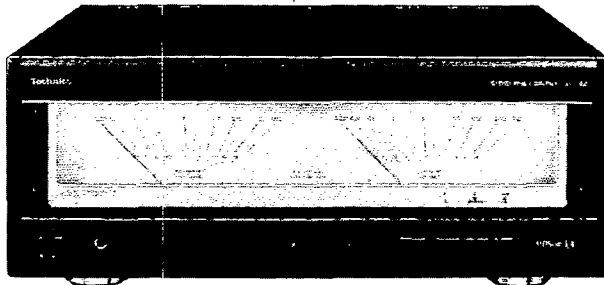


Service Manual

Stereo Power Amplifier

Amplifier

SE-A2000



Colour

(K)...Black Type

Area

Suffix for Model No.	Area	Colour
(EG)	Europe.	(K)
(EB)	Great Britain.	
(G)	Asia, Latin America, Middle Near East and Africa.	

SPECIFICATIONS (DIN 45 500)

20 Hz–20 kHz continuous power output both channels driven	2 × 100 W (8 Ω) 2 × 140 W (4 Ω)
1 kHz continuous power output both channels driven (THD: 1%)	2 × 110 W (8 Ω) 2 × 160 W (4 Ω)
63 Hz–12.5 kHz continuous power output both channels driven (THD: 0.7%)	2 × 105 W (8 Ω) 2 × 145 W (4 Ω)
Total harmonic distortion rated power at 20 Hz–20 kHz	0.005% (8 Ω) 0.009% (4 Ω)
half power at 20 Hz–20 kHz	0.003% (8 Ω)
Intermodulation distortion (50 Hz: 7 kHz = 4:1, SMPTE) rated power	0.005% (8 Ω)
Power bandwidth (both channel driven) –3 dB THD 0.05%	5 Hz–80 kHz (8 Ω)
Residual hum and noise	0.15 mV
Damping factor	100 (8 Ω) 50 (4 Ω)
Headphones output level/impedance	680 mV/330 Ω
Load impedance	
A or B	4 Ω–16 Ω
A and B	8 Ω–16 Ω
Input sensitivity/impedance	1.0 V/33 kΩ
S/N (rated power, 4 Ω)	107 dB (115 dB, IHF '66)
Frequency response	0.8 Hz–150 kHz (+0, –3 dB) +0 dB, –0.2 dB (20 Hz–20 kHz)

■ GENERAL

Power consumption	380 W
Power supply	
For (EG) area.	AC 50 Hz/60 Hz, 230 V
For (EB) area.	AC 50 Hz/60 Hz, 230 V–240 V
For (G) area.	AC 50 Hz/60 Hz, 110 V–127 V/220 V–240 V
Dimensions (W × H × D)	448 × 186 × 431 mm
Weight	22 kg

Notes:

- Design and specifications are subject to change without notice. Weight and dimensions are approximate.
- Total harmonic distortion is measured by the digital spectrum analyzer.
- For areas except (EG)**
The specification values given have been measured while using a 240 V power supply.

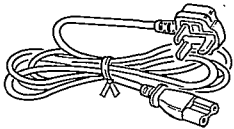
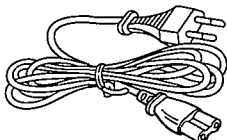

Technics

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ACCESSORIES

<ul style="list-style-type: none"> • AC power supply cord 	<ul style="list-style-type: none"> • Power plug adaptor
<p>[FOR (EB) area.]</p>  <p>(VJA0733)</p>	<p>[FOR (EG, G) areas.]</p>  <p>(RJA0019-2K)</p>
	<p>[FOR (G) area.]</p>  <p>(SJP5213-2)</p>

PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C701~C704 through a 10Ω, 5W resistor to ground.

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices. After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

Current consumption at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage 230V/240V/110-127V/220-240V.

Power supply voltage	AC 230V		AC 240V		AC 120V (AC 110-127V)		AC 240V (AC 220-240V)	
	50Hz	150~450mA	50Hz	140~430mA	50Hz	260~880mA	50Hz	140~430mA
Consumed current 50/60Hz	60Hz	120~360mA	60Hz	112~344mA	60Hz	208~704mA	60Hz	112~344mA



■ CAUTION FOR AC MAINS LEAD

[For (EB) area.]

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:


Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

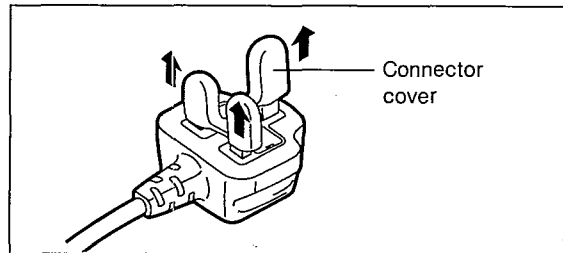
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol .

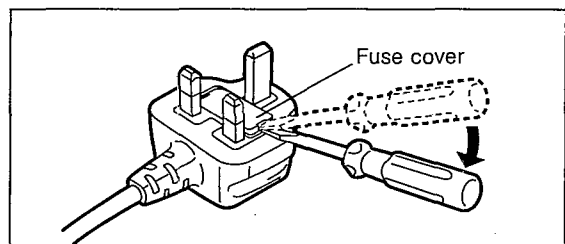
Before use

Remove the connector cover as follows.

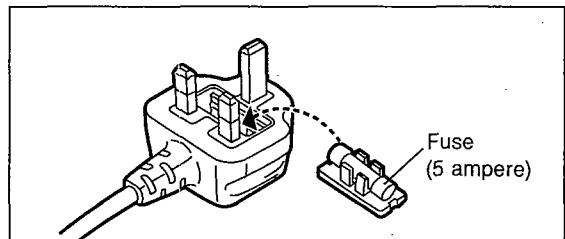


How to replace the fuse

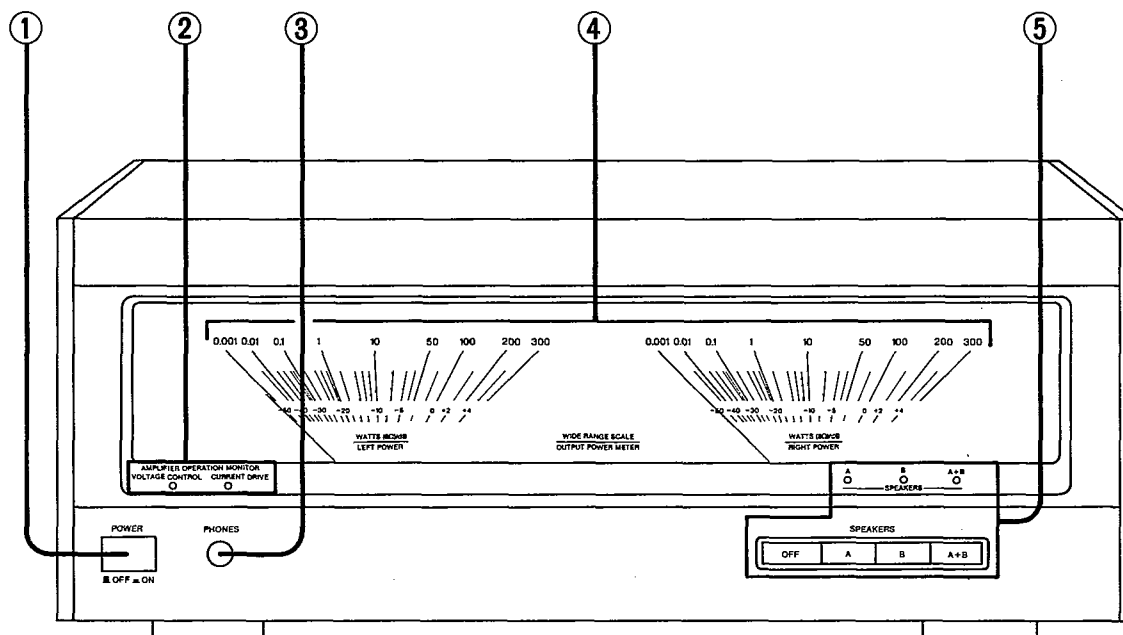
1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



FRONT PANEL CONTROLS AND FUNCTIONS



① Power switch (POWER)

② Operation indicators (AMPLIFIER OPERATION MONITOR)

These indicators illuminate to indicate the operating condition of this unit.

VOLTAGE CONTROL:

Illuminates up when the power is switched on. Indicates that the voltage control amplifier is ready to operate.

CURRENT DRIVE:

Illuminates approximately 3 seconds after the voltage control amplifier indicator illuminates. Indicates that the main unit is ready to operate.

If an abnormal condition in the circuitry is detected, such as DC voltage appearing in the output, or a short-circuit of the positive (+) and negative (-) wires from the speaker terminals, the protection circuit functions and this indicator will not illuminate.

③ Headphones jack (PHONES)

④ Power meters

Indicate the output (watts) of this unit.

When speakers having an impedance of $8\ \Omega$ are connected, the output level will be as indicated. However, if the speaker impedance is $16\ \Omega$, the output level will be one-half the indicated value, and if the impedance is $4\ \Omega$, the output level will be double the indicated value.

$$\text{Actual output} = \text{meter indication} \times \frac{8\ (\Omega)}{\text{impedance of the speakers}\ (\Omega)}$$

⑤ Speaker selectors/indicators (SPEAKERS)

These selectors are used to select the speakers (A and/or B).
OFF: No sound will be heard from the speakers.

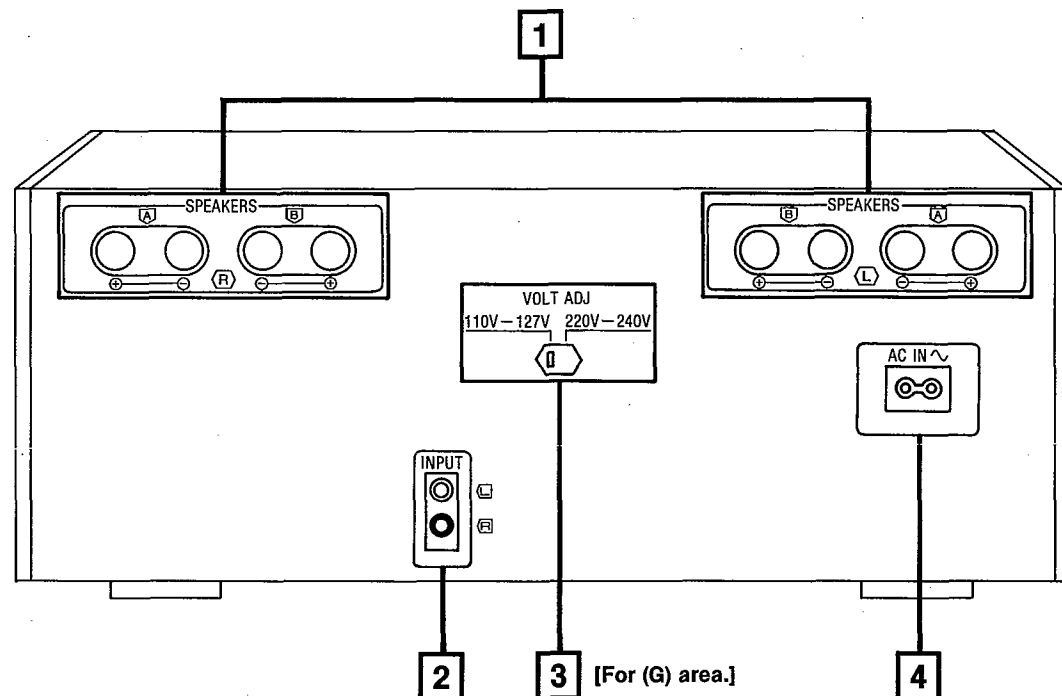
A: Sound can be heard from the speakers connected to the "A" terminals.

B: Sound can be heard from the speakers connected to the "B" terminals.

A + B: Sound can be heard simultaneously from the speakers connected to the "A" terminals and the "B" terminals.

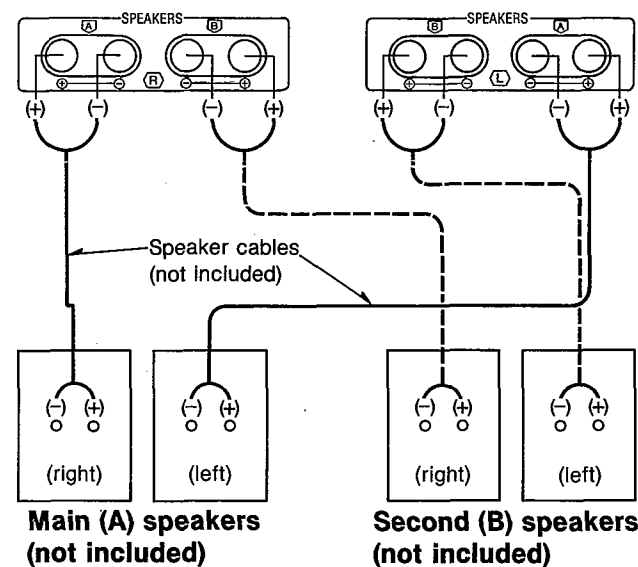
CONNECTIONS

Before making connections, be sure that the power to this unit and all other equipment is first turned off.



1 To connect speakers

One pair of speakers can be connected to the "A" terminals of this unit and one pair to the "B" terminals.



Note:
Be sure to only connect positive (+) wires to positive (+) terminals, and negative (-) wires to negative (-) terminals.

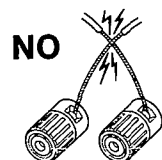
Speaker impedance

- When only the "A" or only the "B" terminals are used: 4-16 ohms
- When both the "A" and the "B" terminals are used simultaneously: 8-16 ohms

Connection of speaker wires

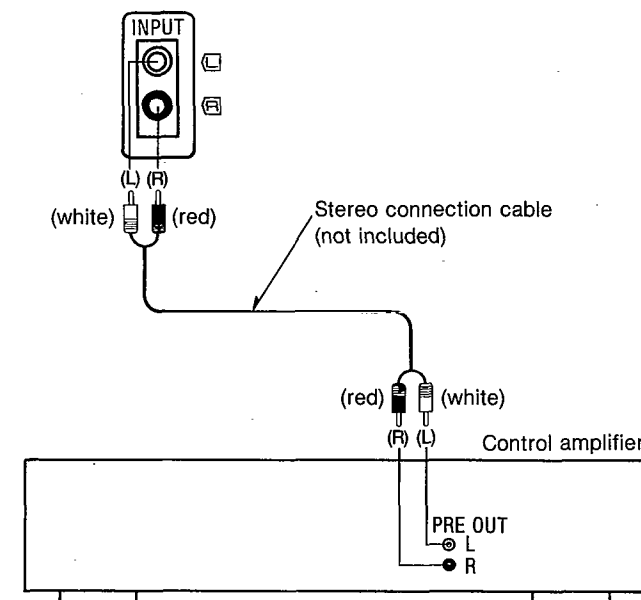
1. Twist the center conductor. 15 mm → Twist.
2. Turn the knob to the left and insert the wire. →
3. Tighten the knob by turning it to the right and pull the wire to assure a proper connection. →

To prevent damage to the circuitry, never short-circuit positive (+) and negative (-) speaker wires.



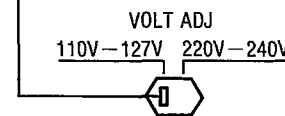
2 To connect to the control amplifier

Use a stereo connection cable (not included) to connect to the output terminals of the control amplifier.



3 To set the power voltage [For (G) area.]

Set the voltage selector to "110 V-127 V" or "220 V-240 V" according to the area in which the unit will be used. [Use a minus (-) screwdriver]



Note:
Note that this unit will be seriously damaged if this setting is not made correctly.

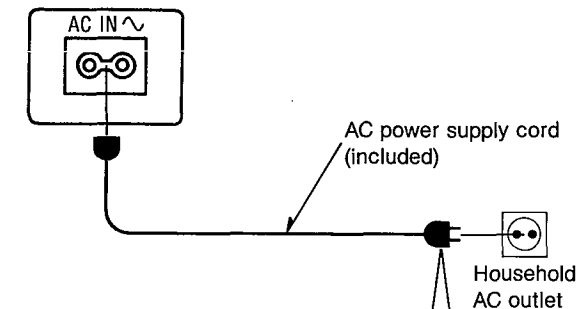
Caution:
Do not place books, etc., on top of this unit so that the heat radiation vents remain unblocked.

4 To connect the AC power supply cord

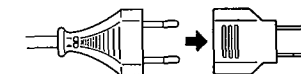
[For (EB) area.]
BE SURE TO READ THE CAUTION FOR THE AC MAINS LEAD ON PAGE 3 BEFORE MAKING THE FOLLOWING CONNECTION.

Connect the AC power supply cord (included) after all other cables and cords are connected.

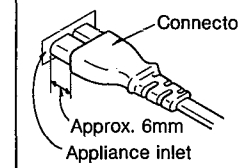
Note:
The configuration of the AC power supply cord differs according to area.



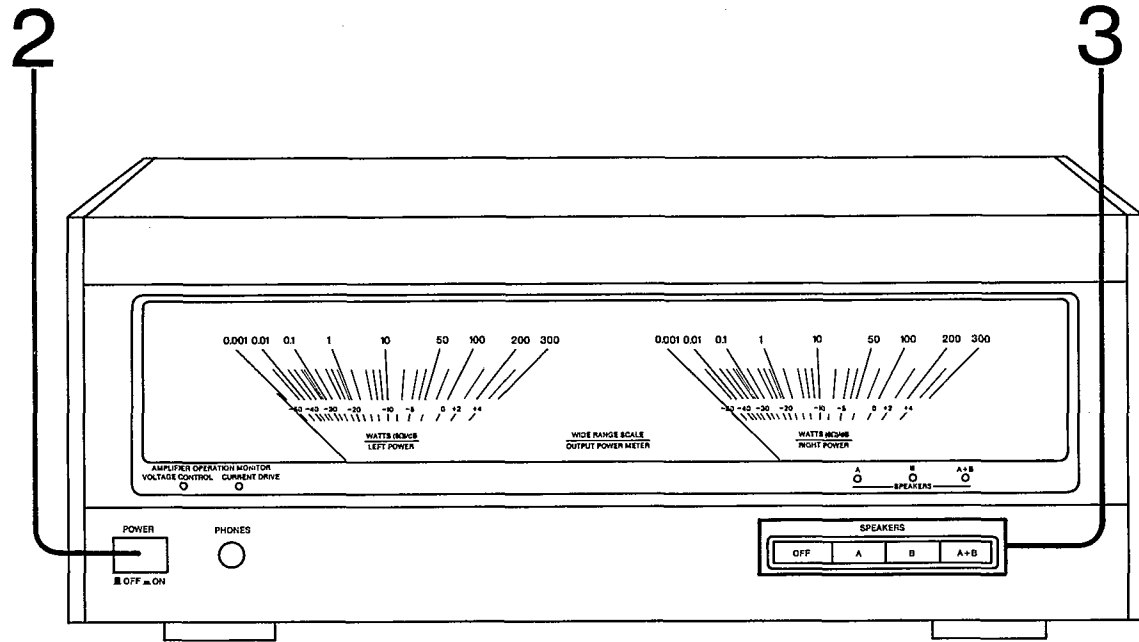
[For (G) area.]
If the power plug will not fit your socket, use the power plug adaptor (included).



