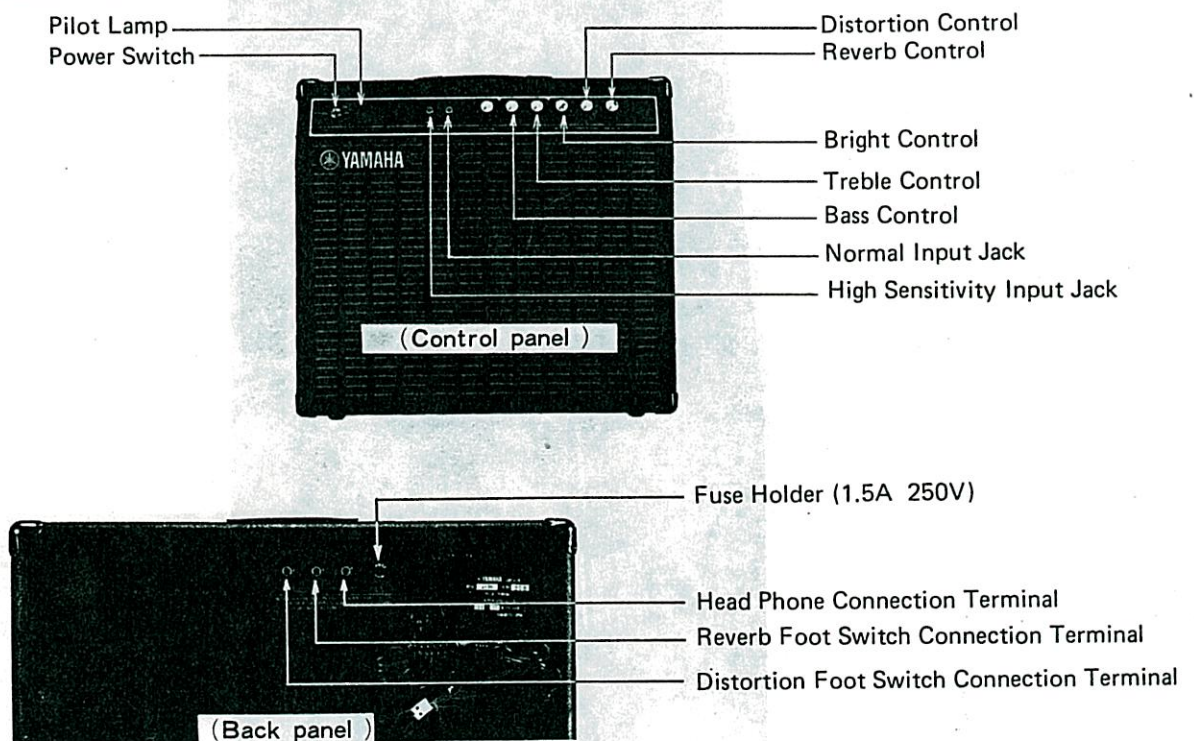


SPECIFICATIONS

Output Power	30 Watts RMS @ 3% THD 8 ohms 40 Watts RMS @ 10% THD 8 ohms
Speaker	30 cm (12") x 1 JA3059
Input Sensitivity	HIGH : -34 dBm @ 1KHz (Volume & Tone Controls at max.) LOW : -28 dBm
Input Impedance	HIGH : 1M ohms LOW : 130K ohms
Head Phone Terminal	-7 dBm @ 1KHz/8 to 150 ohms head phone
Controls	Volume Bass, Treble, Bright Distortion Reverb
Foot Switch Jack	Distortion Reverb
Semi-Conductor in use	Transistors 14 FET 2 Diodes 9
Rated Voltage	AC 100V
Rated Frequency	50/60 Hz
Rated Power Consumption	30 Watts
Dimensions	450 (H) x 500 (W) x 200 (D) m/m
Weight	12.6 kg
Finish	Black leatherette

Specifications subject to change without notice.

Name of the Parts



■DISASSEMBLY

Amp. Unit Removal (Used the Figure in this section)

- A. Remove the 6 screws (marked "O") and remove the back cover.

