SHARP OPTONICA

# SERVICE MANUAL

SX-9100H
SX-9100HB

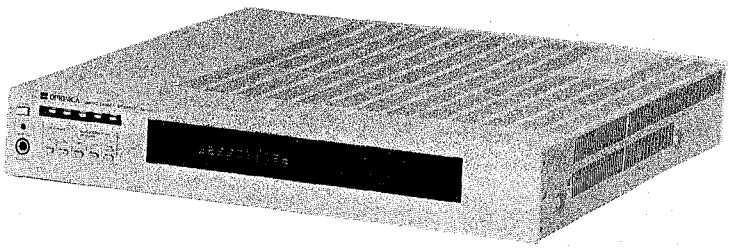

PHOTO: SX-9100H

## STEREO POWER AMPLIFIER

## MODEL
## SX-9100H
(Silver Panel)
## SX-9100HB
(Brown Panel)

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SHARP CORPORATION OSAKA, JAPAN

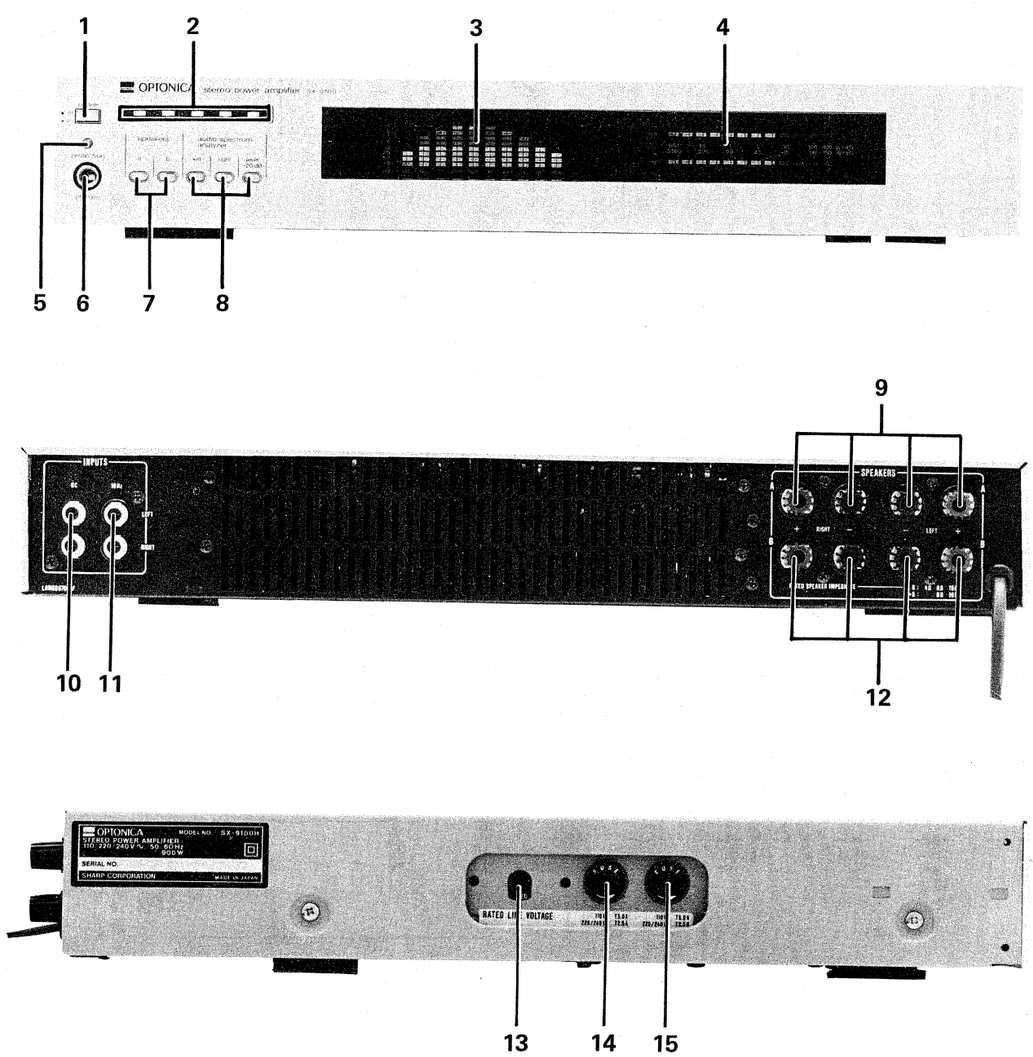
## SPECIFICATIONS

Power source: AC 110/220/240 V, 50/60 Hz
Power consumption: 900 W
Semiconductors: 26-ICs (Integrated Circuit)
26-Transistors
30-FETs
36-Diodes
6-LEDs (Light Emitting Diode)
Dimensions: Width: 430 mm (16-15/16 inch)
Height: 75 mm (2-31/32 inch)
Depth: 447 mm (17-5/8 inch)
Weight: 14 kg (30.86 lbs.)
Circuit type: All FET pure complementary DC circuitry
Continuous power output (at 1 kHz):
2 x 130 W/4 ohms, Both channels driven, 0.005% distortion
2 x 90 W/8 ohms, Both channels driven, 0.005% distortion
Continuous power output (20 Hz to 20 kHz):
2 x 110 W/4 ohms, Both channels driven, 0.015% distortion
2 x 80 W/8 ohms, Both channels driven, 0.015% distortion
Intermodulation: 0.005% at rated power
0.005% at 40 W output
Damping factor: More than 100 (at 1 kHz, 8 ohms)
Power bandwidth: 10 Hz to 50 kHz, at 0.09% distortion 65 W
Frequency response: DC to 100 kHz +0 dB −1.5 dB
Input sensitivity and input impedance: 800 mV/22K ohms

Specifications of this model are subject to change without prior notice.

## LAYOUT OF PARTS

1. Power On/Off switch
2. Switch indicator
3. Audio spectrum indicator
4. Output power indicator
5. Power/protection indicator
6. Headphone socket
7. Speakers selector
8. Audio spectrum indication selector
9. "A" speaker terminals
10. Direct inputs
11. 10 Hz inputs
12. "B" speaker terminals
13. AC line voltage selector
14. Right channel AC line fuse holder
15. Left channel AC line fuse holder






## AC MAINS VOLTAGE SELECTOR/FUSE REPLACEMENT

Check the setting of the voltage selector on the left side panel before plugging in the AC power cord. (If the unit has already been plugged in, unplug it and check the voltage selector.) Adjust the voltage selector as necessary to match the AC power supply of the area in which the SX-9100H/HB is to be used. Our factory carries out the setting in advance to suit each destinnation and uses the fuse of capacity available there. Further adjustment is therefore necessary only when the unit is used in other countries than the original destination.

**1. VOLTAGE SELECTOR ADJUSTMENT**
(Refer to Figure 4–1)
The voltage selector is located on the side panel of the SX-9100H/HB. If adjustment is necessary, use a screwdriver to turn the selector in either direction until the correct voltage level shows in the window next to the adjustment screw.

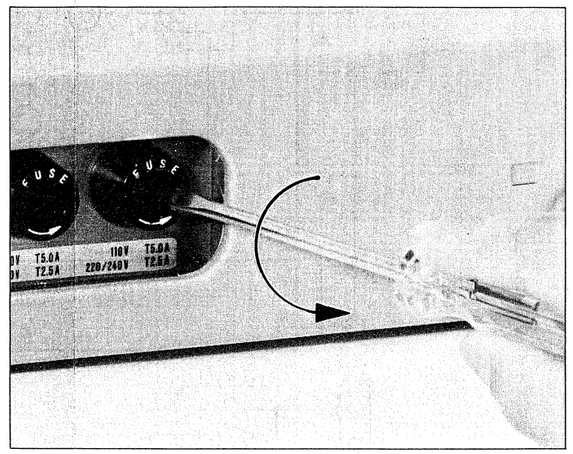



**Figure 4–1**

**2. FUSE REPLACEMENT** (Refer to Figure 4–2)
Use the fuse of T5A for setting at 110 V and of T2.5A for setting at 220 V or 240 V. Leave the change of fuse to a qualified technician as it is dangerous.

**Warning:**
The power supply cord should be removed from AC outlet without fail before changing the fuse.

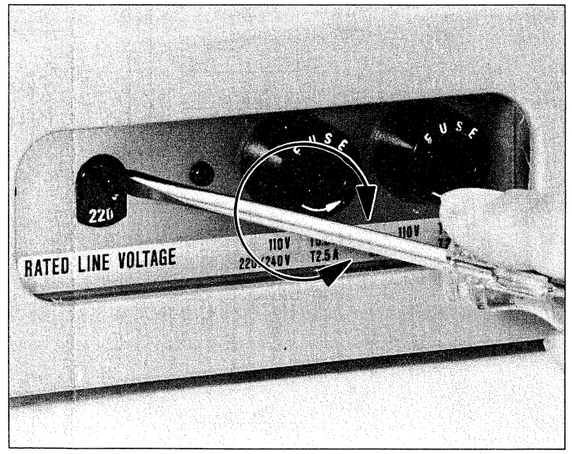



**Figure 4–2**

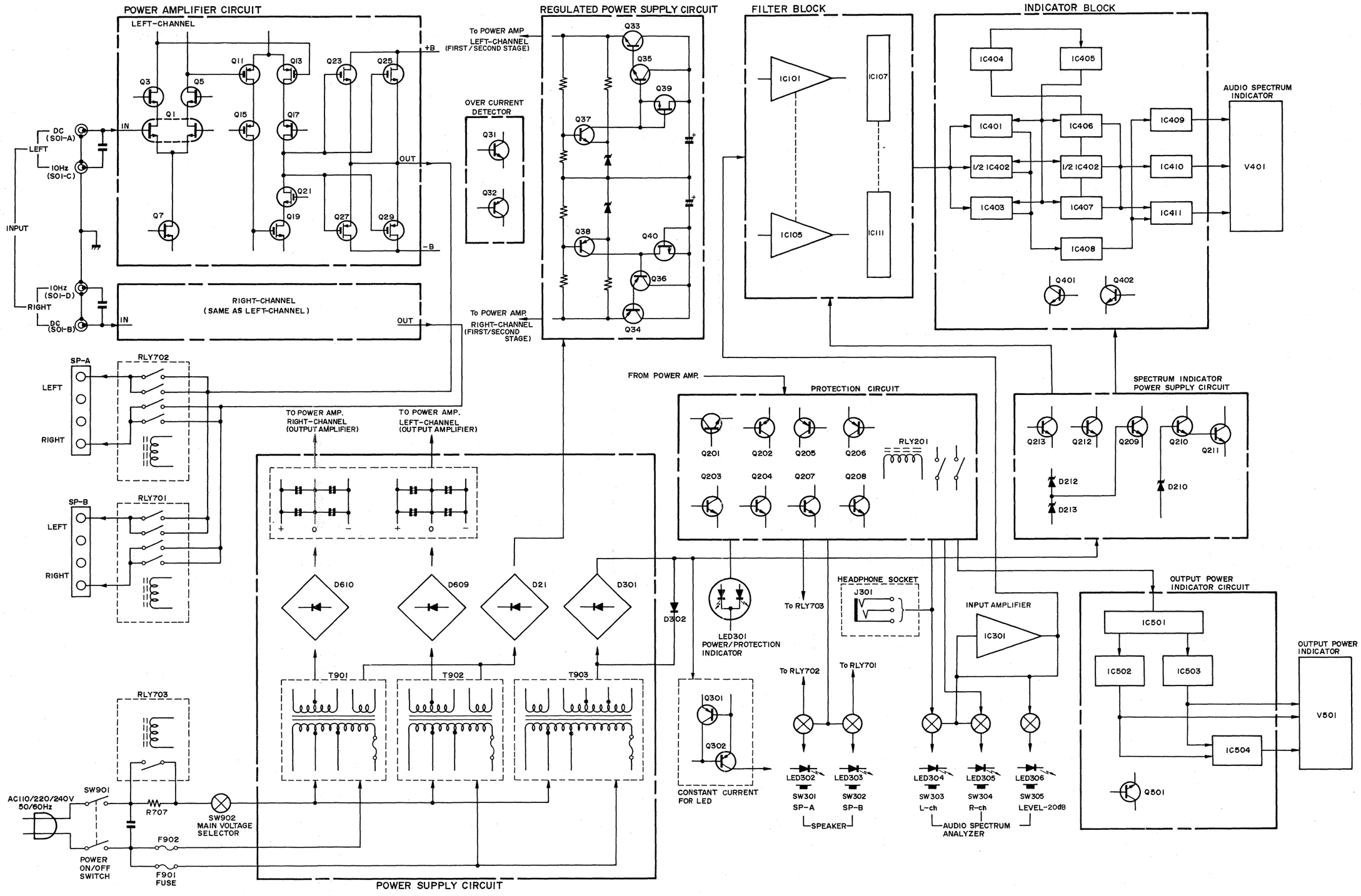



**Figure 5 BLOCK DIAGRAM**

## CIRCUIT DESCRIPTION

### 1. POWER AMPLIFIER SECTION

Employing FETs (Field Effect Transistors) anywhere in it, the power amplifier section is made a direct current (DC) operating unit which comprises two differential amplifiers, the first-stage one and the second-stage one, and the output of which represents a symmetrical complementary circuit. Especially in both differential amplifiers are used dual-type FETs which offer very high gm value and ultra low noise effects.

The signal leaving the input socket (SO1A-D) is applied to the first-stage differential amplifier made of dual-type FET (Q1 or Q2) where it is boosted for the first time; next passing through the first-stage cascode amplifier made of high-voltage withstand junction-type FETs (Q3 and Q5, or Q4 and Q6), it enters the second-stage differential amplifier made of P-channel MOS FETs (Q11 and Q13, or Q12 and Q14) where it is again boosted; further it is applied to the second-stage cascode amplifier formed by FET (Q19 or Q20) where it is subjected to a phase inversion; finally it initiates FET (Q21 or Q22) to drive the output amplifier consisting of FETs (Q23, Q25, Q27 and Q29, or Q24, Q26, Q28 and Q30), into conduction.

To the source of dual-type FET (Q1 or Q2) of the first-stage differential amplifier is fed a constant current which is assured by FET (Q7 or Q8) and Zener diode (D1 or D2) making it less affected by the ambient temperature. Each cascode amplifier in both stages is intended to allow the circuit to accept quite swiftly the input signal however instantaneous it may be, and to assure its output of a characteristic of low noise/low distortion as well.

What's more, FETs (Q11 and Q13, or Q12 and Q14) in the second-stage differential amplifier are connected to the same one heat sink, as a result of which all of them are made quite equal in their output characteristic. The output amplifier is made such a symmetrical complementary crcuit that it incorporates eight power MOS FETs (Q23 thru Q30), the four of which acts on the right channel while the other four, on the left channel.

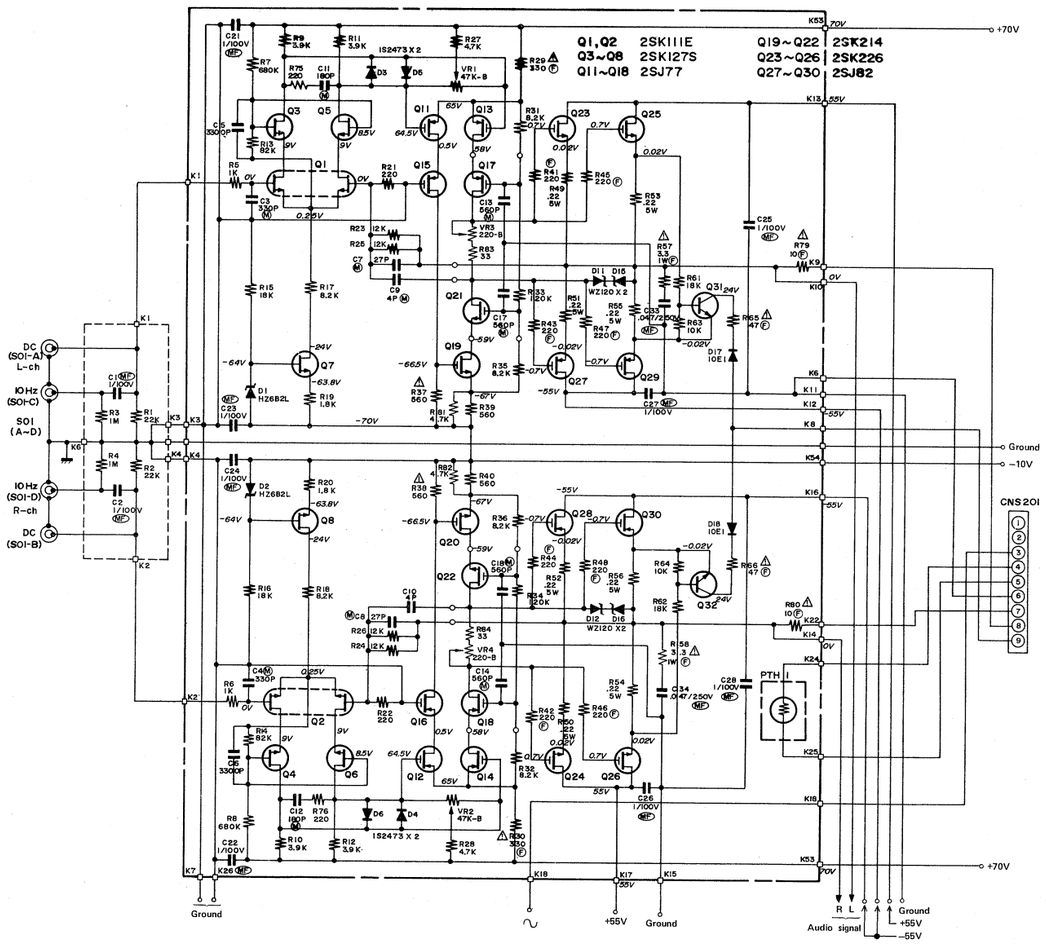
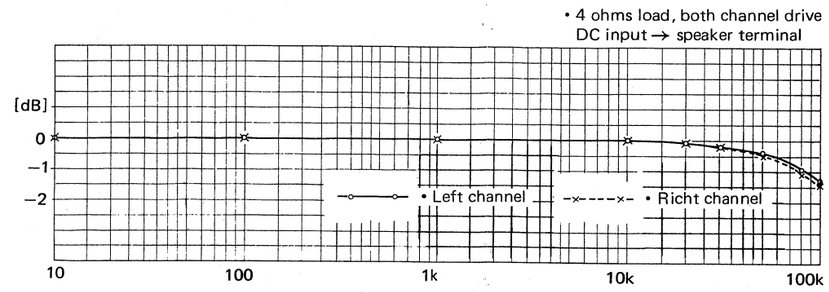


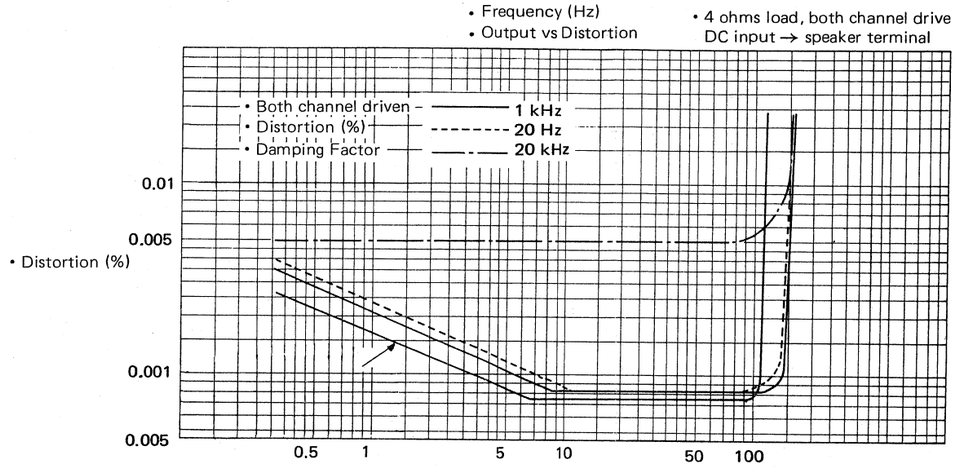

Figure 7 POWER AMPLIFIER CIRCUIT



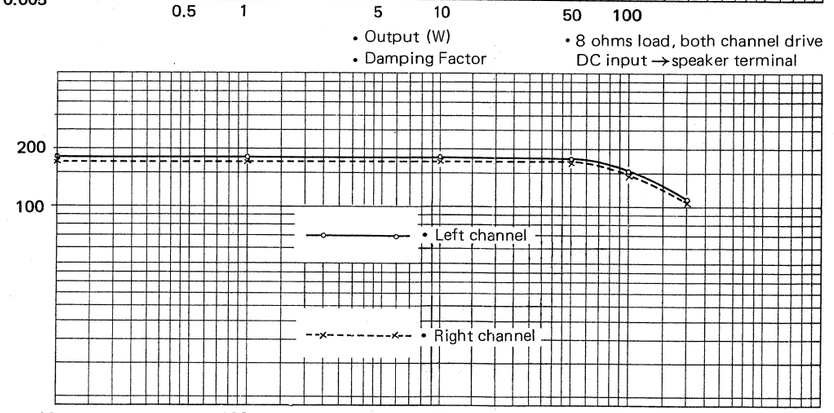
## DATAGRAPH




• Frequency (Hz)
• Output vs Distortion

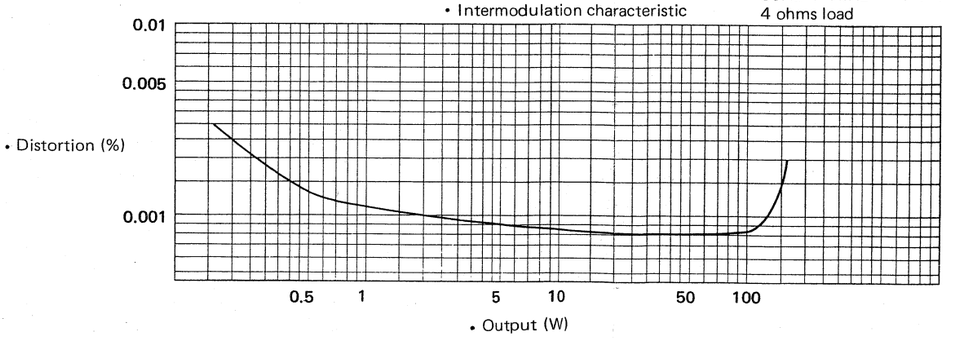



• Output (W)
• Damping Factor




• Frequency (Hz)
• Intermodulation characteristic

• 60Hz : 7kHz 4 : 1
4 ohms load




• Output (W)

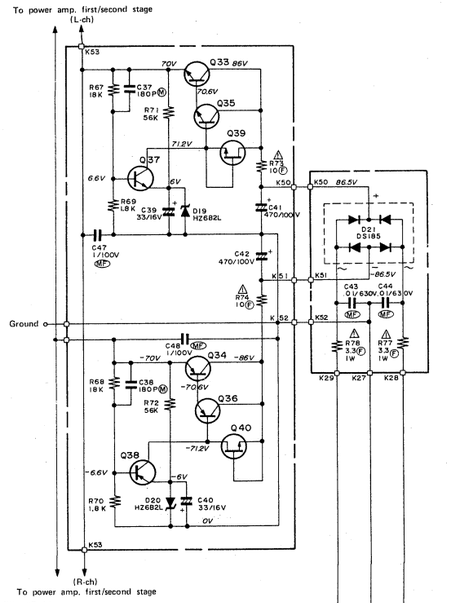
## 2. POWER SUPPLY CIRCUIT

The power supply circuit consists of three transformers (T901, T902 and T903); the T901 and T902 are of a troidal type and their output is applied to the power amplifier section which requires most power consumption, and separately for the right and left channels; the T903 feeds power to the other circuits. AC power from the transformer (T901 or T902) is converted by the bridge rectifier circuit made of diode (D601 or D602) to become DC power, then it is delivered to the smoothing circuit formed by electrolytic capacitors (C603, C604, C607 and C608, or C601, C602, C605 and C606) where it is deprived of its ripple components, and enters the output amplifier in the power amplifier section.