Insertion of Connector
Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.



OPERATION



In order to protect the speakers, before performing the following procedure, set the volume on the control amplifier to the minimum position.

1 Switch on the power of the control amplifier.

2 Switch ON the power of this unit. (The operation indicators will illuminate.)

3 Select the speakers to be used. (The corresponding speaker indicator will illuminate.)

4 Operate the tape deck, CD player, or other equipment and adjust the volume on the control amplifier.

NOTE:

Because this unit has a very high output level, if the permissible input of the speaker is only low, the speakers could become damaged. Therefore, watch the power meters while adjusting the volume on the control amplifier and do not exceed the permissible input of the speakers being used.

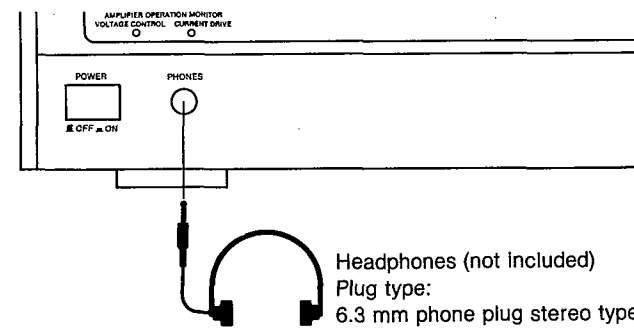
After listening is finished:

First switch off the power of this unit, and then switch off the power of the control amplifier.

When listening through headphones

Connect the headphones to the headphones jack.

Always be sure to turn down the volume on the control amplifier before connecting the headphones.



If the sound from the speakers is not wanted, set the speaker selector to the "OFF" position.

Note:

Avoid listening for prolonged periods of time to prevent hearing damage.

DESCRIPTION OF TECHNICAL FEATURES

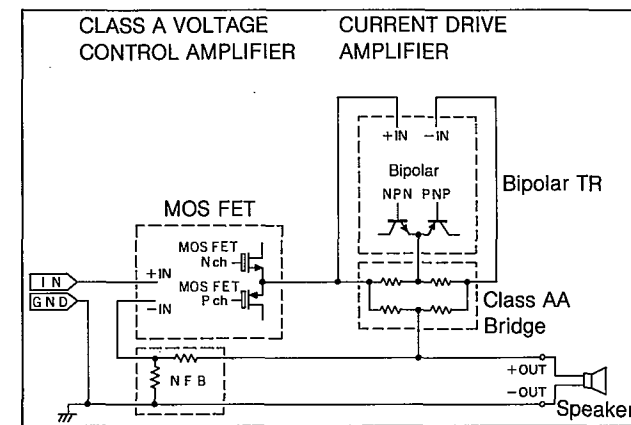
Newly developed "MOS class AA" circuit

Technics developed the Class AA circuit in 1985, and since that time it has been used in many amplifiers. With the conventional power amplifiers, a single amplifier was used to perform two functions: "amplify the voltage" and "drive the current to the speakers". The Class AA circuit is a totally new and unique concept which has succeeded in combining two separate amplifiers, each of which performs one specific function.

Great progress has recently been made in semiconductor mass production technology, and the MOS FET, said to be the ideal semiconductor amplifier component, has been improved for use in audio equipment. However, as a component for the output stage, the MOS FET still has its own strong points and weak points when compared with the conventional bipolar transistor. Thus, by extending and expanding the features of the Class AA circuit, which created a whole new concept for the relationship between an amplifier's voltage amplification and current amplification, Technics has now developed the new MOS Class AA circuit, which combines the strong points of both the bipolar transistor and the MOS FET.

Considering the special features of the MOS Class AA circuit from the circuitry aspect, it is comprised of an A class voltage control amplifier which performs overall control of the entire amplifier, and a B class amplifier which generates the current to drive the speakers, thus combining high-quality A class sound with the capability to drive any type of speaker. Furthermore, in order to make the most of the features of this circuitry composition, a MOS FET which has excellent input and output linearity is used for the voltage control amplifier, and a bipolar transistor which has outstanding drive capability is used for the current drive amplifier.

As a result, the sound data from the input source is faithfully reproduced without the addition of any unwanted noise.



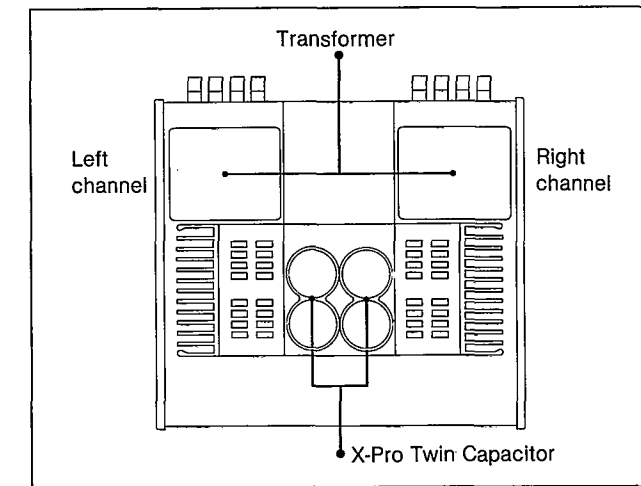
MOS Class AA circuit

Twin-monaural composition with high-performance power supply units

This circuit features a twin-monaural composition in which the left channel and the right channel are independent of each other. As a result, noise generated by mutual interference between the two channels and the cross talk phenomenon have been drastically reduced.

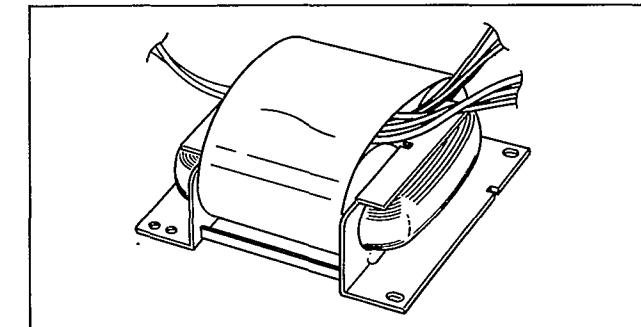
The power supply section for each channel is equipped with a high-performance R-shaped core transformer having extremely low leakage flux. In addition, X-Pro twin capacitors are used for the electrolytic capacitors. In this composition, for each capacitor, there are two electrolytic capacitors, one for the (+)

side and one for the (-) side, packed together with shock-absorbing material into a resin case with a copper cap, thus reducing both mechanical vibration and electromagnetic radiation. Using this twin-monaural composition with its high-performance power supply units, it is possible to reproduce powerful super-bass sounds and achieve excellent channel separation.



R-shaped core transformer with low leakage flux

Most transformers use an EI type core or a toroidal core. However, in either case the core's cross-section is square-shaped, so the magnetic flux induced by the coil is not uniform, but rather lopsided at certain parts. In contrast, this power amplifier is equipped with a transformer which has a core with an R-shaped cross-section, thus reducing leakage flux and preventing the entrance of unwanted noise.



Other features

High-precision large-sized power meters

This model is equipped with the same large-sized power meters which have become a tradition on Technics power amplifiers. Furthermore, it is also equipped with operation indicators that confirm when the voltage control amplifier and the current drive amplifier are ready to operate and with speaker indicators.

Electronic speaker selectors

Electronic switches are used for the speaker selectors. Gold-clad contacts are used for the selector relays, thus providing light-touch operation and high reliability.

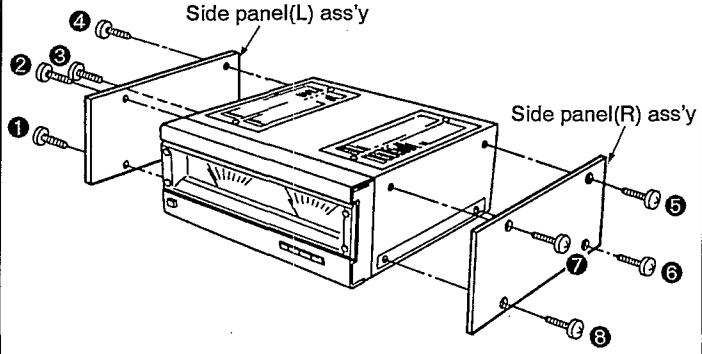
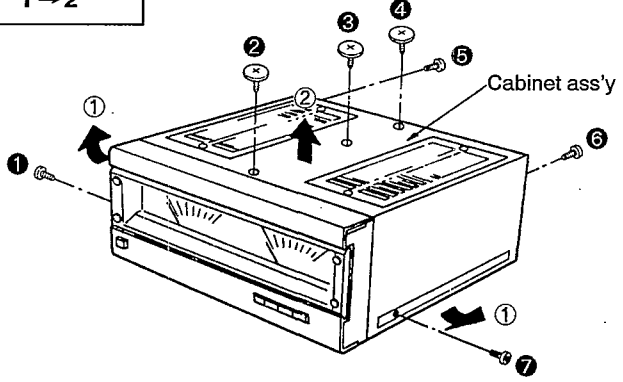
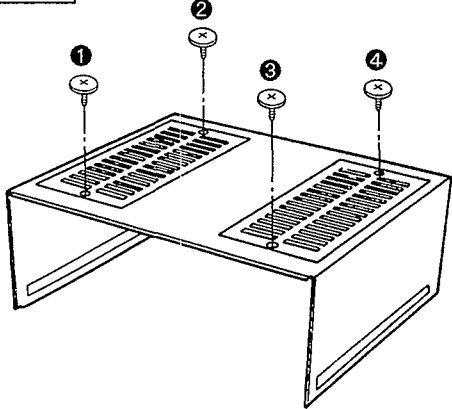
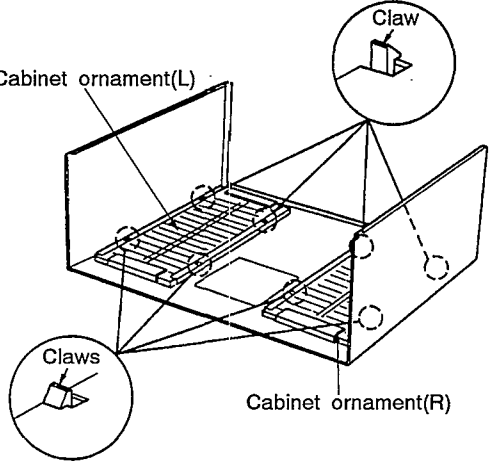
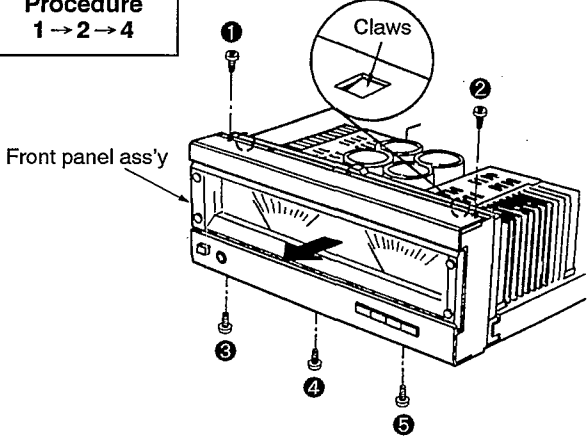
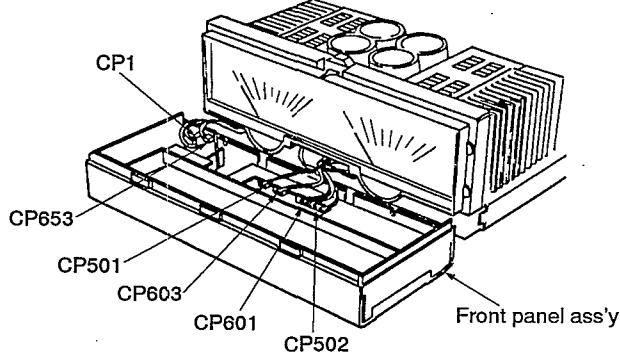
High-rigidity chassis

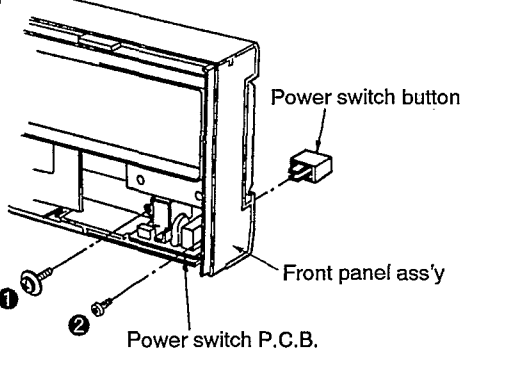
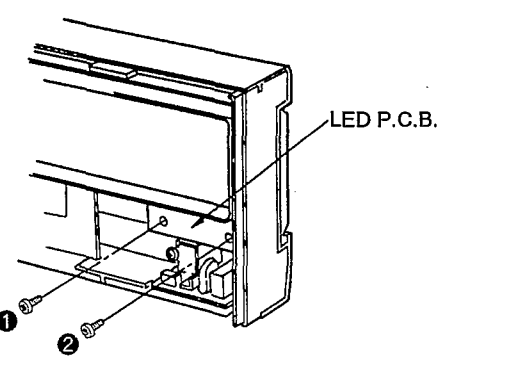
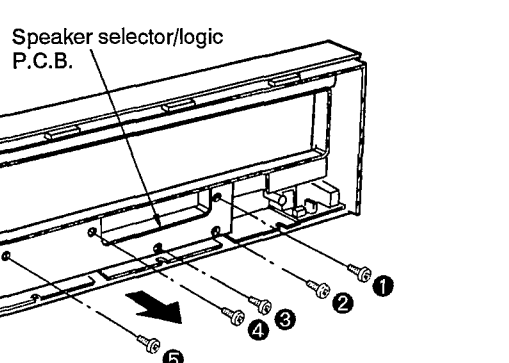
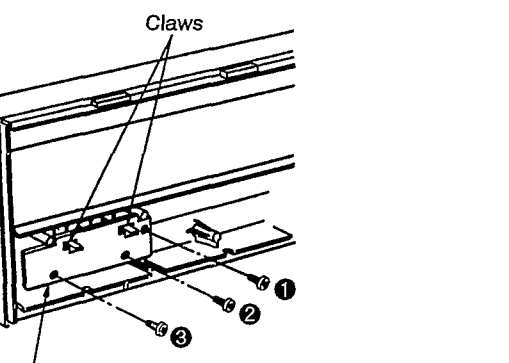
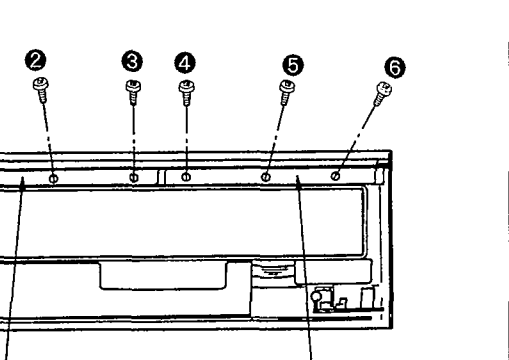
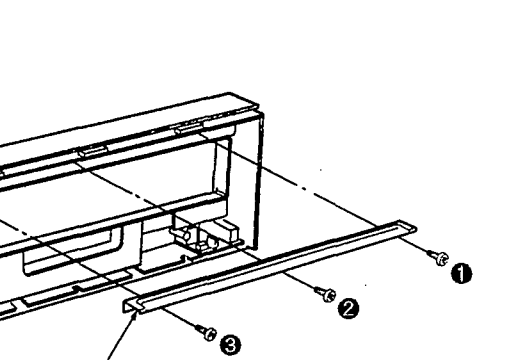
In order to provide solid support for the high-performance circuitry components, the cabinet features a completely vibration-proof design made possible by a high-rigidity chassis.

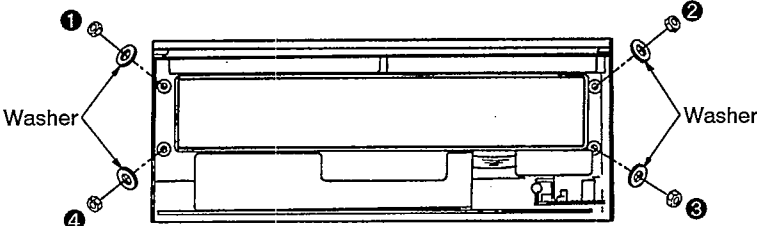
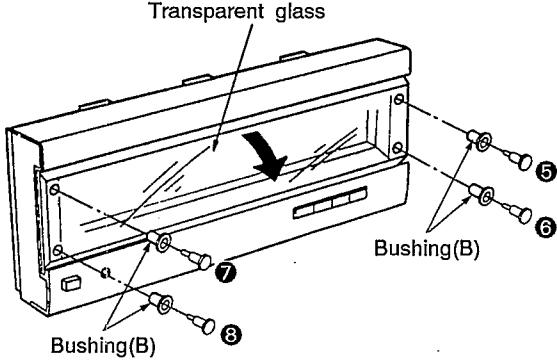
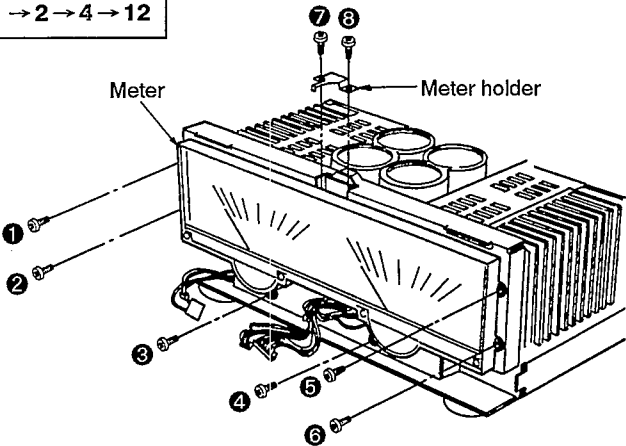
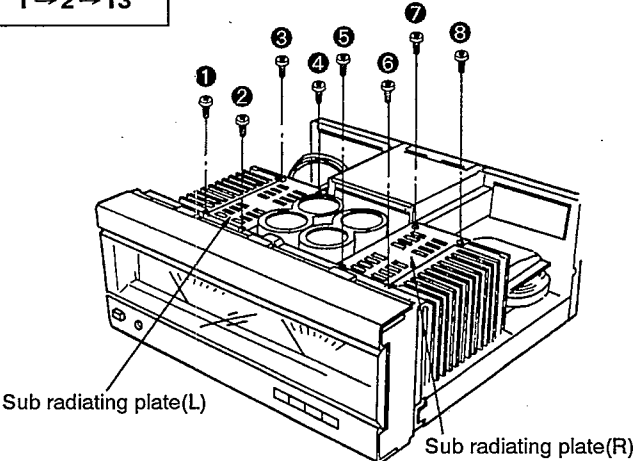
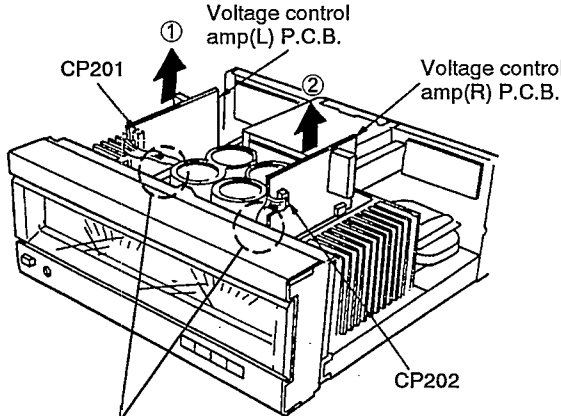
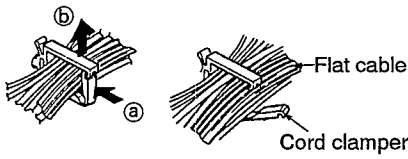
DISASSEMBLY INSTRUCTIONS