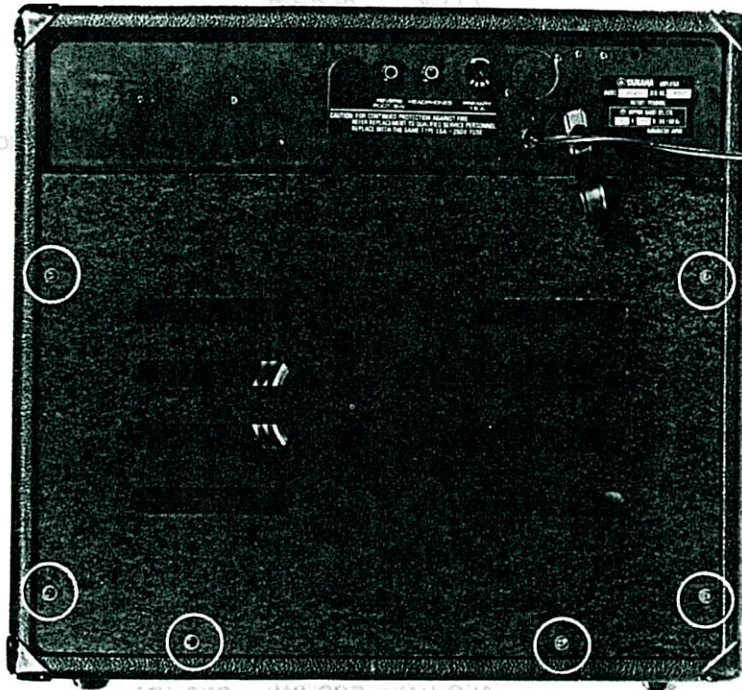


Fig. 1

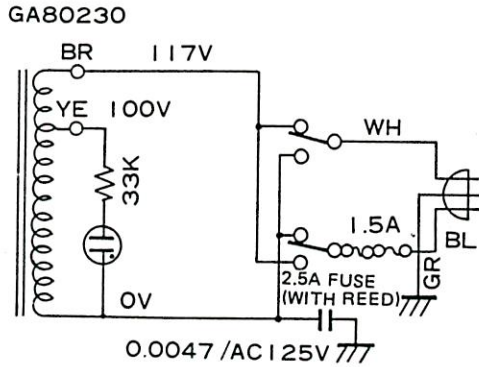
- B. Remove the 4 screws fixing the Amp. unit (See Fig. 2) and slide out the unit. Before slide out the unit, disconnect the speaker cord from the speaker terminal.