Another AC power from the secondary of the transformer (T901 or T902) is also converted by the bridge rectifier circuit made of diode (D21) to become DC power charging the electrolytic capacitors (C41 and C42); a positive side of this charge voltage is applied to the constant voltage circuit formed by transistors (Q33, Q35 and Q37) and FET (Q39) while a negative (—) side of it, to the constant voltage circuit formed by transistors (Q34, Q36 and Q38) and FET (Q40). The transistor (Q37 or Q38) serves the role of detecting the output voltage; say, it aims at a comparison of the reference voltage which is made steady by Zener diode (D19 or D20), with the voltage available partly at resistors (R67 and R69, or R68 and R70). For instance, as the positive (+) side of output voltage rises, so does the voltage at the base of transistor (Q37), and a current is thus caused and if flows from the collector of transistor (Q37) into the limiter circuit. As a result, since the voltage at the source of FET (Q39) falls, the voltage at the base of transistor (Q33) falls too, so that the resistance at the collector-emitter junction of transistor (Q33) increases to cause a fall of the output voltage.

On the other hand, if the positive (+) side of output voltage falls, the circuitry motion reverse to the abovementioned holds true.

The output of these constant voltage circuits is then fed to both the first-stage amplifier and the second-stage amplifier.



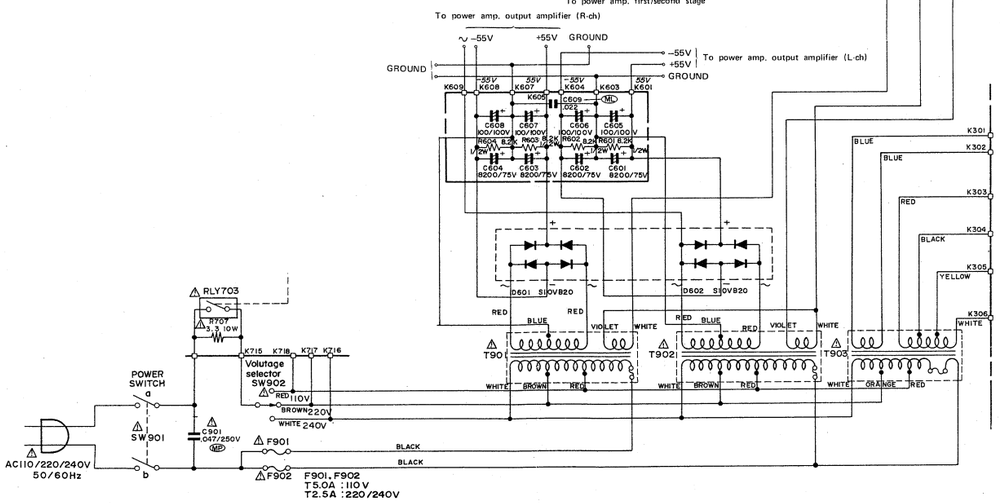




**Figure 9 POWER SUPPLY CIRCUIT**



## 3. PROTECTION CIRCUIT

The protection circuit used in this set is so designed as to function in the following instances,

(1) It protects the speaker against possible shock noise caused when the power switch is turned on.
(2) It protects the speaker against possible shock noise caused when the power switch is turned off.
(3) It functions when DC voltage is generated at the speaker terminal (for instance, when DC voltage gets unbalanced due to a trouble inside the amplifier).
(4) In the case of the temperature of heat sink increasing abnormally.
(5) The speaker terminals are shorted and the load impedance is lowered (for instance, when several speakers are connected in parallel to the amplifier).

The transistor (Q201) is to remove powersupply ripples applied to the protection circuit. The transistors (Q204 and Q205) are usually kept off in the normal state but it turns on if too large current (due to shortage of the speaker terminals, for instance) runs into the output amplifier of the power amplifier section; this turning on will cause a current to apply it to the protection relays (RLY701 and RLY702) disconnecting the output amplifier and the speaker terminals from each other. The transistors (Q207 and Q208) are Schmidt trigger circuit, and they make the protection indicator LED (D301) light up in red or in green according to whether the protection circuit is in action or in stop.

The relay (RLY201) is intended to control the signals applied to the headphone circuit and to the output indicator circuit; in the above cases (1) thru (5), it functions, together with the relays (RLY701 and RLY702), to protect those circuits against damage.

The relay (RLY703) and resistor (R707) work in this way: instantly when the power switch is turned on, since the relay is still open then, the possibly resultant rush current is blocked out by the resistor; only about 0.2 second after, the relay gets closed and it carries the desired current into the succeeding circuit.

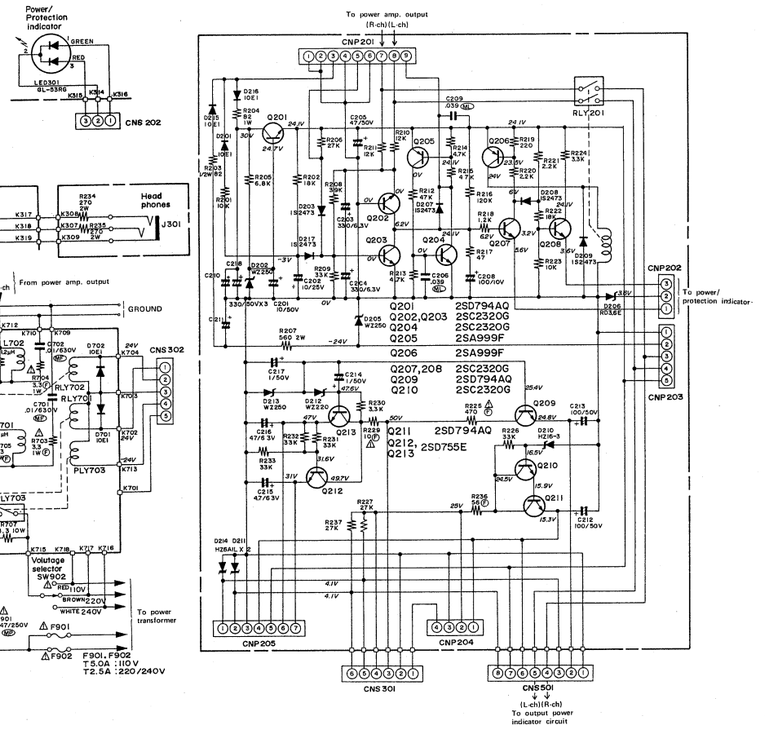



**Figure 10 PROTECTION CIRCUIT**

## ■ OUTPUT POWER INDICATOR (V501) AND AUDIO SPECTRUM INDICATOR (V401)

These indicators are both of fluorecent lighting tube and the following will discuss their functions individually.

### • OUTPUT POWER INDICATOR (V501)

The construction of this output power indicator is as shown in Fig. 11--1. It consists of three color segments; the red ones belong to the plates (P1, P2, P13 and P14); the yellow ones, to the plates (P3, P4, P15 and P16); the green ones, to the plates (P5 thru P12, and P17 thru P24): it further includes cathode (F) and grid (G).

It is so designed that DC voltage of approx. 4 V is applied to the cathod (F) while DC voltage of approx. 15 V, to the grid (G); hence the pulse signal of approx. 15 V is fed to the plates (P5 thru P12, and P17 thru P24) while the pulse signal of approx. 25 V, to the plates (P1 thru P4 and P13 thru P16). As a result, the respective plates become "High" level in potential so that the segments belonging to them will light up; the lighting continues as long as the potential is at "High" level.

### • AUDIO SPECTRUM INDICATOR (V401)

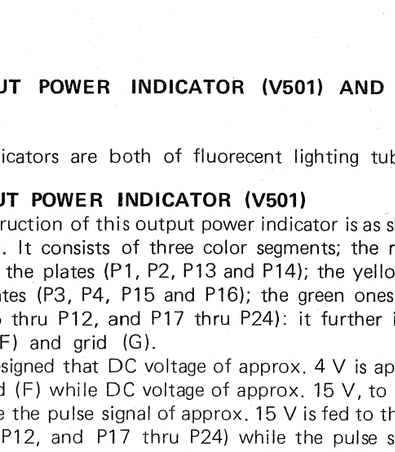
The construction of this audio spectrum indicator is as shown in Fig. 11–2.

It consists of three color segments; the green ones belong to the plates (P1 thru P4); the yellow ones, to the plates (P5 and P6); the red ones, to the plates (P7 and P8): it further includes cathode (F) and grids (G1 thru G10) both of which form a matrix circuit together with the plates (P1 thru P8), unlike the said the output power indicator (V501).

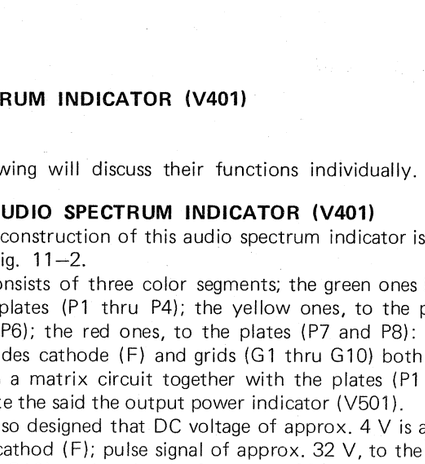
It is so designed that DC voltage of approx. 4 V is applied to the cathod (F); pulse signal of approx. 32 V, to the grids (G1 thru G10); pulse signal of approx. 32 V, to the plates (P1 thru P4); pulse signal of approx. 45 V, to the plates (P5 thru P8): therefore, the segments belonging to the plates will light up. If the pulse signal applied, for instance, to the grid (G10) increases to "High" level in potential, the pulse signal supplied to the plates (P1 thru P8) increases to "High" level too, so that the segments belonging to the plates will light up: the lighting keeps on as long as the potential is at "High" level.

Although the segments light up from one to another in sequence, they, actually, seem to light up almost simultaneously because their speed is remarkably too high for the human eyes to experience the time lag of their lighting up.

OUTPUT POWER INDICATOR (V501)




AUDIO SPECTRUM INDICATOR (V401)




red segment (P1.P2.P12.P13)
yellow segment (P3.P4.P10.P11)
green segment (P5~P12. P17~P24)

red segment (P7. P8)
yellow segment (P5. P6)
green segment (P1~P4)

PIN CONNECTION P: Plate F: Cathode G: Grid

| PIN No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F | G | P24 | P12 | P23 | P11 | P22 | P10 | P21 | P9 | P20 | P8 | P19 | P7 |
| PIN No. | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| CONNECTION | P18 | P6 | P17 | P5 | P16 | P4 | P15 | P13 | P14 | P2 | P13 | P1 | G | F |

PIN CONNECTION P: Plate F: Cathode G: Grid

| PIN No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F | P8 | P7 | P6 | P5 | G10 | G9 | G8 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | P1 | P2 | P3 | P4 | F |

**Figure 11–1 OUTPUT POWER INDICATOR (V501)**

**Figure 11–2 AUDIO SPECTRUM INDICATOR (V401)**



## 4. OUTPUT POWER INDICATOR CIRCUIT

The output power indicator circuit is composed of integrated circuits (IC501 thru IC504) and transistor (Q501), and it drives the output power indicator (V501) to tell the operator a variety of output power level of the unit. The signal leaving the power amplifier is applied to pin ④ (left-channel signal input) or pin ⑤ (right-channel signal input) of the integrated circuit (IC501); there it is rectified and logarichmic-compressed to become DC signal going out of pin ② or ⑧ . This DC signal is next passed on via variable resistor (VR501 or VR502) to pin ② of the integrated circuit (IC502 or IC503); there it is converted into one of 12 different digital signals according to its input level here, going out of one of pins ③ thru ⑭ having approx. 15 V in it.

The output from either of pins ⑦ thru ⑭ is coupled to the plates (P17 thru P24, and P5 thru P12) of the output power indicator (V501) to light the green segments; the output from either of pins ③ thru ⑥ is applied to pins ① thru ⑧ of the integrated circuit (IC504) to increase to approx. 25 V, then it enters the plates (P1 thru P4, and P13 thru P16) of the output power indicator (V501) to light up both the red and yellow segments.

The transistor (Q501) is intended to work for about 5 seconds after the power switch has been turned on, so as to reduce the voltage applied then to the grid (G) and, thereby to prevent a normal indication of the output power indicator (V501) from being affected by undesired noises or the like. The same holds true for the case where the power switch is turned off.

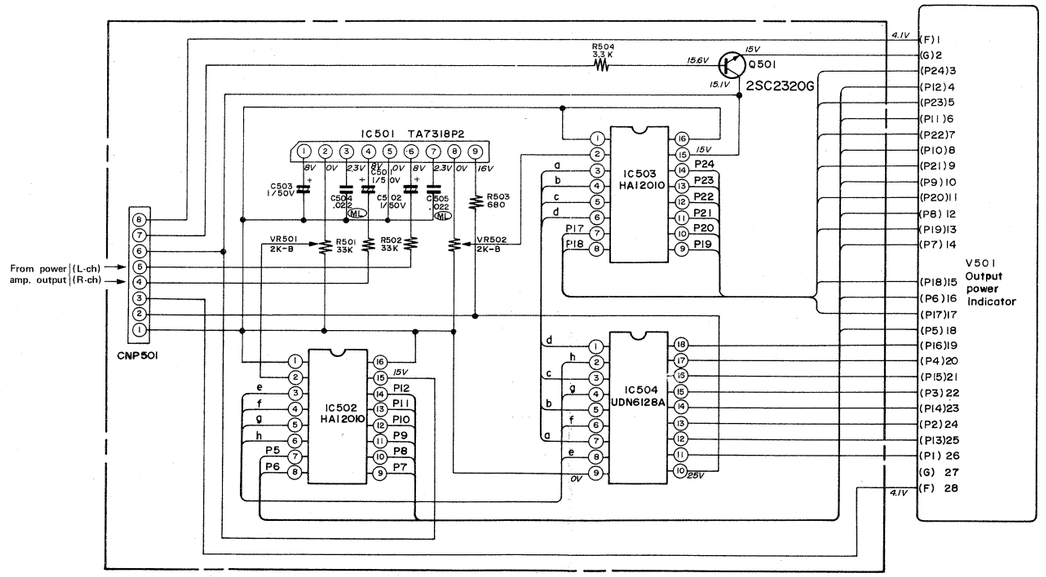



**Figure 12 OUTPUT POWER INDICATOR CIRCUIT**

## 5. AUDIO SPECTRUM INDICATOR CIRCUIT

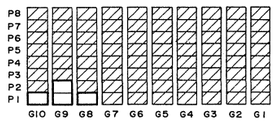
The audio spectrum indicator circuit consists of input amplifier section, filter block and indicator block, and it serves to drive the audio spectrum indicator (V401) to tell the operator of what frequencies the output signal consists.

### 5–1. Input Amplifier Section (Refer to Figure 13–2)

The input amplifier consists of integrated circuit (IC301) and resistors (R308 thru R312), and it serves the role of a buffer for the next stage, the filter block.

The prime functions of it are as follows:

- Coming out of the power amplifier, the signal is here converted into a low impedance signal, then it is applied to the filter block.
- When the audio spectrum indication selector switches "left" (SW303) and "right" (SW304) are both turned on, the signals of both channels are here mixed together, then applied to the filter block.
- A part of the signal coming from the power amplifier is applied not only to the headphone circuit via pins ③ and ④ of the socket (CNS203) but to pin ⑥ of the integrated circuit (IC301) via the audio spectrum indication selector switch (SW303 or SW304) as well; in the latter case, the signal is coverted into a low impedance signal and applied to the filter block through pin ④ of the plug (CNP303).



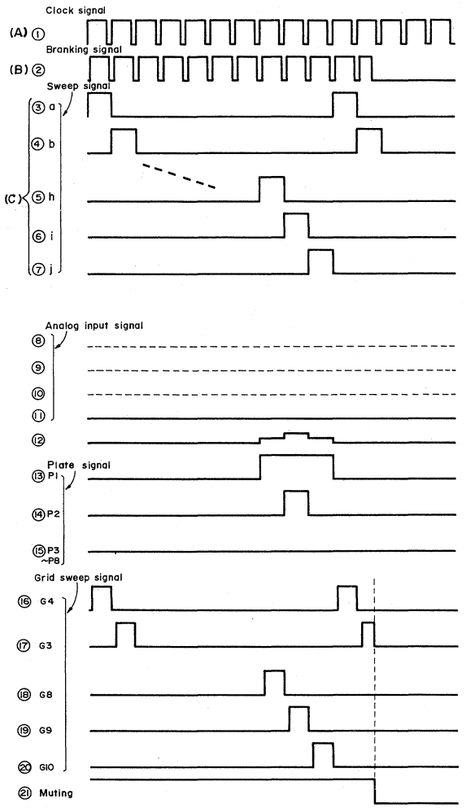




**Figure 13–1 SPECTRUM INDICATOR TIMING CHART**

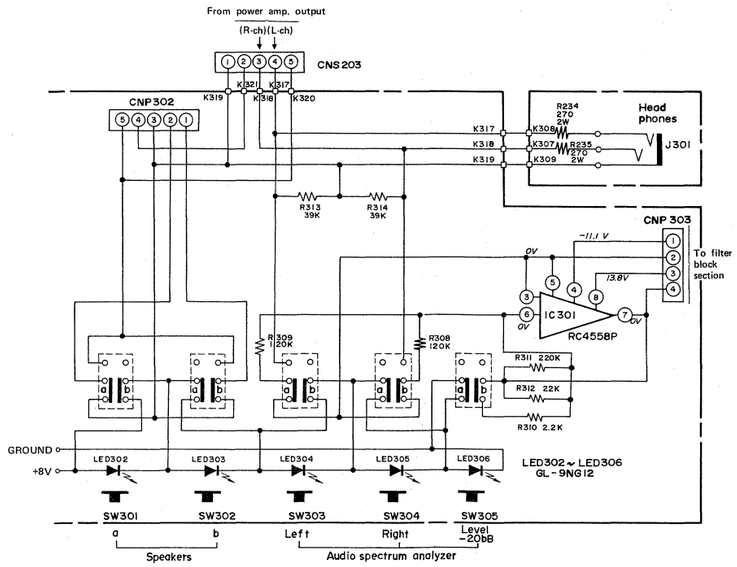



**Figure 13–2 INPUT AMPLIFIER SECTION**



### 5–2. Filter Block Section (Refer to Figure 13–1, Figure 14)

The filter block is composed of integrated circuits (IC101 thru IC111), resistors (R101 thru R159), capacitors (C101 thru C173) and variable resistors (VR101 thru VR110), and it is here that the input signal is divided into signals of 10 different frequency-bands (in the range from 30 Hz to 16 kHz), rectified and logarithmic-compressed before entering the next circuit. Passing through pin ④ of the socket (CNS303), the input signal is first applied to the filter circuit composed of resistors (R101 thru R142), capacitors (C101 thru C154) and integrated circuits (IC101 thru IC105) where it is divided into signals of 10 different-frequency bands, and then to the pins ④ and ⑥ of the integrated circuits (IC107 thru IC111) via the variable resistors (VR101 thru VR110); there each signal is rectified and logarithmic-compressed to become DC voltage in direct accordance with its before-designated band, entering the next block via the socket (CNS401).