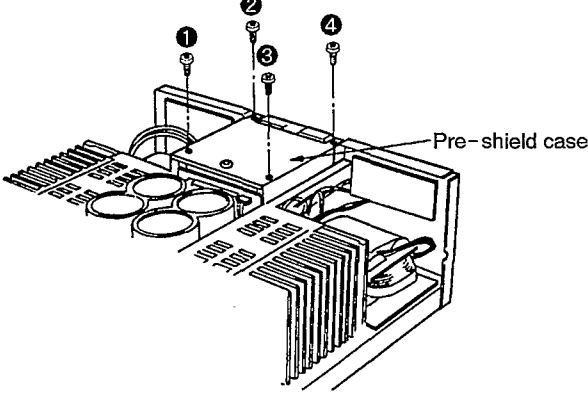
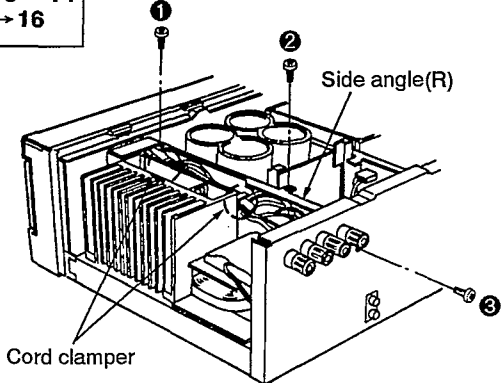
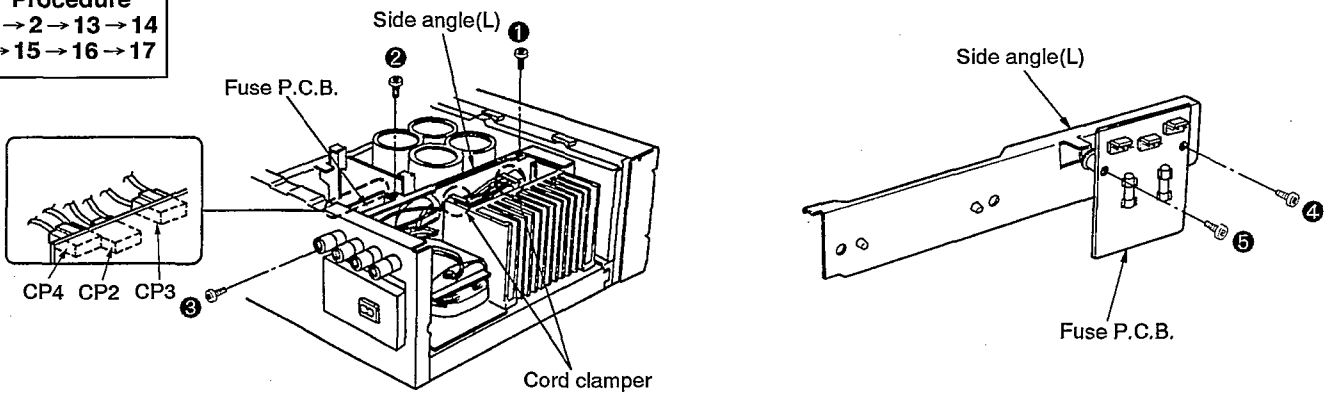
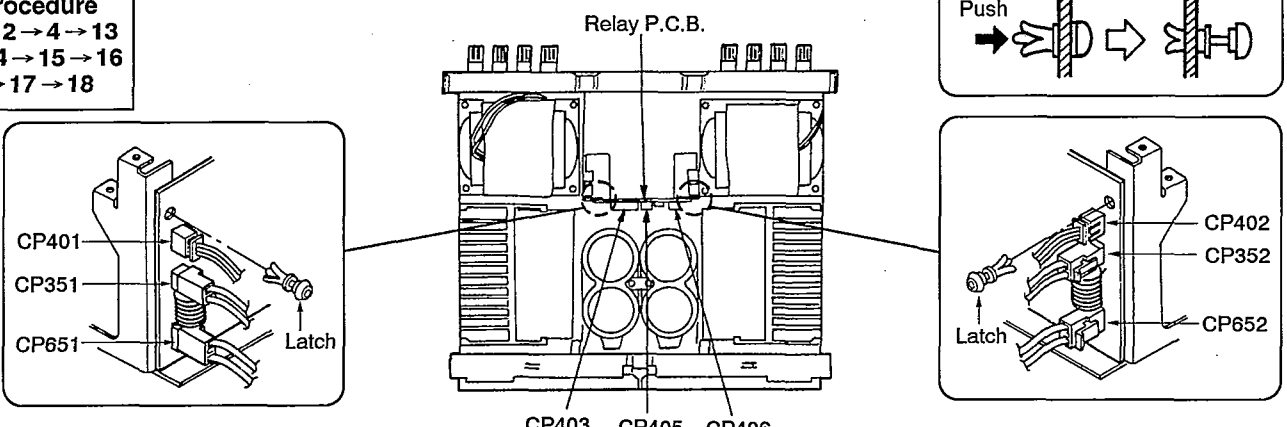
"ATTENTION SERVICER"

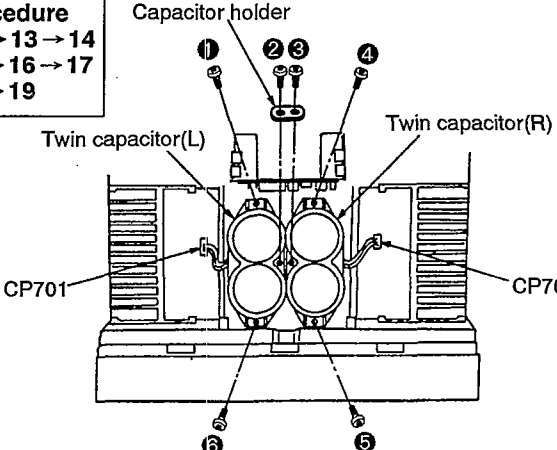
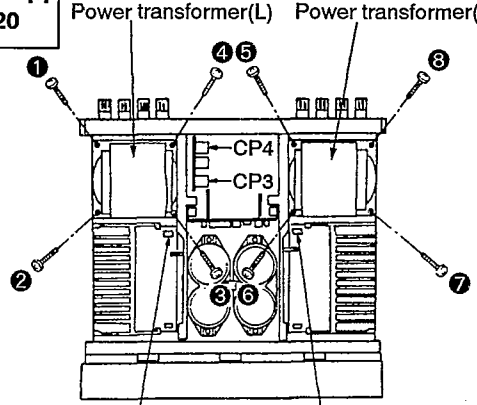
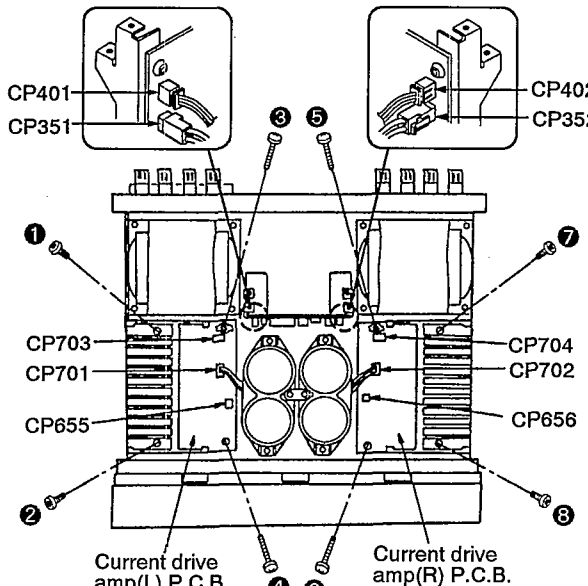
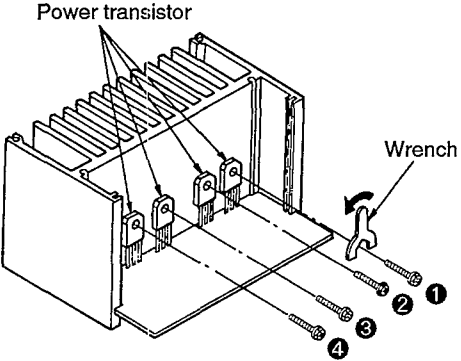
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

<p>Ref.No. 1</p>	<p>Removal of the side panel(L) ass'y and side panel(R) ass'y</p>	<p>Ref.No. 2</p>	<p>Removal of the cabinet ass'y</p>
<p>Procedure 1</p>	 <p>Side panel(L) ass'y</p> <p>Side panel(R) ass'y</p> <ul style="list-style-type: none"> Remove the 8 screws(① ~ ⑧). 	<p>Procedure 1→2</p>	 <p>Cabinet ass'y</p> <ol style="list-style-type: none"> Remove the 7 screws(① ~ ⑦). Stretch the cabinet ass'y in the direction of arrow ①, and then remove the cabinet ass'y in the direction of arrow ②.
<p>Ref.No. 3</p>	<p>Removal of the cabinet ornament(L) and cabinet ornament(R)</p>	<p>Ref.No. 4</p>	<p>Removal of front panel ass'y</p>
<p>Procedure 1→2→3</p>	 <p>1. Remove the 4 screws(① ~ ④).</p>  <p>Cabinet ornament(L)</p> <p>Cabinet ornament(R)</p> <p>Claw</p> <p>2. Release the 8 claws.</p>	<p>Procedure 1→2→4</p>	 <p>Front panel ass'y</p> <p>Claws</p> <ol style="list-style-type: none"> Remove the 5 screws(① ~ ⑤). Release the 2 claws and then remove the front panel ass'y in the direction of arrow.  <p>CP1</p> <p>CP653</p> <p>CP501</p> <p>CP603</p> <p>CP601</p> <p>CP502</p> <p>Front panel ass'y</p> <ol style="list-style-type: none"> Remove the 6 connectors(CP1, CP501, CP502, CP601, CP603, CP653).

<p>Ref.No. 5</p>	<p>Removal of the power switch P.C.B.</p>	<p>Ref.No. 6</p>	<p>Removal of the LED P.C.B.</p>
<p>Procedure 1 → 2 → 4 → 5</p>	 <p>1. Remove the power switch button by pushing it from behind the front panel ass'y. 2. Remove the 2 screws (①, ②).</p>	<p>Procedure 1 → 2 → 4 → 6</p>	 <p>• Remove the 2 screws (①, ②).</p>
<p>Ref.No. 7</p>	<p>Removal of the speaker selector/logic P.C.B.</p>	<p>Ref.No. 8</p>	<p>Removal of the speaker switch P.C.B.</p>
<p>Procedure 1 → 2 → 4 → 7</p>	 <p>1. Remove the 5 screws (① ~ ⑤). 2. Remove the speaker selector/logic P.C.B. in the direction of arrow.</p>	<p>Procedure 1 → 2 → 4 → 7 → 8</p>	 <p>1. Remove the 3 screws (① ~ ③). 2. Release the 2 claws.</p>
<p>Ref.No. 9</p>	<p>Removal of the lamp(1) P.C.B. and lamp(2) P.C.B.</p>	<p>Ref.No. 10</p>	<p>Removal of the lamp house</p>
<p>Procedure 1 → 2 → 4 → 9</p>	 <p>• Remove the 6 screws (① ~ ⑥).</p>	<p>Procedure 1 → 2 → 4 → 9 → 10</p>	 <p>• Remove the 3 screws (① ~ ③).</p>

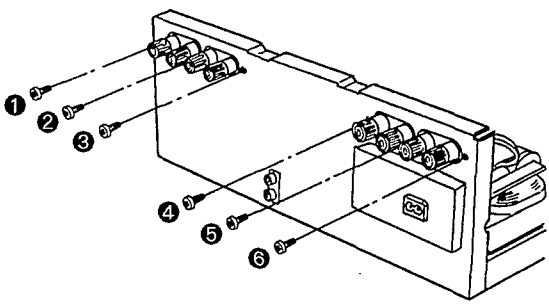
Ref.No. 11	Removal of the transparent glass		
Procedure 1 → 2 → 4 → 11			
			
<ol style="list-style-type: none"> 1. Remove the 4 nuts(① ~ ④). 2. Remove the 4 washers. 		<ol style="list-style-type: none"> 3. Pull out the 4 screws(⑤ ~ ⑧) and bushing(B). 4. Remove the transparent glass in the direction of arrow. 	
Ref.No. 12	Removal of the meter	Ref.No. 13	Removal of the sub radiating plate (L) and sub radiating plate (R)
Procedure 1 → 2 → 4 → 12			Procedure 1 → 2 → 13
			
<ol style="list-style-type: none"> 1. Remove the 8 screws(① ~ ⑧). 2. Remove the meter holder. 		<ul style="list-style-type: none"> • Remove the 8 screws(① ~ ⑧). 	
Ref.No. 14	Removal of the voltage control amp(L) P.C.B. and voltage control amp(R) P.C.B.		
Procedure 1 → 2 → 13 → 14			
<p>■ Removal of the voltage control amp(L) P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the flat cable form cord clamber. 2. Pull out the voltage control amp(L) P.C.B. in the direction of arrow ①. 3. Remove the 1 connector(CP201). <p>■ Removal of the voltage control amp(R) P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the flat cable form cord clamber. 2. Pull out the voltage control amp(R) P.C.B. in the direction of arrow ②. 3. Remove the 1 connector(CP202). 		 <div data-bbox="831 1816 1273 1995" style="border: 1px solid black; padding: 5px;">  </div>	

<p>Ref.No. 15</p>	<p>Removal of the pre-shield case</p>	<p>Ref.No. 16</p>	<p>Removal of the side angle(R)</p>
<p>Procedure 1 → 2 → 15</p>	 <p>• Remove the 4 screws(① ~ ④).</p>		<p>Procedure 1 → 2 → 13 → 14 → 15 → 16</p>  <p>1. Remove the lead wire form cord clamber. 2. Remove the 3 screws(① ~ ③).</p>
<p>Ref.No. 17</p>	<p>Removal of the side angle(L) and fuse P.C.B.</p>	 <p>1. Remove the 3 connectors(CP2, CP3, CP4). 2. Remove the lead wire form cord clamber. 3. Remove the 3 screws(① ~ ③). 4. Remove the side angle(L) and fuse P.C.B.</p> <p>5. Remove the 2 screws(④, ⑤), and then remove the fuse P.C.B.</p>	
<p>Ref.No. 18</p>	<p>Removal of the relay P.C.B.</p>	<p>■ Removal of the latch</p>  <p>1. Remove the 2 latches. 2. Remove the 9 connectors(CP351, CP352, CP401, CP402, CP403, CP405, CP406, CP651, CP652).</p>	

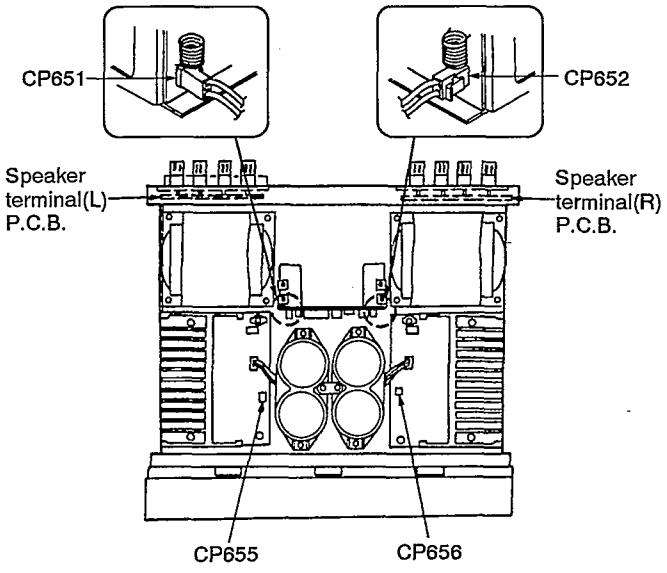
Ref.No. 19	Removal of the twin capacitor(L) and twin capacitor(R)	Ref.No. 20	Removal of the power transformer (L) and power transformer(R)
Procedure 1 → 2 → 13 → 14 → 15 → 16 → 17 → 19	 <ol style="list-style-type: none"> 1. Remove the 2 connectors (CP701, CP702) 2. Remove the 6 screws (1 ~ 6). 3. Remove the capacitor holder. 	Procedure 1 → 2 → 13 → 14 → 15 → 20	 <ol style="list-style-type: none"> 1. Remove the 8 screws (1 ~ 8). 2. Remove the 4 connectors (CP3, CP4, CP703, CP704).
Ref.No. 21	Removal of the current drive amp(L) P.C.B. and current drive amp(R) P.C.B.	 <ol style="list-style-type: none"> 1. Remove the 4 screws (1 ~ 4). 2. Remove the 5 connectors (CP351, CP401, CP655, CP701, CP703). 3. Remove the 4 screws (5 ~ 8). 4. Remove the 5 connectors (CP352, CP402, CP656, CP702, CP704). 	
Ref.No. 22	Removal of the power transistor	<ol style="list-style-type: none"> 1. Unsolder the power transistor. 2. Remove the 4 screws (1 ~ 4). <p>(This figure show the left (L ch) power transistor. Remove the right (R ch) power transistor in the same way.)</p> <ul style="list-style-type: none"> • When mounting the regulator transistor. Apply silicone compound (RFKX0002) to the rear side of regulator transistor. 	

Ref.No. 23 **Removal of the speaker terminal(L) P.C.B. and speaker terminal(R) P.C.B.**

Procedure
 1 → 2 → 13 → 14
 → 15 → 16 → 17
 → 23



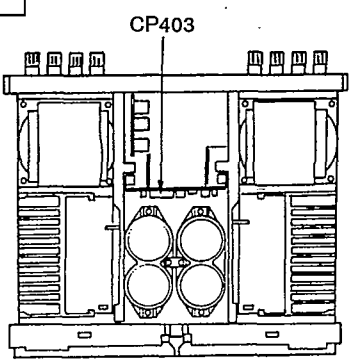
1. Remove the 6 screws(① ~ ⑥).