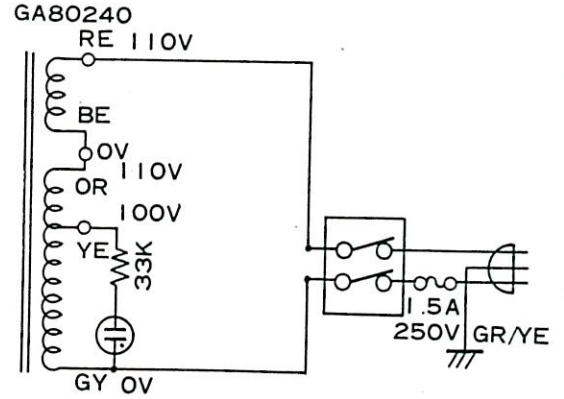
Fig. 2

POWER SUPPLY CIRCUIT ARRANGEMENTS ACCORDING TO THE DESTINATION

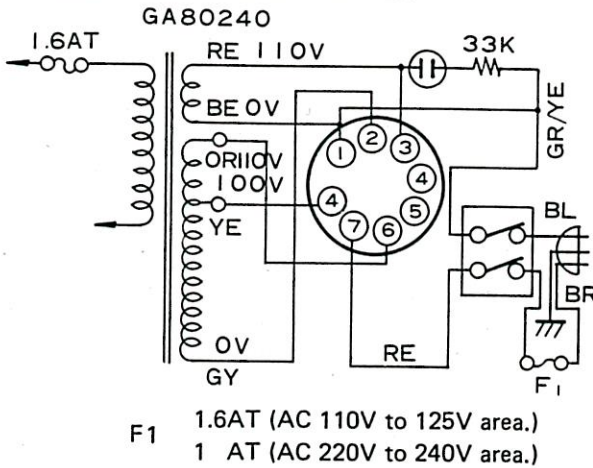
For U.S./Canadian model



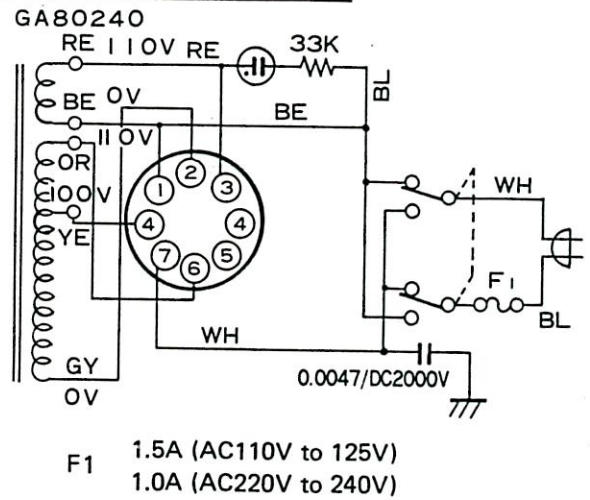
For Australian model



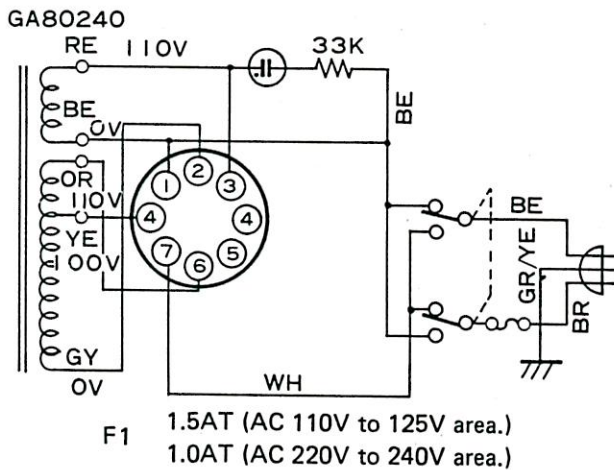
For BS/North European model



For General Export model

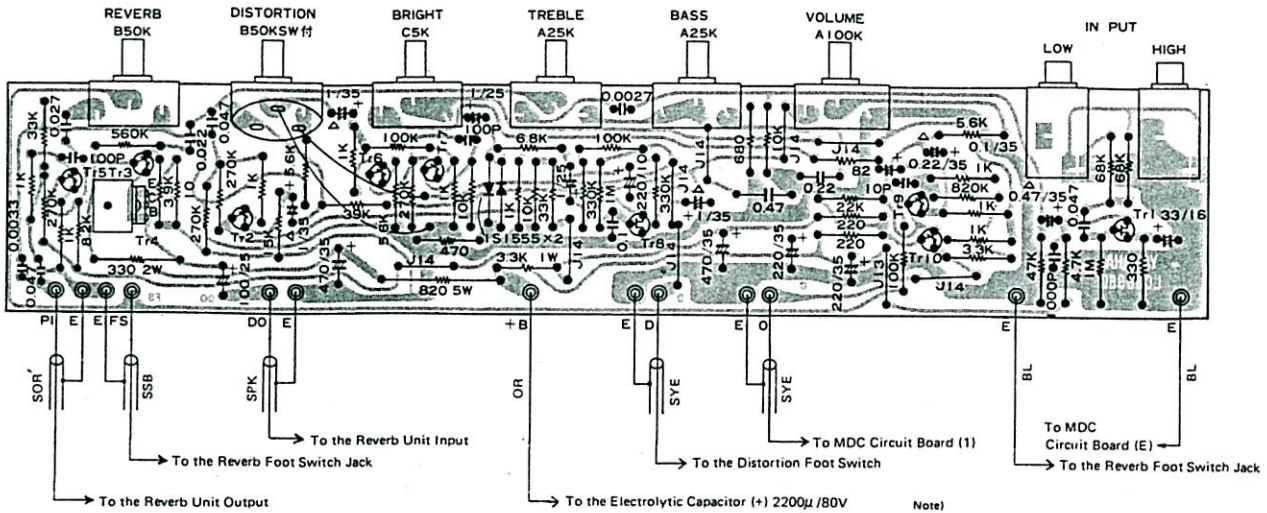


For South African model



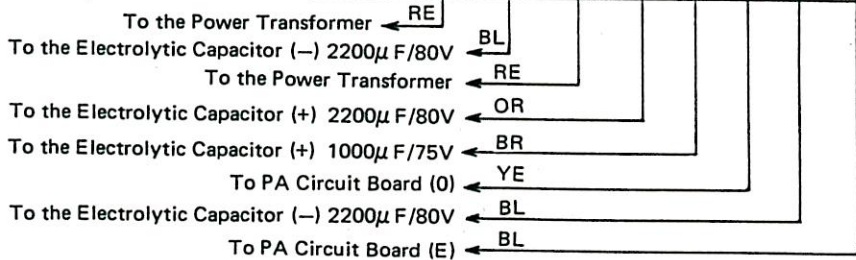
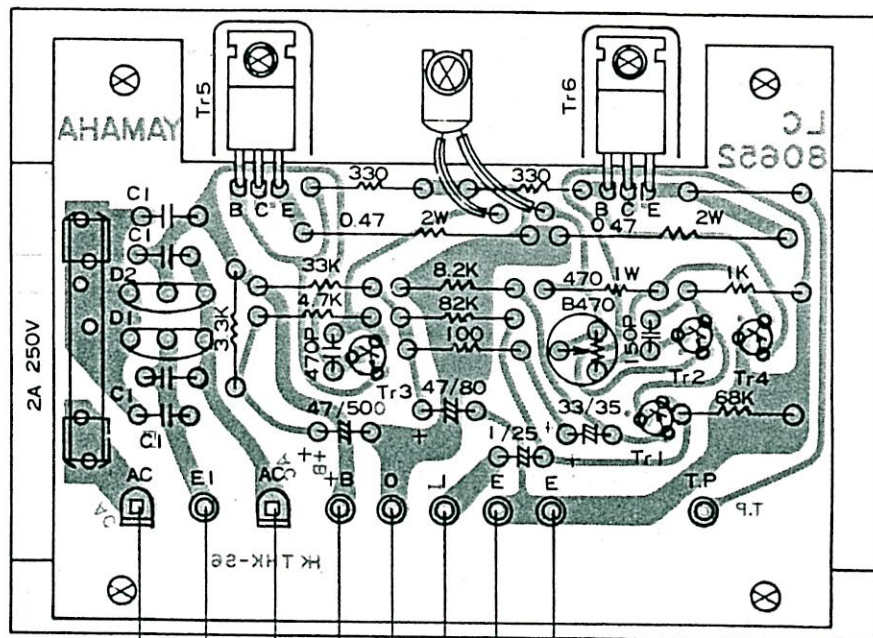
CIRCUIT BOARDS DIAGRAM

1. PA (Pre-amplifier) Circuit Board NA80100



- Note)
1. Printed Circuit Board LC80960
 2. Transistors Tr1,8 2SK30A
Tr2,3,5,6,7,9,10 2SC1681
Tr4 2SD526
 3. Silicon Grease must be lubricated between Tr4 and Radiator Plate.
 4. Marked "△" shows Tantalum Electrolytic Capacitor.
 5. This circuit board shows the drawing of the parts arrangement.

2. MDC (Main Amp. & Power Supply) Circuit Board NA80101



- Note)
1. Printed Circuit Board LC80652
 2. Transistors
Tr1 2SA561 Tr5 2SD526
Tr2,3 2SC1509 Tr6 2SB596
Tr4 2SA777
 - Diodes
D1 10DC-4R (RE)
D2 10DC-4 (BL)
 - Capacitor
C1 0.0047/500V
 3. Silicon Grease must be lubricated on the Power Transistor (Tr5, Tr6) and Varistor (STV-3).
 4. This circuit board shows the drawing of the parts arrangement.

ELECTRICAL CHECKS AND ADJUSTMENTS

1. Specification

1) Amplifier Characteristics

1)-1 Gain

1. Connect an 8-ohm dummy load to the output terminal.
2. Set up the various controls as shown in Table-1.

DISTORTION, REVERB	MIN
VOLUME, BASS, TREBLE	MAX

Table-1

3. Feed a $-30\text{dBm}/400\text{Hz}$ signal through the input jack.
4. The output signal level from the output terminal should be within the limits indicated in Table-2.