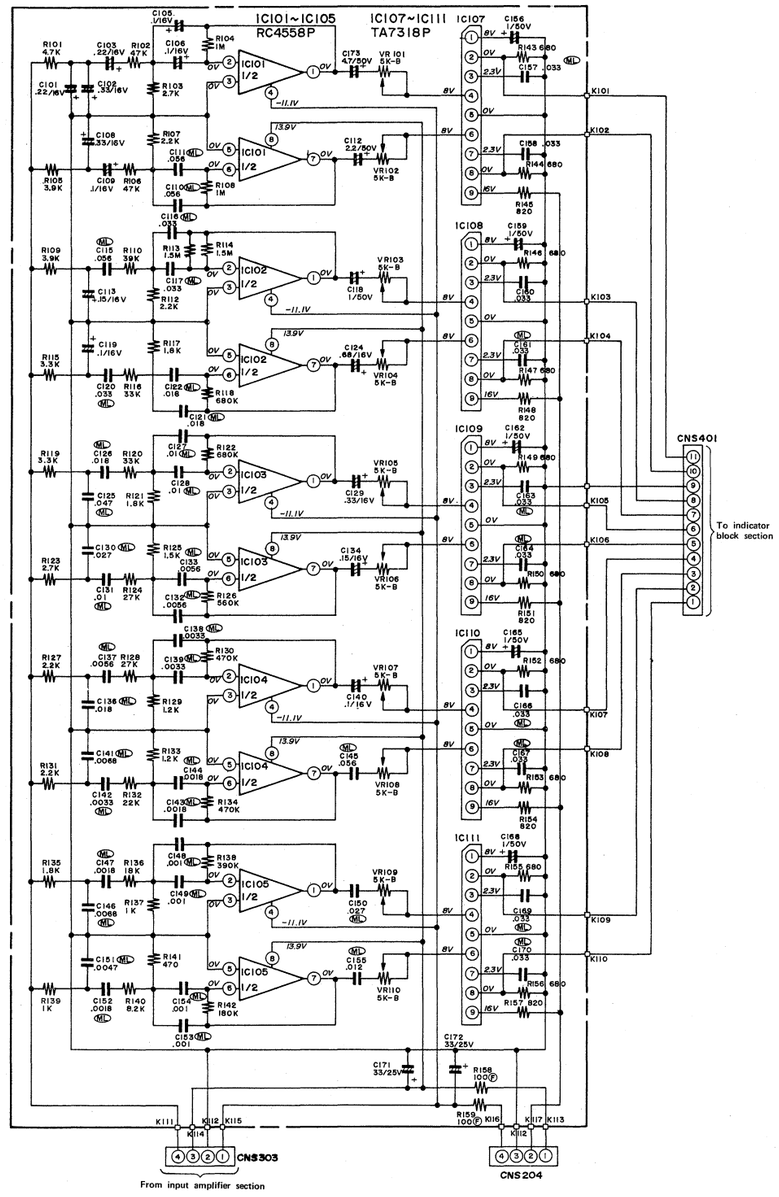



**Figure 14 FILTER BLOCK SECTION**

**5–3. Indicator Block Section (Refer to Figure 13–1, Figure 15)**

The indicator block comprises integrated circuits (IC401 thru IC411) and transistors (Q401 and Q402), through which the input signal is converted into a digital signal to light up the audio spectrum indicator (V401).

The integrated circuit (IC404) consists of inverter gates (1 thru 3), and clock pulse (A) is here generated and applied to pin ⑭ of the integrated circuit (IC405) where it is divided into 10 different pulse signals ("a" thru "j") going out of the circuit one after another; ("a" thru "d") are applied to the integrated circuit (IC407); ("e" and "f"), to the integrated circuit (IC402 1/2); ("g" thru "j"), to the integrated circuit (IC406).

The integrated circuits (IC406, IC407 and IC402 1/2) from AND gate; to one input of it is applied the pulse signal from the integrated circuit (IC405) while to the other input, the blank signal (B) from the integrated circuit (IC404) of inverter gate. Only if these two inputs go to "High" level at a time, does there appear an output entering the integrated circuits (IC410 and IC411); there it is boosted to approx. 30 V while it has been kept at approx. 12 V to 15 V, then fed to the grids (G1 thru G10) of the audio spectrum indicator (V401).

Meanwhile, 10 different DC signals which have been produced by the preceding circuit (the filter block) are now delivered via the plug (CNP401) to the integrated circuits (IC401, IC402 1/2 and IC403).

Either of the integrated circuits (IC401, IC402 1/2 and IC403) comprises 4 gates in the same way, and it switches on whenever one of the pulse signals ("a" thru "j") reaches "High" level. Now, suppose that the potential at pin ⑪ ("j") of the integrated circuit (IC405) goes to "High" level. The gate (1), then, turns on so the signal which has been applied to pin ⑨ of the integrated circuit (IC401) goes out of pin ⑧ of it. The other pulse signals ("a" thru "i") of the integrated circuit (IC405) are also processed in the same way, thereby switching on the gates (2) thru (10) in sequence. Going out of the gates (1) thru (10), the signals are then applied via the resistor (R411) to pin ② of the integrated circuit (IC408) where they are converted into 8 different pulse signals in direct accordance with their input voltage level going out of pins ⑥ thru ⑬ respectively. The outputs of pins ⑥ thru ⑨ are applied to the integrated circuit (IC409) where they are amplified to approx. 45 V entering the plates (P5 thru P8, say, the red and yellow segments) of the audio spectrum indicator (V401); the outputs of pins ⑩ thru ⑬ are amplified to approx. 32 V by the integrated circuit (IC411), then entering the plates (P1 thru P4, say, the green segments) of the audio spectrum indicator (V401).

The transistors (Q401 and Q402) are intended to work for about 5 seconds after the power switch has been turned on so as to reduce the voltage applied to the grids and, hence to prevent a proper indication of the audio spectrum indicator from suffering undesired noises or the like; the same is true for the case where the power switch is turned off.

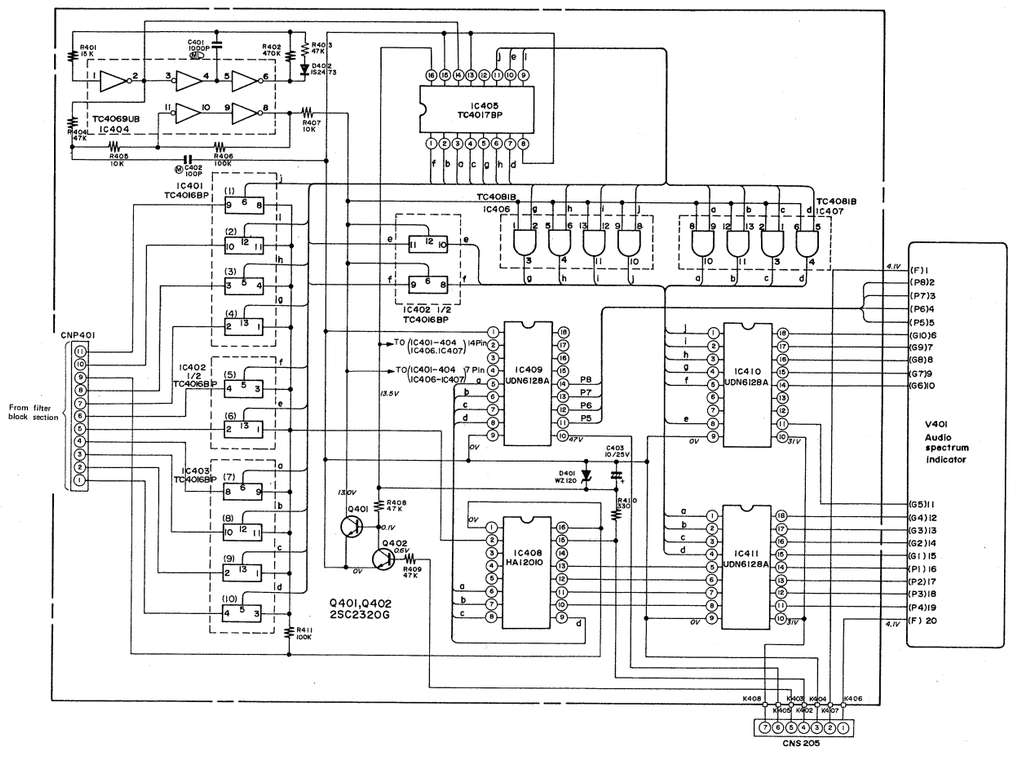



**Figure 15 INDICATOR BLOCK SECTION**



## HEAT PIPE

We shall explain the principles of the movement of Heat Pipe installed in Model SX-9100H.

The major purpose of Heat Pipe is the heat conduction; that is how to conduct the heat generated by Power Transistor as efficiently as possible to the "Fin" part.

As the "Heat in" part is delivered the heat generated by Power Transistor, Fluoro carbon F-11 liquid enclosed therein Pipe is heated and is made evaporated. On the occasion of evaporation, it uses a large quantity of heat as the evaporation heat, and the Fluoro carbon vapour flows towards "Heat out" The vapour transmission is made at sonic speed as the Pipe interior is vacuous.

The vapour at the "Heat out", being radiated by "Fin", is cooled down and due to the increased interior pressure by vapour, F-11 vapour is condensed into liquid.
Here, latent heat is radiated. That is, the heat of "Heat in" has been transmitted to "Heat out". Liquid F-11 flows back to "Heat in" by gravity. (In terms of heat, the "Heat out" part is located at higher position than "Heat in".)
Thus, the heat is transmitted as latent heat from "Heat in" to "Heat out" by the evaporation, transmission and condensation of F-11, making circulating close circuit.

SX-9100H Heat Pipe has effectively located the "Fin" part based on the above-mentioned principle, thus Amplifier with big power has been successfully developed. The new technology has broken through the limit of conventional Heat Sink of Alminium heat conduction, which was only 100 W + 100 W/8 Ω at 100 mm of Set height.

**Cautions:**

(1) Avoid using Set slanted or lengthwise, as Heat Pipe conducts heat by the circulation of activating liquid (F-11 for SX-9100H). Otherwise, activating liquid may not flow back from "Heat out" to "Heat in".
(2) Avoid applying strong force to Heat Pipe. In servicing, Activating liquid leakage may spoil the role as Heat sink.
(3) Never close radiating hole of Set as a large quantity of heat is being radiated from amplifier of big power. Never mount any other set on SX-9100H.
(4) During the adjustment, it is recommended for the legs at the bottom of the unit to be kept as high as possible so as to obtain the better heat radiation.

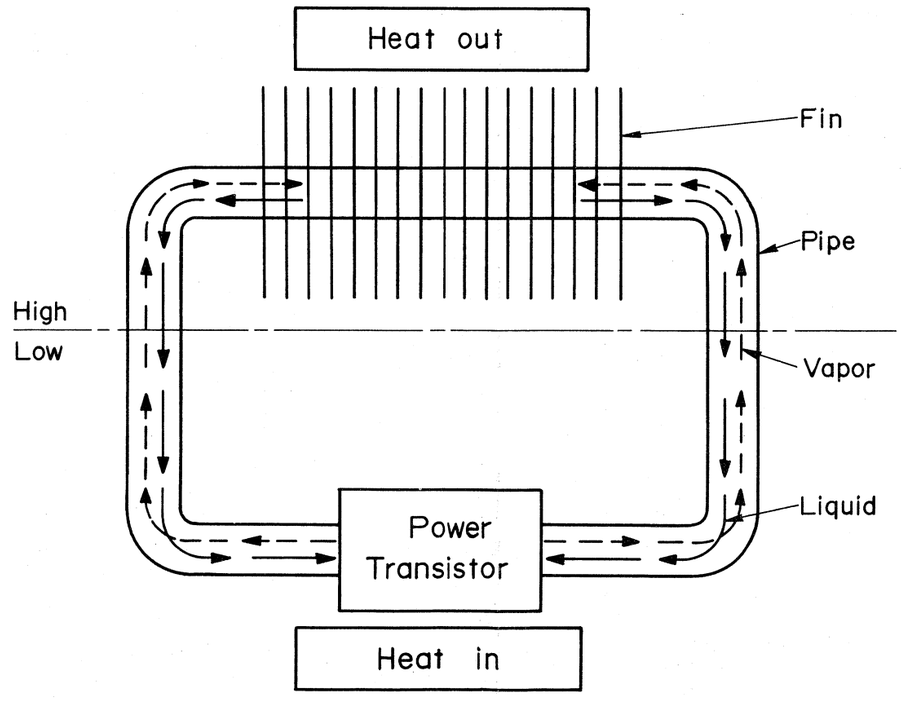



**Figure 16 HEAT PIPE**

## Adjustment of Power Amplifier Section

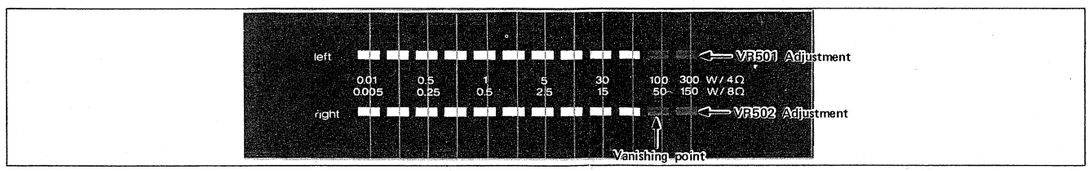
- Instruments necessary for the adjustments:
  1. DC millivoltmeter; 2 sets ( ① , ② )
  2. Signal generator; 1 set
  3. DC voltmeter; 1 set

- Set the power supply voltage at AC 220 V.
- Set the speaker selector switch "a" at "on" position.
- Set the variable resistors (VR1 and VR2) at "mechanical center" position.
- Bring the variable resistors (VR3 and VR4) to the extreme clockwise position.
- Connect the road resistor (4 ohm) to the right and left jacks of the speaker terminal A.

| Step | Meter connection | Adjust | Remarks |
|---|---|---|---|
| 1 | Connect DC millivoltmeter to the speaker terminal "A-left". | VR1 | Rotate the semi-variable resistor (VR1) until the meter indicates 0mV. |
| 2 | Connect DC millivoltmeter to the speaker terminal "A-right". | VR2 | Rotate the semi-variable resistor (VR2) until the meter indicates 0mV. |
| 3 | Connect DC millivoltmeter (1) to TP1 and K712; DC millivoltmeter (2) to TP2 and K712. | VR3 | Rotate the semi-variable resistor (VR3) so that the sum of reading values of the two meters will be 44mV. (However, the difference between the two meters must be less than 20mV.) |
| 4 | Connect DC millivoltmeter (1) to TP3 and K711; DC millivoltmeter (2) to TP4 and K711. | VR4 | Rotate the semi-variable resistor (VR4) so that the sum of reading values of the two meters will be 44mV. (However, the difference between the two meters must be less than 20mV.) |
| 5 | Make sure the voltage of each of the following points is within the range from 10mV to 30mV: Between TP5 and K712; TP6 and K712; TP7 and K711, TP8 and K711. | | |

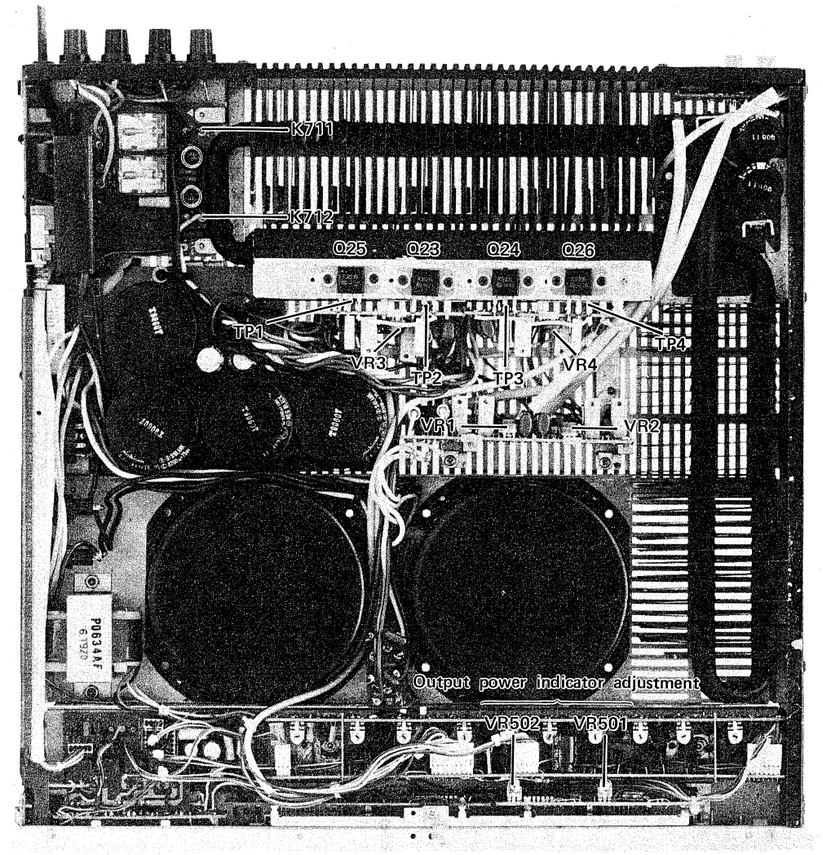
## Adjustment of Output Power Indicator Circuit

| Step | Signal generator | | Meter connection | Adjust | Remarks |
|---|---|---|---|---|---|
| | Connection | Frequency | | | |
| 1 | Connect signal generator to DC input socket (SO1)-"left". | 1kHz | Connect DC voltmeter to the speaker terminal "A-left". | VR501 | 1. Adjust the output of signal generator until DC voltmeter indicates 19.0V.<br>2. Rotate the semi-variable resistor (VR501) to a point where the 11th (counted from left) segment (red) of the output power indicator (V501) to display the left-channel power will begin to vanish. |
| 2 | Adjust the output of signal generator so that DC voltmeter indicates 20.0V, and see that the 11th segment can light up. | | | | |
| 3 | Connect signal generator to DC input socket (SO1)-"right". | 1kHz | Connect DC voltmeter to the speaker terminal "A-right". | VR502 | 1. Adjust the output of signal generator so that DC voltmeter indicates 19.0V.<br>2. Rotate the semi-variable resistor (VR502) to a point where the 11th (counted from left) segment (red) of the output power indicator (V501) to display the right-channel power will begin to vanish. |
| 4 | Adjust the output of signal generator so that DC voltmeter indicates 20.0V, and see that the 11th segment can light up. | | | | |

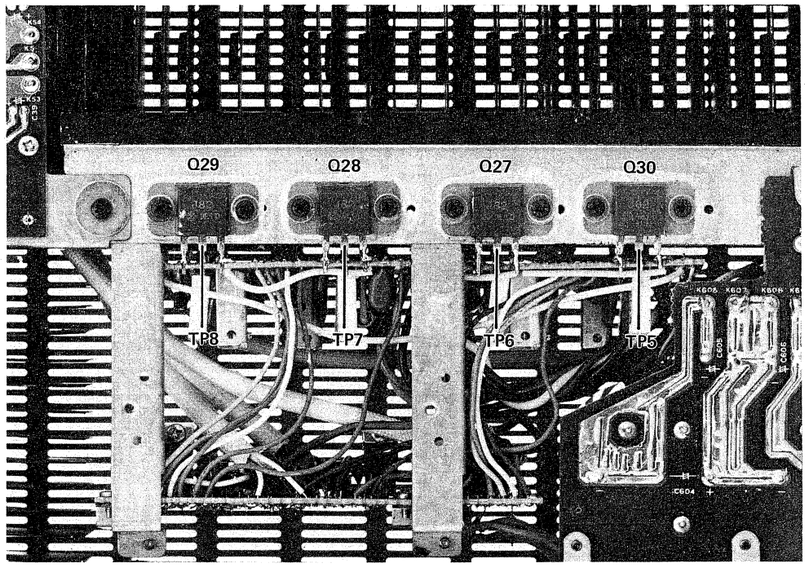



OUTPUT POWER INDICATOR






TOP VIEW

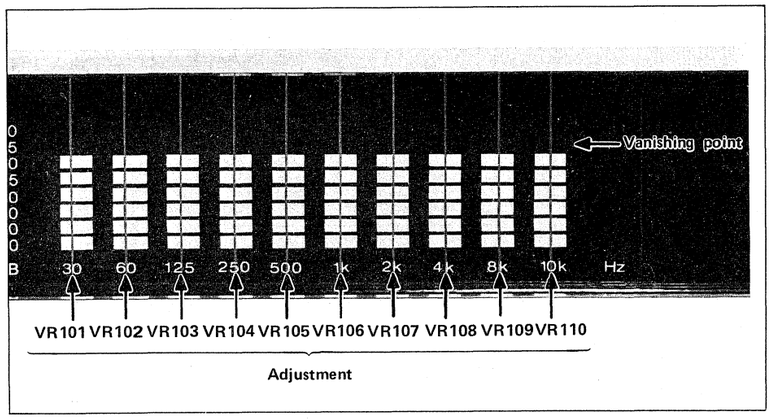



BOTTOM VIEW

Figure 18 ALIGNMENT POINTS

### Adjustment of Audio Spectrum Indicator Circuit

Set the "left" switch, the "right" switch and the "level −20dB" switch belonging to the audio spectrum analyzer switch (SW303, SW304, SW405) to "on", "off" and "off" position respectively.