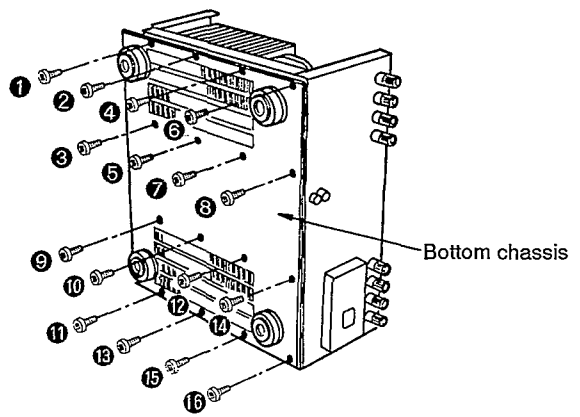
2. Remove the 4 connectors(CP651, CP652, CP655, CP656).

Ref.No. 24 **Removal of the input terminal P.C.B.**

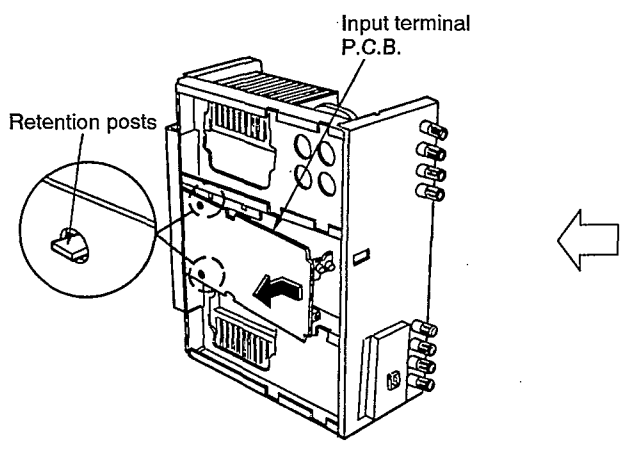
Procedure
 1 → 2 → 4 → 13
 → 14 → 15 → 24



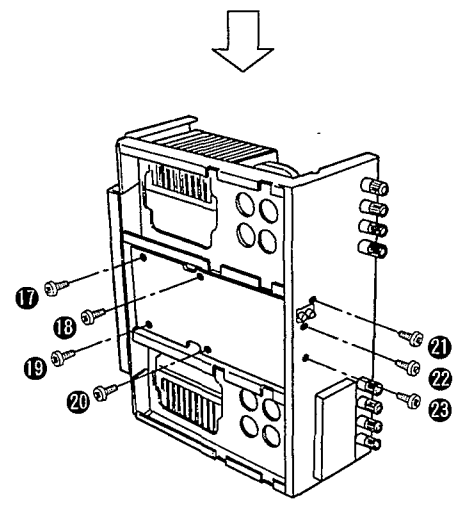
1. Remove the 1 connector(CP403).



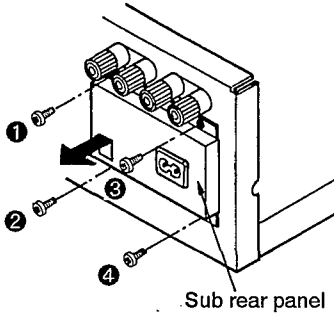
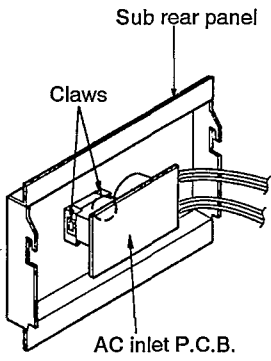
2. Remove the 16 screws(① ~ ⑯).
 3. Remove the bottom chassis.

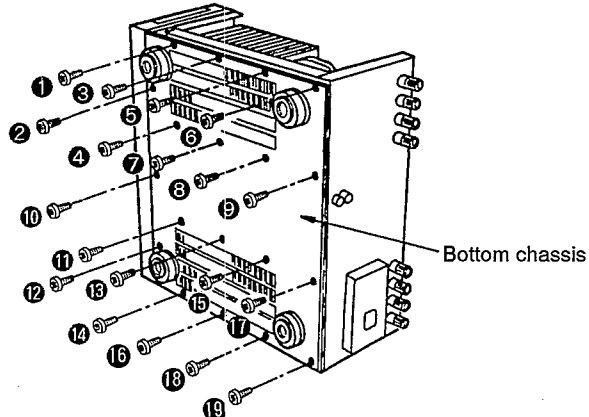
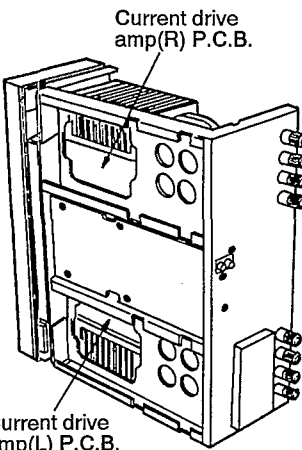
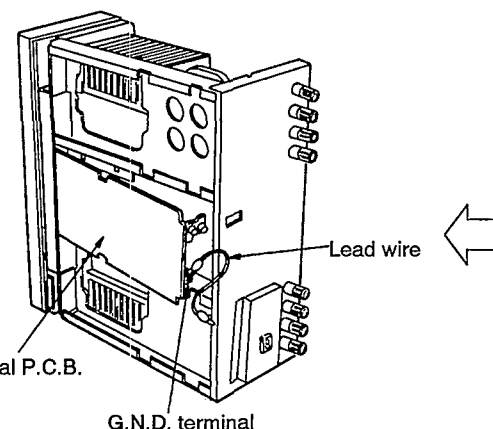
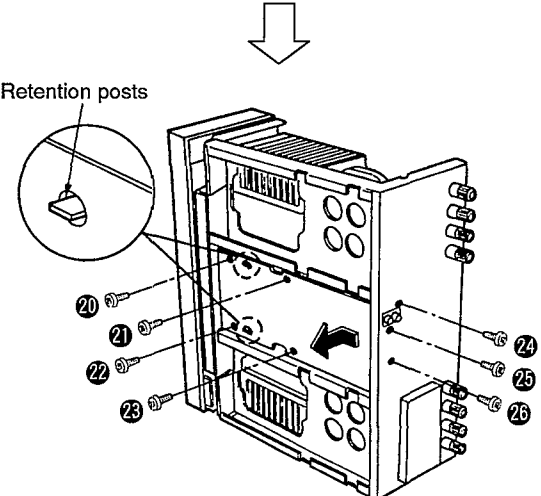


5. Lift the input terminal P.C.B. off the retention posts on the chassis ass'y.
 6. Remove the input terminal P.C.B. in the direction of arrow.



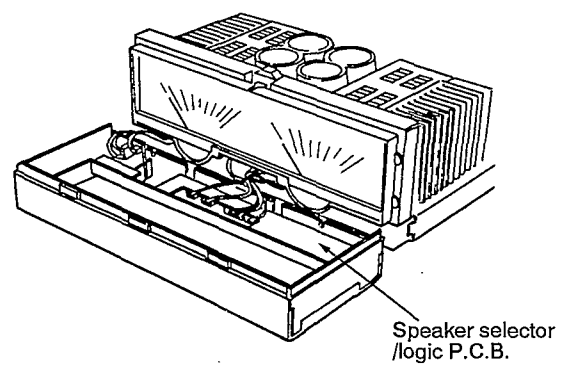
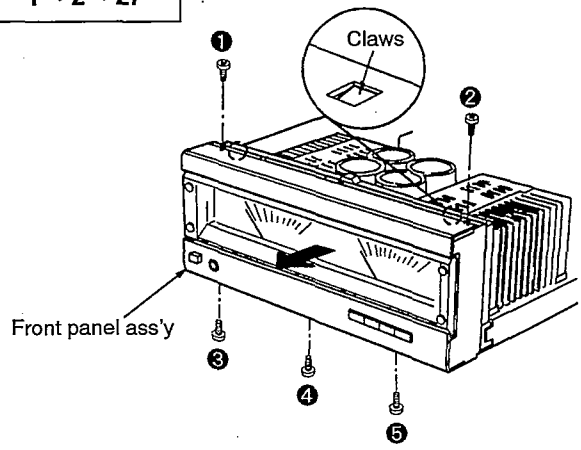
4. Remove the 7 screws(⑰ ~ ㉓).

Ref.No. 25	Removal of the AC inlet P.C.B.
Procedure 1 → 2 → 4 → 13 → 15 → 25	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Sub rear panel</p> </div> <div style="text-align: center;">  <p>Sub rear panel</p> <p>Claws</p> <p>AC inlet P.C.B.</p> </div> </div> <ol style="list-style-type: none"> 1. Remove the 1 connector(CP2). 2. Remove the 4 screws (1 ~ 4). 3. Remove the sub rear panel in the direction of arrow. 4. Release the 2 claws.

Ref.No. 26	How to check the current drive amp(L) P.C.B., current drive amp(R) P.C.B. and input terminal P.C.B.
Procedure 1 → 2 → 26	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Bottom chassis</p> </div> <div style="text-align: center;">  <p>Current drive amp(R) P.C.B.</p> <p>Current drive amp(L) P.C.B.</p> </div> </div> <ol style="list-style-type: none"> 1. Remove the 19 screws (1 ~ 19). 2. Remove the bottom chassis. 3. When checking the soldered surface of current drive amp (L), (R) P.C.B. and replacing the parts, do as shown. <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Lead wire</p> <p>Input terminal P.C.B.</p> <p>G.N.D. terminal</p> </div> <div style="text-align: center;">  <p>Retention posts</p> </div> </div> <ol style="list-style-type: none"> 7. Connect the G.N.D. terminal to the rear panel by the lead wire. 8. When checking the soldered surface of input terminal P.C.B. and replacing the parts, do as shown. 4. Remove the 7 screws (20 ~ 26). 5. Lift the input terminal P.C.B. off the retention posts on the chassis ass'y. 6. Remove the input terminal P.C.B. in the direction of arrow.

Ref.No. 27 **How to check the speaker selector /logic P.C.B.**

Procedure
1 → 2 → 27



1. Remove the 5 screws (1 ~ 5).
2. Release the 2 claws and then remove the front panel ass'y in the direction of arrow.
3. When checking the soldered surface of speaker selector /logic P.C.B. and replacing the parts, do as shown.

Ref.No. 28 **How to check the voltage control amp(L) P.C.B. and voltage control amp(R) P.C.B.**

Procedure
1 → 2 → 13 → 28

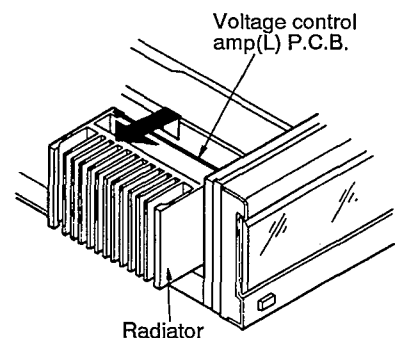
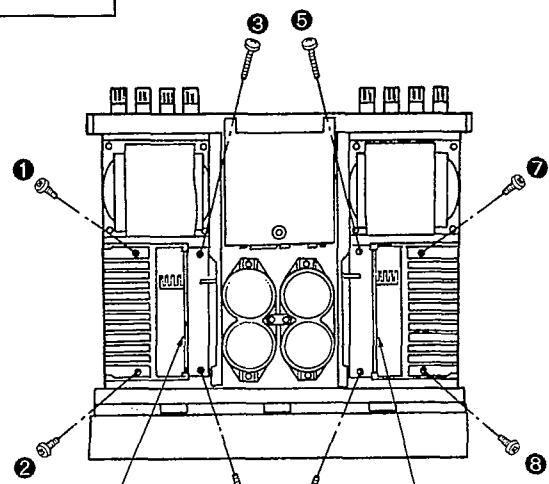


Fig. 1

Fig. 2

1. Remove the 8 screws (1 ~ 8).

2. Pull out the radiator and voltage control amp(L) P.C.B. in the direction of arrow.

Note:

- Connect the ground terminal of current drive amp(L) P.C.B. and chassis by lead wire.
- Figure 2 and figure 3 show the left (L ch) voltage control amp(L) P.C.B.
- Remove the right (R ch) voltage control amp(R) P.C.B. in the same way.

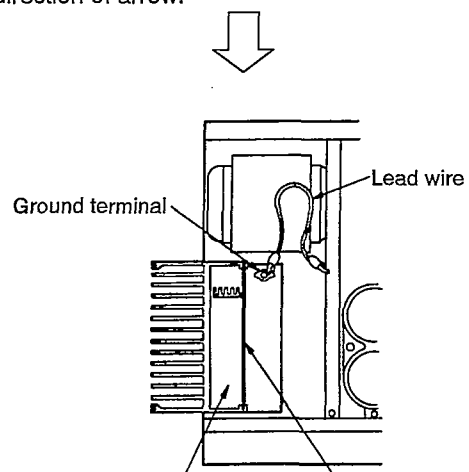
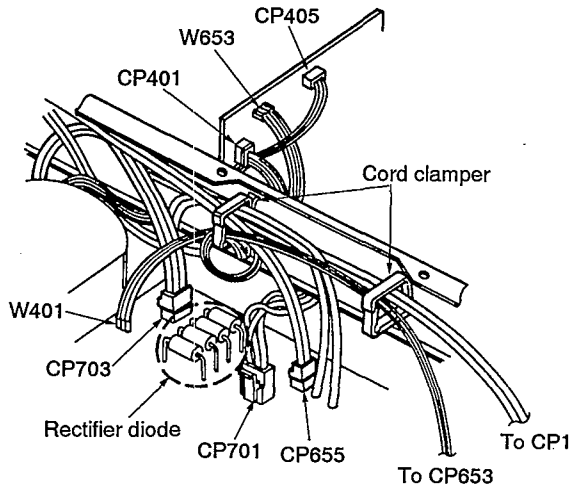


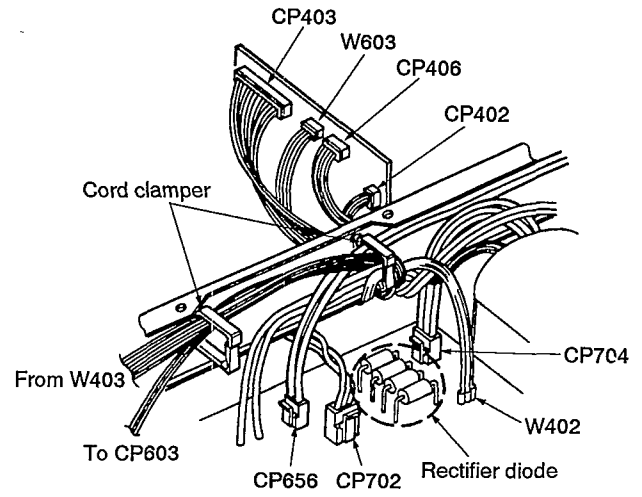
Fig. 3

3. When checking the solderd surface of voltage control amp(L) P.C.B. and replacing the parts, do as shown.

Lead wire and flat cable arrangement

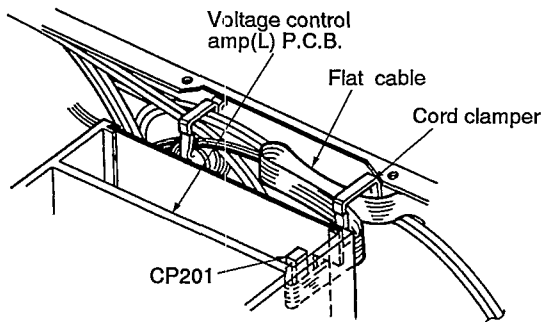


[L side]

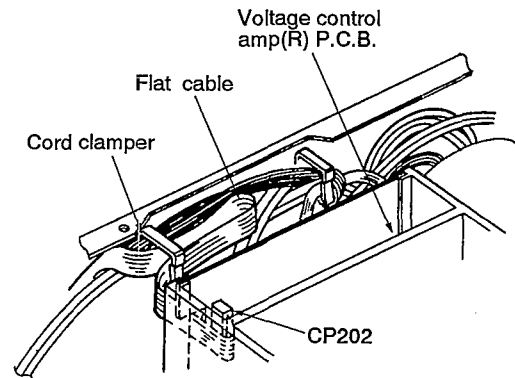


[R side]

1. Put the lead wires and flat cable through the cord clamber.
2. Arrange the various lead wires so that they are not touching the rectifier diode.
3. Care must be taken to avoid damage to the lead wires or flat cable.



[L side]



[R side]

4. After installing the voltage control amp(L), (R) P.C.B., put the flat cable attached to the connector (CP201, CP202) through the cord clamber.

MEASUREMENTS AND ADJUSTMENTS

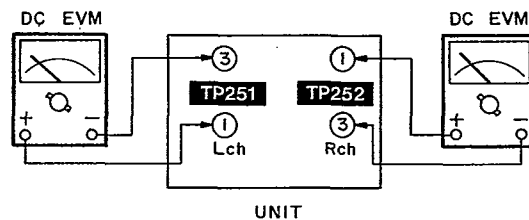
Control positions and equipment used.

- Volume knob..... ∞ (Minimum)
- AC and DC electronic voltmeter (EVM)
- AF Oscillator

(1) VOLTAGE CONTROL (V) AMP. IDLING (ICQ) ADJUSTMENT

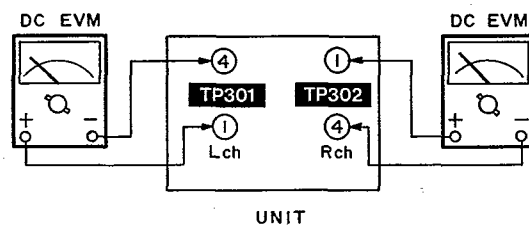
1. Connect the DC voltmeters to both channels of the amplifier, as shown on the right.
2. Set amplifier trimmer potentiometers **VR251** (L-ch.) and **VR252** (R-ch.) to center position.
3. Immediately after power-up (within 8sec. per channel), adjust **VR251** (L-ch.) and **VR252** (R-ch.) so the DC voltmeters read $70 \pm 5 \text{ mV}$.

Note: During adjustment, do not decrease the voltage below 30mV, as it may cause low-level oscillations.