HIGH INPUT JACK	$+23 \pm 3\text{dBm}$
LOW INPUT JACK	$+17 \pm 3\text{dBm}$

Table-2

1)-2 Maximum Output

1. Connect an 8-ohm dummy load to the output terminal.
2. Set up the various controls as shown in Table-1.
3. Feed a 400Hz signal through the high input jack.
4. The output signal level from the output terminal should be 30W (26dBm) and distortion must be less than 3%.

1)-3 Frequency Response

1. Set up the various controls as shown in Table-1.
2. Feed a -50dBm signal through the input jack.
3. The indicated responded output terminal should be within $\pm 3\text{dBm}$ of specified response curve (Fig. 3).

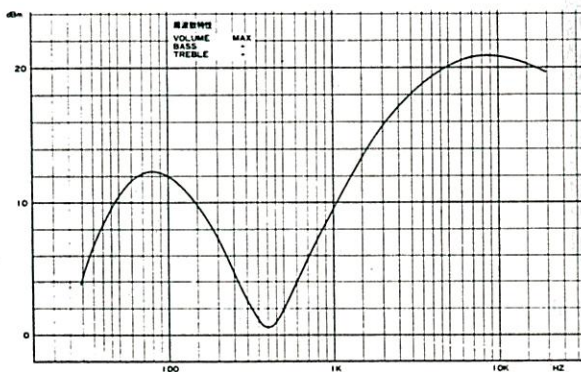


Fig. 3 Frequency Response Curves

1)-4 Tone Control

1. Set up the various controls as shown in Table-1.
2. Feed a respective signals through the high input jack as shown in Table-3.

Control knob	Input Signal			Variation Range
	Treble	Bass	Bright	
Treble	$-50\text{dBm}/7\text{KHz}$			$19 \pm 3\text{dBm}$
Bass		$-50\text{dBm}/70\text{Hz}$		$16 \pm 3\text{dBm}$
Bright			$-60\text{dBm}/7\text{KHz}$	$19 \pm 3\text{dBm}$

Table-3

3. When the each knob is turned from maximum to minimum, variation should be within the limits indicated in Table-3.

1)-5 Head Phone

1. Connect an 8-ohm dummy load to the head phone terminals L and R (Stereophonic terminal).
2. Set up the various controls as shown in Table-1.
3. Feed $-30\text{dBm}/400\text{Hz}$ signal through the input terminal.
4. The output signal level on the both ends of dummy load should be within $-10 \pm 3\text{dBm}$.

1)-6 Reverb Characteristics

1. Turn the Volume Knob from maximum level to minimum level and turn the Reverb Knob from minimum level to maximum level.
2. When the input plug is connected and disconnected, reverberation sound should be ON/OFF.

1)-7 Distortion Characteristics

1. Turn the Distortion Knob from minimum level to maximum level.
2. Feed $-60\text{dBm}/400\text{Hz}$ signal through the input terminal "HIGH".
3. The output signal level from the speaker terminal should be $21 \pm 3\text{dBm}$.

1)-8 Noise Level

1. Set up the various controls as shown in Table-1.
2. Noise level must be -28dBm or less when the input signal is not applied.
3. Noise level must be -13dBm or less when the distortion Knob is positioned at the maximum level. (Power Switch should be ON where noise level is little).

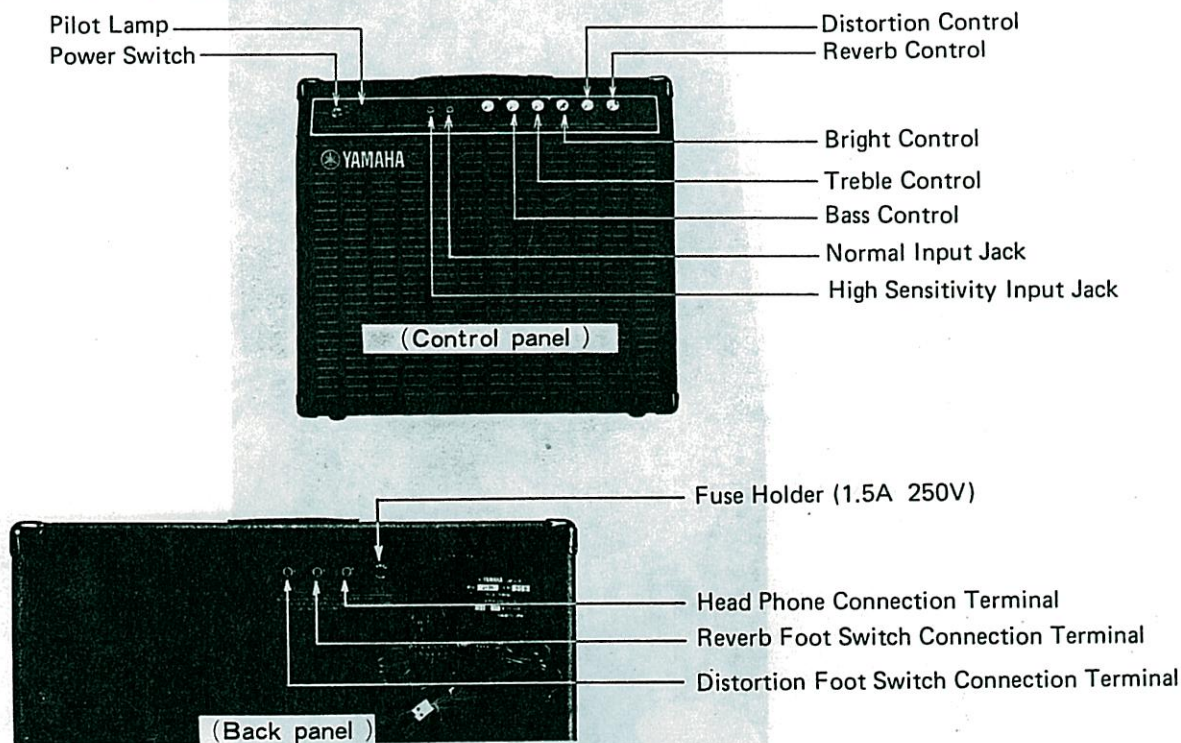
As for the measuring instruments, the output impedance of the oscillator should be 1K ohms or less and the input impedance of the oscilloscope should be 100K ohms or more.