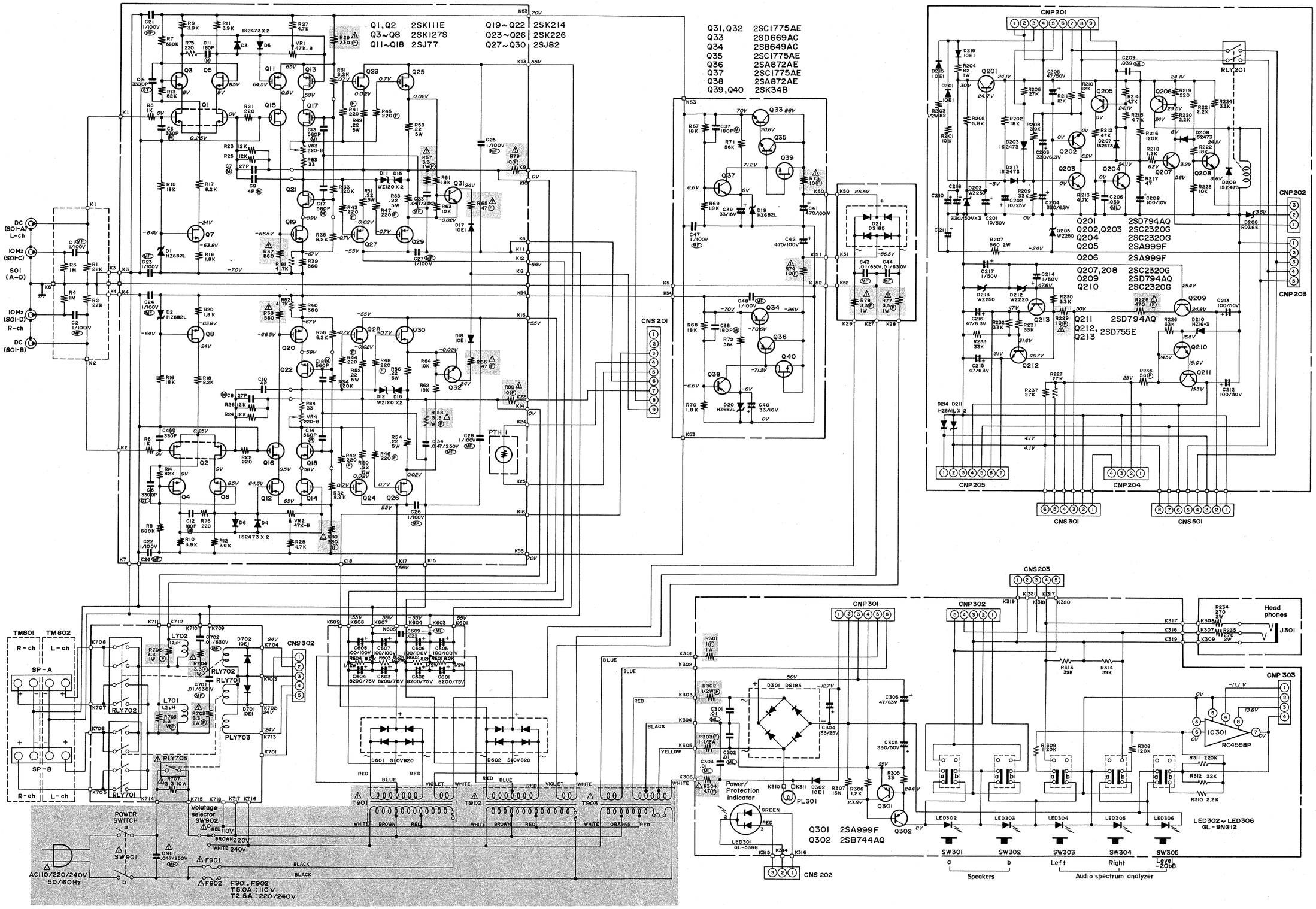

**AUDIO SPECTRUM INDICATOR**




**Figure 19 ALIGNMENT POINTS**

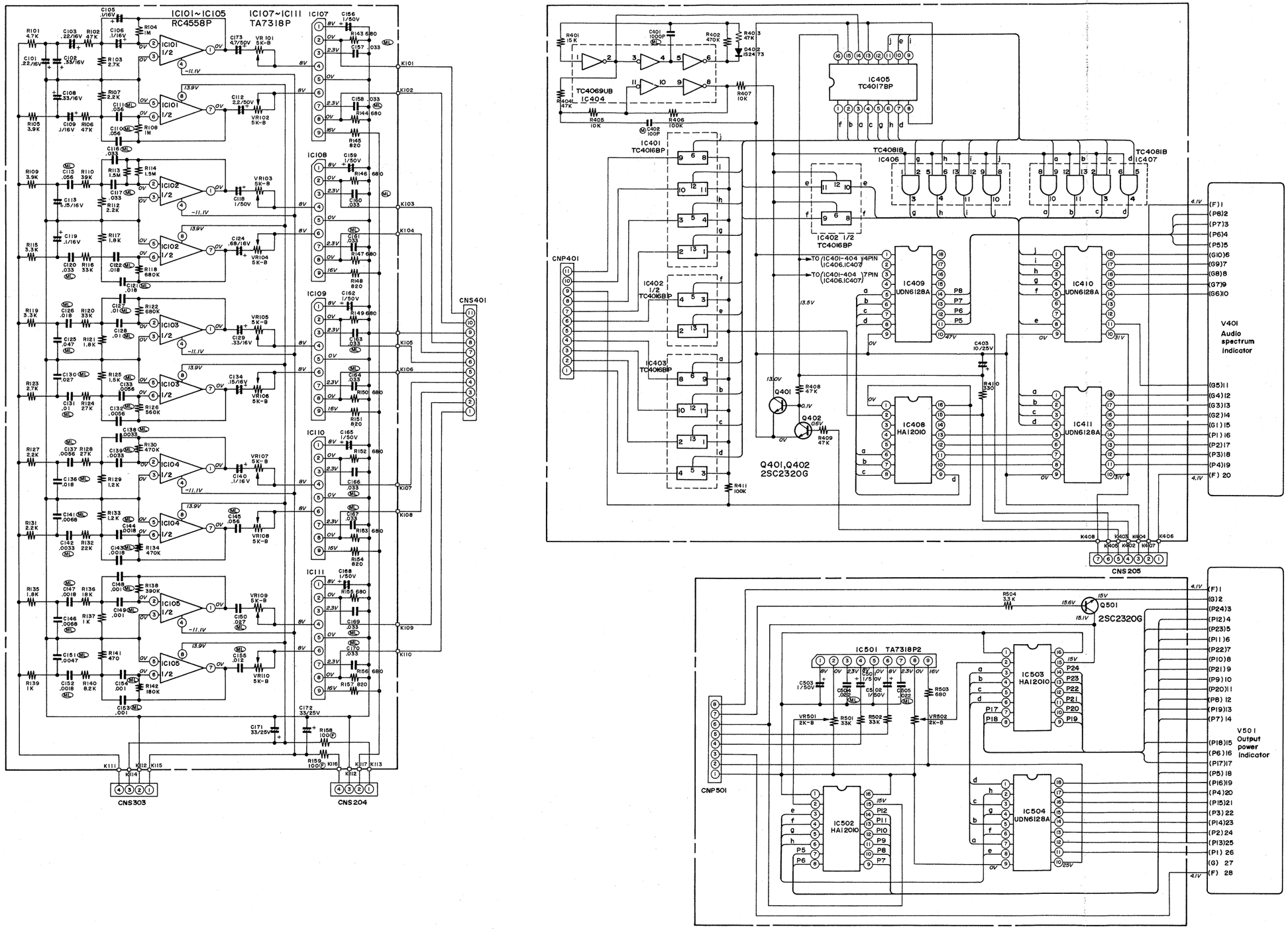


| Step | Signal generator | | Meter connection | Adjust | Remarks |
|---|---|---|---|---|---|
| | Connection | Frequency | | | |
| 1 | Connect signal generator to DC input socket (SO1)-"left". | 1kHz | Connect DC voltmeter to the speaker terminal "A-left". | VR106 | 1. Adjust the output of signal generator so that DC voltmeter indicates 10.0V.<br>2. Vary the frequency of signal generator and fix it where as many as the segments of the audio spectrum indicator can light up.<br>3. Rotate the variable resistor (VR106) to a point where the 6th (counted from the lowest) of the audio spectrum indicator will begin to vanish. |
| 2 | Same as step 1. | 30Hz | Same as step 1. | VR101 | Same as step 1. |
| 3 | Same as step 1. | 60Hz | Same as step 1. | VR102 | Same as step 1. |
| 4 | Same as step 1. | 125Hz | Same as step 1. | VR103 | Same as step 1. |
| 5 | Same as step 1. | 250Hz | Same as step 1. | VR104 | Same as step 1. |
| 6 | Same as step 1. | 500Hz | Same as step 1. | VR105 | Same as step 1. |
| 7 | Same as step 1. | 2kHz | Same as step 1. | VR107 | Same as step 1. |
| 8 | Same as step 1. | 4kHz | Same as step 1. | VR108 | Same as step 1. |
| 9 | Same as step 1. | 8kHz | Same as step 1. | VR109 | Same as step 1. |
| 10 | Same as step 1. | 16kHz | Same as step 1. | VR110 | Same as step 1. |
| 11 | Set "right" switch, "left" switch and "level-20dB" switch belonging to the audio spectrum analyzer switch (SW303, SW304, SW305) respectively to "on", "off" and "off" position. | | | | |
| 12 | Connect signal generator to DC input socket (SO1)-"right". | 1kHz | Connect DC voltmeter to the speaker terminal "A-right". | | 1. Same as step 1.<br>2. Same as step 1.<br>3. See the indication here is the same as in step 1. |
| 13 | Same as step 12. | 30Hz | Same as step 12. | | Same as step 12. |
| 14 | Same as step 12. | 60Hz | Same as step 12. | | Same as step 12. |
| 15 | Same as step 12. | 125Hz | Same as step 12. | | Same as step 12. |
| 16 | Same as step 12. | 250Hz | Same as step 12. | | Same as step 12. |
| 17 | Same as step 12. | 500Hz | Same as step 12. | | Same as step 12. |
| 18 | Same as step 12. | 2kHz | Same as step 12. | | Same as step 12. |
| 19 | Same as step 12. | 4kHz | Same as step 12. | | Same as step 12. |
| 20 | Same as step 12. | 8kHz | Same as step 12. | | Same as step 12. |
| 21 | Same as step 12. | 16kHz | Same as step 12. | | Same as step 12. |
| 22 | Set "left" switch, "right" switch and "level-20dB" switch belonging to the audio spectrum analyzer switch (SW303, SW304, SW305) respectively to "on", "off" and "on" position. | | | | |
| 23 | Same as step 1. | Same as steps 1 thru 10. | Same as step 1. | | 1. Adjust the output of signal generator so that DC voltmeter indicates 1.0V.<br>2. Same as step 1.<br>3. Same as step 12. |
| 24 | Set "right" switch, "left" switch and "level-20dB" switch belonging to the audio spectrum analyzer switch (SW303, SW304, SW305) respectively to "on", "off" and "on" position. | | | | |
| 25 | Same as step 12. | Same as steps 12 thru 21. | Same as step 12. | | 1. Same as step 23.<br>2. Same as step 1.<br>3. Same as step 12. |




(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

**Figure 21 SCHEMATIC DIAGRAM (POWER AMPLIFIER/POWER SUPPLY/PROTECTION)**




(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

**Figure 23 SCHEMATIC DIAGRAM (POWER INDICATOR/SPECTRUM INDICATOR)**

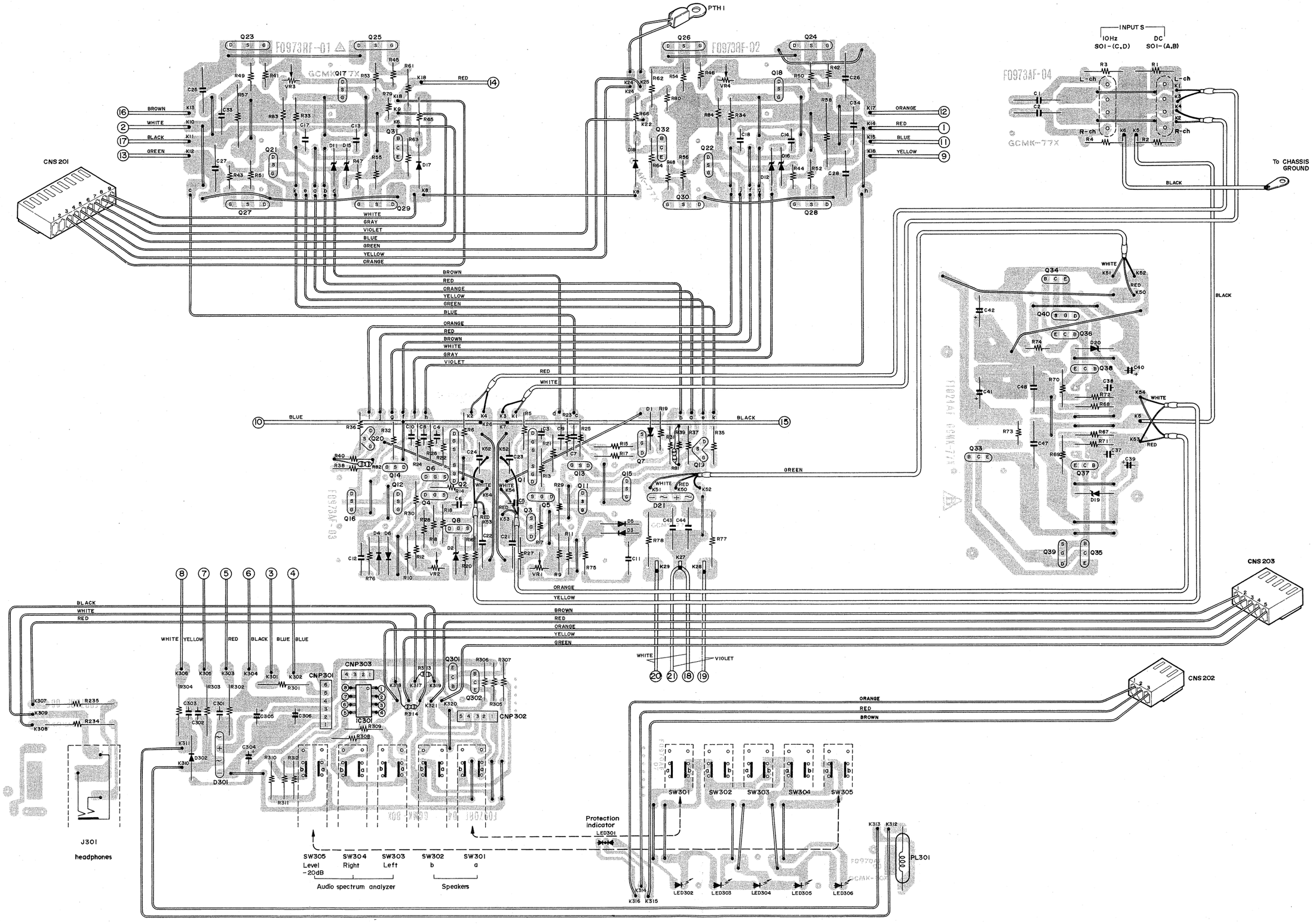



Figure 25 WIRING SIDE OF P.W. BOARD (POWER AMPLIFIER/VOLTAGE REGULATOR)

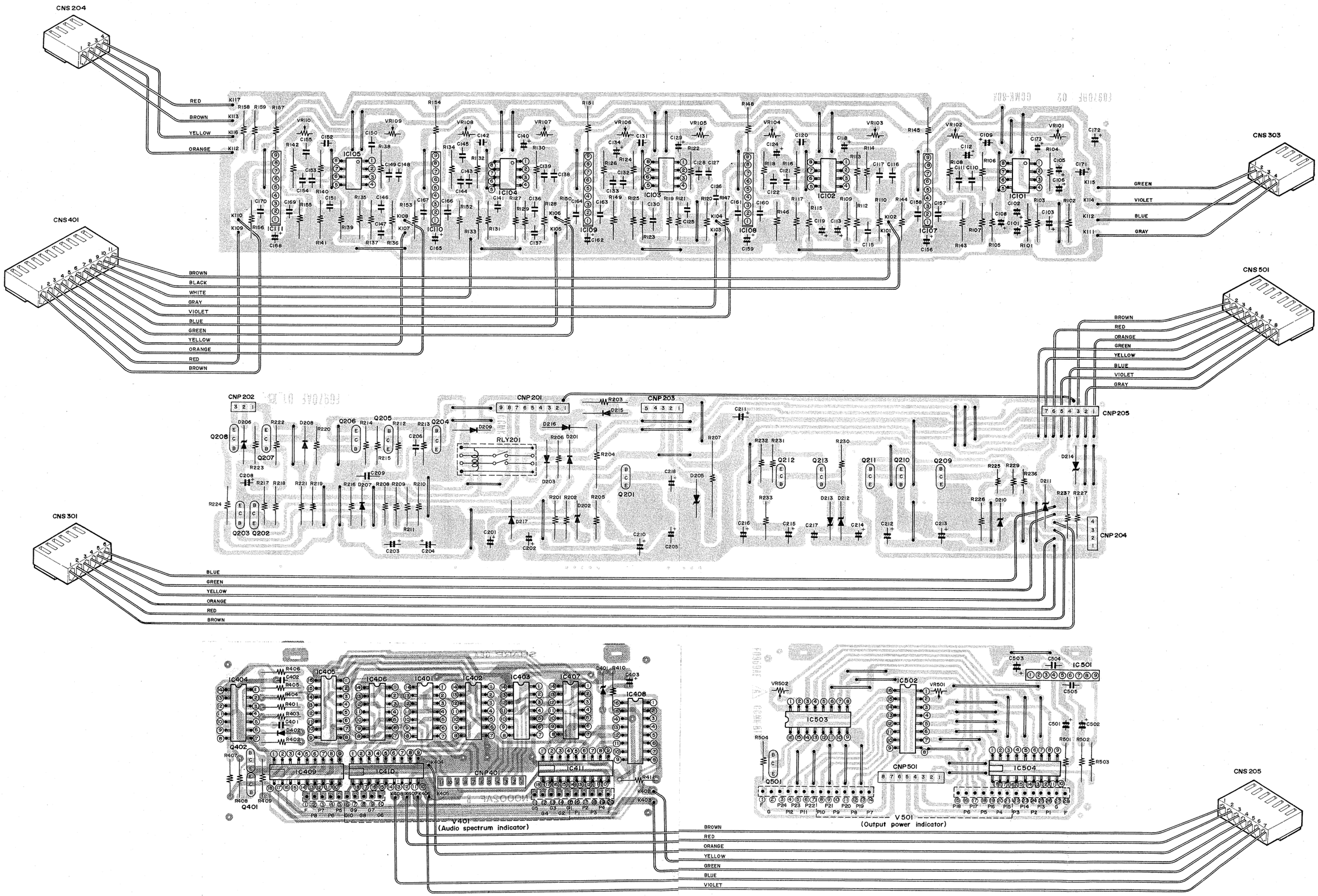



Figure 27 WIRING SIDE OF P.W. BOARD (POWER INDICATOR/SPECTRUM INDICATOR)

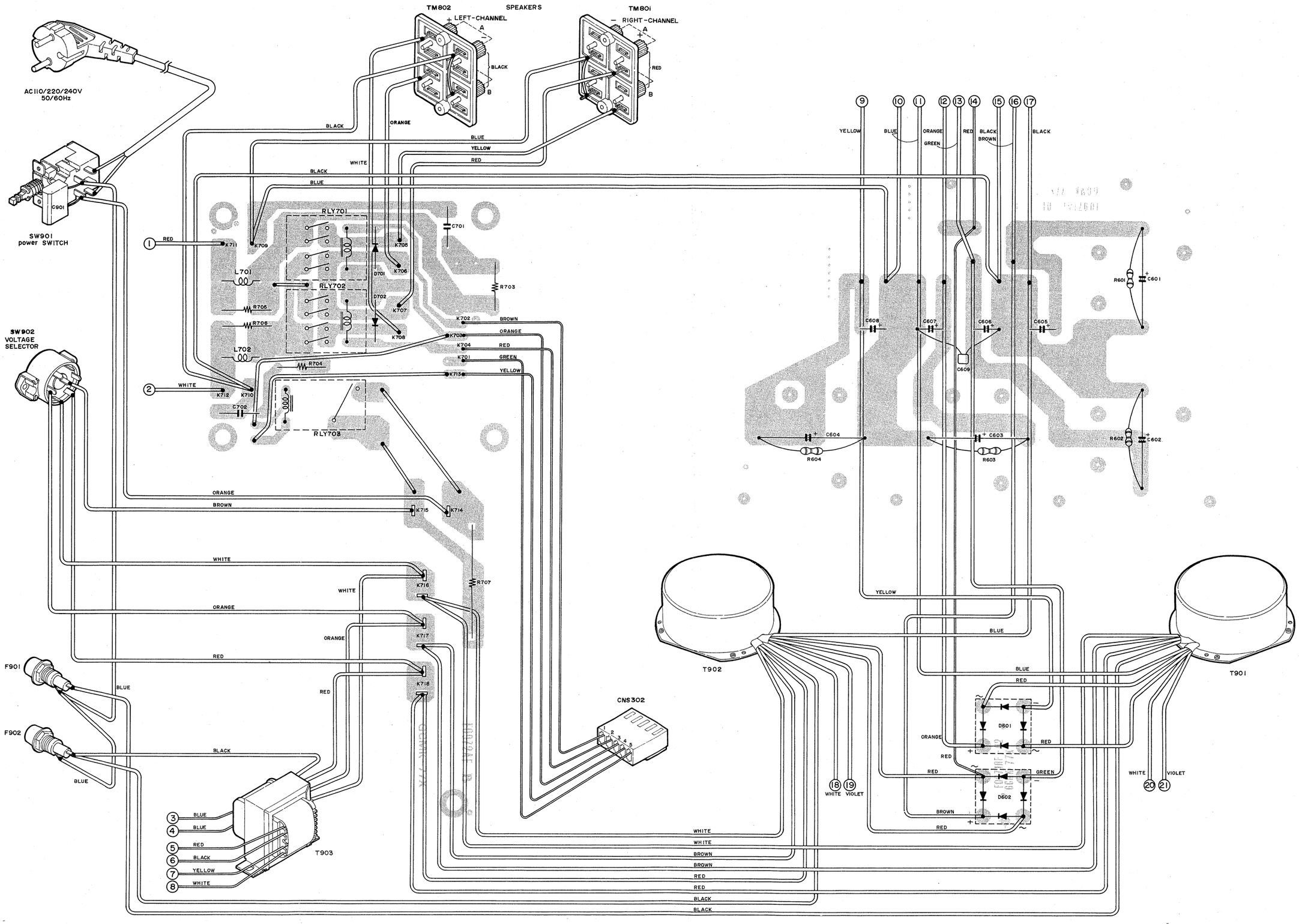
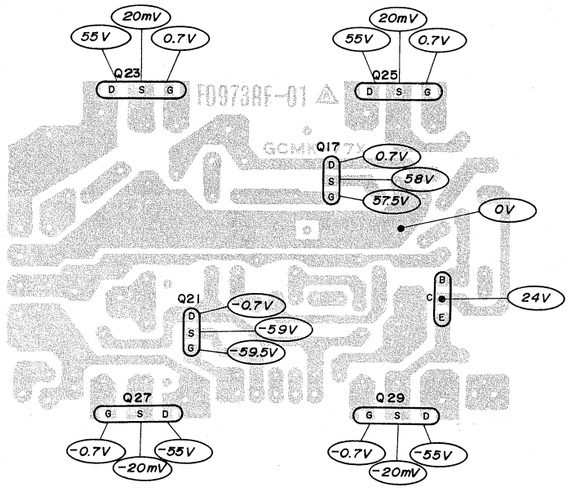
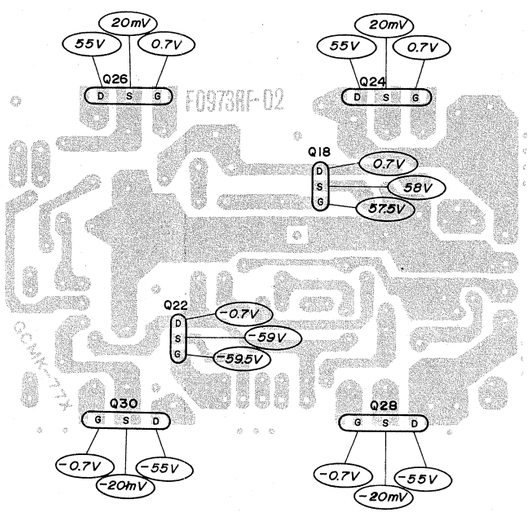
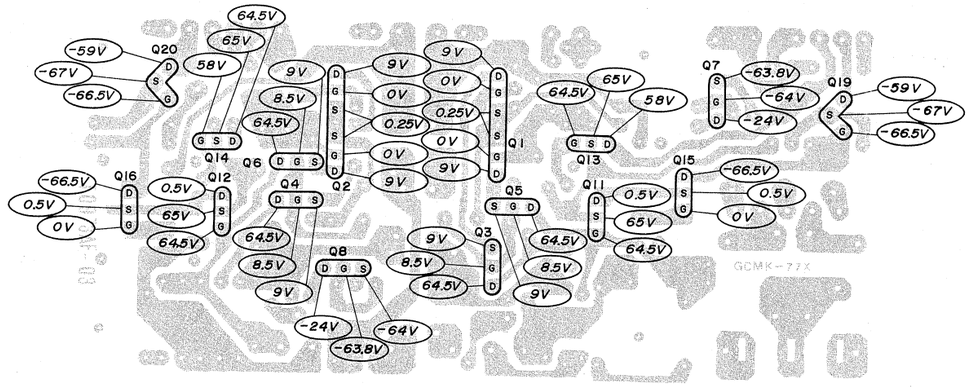
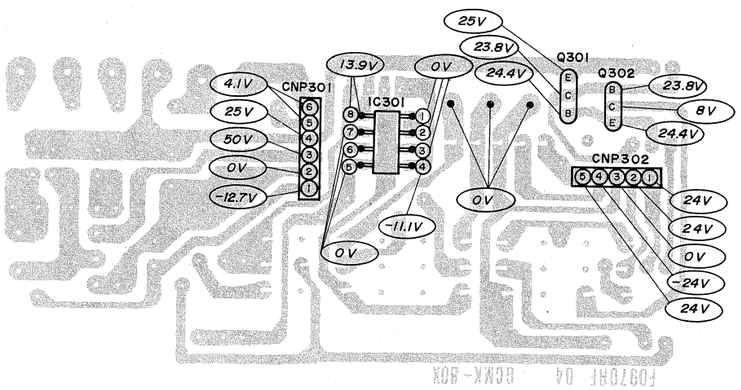