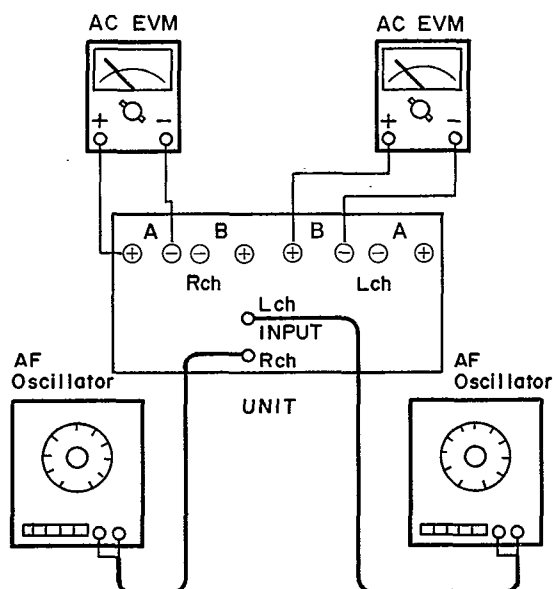
(2) CURRENT DRIVE (C) AMP. IDLING (ICQ) ADJUSTMENT

1. Connect the DC voltmeters to both channels of the amplifier, as shown on the right.
2. Turn amplifier trimmer potentiometers **VR301** (L-ch.) and **VR302** (R-ch.) fully counterclockwise.
3. Adjust **VR301** (L-ch.) and **VR302** (R-ch.) so the DC voltmeters read $3 \pm 1 \text{ mV}$ 90 seconds after power on.

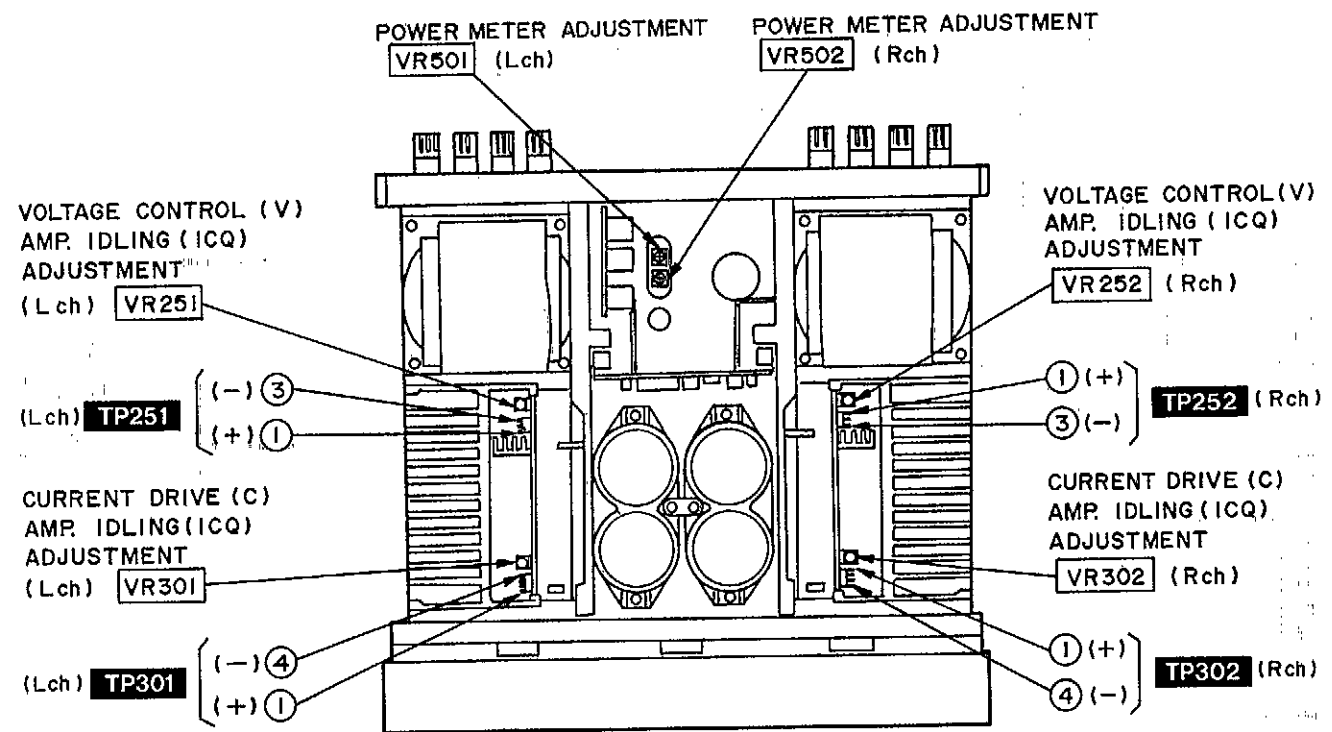


(3) POWER METER ADJUSTMENT

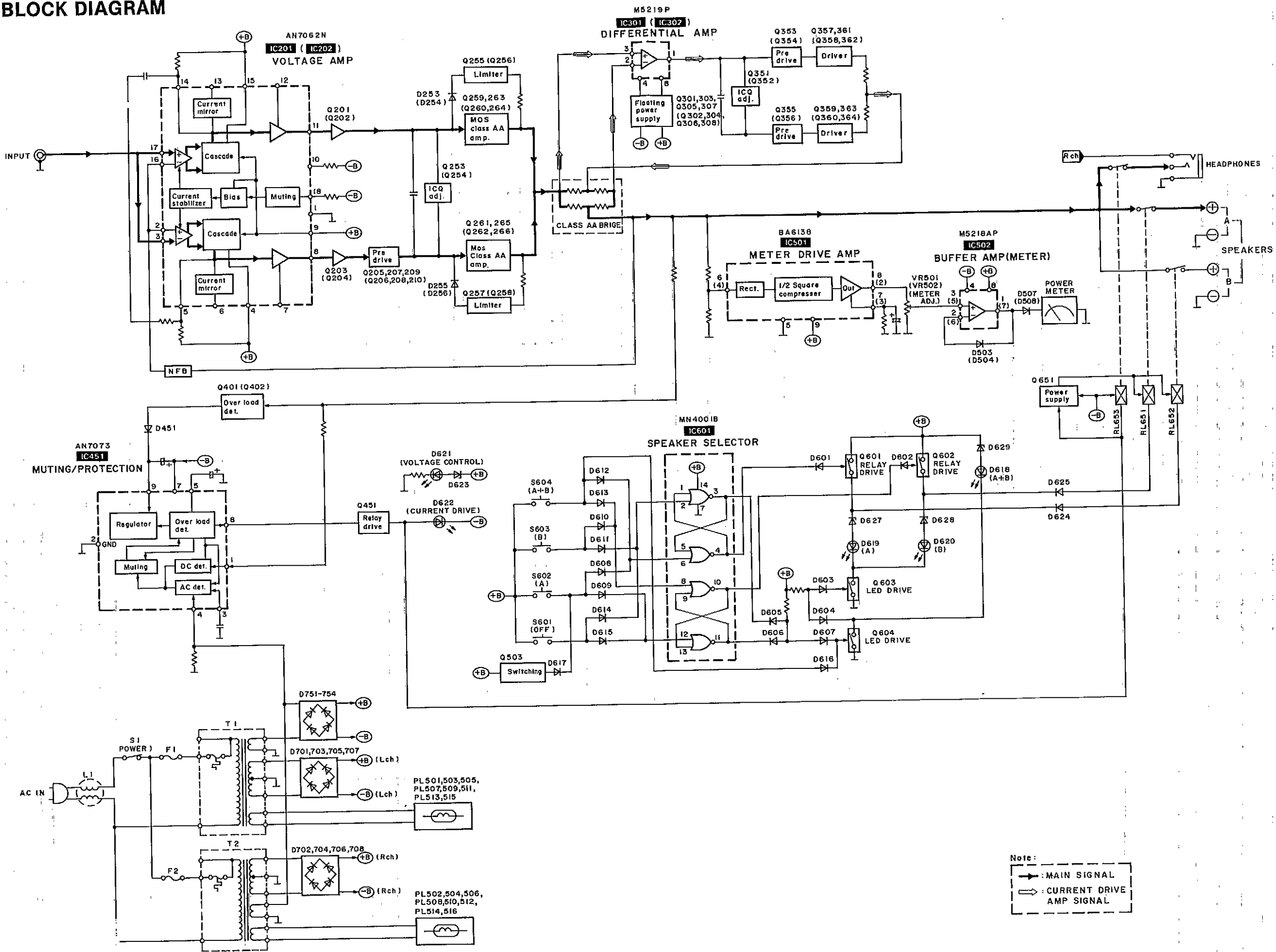
1. Connect an AF signal generator and power meter to the amplifier, as shown on the right.
2. Before powering the amplifier, set **VR501** (L-ch.) and **VR502** (R-ch.) to center position.
3. Zero adjust the power meter.
4. Apply a 1-kHz sinusoidal signal to the amplifier's input jack so the output voltage across the speaker terminals is 28.3 V (speaker load: ∞) (adjust the signal level with the AF generator's output attenuator).
5. Adjust **VR501** (L-ch.) and **VR502** (R-ch.) until the power meter reads 100 W (0dB).



• Adjustment points



■ BLOCK DIAGRAM



1 2 3 4 5 6 7 8 9 10 11 12

■ SCHEMATIC DIAGRAM

(Parts list on pages 42~45.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- S1 : Power (POWER) switch.
- S2 : Voltage Adjustment switch in "220V~240V" position.
(110V~127V → 220V~240V)
[For (G) area.]
- S601~S604:
Speaker selectors (SPEAKERS) switches.
S601: OFF, S602: A
S603: B, S604: A + B

• The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

• Signal line

- Main signal (Lch)
- Current drive amp signal (Lch)
- +B line
- -B line

• Important safety notice:

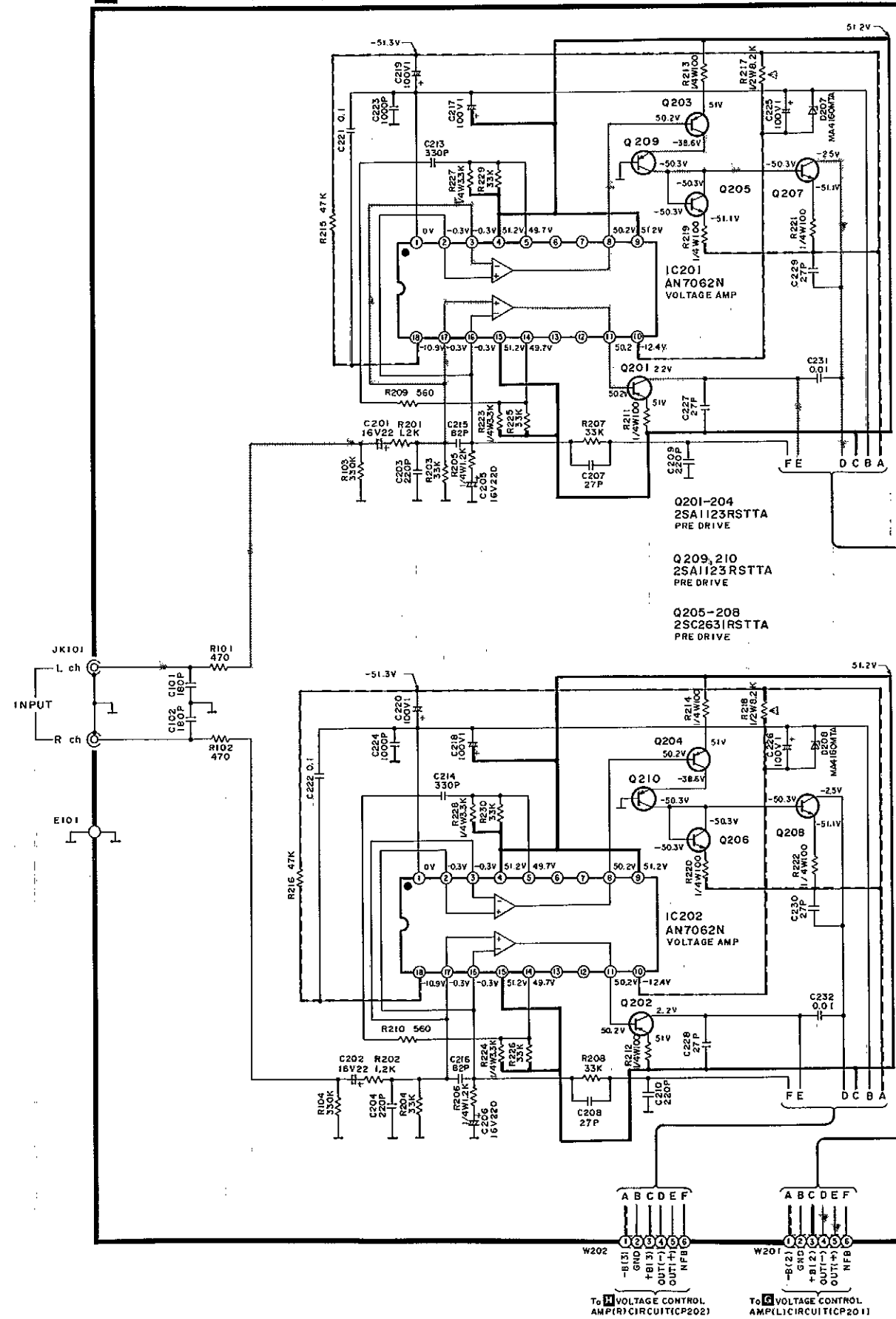
Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occasion calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

• Caution!

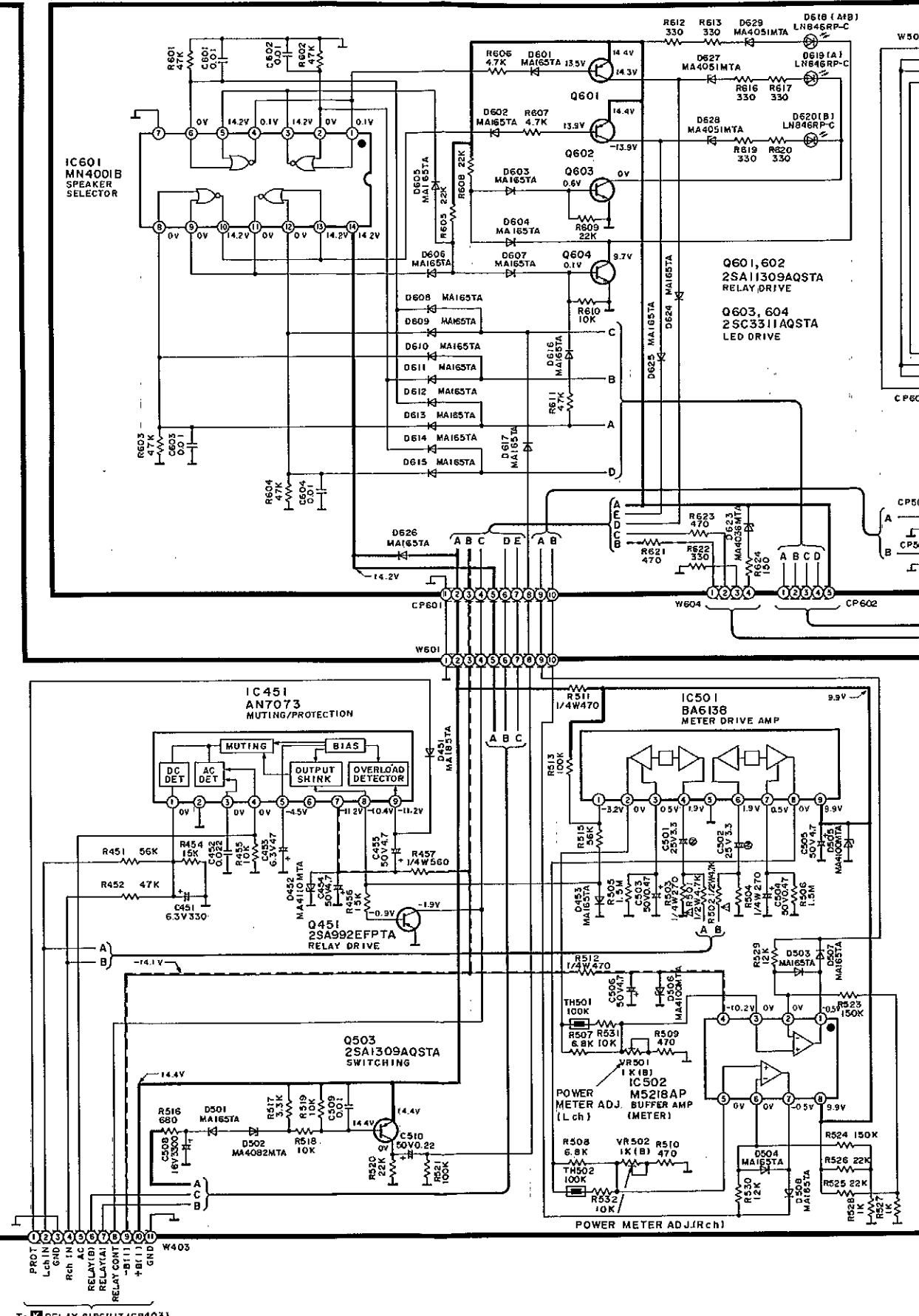
- IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

A
B
C
D
E
F

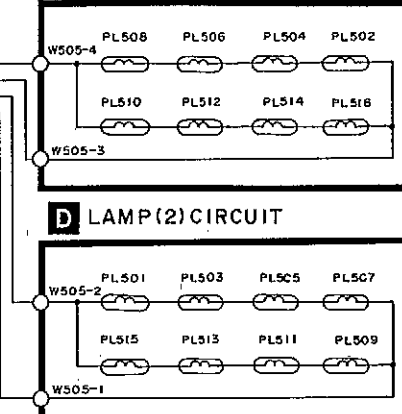
A INPUT TERMINAL CIRCUIT (VOLTAGE AMP/METER AMP/MUTING/PROTECTOR)