SPECIFICATIONS

Output Power	30 Watts RMS @ 3% THD 8 ohms 40 Watts RMS @ 10% THD 8 ohms
Speaker	30 cm (12") x 1 JA3059
Input Sensitivity	HIGH : -34 dBm @ 1KHz (Volume & Tone Controls at max.) LOW : -28 dBm
Input Impedance	HIGH : 1M ohms LOW : 130K ohms
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Foot Switch Jack	Distortion Reverb
Semi-Conductor in use	Transistors 14 FET 2 Diodes 9
Rated Voltage	AC 100V
Rated Frequency	50/60 Hz
Rated Power Consumption	30 Watts
Dimensions	450 (H) x 500 (W) x 200 (D) m/m
Weight	12.6 kg
Finish	Black leatherette

Specifications subject to change without notice.

Name of the Parts



■ DISASSEMBLY

Amp. Unit Removal (Used the Figure in this section)

- A. Remove the 6 screws (marked "O") and remove the back cover.

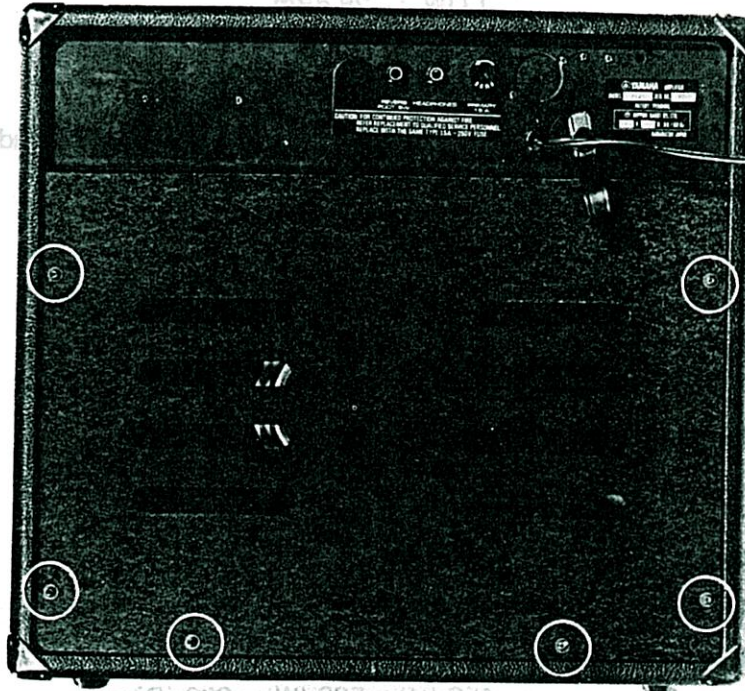


Fig. 1

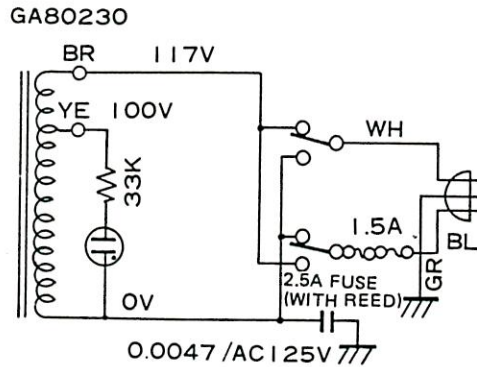
- B. Remove the 4 screws fixing the Amp. unit (See Fig. 2) and slide out the unit. Before slide out the unit, disconnect the speaker cord from the speaker terminal.