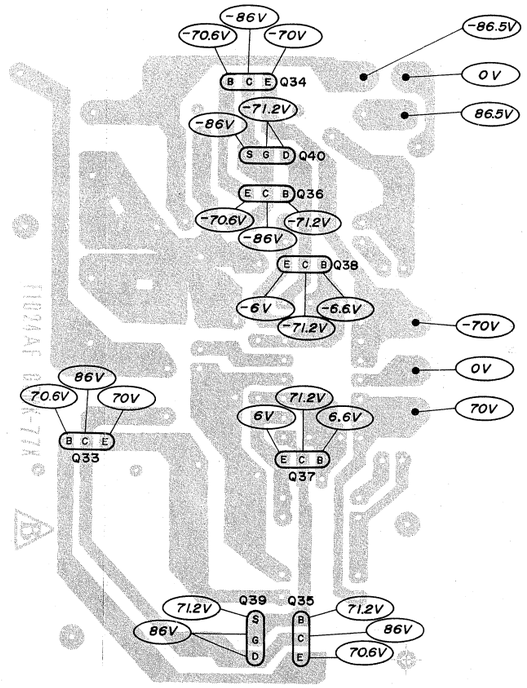

**Figure 29 WIRING SIDE OF P.W. BOARD (POWER SUPPLY)**



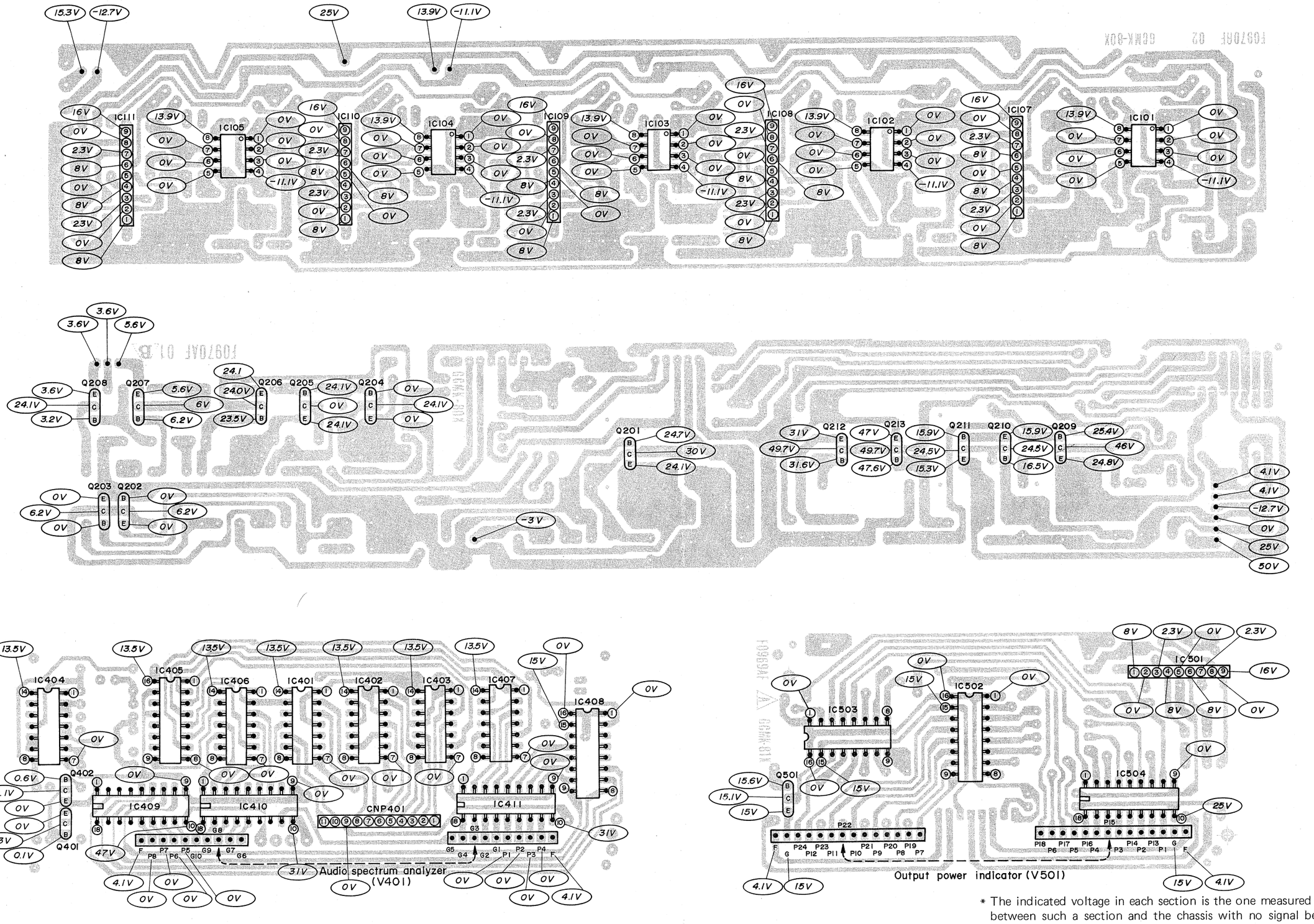



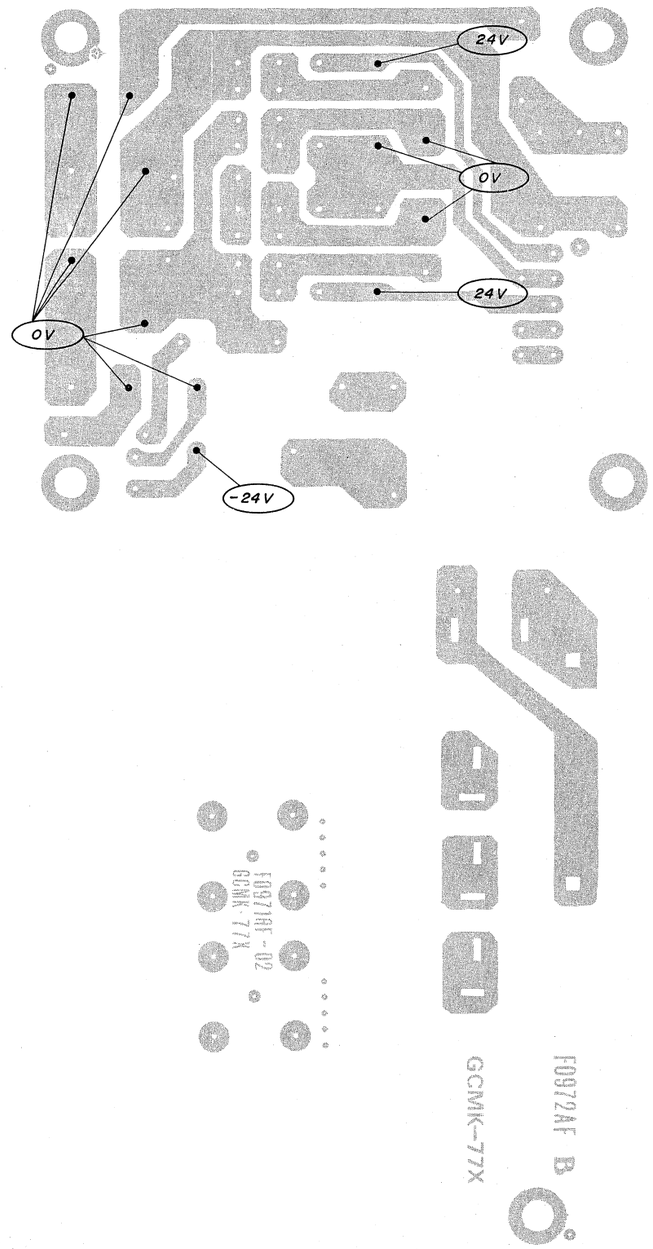

* The indicated voltage in each section is the one measured by VTVM between such a section and the chassis with no signal being given.

**Figure 31 VOLTAGE GUIDE ON P.W. BOARD (POWER AMPLIFIER/VOLTAGE REGULATOR)**




* The indicated voltage in each section is the one measured by VTVM between such a section and the chassis with no signal being given.

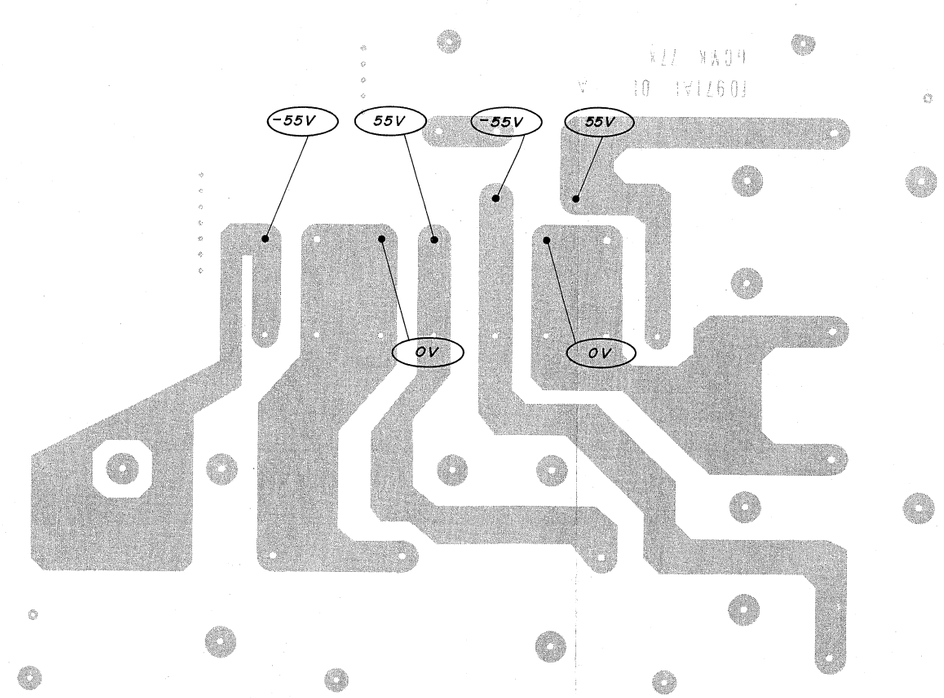
**Figure 33 VOLTAGE GUIDE ON P.W. BOARD (POWER INDICATOR/SPECTRUM INDICATOR)**




NOTES ON SCHEMATIC DIAGRAM

1. SW301: Speakers selector "a" switch (Shown in off mode.)
2. SW302: Speakers selector "b" switch (Shown in off mode.)
3. SW303: Audio spectrum indication selector "left" switch (Shown in off mode.)
4. SW304: Audio spectrum indication selector "right" switch (Shown in off mode.)
5. SW305: Audio spectrum indication selector "level —20dB" switch (Shown in off mode.)
6. SW901: Power On/Off switch (Shown in off mode.)
7. SW902: Mains voltage selector switch (Shown in "220V" position.
8. (M) MICA CAPACITORS
9. (MF) METALIZED FILM CAPACITORS
10. (ML) MYLAR CAPACITORS
11. (ST) STYROL CAPACITORS
12. (MP) METALIZED PAPER CAPACITORS
13. (F) FUSIBLE RESISTORS

Be sure to use regular parts for securing the safety and reliability of the set. Parts marked with "⚠" and parts crosshatched (in black) are especially important for maintaining the safety and protecting ability of the set. Be sure to replace them with parts of specified part number.




* The indicated voltage in each section is the one measured by VTVM between such a section and the chassis with no signal being given.

**Figure 35 VOLTAGE GUIDE ON P.W. BOARD (POWER SUPPLY)**

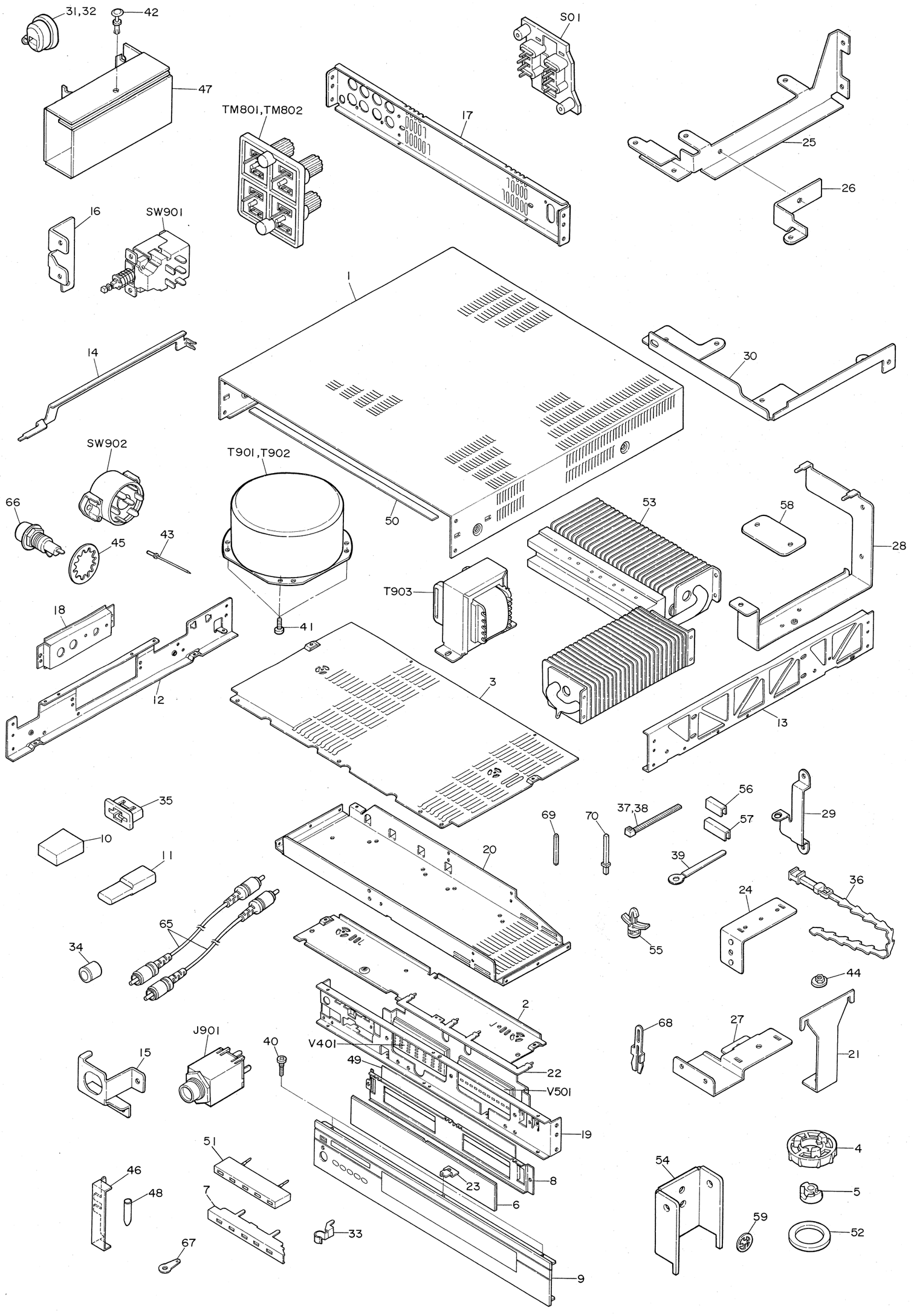



**Figure 38 MISCELLANEOUS PARTS GUIDE**

## DISASSEMBLY

Prior to removing the cabinet, be sure to draw the mains supply plug from an wall outlet and disconnect all of connection cords at the rear of the set.

### A CABINET REMOVAL

1. Remove the 4 screws retaining the cabinet at the right and left surfaces. (Refer to Figure 39–1)
2. Shift the cabinet backward about 5 mm.
3. Giving a force to the bottom of cabinet, hold it up and remove. (Refer to Figure 39–1)

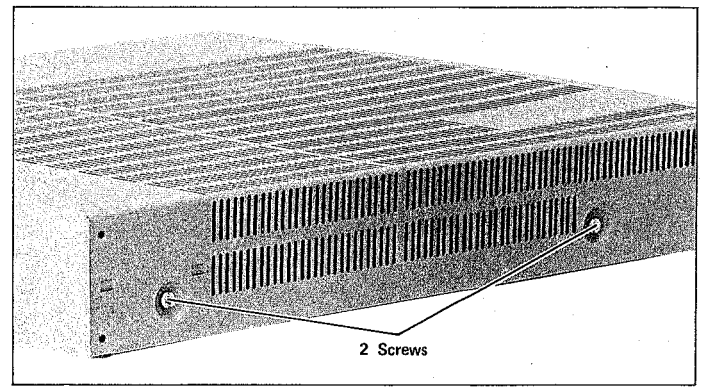



**Figure 39–1**

### B BOTTOM LID REMOVAL

1. Turn the set over and remove the 17 screws retaining the bottom lid, then the bottom lid can be detached by holding it up. (Refer to Figure 39–2)

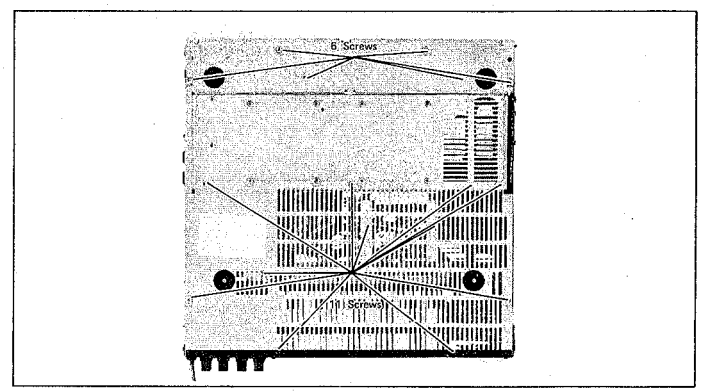



**Figure 39–2**

### C FRONT PANEL REMOVAL

1. Remove the 7 screws retaining the front panel, then the front panel can be detached by pulling it toward you. (Refer to Figures 39–3 and 39–4).