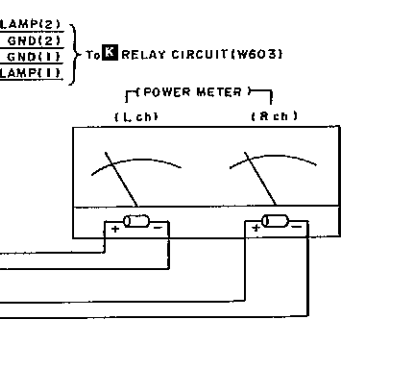
B SPEAKER SELECTOR/LOGIC CIRCUIT



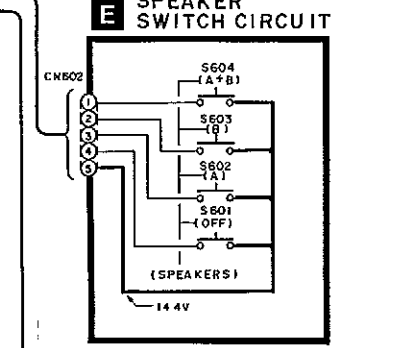
C LAMP(1) CIRCUIT



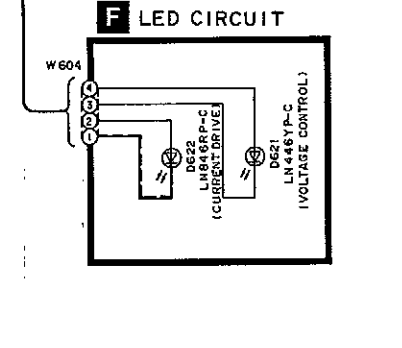
D LAMP(2) CIRCUIT

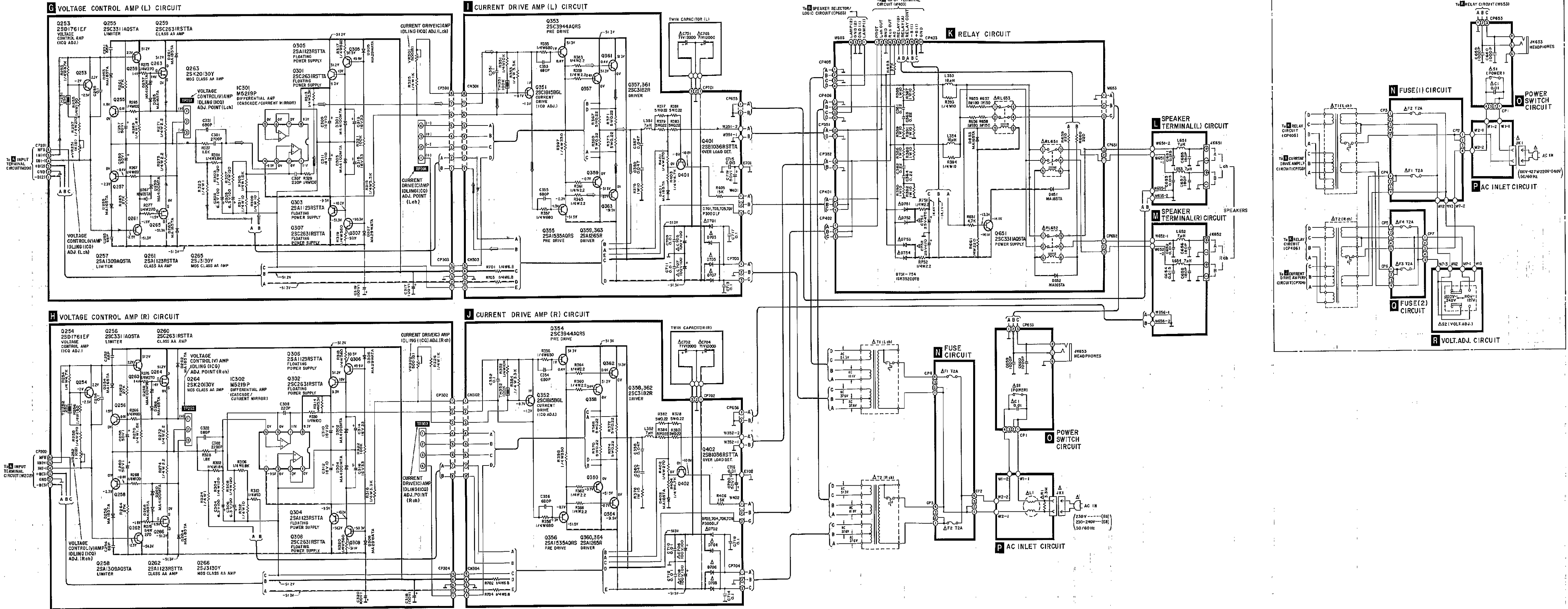


E SPEAKER SWITCH CIRCUIT



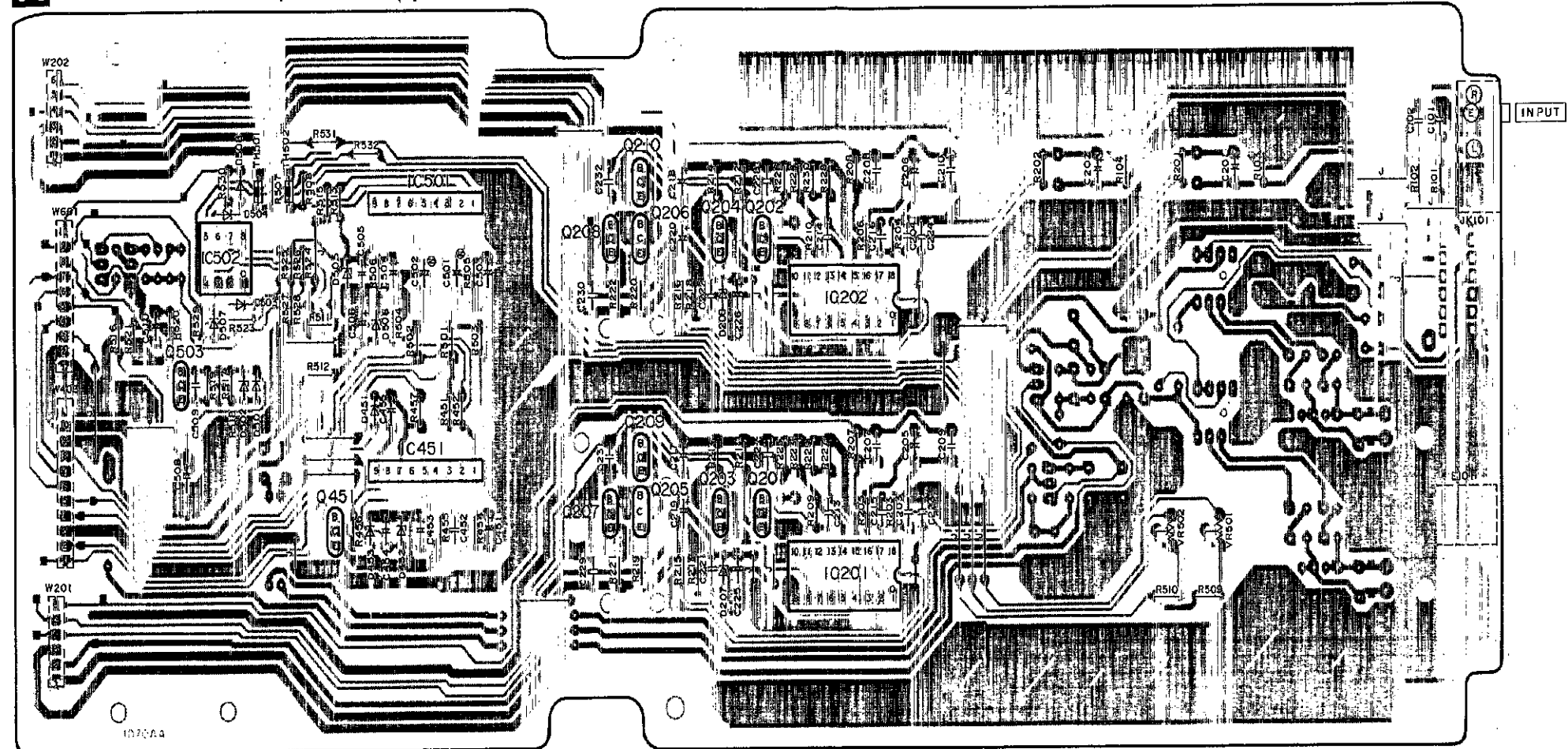
F LED CIRCUIT



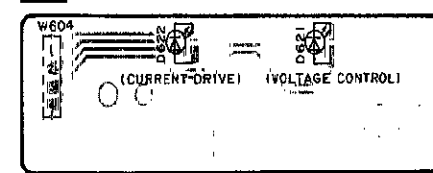


PRINTED CIRCUIT BOARDS DIAGRAM

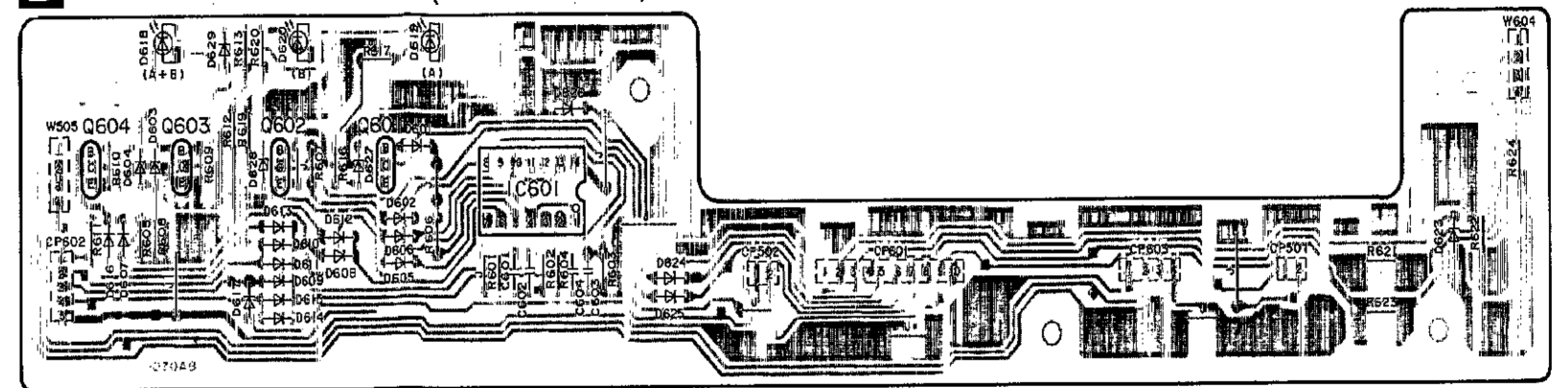
A INPUT TERMINAL P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



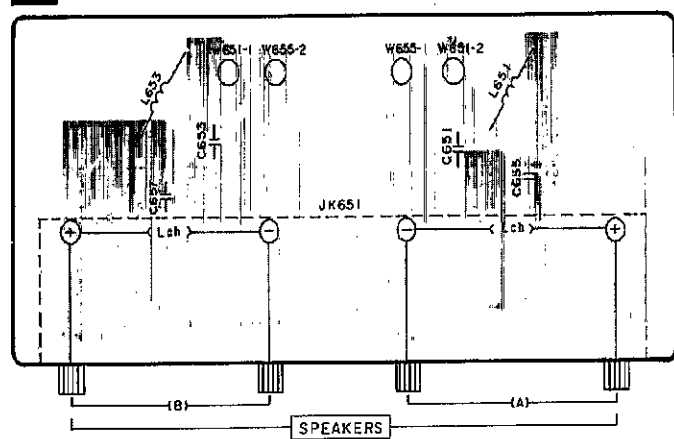
F LED P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



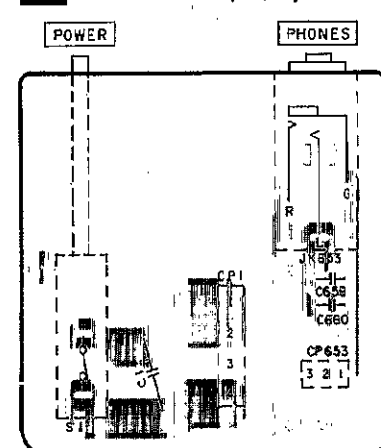
B SPEAKER SELECTOR/LOGIC P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



L SPEAKER TERMINAL (L) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



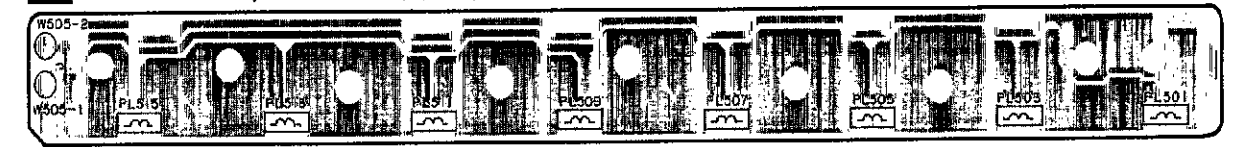
O POWER SWITCH P.C.B. (REP1616A-S... (EB,EG))



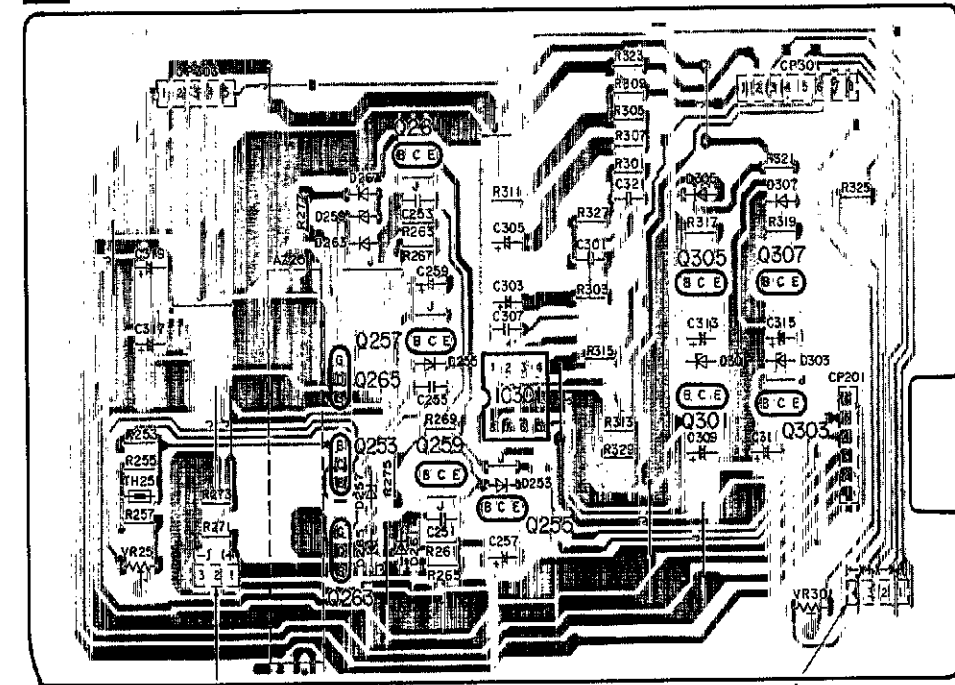
C LAMP (1) P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



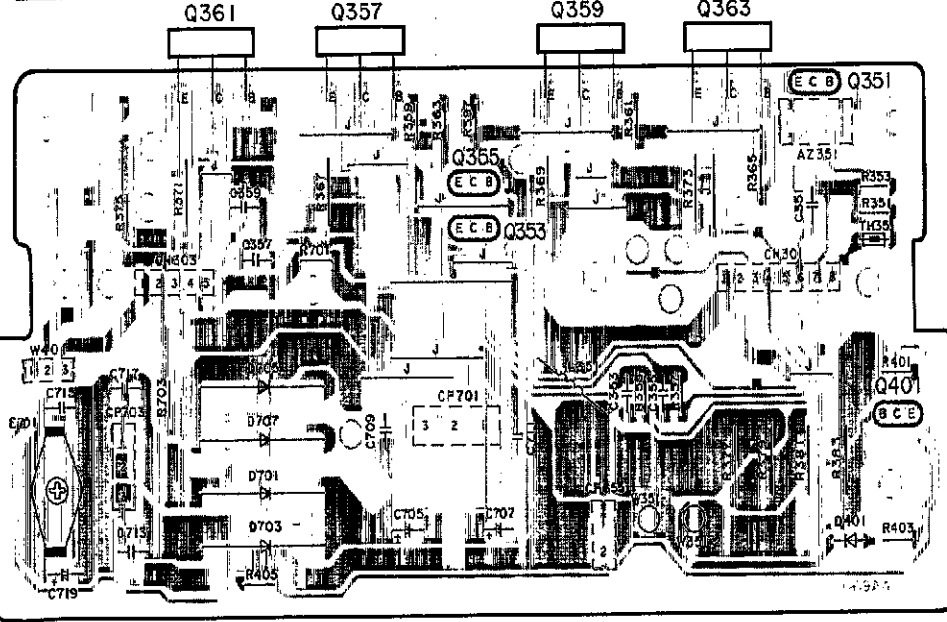
D LAMP (2) P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



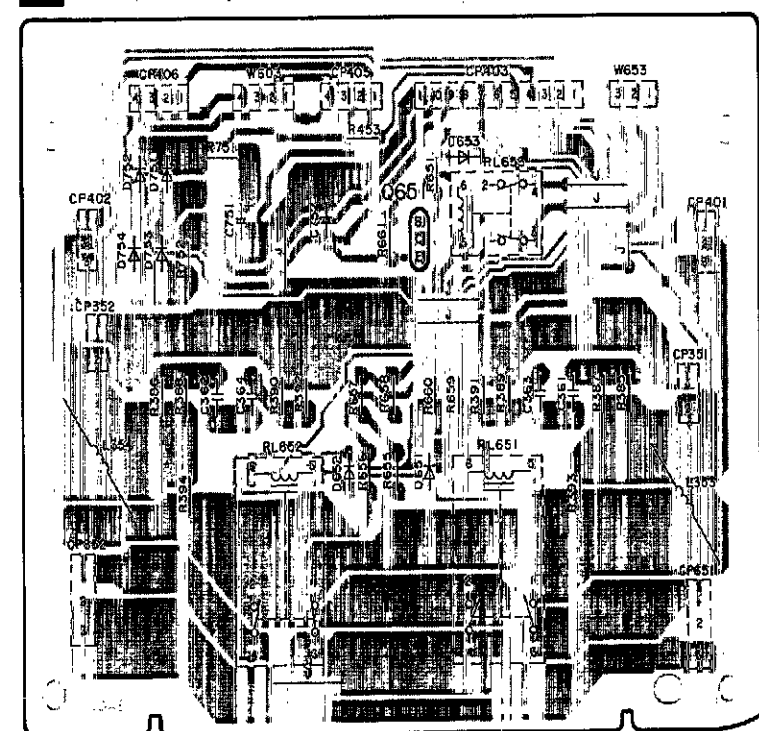
G VOLTAGE CONTROL AMP (L) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



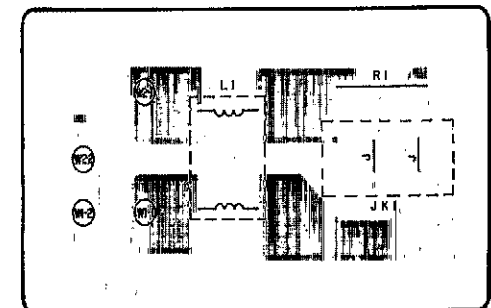
I CURRENT DRIVE AMP (L) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



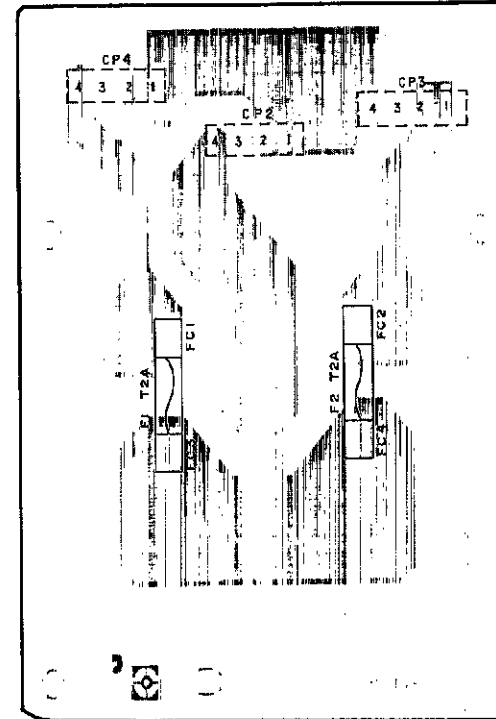
K RELAY P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