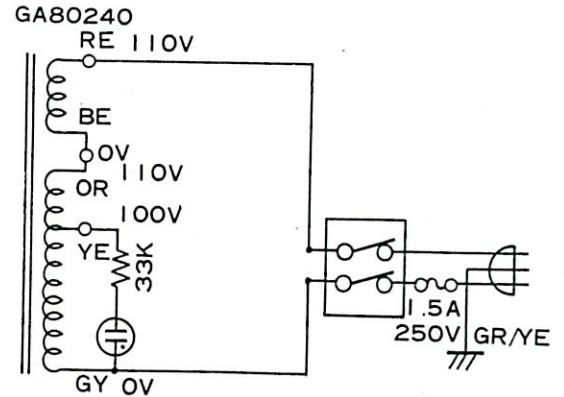
Fig. 2

POWER SUPPLY CIRCUIT ARRANGEMENTS ACCORDING TO THE DESTINATION

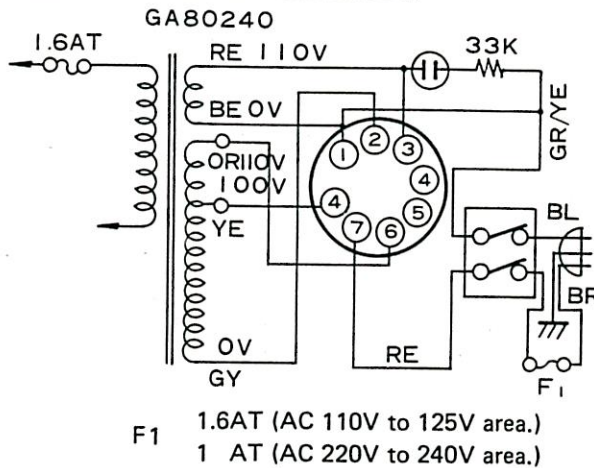
For U.S./Canadian model



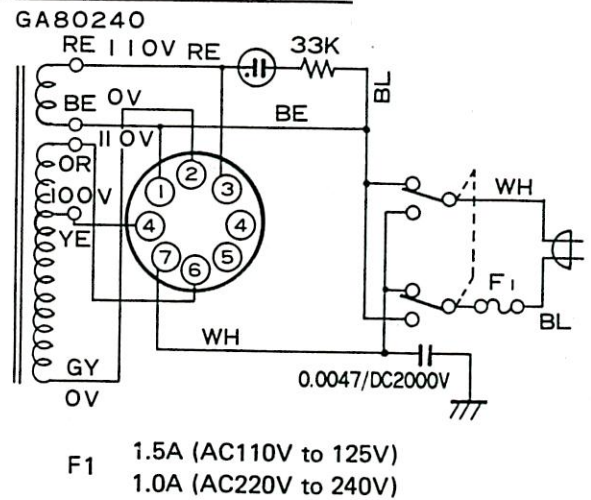
For Australian model



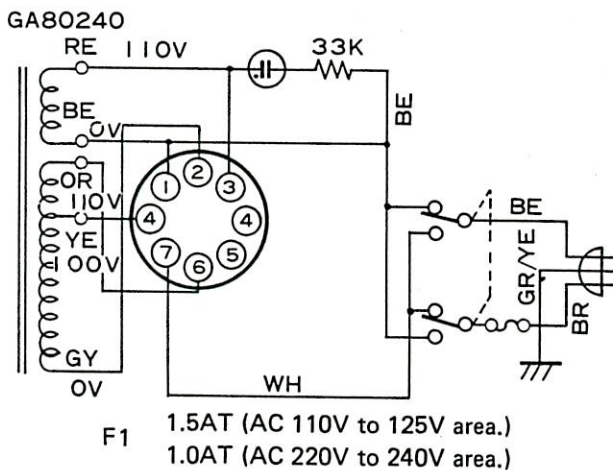
For BS/North European model



For General Export model

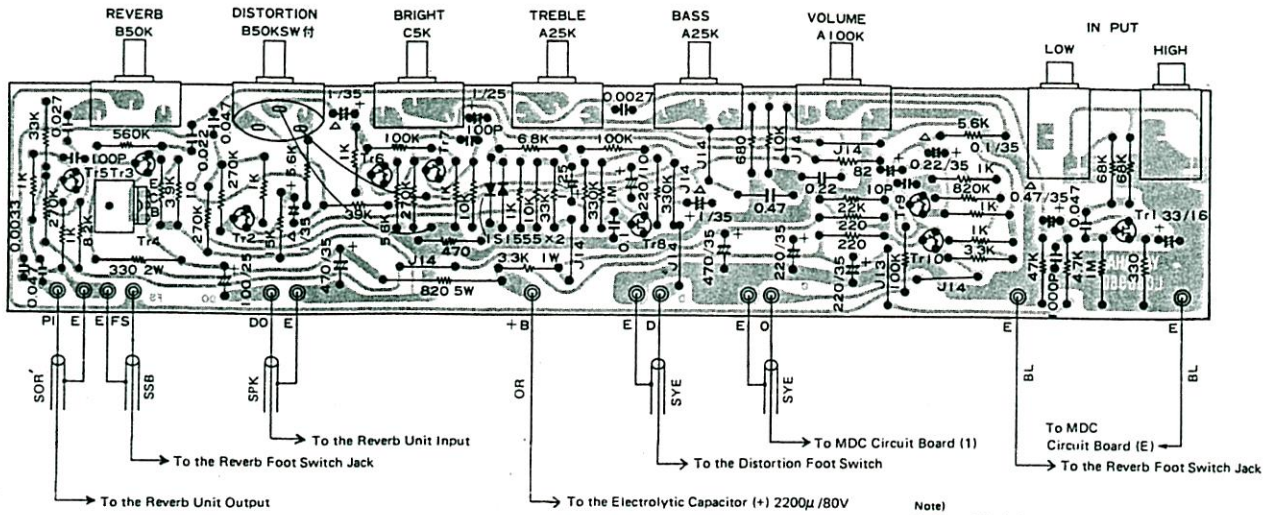


For South African model



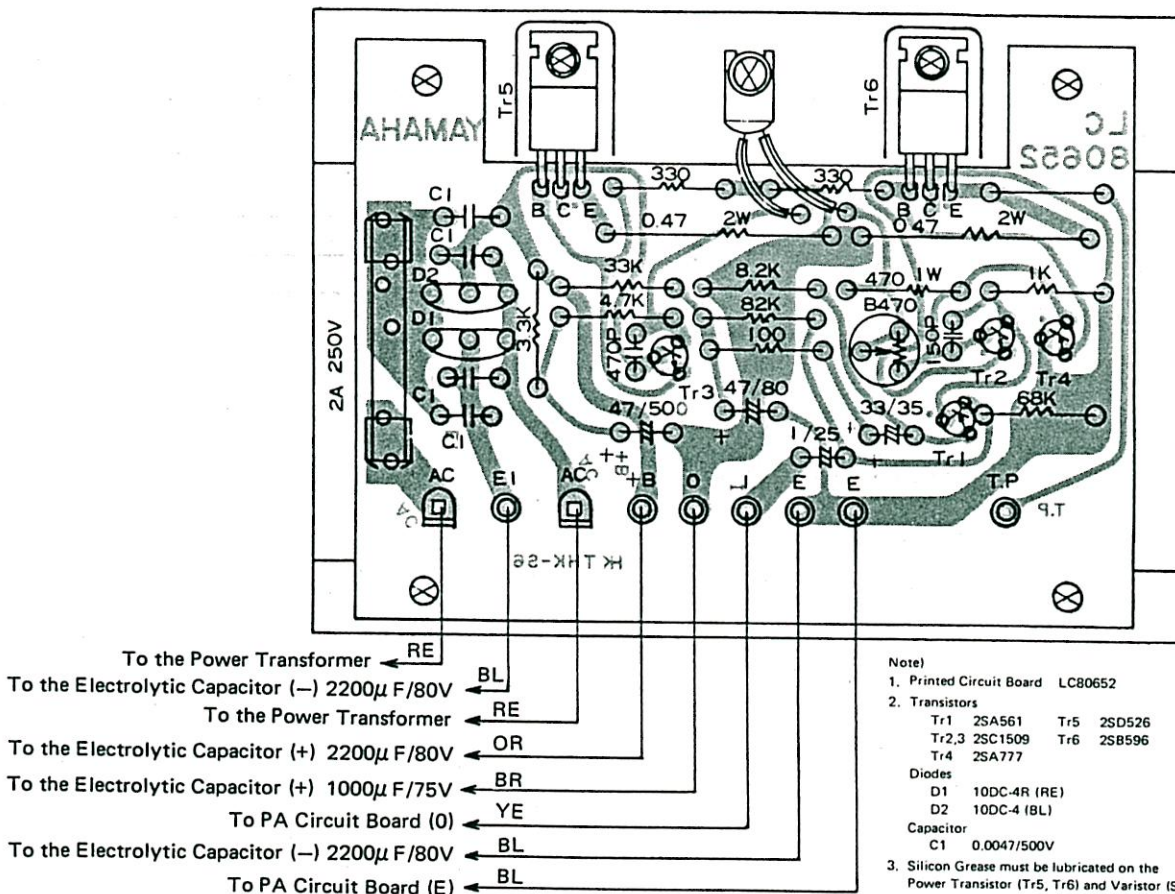
CIRCUIT BOARDS DIAGRAM

1. PA (Pre-amplifier) Circuit Board NA80100



- Note)
1. Printed Circuit Board LC80960
 2. Transistors Tr1,8 2SK30A
Tr2,3,5,6,7,9,10 2SC1681
Tr4 2SD526
 3. Silicon Grease must be lubricated between Tr4 and Radiator Plate.
 4. Marked "△" shows Tantalum Electrolytic Capacitor.
 5. This circuit board shows the drawing of the parts arrangement.

2. MDC (Main Amp. & Power Supply) Circuit Board NA80101



- Note)
1. Printed Circuit Board LC80652
 2. Transistors
Tr1 2SA561 Tr5 2SD526
Tr2,3 2SC1509 Tr6 2SB596
Tr4 2SA777
 - Diodes
D1 10DC-4R (RE)
D2 10DC-4 (BL)
 - Capacitor
C1 0.0047/500V
 3. Silicon Grease must be lubricated on the Power Transistor (Tr5, Tr6) and Varistor (STV-3).
 4. This circuit board shows the drawing of the parts arrangement.

ELECTRICAL CHECKS AND ADJUSTMENTS