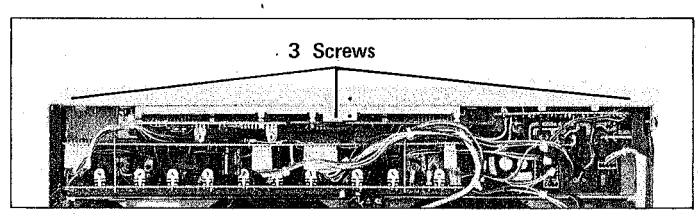



**Figure 39–3**

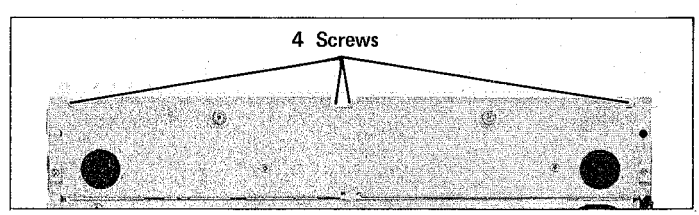



**Figure 39–4**

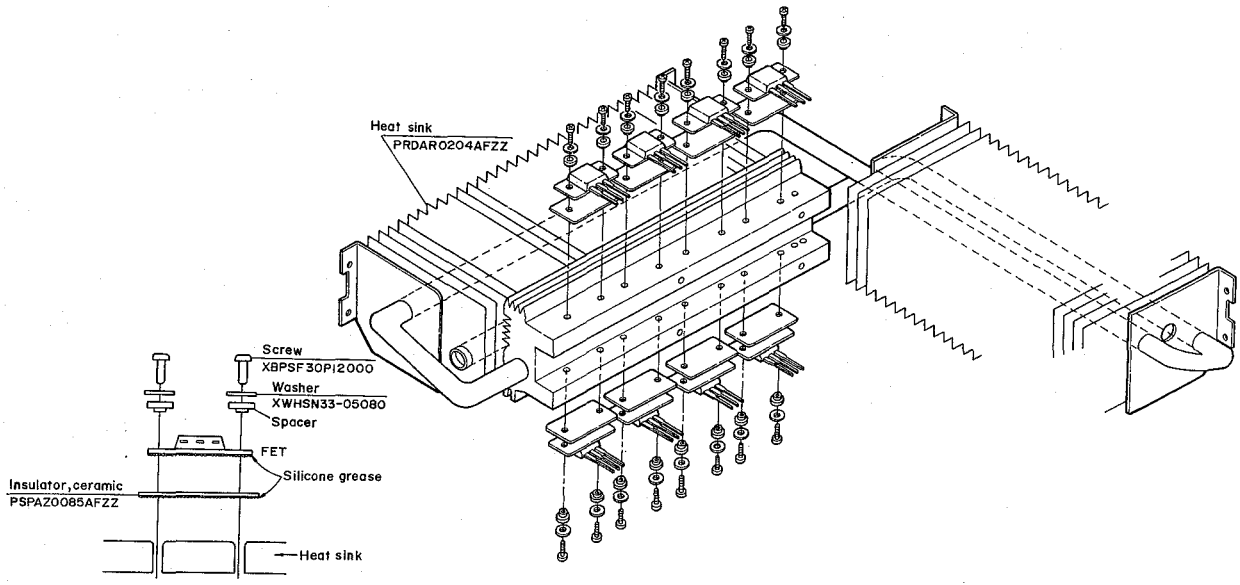
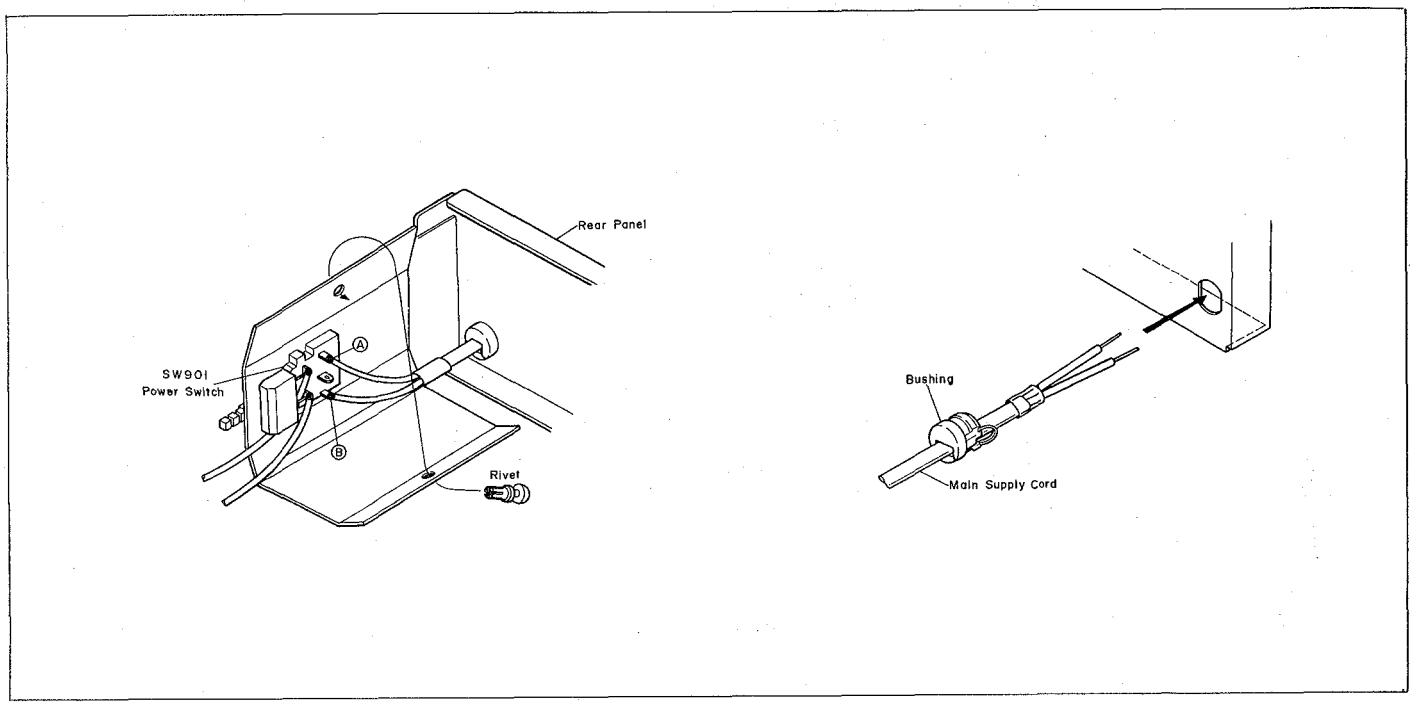



**Figure 40 POWER FET REPLACEMENT**



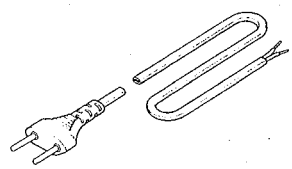
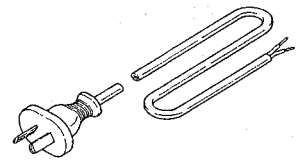
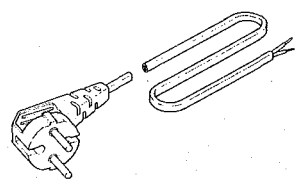
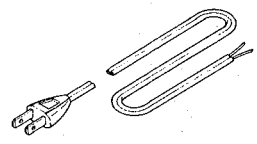
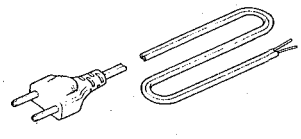
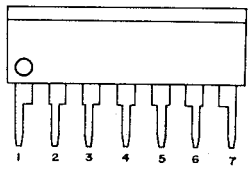

| Mains supply cord | Bushing | Connection | | Figure |
|---|---|---|---|---|
| | | Ⓐ | Ⓑ | |
| (61) QACCS0051AF00 | LBSHC0004AGZZ | Blue | Brown |  |
| (60) QACCL0051AFZZ | LBSHC0004AFZZ | Blue | Brown |  |
| (63) QACCZ0052AF00 | LBSHC0004AGZZ | Blue | Brown |  |
| (62) QACCZ0002TA0F | LBSHC0007AFZZ | Brown | Brown |  |
| (64) QACCZ0053AF00 | LBSHC0007AFZZ | Black | Black |  |

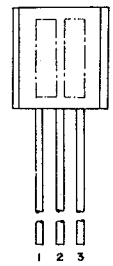
**Figure 41 MAINS SUPPLY CORD WIRING CONNECTIONS**

2SK111E



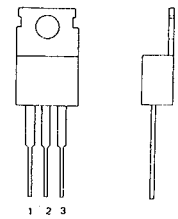

1. Drain-1
2. Gate-1
3. Source-1
4. Void pin
5. Source-2
6. Gate-2
7. Drain-2

2SK127S



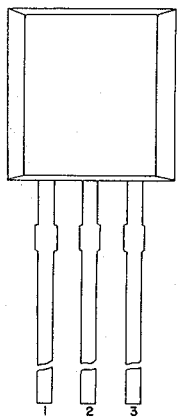

1. Source
2. Gate
3. Drain

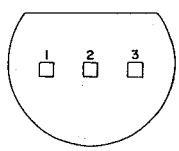
2SJ77
2SJ214




1. Gate
2. Source
3. Drain

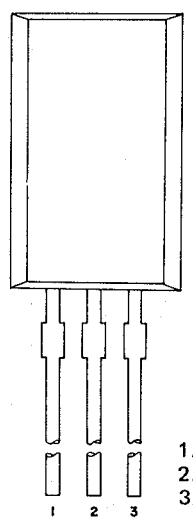
2SC1775AE
2SA872AE



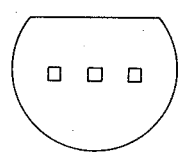




1. Emitter 2. Collector 3. Base

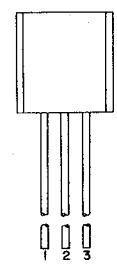
2SD755E



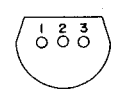

1. Emitter
2. Collector
3. Base



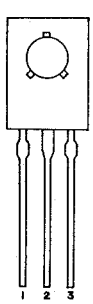
2SC2320G
2SA999F
2SK34B2




1. Emitter
2. Collector
3. Base

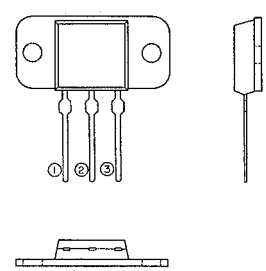



2SD794AQ
2SB744AQ
2SB669AC
2SB649AC




1. Emitter
2. Collector
3. Base

2SJ82
2SK226




1. Gate
2. Source
3. Drain

Figure 42 FETS AND TRANSISTORS TYPE

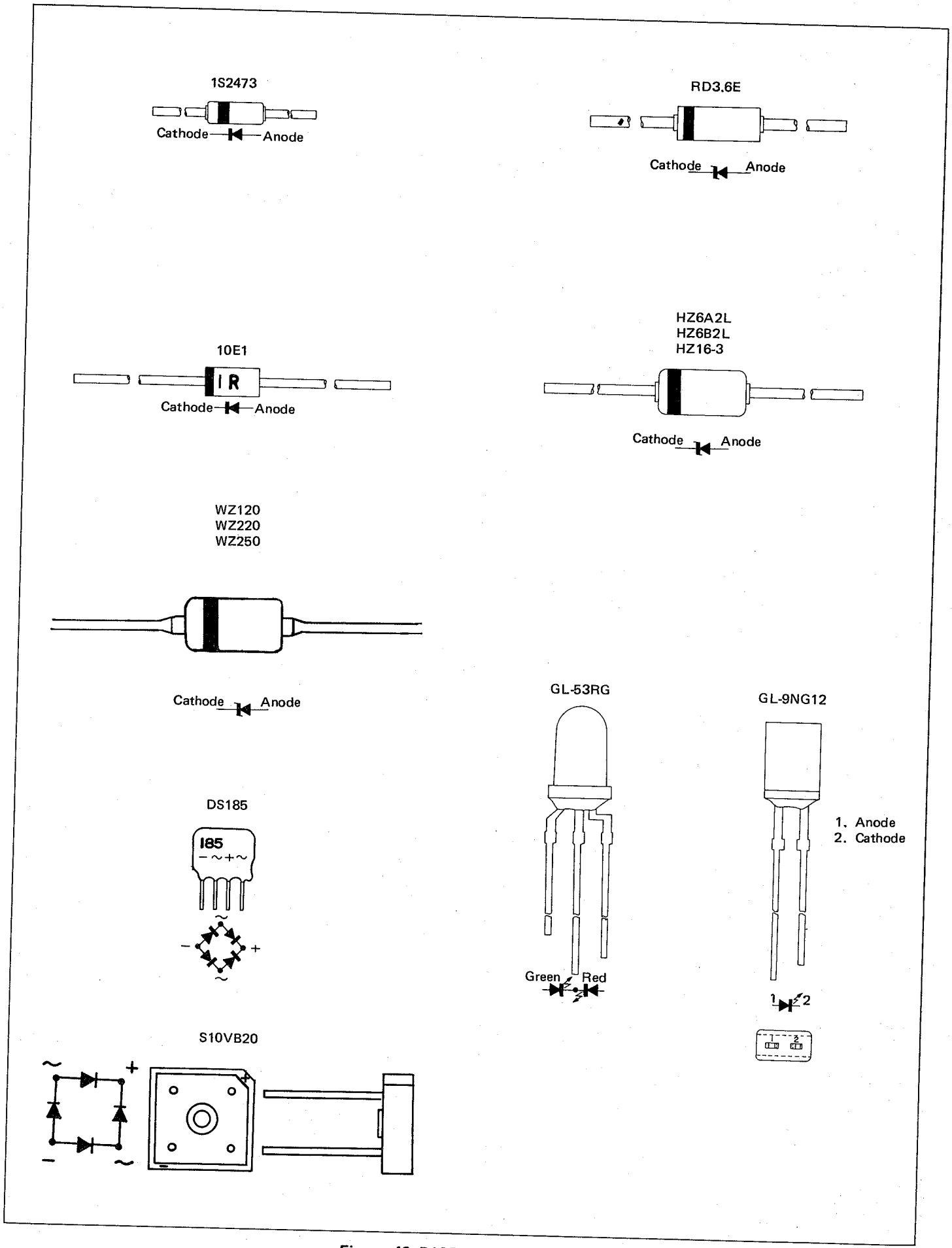
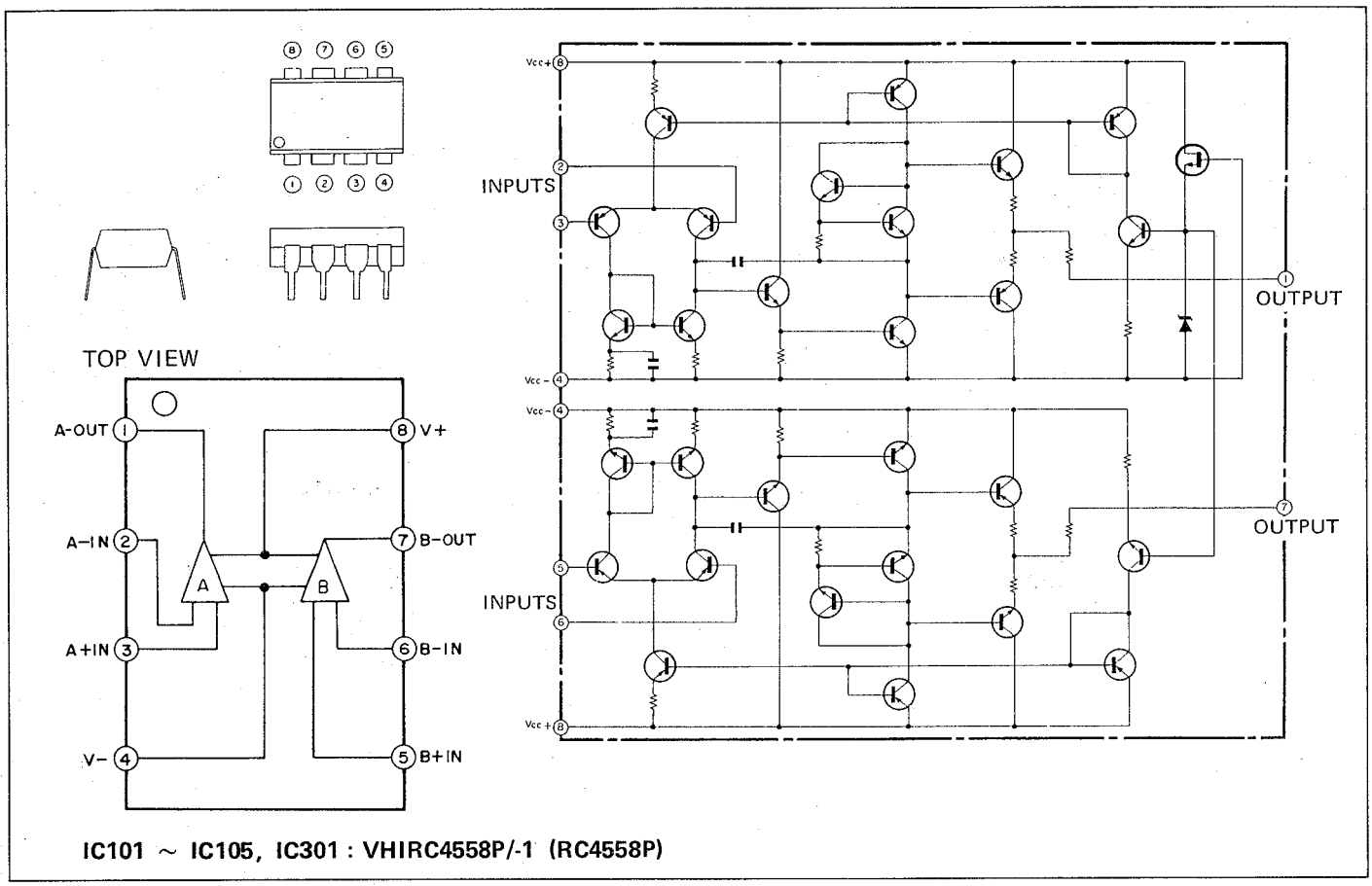
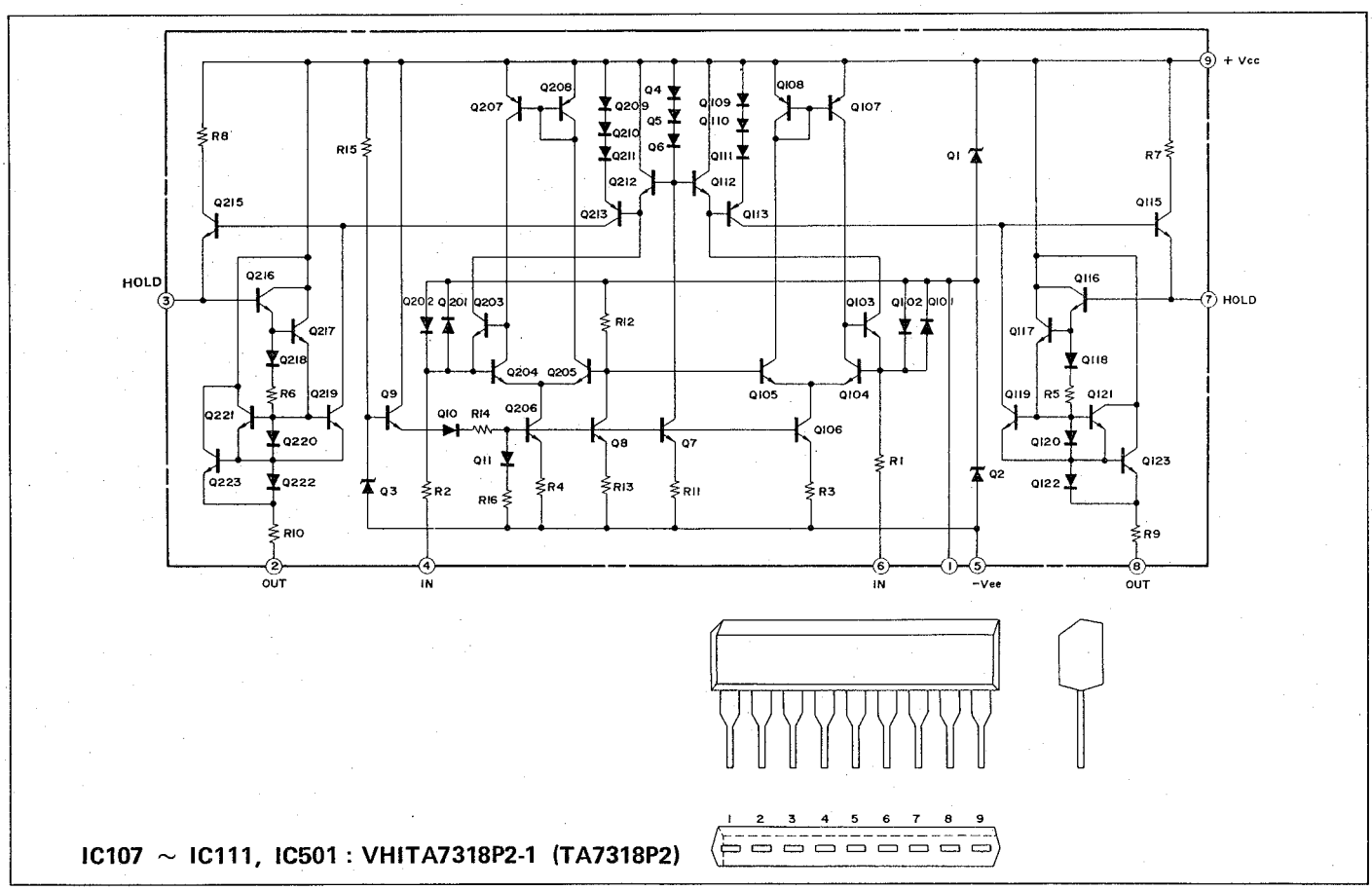



