for Front panel		アンプハンドル	

• General, Canadian, Australian, S.African Models



• US Model



• North Eurpean, B.S Models