1. Specification

1) Amplifier Characteristics

1)-1 Gain

1. Connect an 8-ohm dummy load to the output terminal.
2. Set up the various controls as shown in Table-1.

DISTORTION, REVERB	MIN
VOLUME, BASS, TREBLE	MAX

Table-1

3. Feed a $-30\text{dBm}/400\text{Hz}$ signal through the input jack.
4. The output signal level from the output terminal should be within the limits indicated in Table-2.

HIGH INPUT JACK	$+23 \pm 3\text{dBm}$
LOW INPUT JACK	$+17 \pm 3\text{dBm}$

Table-2

1)-2 Maximum Output

1. Connect an 8-ohm dummy load to the output terminal.
2. Set up the various controls as shown in Table-1.
3. Feed a 400Hz signal through the high input jack.
4. The output signal level from the output terminal should be 30W (26dBm) and distortion must be less than 3%.

1)-3 Frequency Response

1. Set up the various controls as shown in Table-1.
2. Feed a -50dBm signal through the input jack.
3. The indicated responded output terminal should be within $\pm 3\text{dBm}$ of specified response curve (Fig. 3).

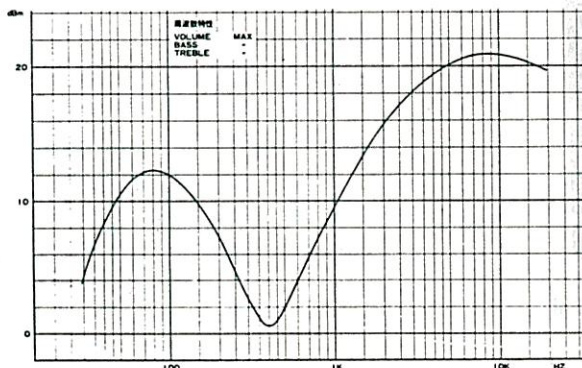


Fig. 3 Frequency Response Curves

1)-4 Tone Control

1. Set up the various controls as shown in Table-1.
2. Feed a respective signals through the high input jack as shown in Table-3.