Figure 43 DIODES TYPE



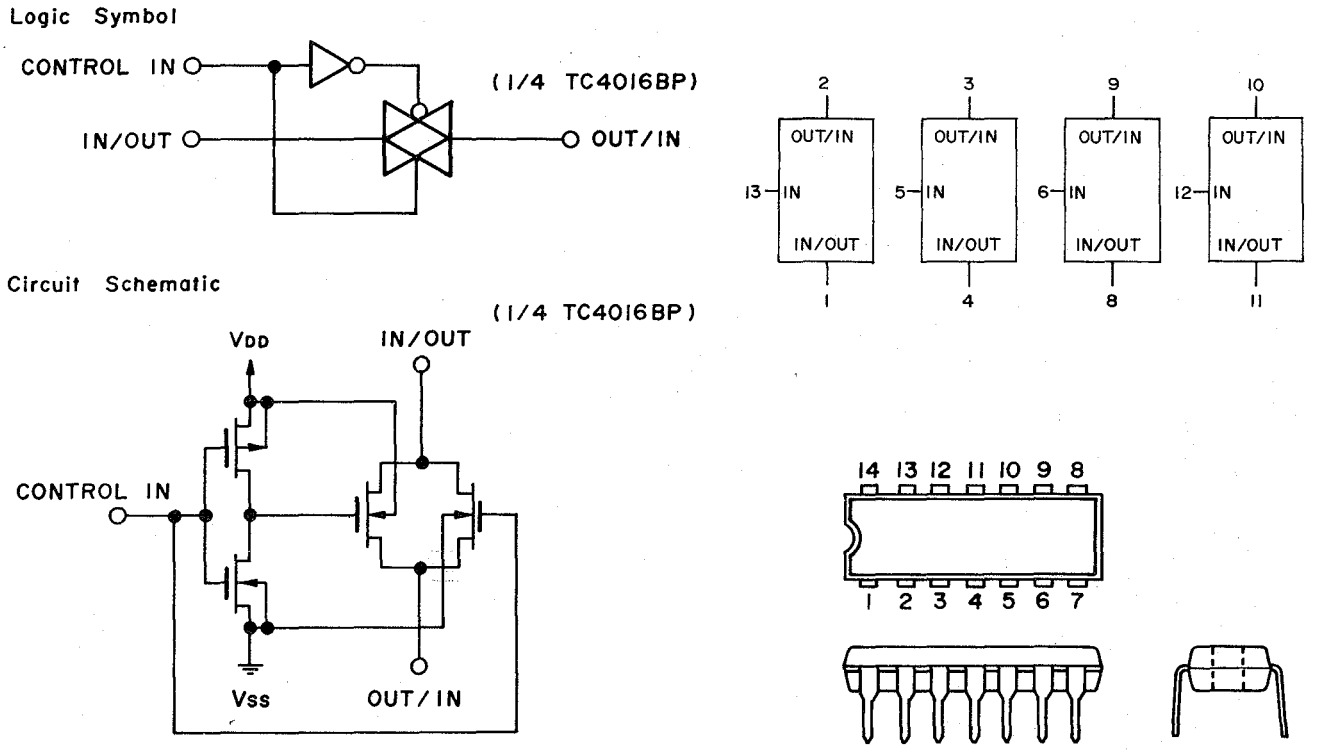

**IC101 ~ IC105, IC301 : VHIRC4558P/-1 (RC4558P)**

**Figure 44–1 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT**



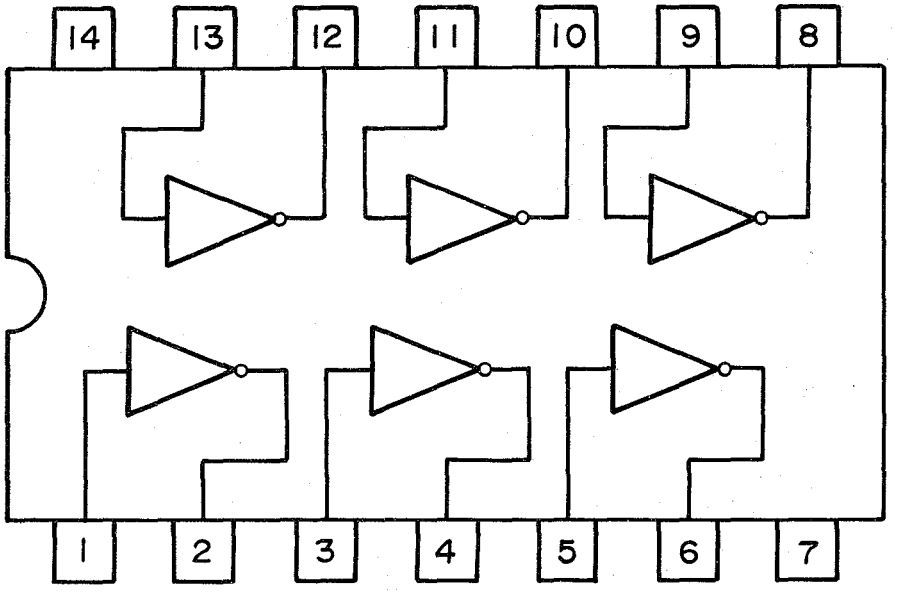

**IC107 ~ IC111, IC501 : VHITA7318P2-1 (TA7318P2)**

**Figure 44–2 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT**



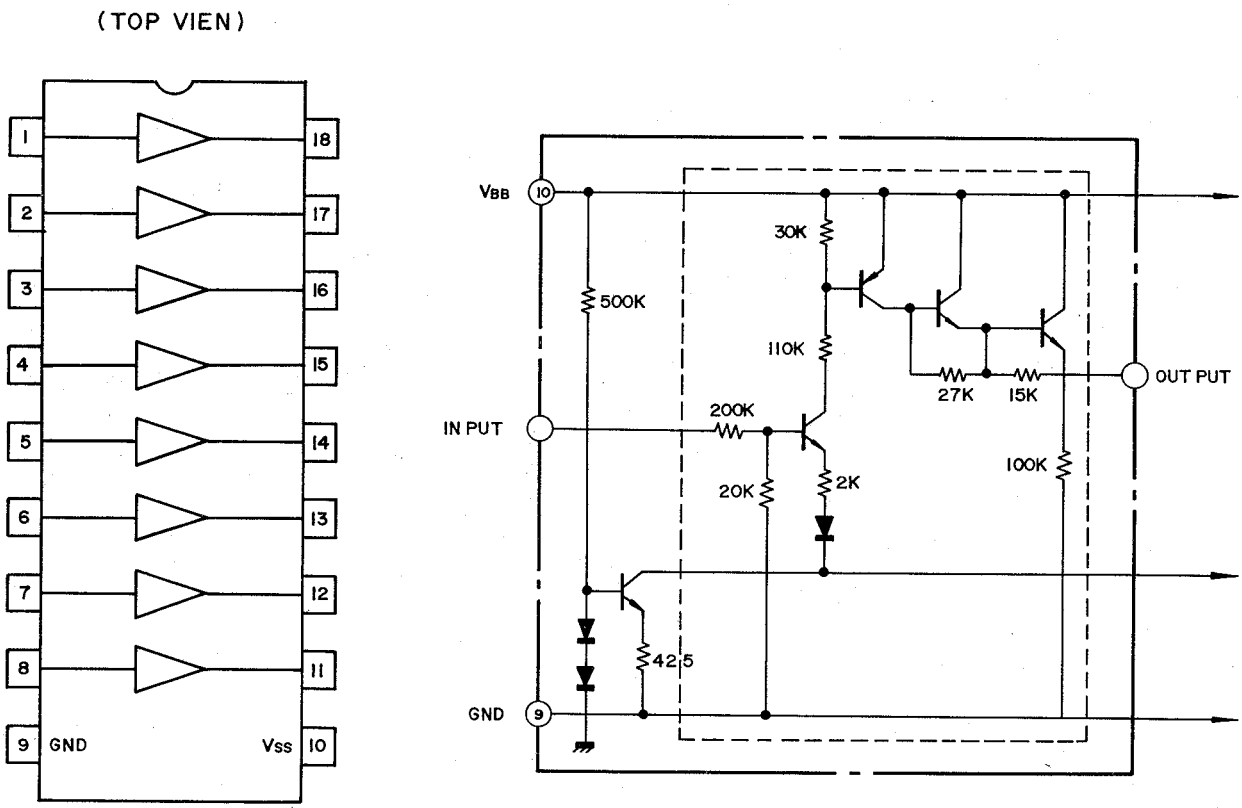

I401 ~ IC403 : RH-IX1127AFZZ (TC4016BP)

Figure 45–1 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT



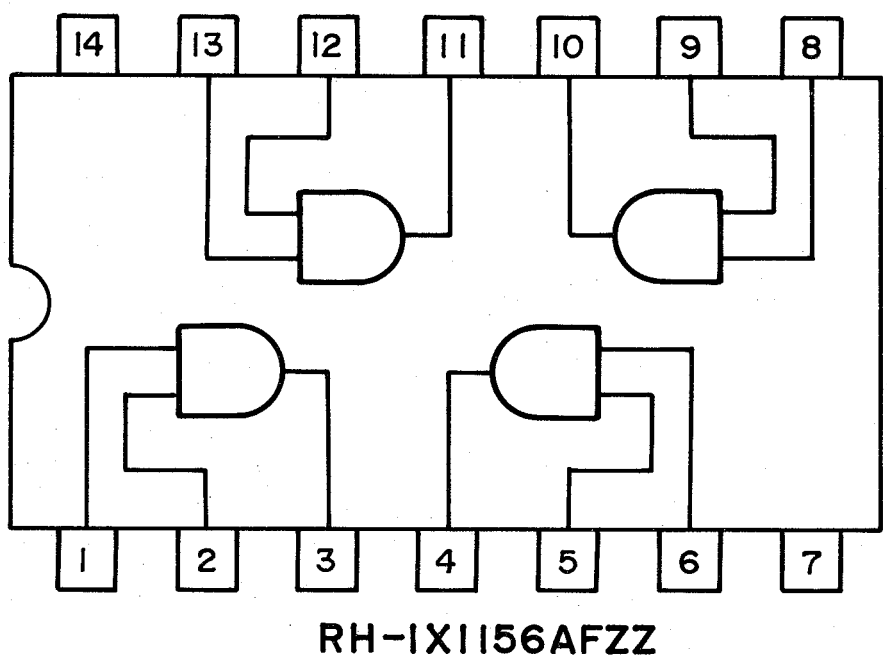

IC404 : RH-IX1154AFZZ (TC4069UBP)

Figure 45–2 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT



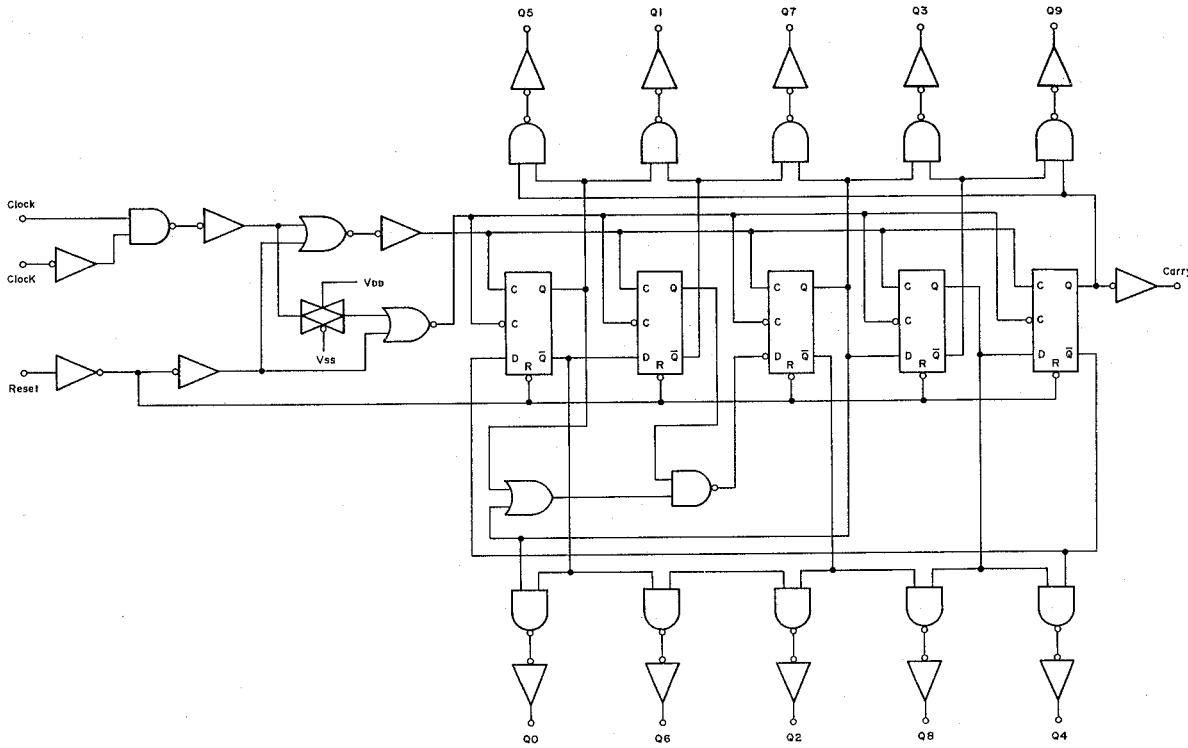

IC409 ~ IC411, IC504 : VHIUDN6128A-1 (UDN6128A)

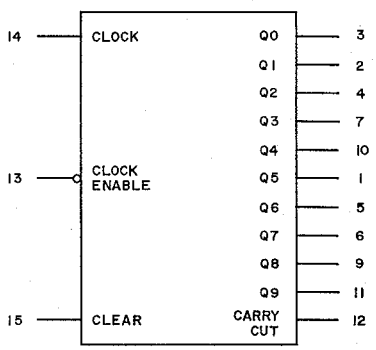
Figure 46–1 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT

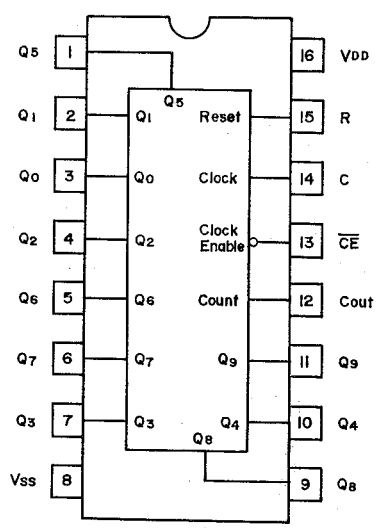


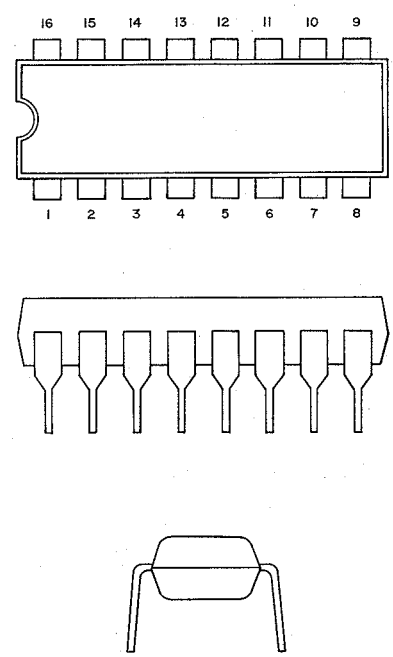

IC406, IC407 : RH-IX1156AFZZ (TC4081BP)

Figure 46–2 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT



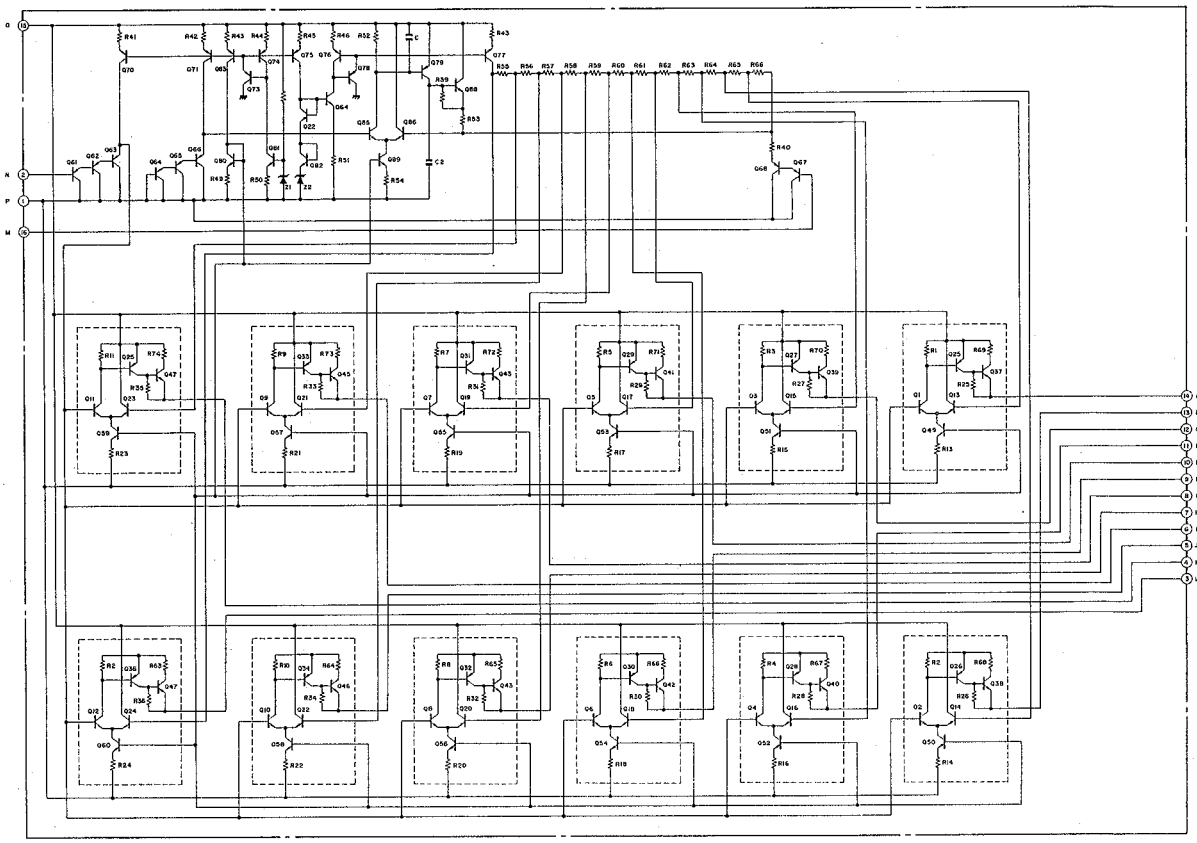



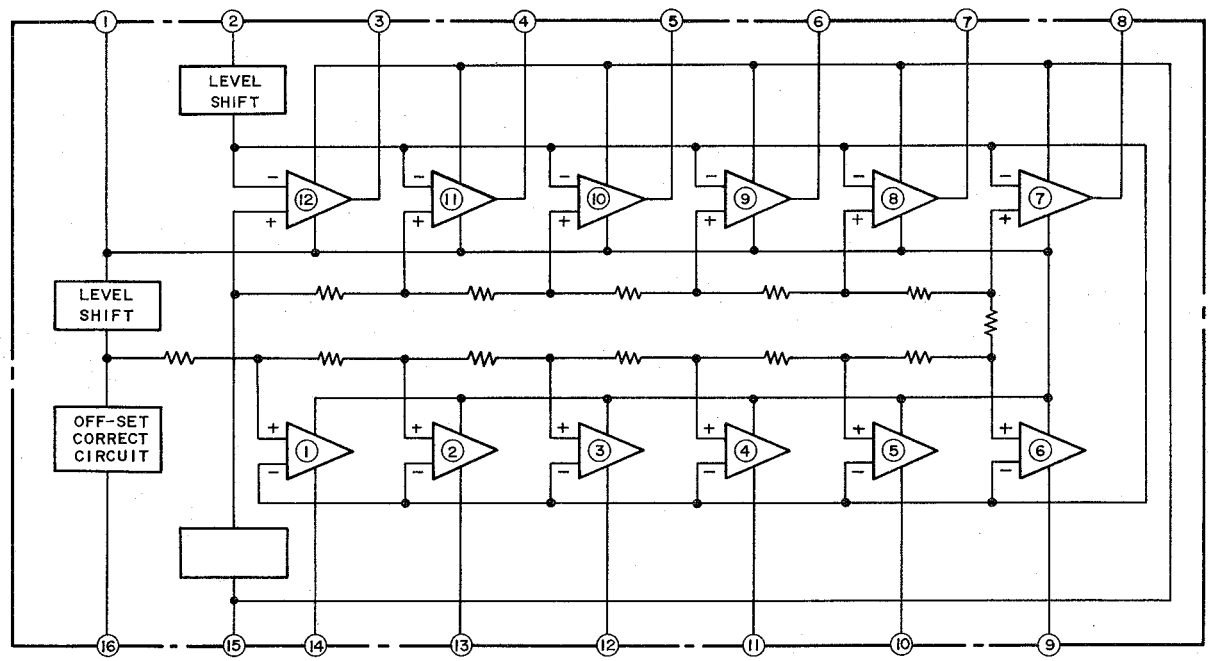




**IC405 : RH-IX1175AFZZ (TC4017BP)**

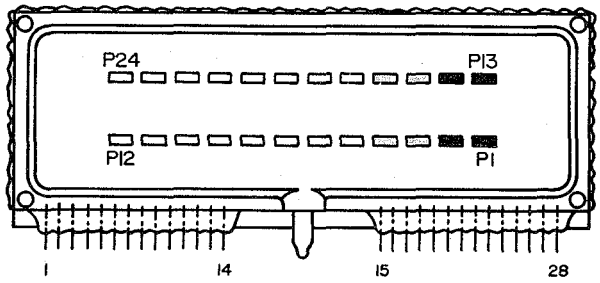
**Figure 47 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT**

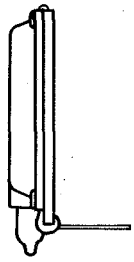


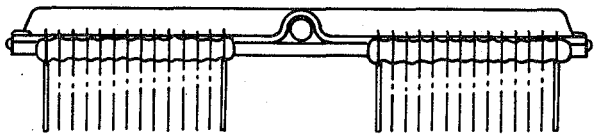



**IC408, IC502, IC503 : VHIHA12010/-1 (HA12010)**

**Figure 48 EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT**





red segment (P1.P2.P12.P13)

yellow segment (P3.P4.P10.P11)

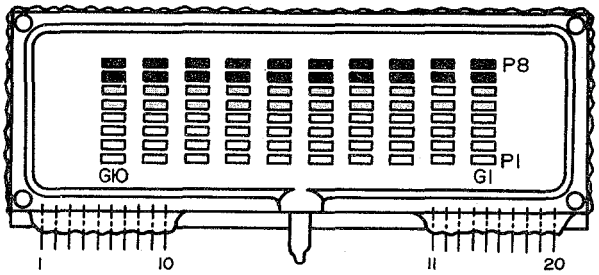
green segment (P5~P12.P17~P24)

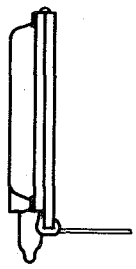
PIN CONNECTION P:Plate F:Cathode G:Grid

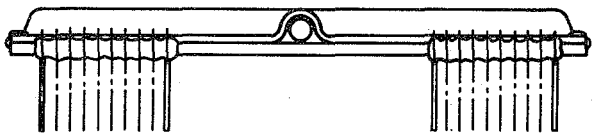
| PIN No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F | G | P24 | P12 | P23 | P11 | P22 | P10 | P21 | P9 | P20 | P8 | P19 | P7 |
| PIN No. | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| CONNECTION | P18 | P6 | P17 | P5 | P16 | P4 | P15 | P13 | P14 | P2 | P13 | P1 | G | F |

**V501 : VVKFG24SDL/-1**

**Figure 49–1 OUTPUT POWER INDICATOR**





red segment (P7. P8)

yellow segment (P5. P6)

green segment (P1~P4)

PIN CONNECTION P:Plate F:Cathode G:Grid

| PIN No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F | P8 | P7 | P6 | P5 | G10 | G9 | G8 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | P1 | P2 | P3 | P4 | F |

**V401 : VVKFG80SB1/-1**

**Figure 49–2 AUDIO SPECTRUM INDICATOR**

## CAUTIONS ON HANDLING MOS IC

(IC301, IC302, IC802, IC803, IC804)

MOS IC is to control the electric conductivity between the source and drain by using the voltage at the gate electrode through insulating oxide film ($SiO_2$). If overvoltage is applied to the gate electrode, the insulator at the gate electrode undergoes dielectric breakdown. Once such dielectric breakdown occurs, the junction between the gate and other terminals is shortcircuited and MOS IC is so damaged that its quality will not be recovered again.