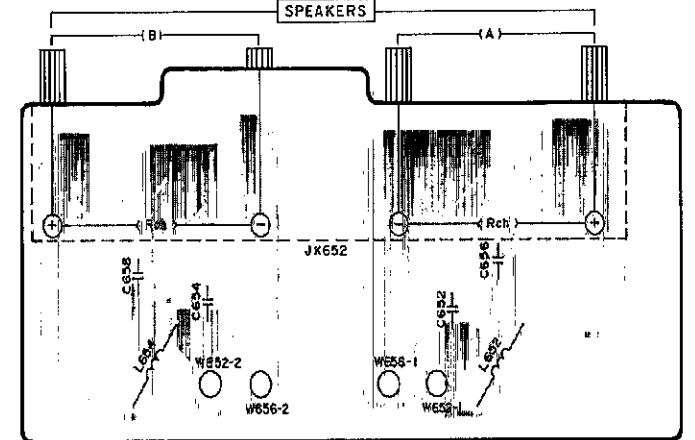
P AC INLET P.C.B. (REP1616A-S... (EB,EG))



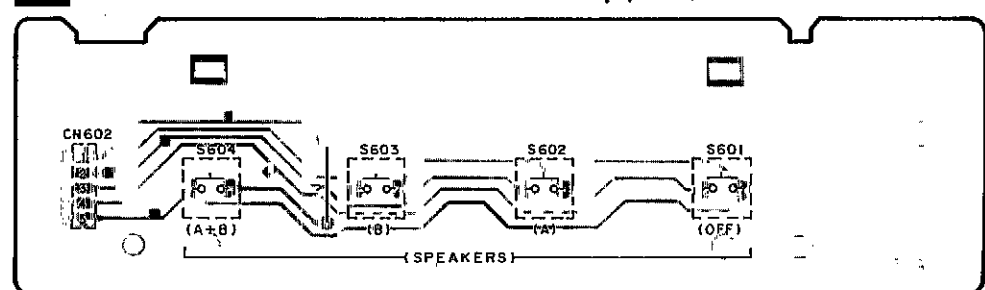
N FUSE P.C.B. (REP1615A-M... (EB,EG))



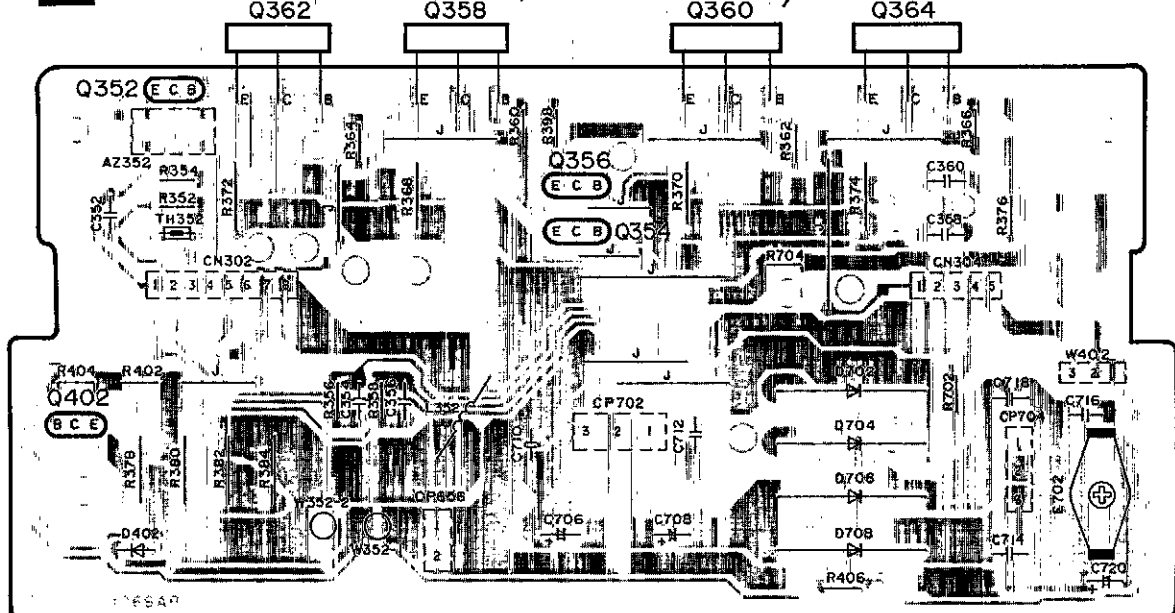
M SPEAKER TERMINAL (R) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



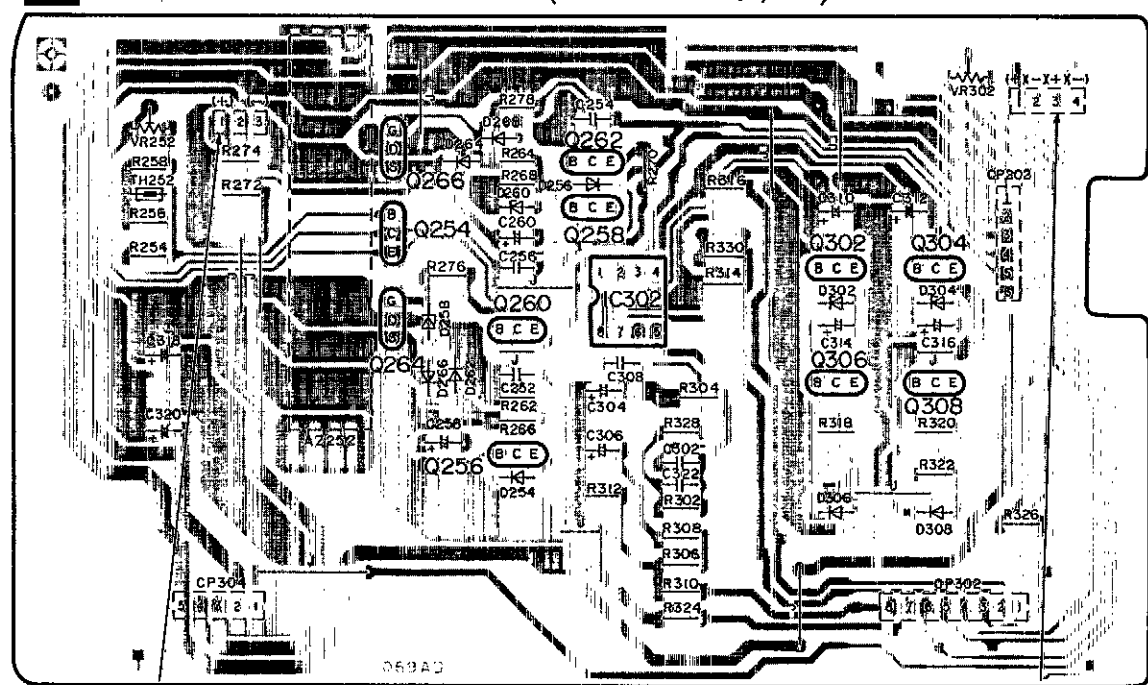
E SPEAKER SWITCH P.C.B. (REP1616A-S... (EB,EG)
REP1616B-S... (G))



J CURRENT DRIVE AMP (R) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



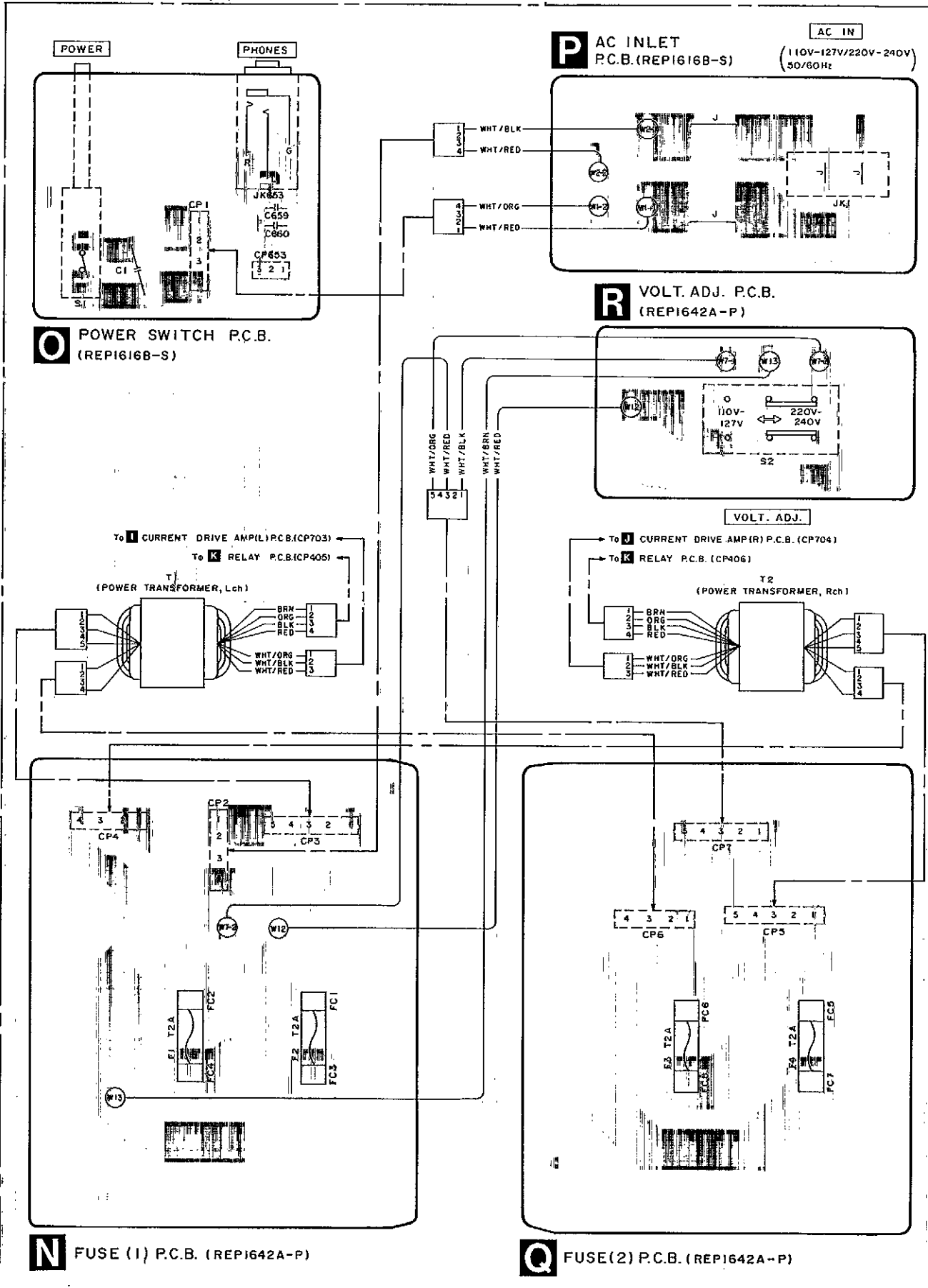
H VOLTAGE CONTROL AMP (R) P.C.B. (REP1615A-M... (EB,EG)
REP1615B-M... (G))



TP252
VOLTAGE CONTROL (V) AMP.
IDLING (IC) ADJ. POINT (Rch)

TP302
CURRENT DRIVE (C) AMP.
IDLING (IC) ADJ. POINT (Rch)

Power Source P.C.B. For (G) area.



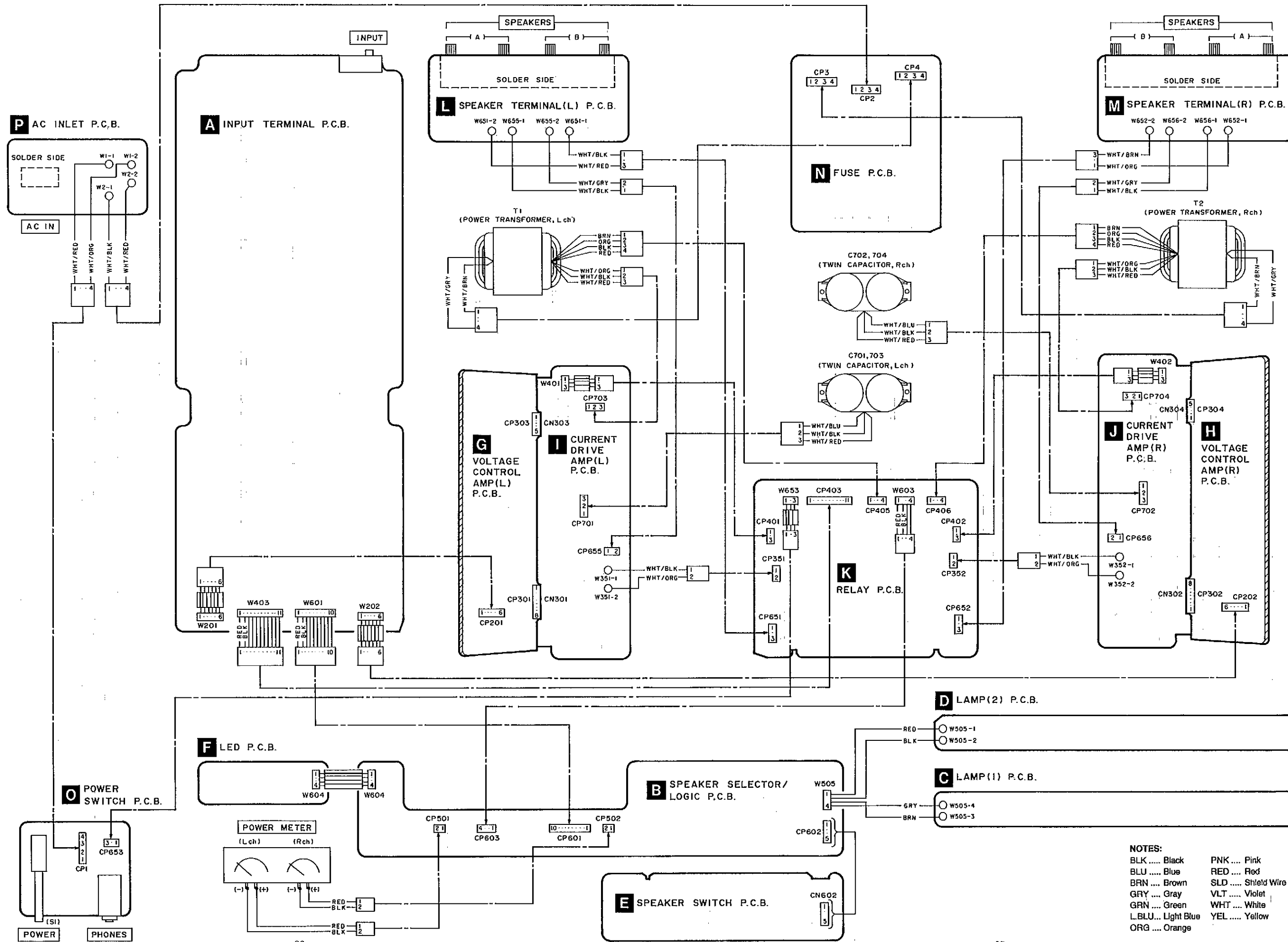
N FUSE (1) P.C.B. (REP1642A-P)

Q FUSE (2) P.C.B. (REP1642A-P)

TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

M5218AP 	M5219P 	MN4001B 	AN7082N 	AN7073 	BA6138
2SA992EFPTA 2SA1123RSTTA 2SC1815BGL 2SC2631RSTTA		2SA1309AQSTA 2SB1036RSTTA 2SC3311AQSTA		2SA1535AQRS 2SC3944AQRS 2SD1761EF	
2SJ130Y 2SK20130Y	2SA1265R 2SC3182R	MA165TA MA29WATA 1SR35200TB		MA4036MTA MA4051MTA MA4082MTA	
MA4100MTA MA4110MTA MA4160MTA	MA185TA	P300DLF		LN446P-C LN846RP-C	