Control knob	Input Signal			Variation Range
	Treble	Bass	Bright	
Treble	$-50\text{dBm}/7\text{KHz}$			$19 \pm 3\text{dBm}$
Bass		$-50\text{dBm}/70\text{Hz}$		$16 \pm 3\text{dBm}$
Bright			$-60\text{dBm}/7\text{KHz}$	$19 \pm 3\text{dBm}$

Table-3

3. When the each knob is turned from maximum to minimum, variation should be within the limits indicated in Table-3.

1)-5 Head Phone

1. Connect an 8-ohm dummy load to the head phone terminals L and R (Stereophonic terminal).
2. Set up the various controls as shown in Table-1.
3. Feed $-30\text{dBm}/400\text{Hz}$ signal through the input terminal.
4. The output signal level on the both ends of dummy load should be within $-10 \pm 3\text{dBm}$.

1)-6 Reverb Characteristics

1. Turn the Volume Knob from maximum level to minimum level and turn the Reverb Knob from minimum level to maximum level.
2. When the input plug is connected and disconnected, reverberation sound should be ON/OFF.

1)-7 Distortion Characteristics

1. Turn the Distortion Knob from minimum level to maximum level.
2. Feed $-60\text{dBm}/400\text{Hz}$ signal through the input terminal "HIGH".
3. The output signal level from the speaker terminal should be $21 \pm 3\text{dBm}$.

1)-8 Noise Level

1. Set up the various controls as shown in Table-1.
2. Noise level must be -28dBm or less when the input signal is not applied.
3. Noise level must be -13dBm or less when the distortion Knob is positioned at the maximum level. (Power Switch should be ON where noise level is little).

As for the measuring instruments, the output impedance of the oscillator should be 1K ohms or less and the input impedance of the oscilloscope should be 100K ohms or more.

2. PA (Pre Amp.) Circuit Board Checking

1) Amplifier Characteristics

1)-1 Gain

1. Connect a 33K ohm dummy load between (O) and (E).
2. Apply $+62 \pm 2V$ to B terminal.
3. Feed $-26dBm/400Hz$ signal through the input terminal "HIGH".
4. The output signal level between (O) and (E) should be $-13 \pm 2dBm$.
The knobs must be positioned as shown in Table-1.

2) Reverb Characteristics

2)-1 Drive Circuit

1. Connect a 100 ohms dummy load to DO-E terminal under the condition described in 1)-1.
2. The output signal level should be $-16 \pm 2dBm$ at both ends of the dummy load.

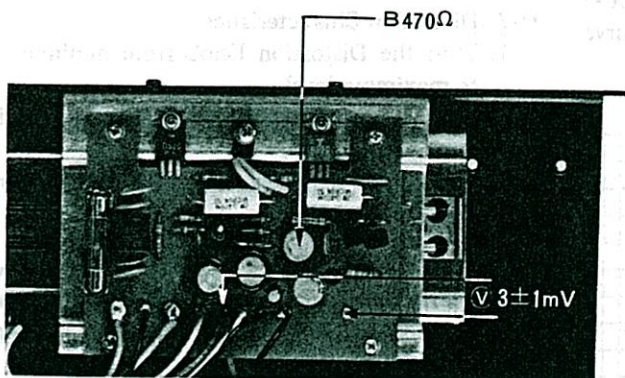
2)-2 Pick-up Circuit.

1. Turn the Reverb Knob to the maximum level under the condition described in 1)-1.
2. Feed $-40dBm/400Hz$ signal to the PI terminal.
3. The output signal level between (O) and (E) should be $-10 \pm 2dBm$. (Dummy load between (O) and (E) is 33K ohms)

3) MDC (Main Amp. & Power Supply) Circuit Board

3)-1 Idling Current Adjustment

Adjust variable resistor B (470 ohms) so that the voltage of TP terminal (0.47 ohms at both ends) is $3 \pm 1mV$ at no signal.



3)-2 Output Power

1. Feed $-12dBm/1KHz$ signal to the input terminal I.
2. The output signal level at both ends of dummy load should be $26 \pm 2dBm$ (30W) and distortion should be within 3%.

3)-3 Frequency Characteristics

1. The output level variation should be within $\pm 3dBm$ when frequency for output level is changed within the range 70Hz to 10KHz, basing in the standard output of 30W/1KHz.

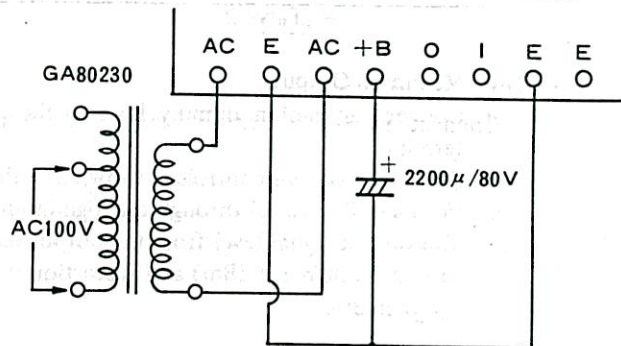
3)-4 Noise Level

Noise level at the output terminal should be $-50dBm$ or less when the input terminal is short-circuited.

3)-5 Stability

1. Connect a $0.1\mu F$ capacitor in parallel with output terminal.
2. The oscillation must not occur at the point of frequency's (50Hz, 1KHz, 10KHz) under the condition described in 3)-3.

Power Supply Circuit necessary for the measurement



Measuring Instruments used in this section should be same instruments used in section 1 (ELECTRICAL CHECKS AND ADJUSTMENTS).