WIRING CONNECTION DIAGRAM



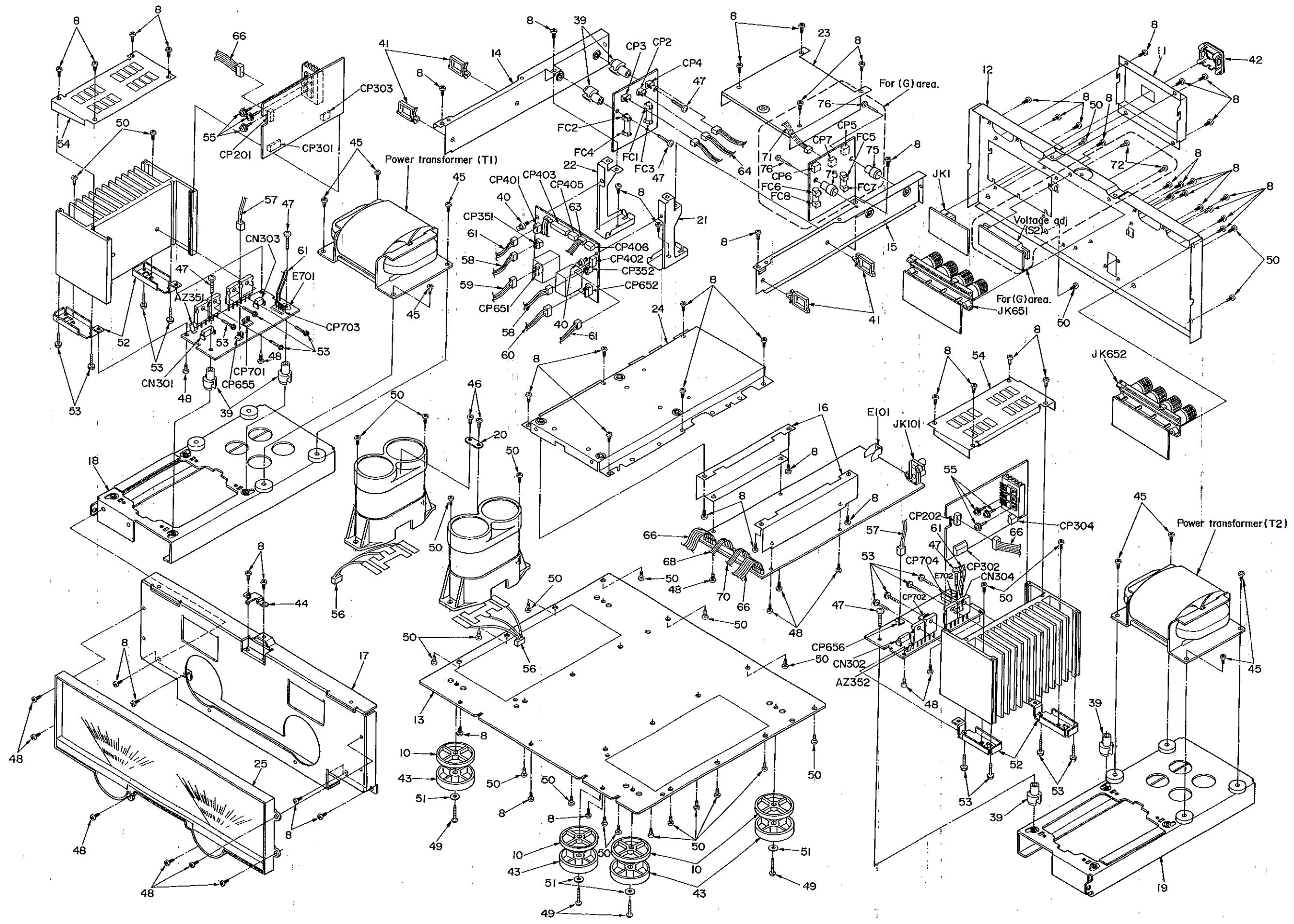
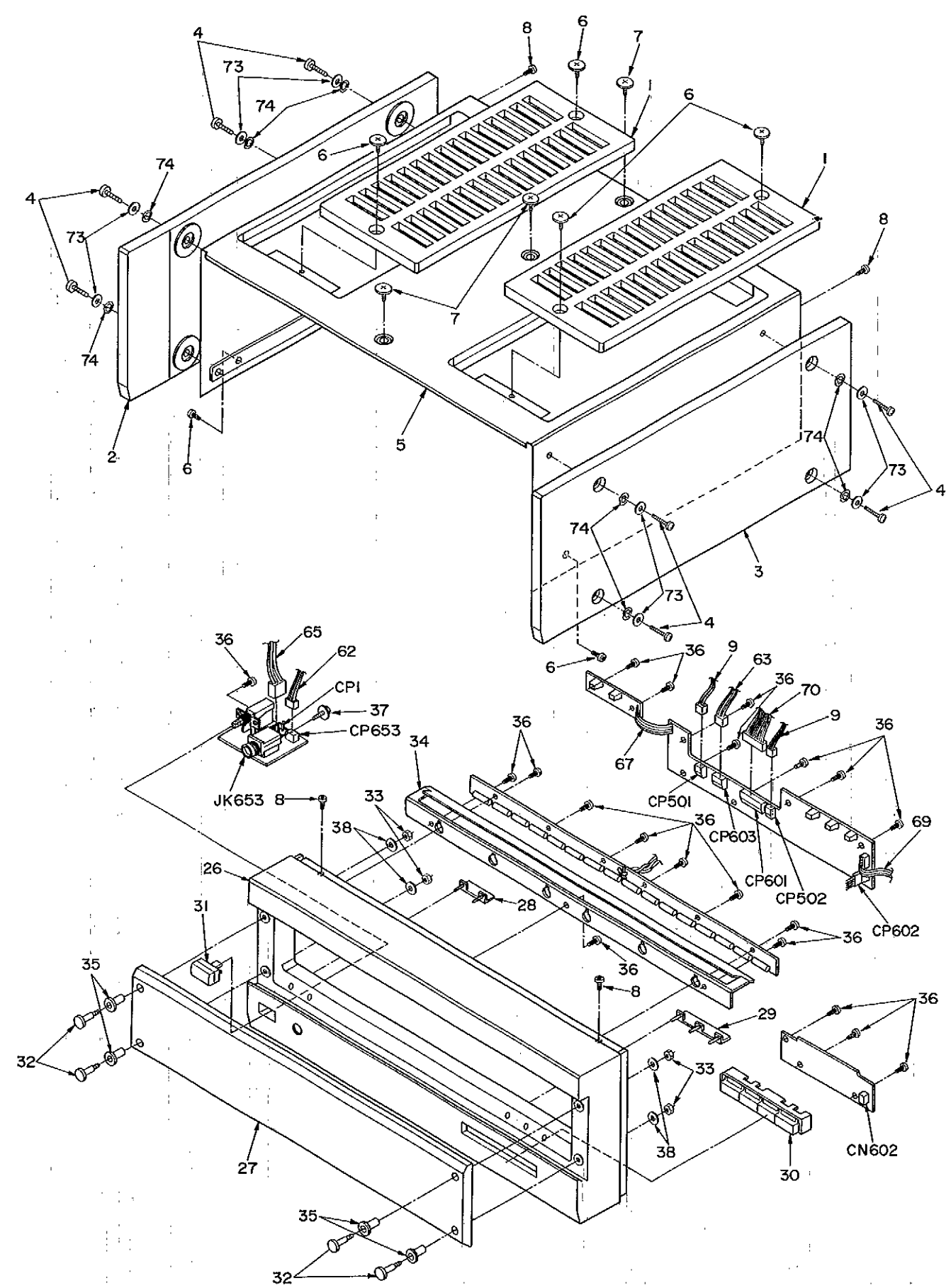
NOTES:
 BLK Black PNK Pink
 BLU Blue RED Red
 BRN Brown SLD Shield Wire
 GRY Gray VLT Violet
 GRN Green WHT White
 L.BLU... Light Blue YEL Yellow
 ORG Orange

REPLACEMENT PARTS LIST

Note: *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
				43	SKL306	RUBBER FOOT	
				44	SUM2987	METER HOLDER	
				45	XTBS3+10JFZ1	SCREW	
1	RGK0397-K	CABINET ORNAMENT (L) - (R)		46	XTB3+10JFZ	SCREW	
2	RFKNA2000EGA	SIDE PANEL (L) ASS'Y		47	XTB3+20J	SCREW	
3	RFKNA2000EGB	SIDE PANEL (R) ASS'Y		48	XTB3+8JFZ	SCREW	
4	RHD30034	SCREW		49	XTB4+16FFZ	SCREW	
5	RFKKEA2000EG	CABINET ASS'Y		50	XTB4+8FFZ	SCREW	
6	SNE2095-5	SCREW		51	XWEGX12PVC	WASHER	
7	SNE2129-3	SCREW		52	RMQ0111	RADIATOR ANGLE	
8	XTBS3+8JFZ1	SCREW		53	SNE2117-1	SCREW	
9	RFKEA2000EGA	CONNECTOR ASS'Y (2P)		54	RMV0036	SUB RADIATING PLATE (L) - (R)	
10	RGQ0085-K	FOOT SPACER		55	XYN3+F8	SCREW	
11	RGRO069B-B	SUB REAR PANEL		56	REZ0158	CONNECTOR ASS'Y (3P)	
12	RGRO172A-A	REAR PANEL	(EG)	57	RFKEA2000EGB	CONNECTOR ASS'Y (2P)	
12	RGRO172A-B	REAR PANEL	(EB)	58	RFKEA2000EGC	CONNECTOR ASS'Y (2P)	
12	RGRO172B-A	REAR PANEL	(G)	59	RFKEA2000EGD	CONNECTOR ASS'Y (3P)	
13	RKU0018-2	BOTTOM CHASSIS		60	RFKEA2000EGE	CONNECTOR ASS'Y (3P)	
14	RFMA0250	SIDE ANGLE (L)		61	RFKEA2000EGF	CONNECTOR ASS'Y (3P)	
15	RFMA0251	SIDE ANGLE (R)		62	RFKEA2000EGG	CONNECTOR ASS'Y (3P)	
16	RFMA0697	P. C. B. HOLDER		63	RFKEA2000EGH	CONNECTOR ASS'Y (4P)	
17	RFMA0698	METER HOLDER		64	RFKEA2000EGI	CONNECTOR ASS'Y (4P)	
18	RFKNA2000EGC	TRANSFORMER CHASSIS (L) ASS'Y		65	RFKEA2000EGJ	CONNECTOR ASS'Y (4P)	
19	RFKNA2000EGD	TRANSFORMER CHASSIS (R) ASS'Y		66	RFKEA2000EGK	CONNECTOR ASS'Y (6P)	
20	RMQ0112-1	CAPACITOR HOLDER		67	RFKEA2000EGL	CABLE ASS'Y (4P)	
21	RMQ0113	P. C. B. HOLDER (R)		68	RFKEA2000EGM	CONNECTOR ASS'Y (11P)	
22	RMQ0114	P. C. B. HOLDER (L)		69	RFKEA2000EGN	CONNECTOR ASS'Y (4P)	
23	RSC0077A	PRE SHIELD CASE		70	RFKEA2000EGP	CONNECTOR ASS'Y (10P)	
24	RSC0078A	DAC CASE		71	RFKEA2000EGQ	CONNECTOR ASS'Y (5P)	(G)
25	RSE0003	METER		72	XTBS3+8JFZ1	SCREW	(G)
26	RFKGEA2000EG	FRONT PANEL ASS'Y		73	RHM85001	WAVE WASHER	
27	RGK0557-T	TRANSPARENT GLASS		74	XWEGFZ	WASHER	
28	RGL0192-Q	PANEL LIGHT (A)		75	SHE187-2	P. C. B. SUPPORT	(G)
29	RGL0193-Q	PANEL LIGHT (B)		76	XTB3+20J	SCREW	(G)
30	RGU0512C-K	SPEAKERS BUTTON					
31	RGU0890-K	POWER SWITCH BUTTON					
32	RHD30042	SCREW					
33	RHN30004	NUT					
34	RFMA0699	LAMP HOUSE					
35	RFMD308-K	BUSHING (B)					
36	XTBS26+8J	SCREW					
37	XTWS3+8T	SCREW					
38	XWG3	WASHER					
39	SHE187-2	P. C. B. SUPPORT					
40	SHR415	LATCH					
41	SHR9814	CLAMPER					
42	SJS9231A	AC INLET COVER					

CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Notes: *Important safety notice: Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list. *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas. *The "(SF)" mark denotes the standard part.

Table with columns: Ref. No., Part No., Part Name & Description, Remarks. Lists various electronic components like diodes, transistors, resistors, capacitors, relays, and transformers.

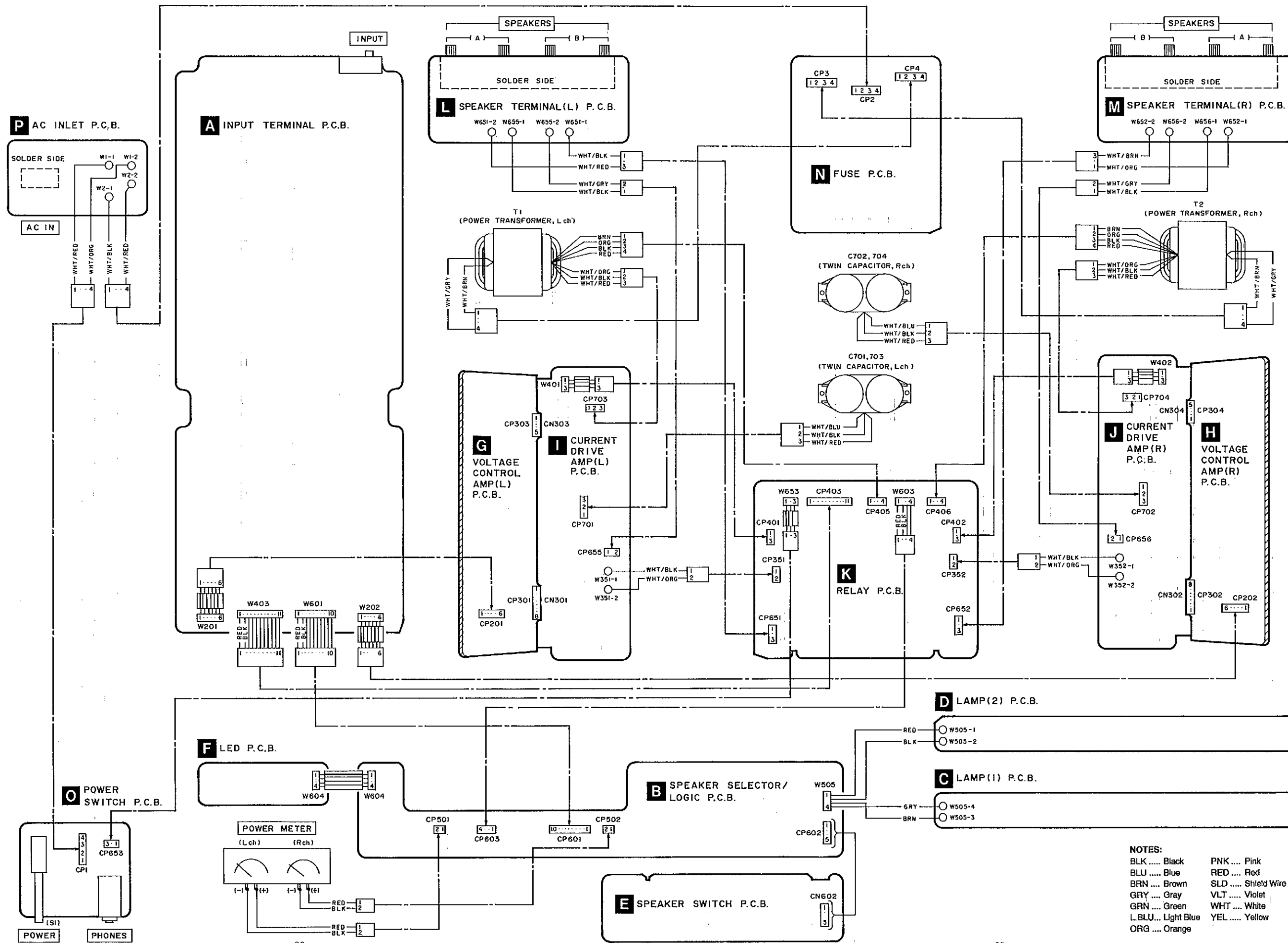
Table with columns: Ref. No., Part No., Part Name & Description, Remarks. Lists various electronic components like fuses, relays, transformers, and connectors.

RESISTORS AND CAPACITORS

Notes: * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F) * Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Table with columns: Ref. No., Part No., Values & Remarks. Lists various resistors and capacitors with their specific values and remarks.

■ WIRING CONNECTION DIAGRAM



NOTES:
 BLK Black PNK Pink
 BLU Blue RED Red
 BRN Brown SLD Shield Wire
 GRY Gray VLT Violet
 GRN Green WHT White
 L.BLU... Light Blue YEL Yellow
 ORG Orange

■ REPLACEMENT PARTS LIST

Note: *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		GABINET AND CHASSIS		43	SKL306	HUBBER FOOT	
				44	SUM2987	METER HOLDER	
1	RGK0397-K	CABINET ORNAMENT (L) - (R)		45	XTBS3+10JFZ1	SCREW	
2	RFKNA2000EGA	SIDE PANEL (L) ASS' Y		46	XTB3+10JFZ	SCREW	
3	RFKNA2000EGB	SIDE PANEL (R) ASS' Y		47	XTB3+20J	SCREW	
4	RHD30034	SCREW		48	XTB3+8JFZ	SCREW	
5	RFKKEA2000EG	CABINET ASS' Y		49	XTB4+16FFZ	SCREW	
6	SNE2095-5	SCREW		50	XTB4+8FFZ	SCREW	
7	SNE2129-3	SCREW		51	XWEGX12PVC	WASHER	
8	XTBS3+8JFZ1	SCREW		52	RMQ0111	RADIATOR ANGLE	
9	RFKEA2000EGA	CONNECTOR ASS' Y (2P)		53	SNE2117-1	SCREW	
10	RGQ0085-K	FOOT SPACER		54	RMV0036	SUB RADIATING PLATE (L) - (R)	
11	RGRO069B-B	SUB REAR PANEL		55	XYN3+F8	SCREW	
12	RGRO172A-A	REAR PANEL	(EG)	56	REZ0158	CONNECTOR ASS' Y (3P)	
12	RGRO172A-B	REAR PANEL	(EB)	57	RFKEA2000EGB	CONNECTOR ASS' Y (2P)	
12	RGRO172B-A	REAR PANEL	(G)	58	RFKEA2000EGC	CONNECTOR ASS' Y (2P)	
13	RKU0018-2	BOTTOM CHASSIS		59	RFKEA2000EGD	CONNECTOR ASS' Y (3P)	
14	RFMA0250	SIDE ANGLE (L)		60	RFKEA2000EGE	CONNECTOR ASS' Y (3P)	
15	RFMA0251	SIDE ANGLE (R)		61	RFKEA2000EGF	CONNECTOR ASS' Y (3P)	
16	RFMA0697	P. C. B. HOLDER		62	RFKEA2000EGG	CONNECTOR ASS' Y (3P)	
17	RFMA0698	METER HOLDER		63	RFKEA2000EGH	CONNECTOR ASS' Y (4P)	
18	RFKNA2000EGC	TRANSFORMER CHASSIS (L) ASS' Y		64	RFKEA2000EGI	CONNECTOR ASS' Y (4P)	
19	RFKNA2000EGD	TRANSFORMER CHASSIS (R) ASS' Y		65	RFKEA2000EGJ	CONNECTOR ASS' Y (4P)	
20	RFKNA2000EGE	TRANSFORMER CHASSIS (L) ASS' Y		66	RFKEA2000EGK	CONNECTOR ASS' Y (6P)	
21	RFKNA2000EGF	TRANSFORMER CHASSIS (R) ASS' Y		67	RFKEA2000EGL	CABLE ASS' Y (4P)	
22	RFKNA2000EGG	TRANSFORMER CHASSIS (L) ASS' Y		68	RFKEA2000EGM	CONNECTOR ASS' Y (11P)	
23	RFKNA2000EGH	TRANSFORMER CHASSIS (R) ASS' Y		69	RFKEA2000EGN	CONNECTOR ASS' Y (4P)	
24	RFKNA2000EGI	TRANSFORMER CHASSIS (L) ASS' Y		70	RFKEA2000EGP	CONNECTOR ASS' Y (10P)	
25	RFKNA2000EGJ	TRANSFORMER CHASSIS (R) ASS' Y		71	RFKEA2000EGQ	CONNECTOR ASS' Y (5P)	(G)
26	RFKNA2000EGK	TRANSFORMER CHASSIS (L) ASS' Y		72	XTBS3+8JFZ1	SCREW	(G)
27	RFKNA2000EGL	TRANSFORMER CHASSIS (R) ASS' Y		73	RHM85001	WAVE WASHER	
28	RFKNA2000EGM	TRANSFORMER CHASSIS (L) ASS' Y		74	XWEGFZ	WASHER	
29	RFKNA2000EGN	TRANSFORMER CHASSIS (R) ASS' Y		75	SHE187-2	P. C. B. SUPPORT	(G)
30	RFKNA2000EGP	TRANSFORMER CHASSIS (L) ASS' Y		76	XTB3+20J	SCREW	(G)
31	RFKNA2000EGQ	TRANSFORMER CHASSIS (R) ASS' Y					
32	RHD30042	SCREW					
33	RHN30004	NUT					
34	RFMA0699	LAMP HOUSE					
35	RFMD308-K	BUSHING (B)					
36	XTBS26+8J	SCREW					
37	XTWS3+8T	SCREW					
38	XWG3	WASHER					
39	SHE187-2	P. C. B. SUPPORT					
40	SHR415	LATCH					
41	SHR9814	CLAMPER					
42	SJS9231A	AC INLET COVER					

CABINET PARTS LOCATION