And, MOS IC is highly sensitive to static charge because its gate oxide film is as thin as 1000Å to 1500Å. Input protective circuit is provided to protect MOS IC but this circuit can not always play its role according to the conditions of using MOS IC.

Therefore, pay due attention to the following when handling it.

### ▪ CAUTIONS ON TRANSPORTATION AND PRESERVATION

As for MOS IC, either the input or output terminal has remarkably high impedance in comparison with ordinary semiconductor IC. Therefore, MOS IC is liable to be affected by the induction of neary-by high-tension power source or A.C. power source and it may be given a larger voltage unexpectedly due to body discharged possibly causing dielectric breakdown of the gate. To eliminate this, during transportation and preservation of MOS IC all the terminals should be kept at the same potential in the following methods (to shortcircuit all the terminals).

① Wind thin wire around MOS IC.
② Fit metallic ring on it.
③ Pack it with aluminum foil.
④ Hold it by electric conductive jig.
⑤ Put it in a special case for MOS IC.

**Note:** Never put MOS IC in a mal-conductive container such as made of polystyrene.

### ▪ CAUTIONS ON SERVICING

① A soldering tool to be used should be the less-leak one (more than 100 Kohm of leak resistance—there may be a soldering tool of more than 1 Meg.ohm to be used for semiconductor). Otherwise, ground the soldering tool when using it.
② Ground the earth terminal of a measuring instrument.
③ Ground a bench.
④ Before insertion or removal of IC to or from P.W.B., be sure to turn off the power switch.
⑤ When inserting IC to P.W.B., ground the earth terminal of P.W.B.
⑥ Never touch the terminals of IC by hand.
⑦ Be sure to ground the earth terminal of D.C. power source.
⑧ To prevent IC from being broken due to human body discharge, it is necessary to ground the human body. But this requires the greatest care as otherwise the body encounters large current (absolutely avoid touching A.C. power source).
⑨ As MOS IC is actuated with a small current, be sure to remove soldering flux and perform moisture-proof treatment after repairing. (Apply moisture-proof agent for electronic calculator.)

# REPLACEMENT PARTS LIST

**"HOW TO ORDER REPLACEMENT PARTS"**

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

NOTES: Be sure to use regular parts for securing the safety and reliability of the set. Parts marked with " ⚠ " and parts cross-hatched (in black) are especially important for maintaining the safety and protecting ability of the set. Be sure to replace them with parts of specified part number.

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| | | **INTEGRATED CIRCUITS** | |
| IC101, IC102, IC103, IC104, IC105 | VHIRC4558P/-1 | Filter Amplifier (RC4558P) | AG |
| IC107, IC108, IC109, IC110, IC111 | VHITA7318P2-1 | Logarithm Compressor (TA7318P2) | AK |
| IC301 | VHIRC4558P/-1 | Buffer and Mixing Amplifier (RC4558P) | AG |
| IC401, IC402, IC403 | RH-IX1127AFZZ | Bilateral Switch (TC4016BP) | AK |
| IC404 | RH-IX1154AFZZ | Clock Pulse Oscillator (TC4069UB) | AE |
| IC405 | RH-IX1175AFZZ | Decimal Divider (TC4017BP) | AQ |
| IC406, IC407 | RH-IX1156AFZZ | Blanking (TC4081B) | AE |
| IC408 | VHIHA12010/-1 | Level Compalator (HA12010) | AQ |
| IC409, IC410, IC411 | VHIUDN6128A-1 | Buffer (UDN6128A) | AP |
| IC501 | VHITA7318P2-1 | Logarithm Compressor (TA7318P2) | AK |
| IC502, IC503 | VHIHA12010/-1 | Level Comparator (HA12010) | AQ |
| IC504 | VHIUDN6128A-1 | Buffer (UDN6128A) | AP |
| | | **FETS** | |
| Q1, Q2 | VS2SK111-E/-1 | Dual FET, Power Amplifier Circuit, First-stage Differential Amplifier (2SK111E) | AL |
| Q3, Q4, Q5, Q6 | VS2SK127-S/1F | Power Amplifier Circuit, First-stage Cascode Amplifier (2SK127S) | AE |
| Q7, Q8 | VS2SK127-S/1F | Power Amplifier Circuit, Constant Current Circuit (2SK127S) | AE |
| Q11, Q12, Q13, Q14 | VS2SJ77-///1F | Power Amplifier Circuit, Second-stage Differential Amplifier (2SJ77) | AK |
| Q15, Q16, Q17, Q18 | VS2SJ77-///1F | Power Amplifier Circuit, Second-stage Cascode Amplifier (2SJ77) | AK |
| Q19 | VS2SK214-//1F | Power Amplifier Circuit, Cascode Amplifier (2SK214) | AH |
| Q20, Q21 | VS2SK214-//1F | Power Amplifier Circuit, Phase Inverter (2SK214) | AH |
| Q22 | VS2SK214-//1F | Power Amplifier Circuit, Cascode Amplifier (2SK214) | AH |
| Q23, Q24, Q25, Q26 | VS2SK226-//1F | Power Amplifier Circuit, SEPP (Single ended push-pull) Amplifier (2SK226) | AU |
| Q27, Q28, Q29, Q30 | VS2SJ82-///1F | Power Amplifier Circuit, SEPP (Single ended push-pull) Amplifier (2SJ82) | AU |
| Q39, Q40 | VS2SK34-B2/1F | Constant Voltage Circuit, Constant Current Load (2SK34B) | AE |
| | | **TRANSISTORS** | |
| Q31, Q32 | VS2SC1775AE-1 | Power Amplifier Circuit Over Current Detection Circuit (2SC1775AE) | AC |
| Q33 | VS2SD669A-C-1 | Constant Voltage Circuit, Voltage Regulator (2SD669AC) | AF |
| Q34 | VS2SB649A-C-1 | Constant Voltage Circuit, Voltage Regulator (2SB649AC) | AF |
| Q35 | VS2SC1775AE-1 | Constant Voltage Circuit, Voltage Regulator (2SC1775AE) | AC |
| Q36 | VS2SA872A-E-1 | Constant Voltage Circuit, Voltage Regulator (2SA872AE) | AC |
| Q37 | VS2SC1775AE-1 | Constant Voltage Circuit, Voltage Comparison (2SC1775AE) | AC |
| Q38 | VS2SA872A-E-1 | Constant Voltage Circuit, Voltage Comparison (2SA872AE) | AC |
| Q201 | VS2SD794A-Q-1 | Voltage Regulator (2SD794AQ) | AE |
| Q202, Q203 | VS2SC2320-G-1 | Abnormal Detection (2SC2320G) | AB |
| Q204 | VS2SC2320-G-1 | Latch (2SC2320G) | AB |
| Q205 | VS2SA999-F/-1 | Latch (2SA999F) | AC |
| Q206 | VS2SA999-F/-1 | Relay Switching (2SA999F) | AC |
| Q207, Q208 | VS2SC2320-G-1 | LED Switching (2SC2320G) | AB |
| Q209 | VS2SD794A-Q-1 | Voltage Regulator (2SD794AQ) | AE |
| Q210 | VS2SC2320-G-1 | Voltage Regulator (2SC2320G) | AB |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| Q211 | VS2SD794A-Q-1 | Voltage Regulator (2SD794AQ) | AE |
| Q212, Q213 | VS2SD755-E/-1 | Voltage Regulator (2SD755E) | AD |
| Q301 | VS2SA999-F/-1 | Constant Current (2SA999F) | AC |
| Q302 | VS2SB744A-Q-1 | Constant Current (2SB744AQ) | AE |
| Q401, Q402 | VS2SC2320-G-1 | Muting (2SC2320G) | AB |
| Q501 | VS2SC2320-G-1 | Muting (2SC2320G) | AB |
| | | **DIODES** | |
| D1, D2 | VHEHZ6B2L//-1 | Zener, 6V/0.4W (HZ6B2L) | AC |
| D3, D4, D5, D6 | VHD1S2473//-1 | Latch Prevention (1S2473) | AA |
| D11, D12, D15, D16 | VHEWZ-120//-1 | Zener, 12V/0.5W (WZ120) | AC |
| D17, D18 | VHD10E1////-1 | Over Current Rectifier (10E1) | AC |
| D19, D20 | VHEHZ6B2L//-1 | Zener, 6V/0.4W (HZ6B2L) | AC |
| D21 | VHDDS185-D/-1 | Power Rectifier 200V/1.3A (DS185) | AE |
| D201 | VHD10E1////-1 | Rectifier (10E1) | AC |
| D202 | VHEWZ250///-1 | Zener, 25V/0.5W (WZ250) | AC |
| D203 | VHD1S2473//-1 | Malfunction Prevention (1S2473) | AA |
| D205 | VHEWZ250///-1 | Zener, 25V/0.5W (WZ250) | AC |
| D206 | VHERD3R6EC/-1 | Zener, 3.6V/0.4W (RD3.6E) | AB |
| D207, D208 | VHD1S2473//-1 | Malfunction Prevention (1S2473) | AA |
| D209 | VHD1S2473//-1 | Surge Current Prevention (1S2473) | AA |
| D210 | VHEHZ16-3//-1 | Zener, 16V/0.5W (HZ16-3) | AB |
| D211 | VHEHZ6A-1L/-1 | Zener, 6V/0.4W (HZ6A1L) | AB |
| D212 | VHEWZ220///-1 | Zener, 22V/0.5W (WZ220) | AB |
| D213 | VHEWZ250///-1 | Zener, 25V/0.5W (WZ250) | AC |
| D214 | VHEHZ6A-1L/-1 | Zener, 6V/0.4W (HZ6A1L) | AB |
| D215, D216 | VHD10E1////-1 | Rectifier 100V/1A (10E1) | AC |
| D217 | VHD1S2473//-1 | Malfunction Prevention (1S2473) | AA |
| D301 | VHDDS185-D/-1 | Power Rectifier 200V/1.3A (DS185) | AE |
| D302 | VHD10E1////-1 | Rectifier 100V/1A (10E1) | AC |
| D402 | VHD1S2473//-1 | Clock Pulse Oscillator (1S2473) | AA |
| D601 | VHDS10VB20/-1 | Power Rectifier, Main (S10VB20) | AM |
| D602 | VHDS10VB20/-1 | Power Rectifier, Main (S10VB20) | AM |
| D701, D702 | RH-DX1006AFZZ | Surge Current Prevention (10E1) | AB |
| | | **LED (Light Emitting Diode)** | |
| LED301 | VHPGL-53RG/1F | Indicator, Power/Protection (GL-53RG) | AG |
| LED302 | VHPGL-9NG12-1 | Indicator, "a" Speakers Switch (GL-9NG12) | AD |
| LED303 | VHPGL-9NG12-1 | Indicator, "b" Speakers Switch (GL-9NG12) | AD |
| LED304 | VHPGL-9NG12-1 | Indicator, "Left Channel" Audio Spectrum Switch (GL-9NG12) | AD |
| LED305 | VHPGL-9NG12-1 | Indicator, "Right Channel" Audio Spectrum Switch (GL-9NG12) | AD |
| LED306 | VHPGL-9NG12-1 | Indicator, Level Switch (GL-9NG12) | AD |
| | | **COILS** | |
| L701, L702 | RCILZ0067AFZZ | 1.2μH, Oscillation Prevention | AD |
| | | **POSISTOR** | |
| PTH1 | RH-QX1001AFZZ | Temperatures Detection | AF |
| | | **RELAYS** | |
| RLY201 | RRLYZ0053AFZZ | Relay, Protection | AP |
| RLY701 | RRLYZ0071AFZZ | Relay, Speaker-A | AR |
| RLY702 | RRLYZ0071AFZZ | Relay, Speaker-B | AR |
| RLY703 | RRLYZ0072AFZZ | Relay, Rush Current Prevention | AQ |
| | | **TRANSFORMERS** | |
| T901 | RTRNP0633AFZZ | Right Channel Power Amplifier, Power Source | BP |
| △T902 | RTRNP0633AFZZ | Left Channel Power Amplifier, Power Source | BP |
| T903 | RTRNP0634AFZZ | Power Source | BA |
| | | **CONTROLS** | |
| VR1, VR2 | RVR-M0082AGZZ | 47K ohm (B), Offset Voltage Adjust | AF |
| VR3, VR4 | RVR-M0070AGZZ | 220 ohm (B), Offset Voltage Adjust | AE |
| VR101, VR102, VR103, VR104, VR105, VR106, VR107, VR108, VR109, VR110 | RVR-M0168AFZZ | 5K ohm (B), Spectrum Indicator Level Adjust | AC |
| VR501, VR502 | RVR-M0166AFZZ | 2K ohm (B), Output Power Indicator Level Adjust | AC |
| | | **FLUORESCENT LIGHTING TUBES** | |
| V401 | VVKFG80SB1/-1 | Audio Spectrum Indicator | BN |
| V501 | VVKFG24SDL/-1 | Output Power Indicator | BG |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| | | **ELECTROLYTIC CAPACITORS** | |
| C39, C40 | VCEAAU1CW336Y | 33MFD, 16V, +50 −10% | AB |
| C41, C42 | RC-EZ1126AFZZ | 470MFD, 100V, ±20% | AN |
| C101 | VCAAAU1CF224M | .22MFD, 16V, ±20%, Aluminum | AC |
| C102 | VCAAAU1CF334M | .33MFD, 16V, ±20%, Aluminum | AB |
| C103 | VCAAAU1CF224M | .22MFD, 16V, ±20%, Aluminum | AC |
| C105, C106 | VCAAAU1CF104M | .1MFD, 16V, ±20%, Aluminum | AB |
| C108 | VCAAAU1CF334M | .33MFD, 16V, ±20%, Aluminum | AB |
| C109 | VCAAAU1CF104M | .1MFD, 16V, ±20%, Aluminum | AB |
| C112 | VCEALU1HC225M | 2.2MFD, 50V, ±20% | AB |
| C113 | VCAAAU1CF154M | .15MFD, 16V, ±20%, Aluminum | AB |
| C118 | VCEALU1HC105M | 1MFD, 50V, ±20% | AB |
| C119 | VCAAAU1CF104M | .1MFD, 16V, ±20%, Aluminum | AB |
| C124 | VCAAAU1CF684M | .68MFD, 16V, ±20%, Aluminum | AB |
| C129 | VCAAAU1CF334M | .33MFD, 16V, ±20%, Aluminum | AB |
| C134 | VCAAAU1CF154M | .15MFD, 16V, ±20%, Aluminum | AB |
| C140 | VCAAAU1CF104M | .1MFD, 16V, ±20%, Aluminum | AB |
| C156 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C159 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C162 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C165 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C168 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C171, C172 | VCEAAU1EW336Y | 33MFD, 25V, +50 −10% | AB |
| C173 | VCEALU1HC475M | 4.7MFD, 50V, ±20% | AC |
| C201 | VCEAAU1HW106Y | 10MFD, 50V, +50 −10% | AB |
| C202 | VCEAAU1EW106Y | 10MFD, 25V, +50 −10% | AB |
| C203, C204 | RC-EZS337AF0J | 330MFD, 6.3V, ±20% | AB |
| C205 | RC-EZS476AF1H | 47MFD, 50V, ±20% | AC |
| C208 | VCEAAU1AW107Y | 100MFD, 10V, +50 −10% | AB |
| C210, C211 | RC-EZS337AF1H | 330MFD, 50V, ±20% | AE |
| C212, C213 | RC-EZS107AF1H | 100MFD, 50V, ±20% | AC |
| C214 | VCEAAU1HW105Y | 1MFD, 50V, ±20% | AB |
| C215, C216 | RC-EZS476AF1J | 47MFD, 63V, ±20% | AC |
| C217 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C218 | RC-EZS337AF1H | 330MFD, 50V, ±20% | AE |
| C304 | VCEAAU1EW336Y | 33MFD, 25V, +50 −10% | AB |
| C305 | RC-EZS337AF1H | 330MFD, 50V, ±20% | AE |
| C306 | RC-EZS476AF1J | 47MFD, 63V, ±20% | AC |
| C403 | VCEAAU1EW106Y | 10MFD, 25V, +50 −10% | AB |
| C501, C502, C503 | VCEAAU1HW105Y | 1MFD, 50V, +50 −10% | AB |
| C601, C602, C603, C604 | RC-EZ1125AFZZ | 8200MFD, 75V, +50 −10% | AY |
| C605, C606, C607, C608 | RC-EZ1058AFZZ | 100MFD, 100V, ±20% | AH |
| | | **CAPACITORS** | |
| C1, C2 | VCFYSU1AB105K | 1MFD, 100V, ±10%, Metalized Film | |
| C3, C4 | VCMZYU1HC331J | 330PF, 50V, ±5%, Mica | |
| C5, C6 | VCQSMU1HS332J | 3300PF, 50V, ±5%, Styrol | AB |
| C7, C8 | VCMZYU1HC270J | 27PF, 50V, ±5%, Mica | |
| C9, C10 | VCMZYU1HC4R0J | 4PF, 50V, ±5%, Mica | |
| C11, C12 | VCMZYU1HC181J | 180PF, 50V, ±5%, Mica | |
| C13, C14 | VCMZYU1HC561J | 560PF, 50V, ±5%, Mica | |
| C17, C18 | VCMZYU1HC561J | 560PF, 50V, ±5%, Mica | |
| C21, C22, C23, C24, C25, C26, C27, C28 | VCFYSU2AB105K | 1MFD, 100V, ±10%, Metalized Film | |
| C33, C34 | VCFYSU2EB473K | .047MFD, 250V, ±10%, Metalized Film | |
| C37, C38 | VCMZYU1HC181J | 180PF, 50V, ±5%, Mica | |
| C43, C44 | VCFYSU2JB103M | .01MFD, 630V, ±20%, Metalized Film | |
| C47, C48 | VCFYSU2AB105K | 1MFD, 100V, ±10%, Metalized Film | |
| C110, C111 | VCQYKU1HM563J | .056MFD, 50V, ±5%, Mylar | AB |
| C115 | VCQYKU1HM563J | .056MFD, 50V, ±5%, Mylar | AB |
| C116, C117 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C120 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C121, C122 | VCQYKU1HM183J | .018MFD, 50V, ±5%, Mylar | AB |
| C125 | VCQYKU1HM473J | .047MFD, 50V, ±5%, Mylar | AB |
| C126 | VCQYKU1HM183J | .018MFD, 50V, ±20%, Mylar | AB |
| C127, C128 | VCQYKU1HM103J | .01MFD, 50V, ±5%, Mylar | AB |
| C130 | VCQYKU1HM273J | .027MFD, 50V, ±5%, Mylar | AB |
| C131 | VCQYKU1HM103J | .01MFD, 50V, ±5%, Mylar | AB |
| C132, C133 | VCQYKU1HM562J | .0056MFD, 50V, ±5%, Mylar | AB |
| C136 | VCQYKU1HM183J | .018MFD, 50V, ±5%, Mylar | AB |
| C137 | VCQYKU1HM562J | .0056MFD, 50V, ±5%, Mylar | AB |
| C138, C139 | VCQYKU1HM332J | .0033MFD, 50V, ±5%, Mylar | AB |
| C141 | VCQYKU1HM682J | .0068MFD, 50V, ±5%, Mylar | AB |
| C142 | VCQYKU1HM332J | .0033MFD, 50V, ±5%, Mylar | AB |
| C143, C144 | VCQYKU1HM182J | .0018MFD, 50V, ±5%, Mylar | AB |
| C145 | VCQYKU1HM563J | .056MFD, 50V, ±5%, Mylar | AB |
| C146 | VCQYKU1HM682J | .0068MFD, 50V, ±5%, Mylar | AB |
| C147 | VCQYKU1HM182J | .0018MFD, 50V, ±5%, Mylar | AB |
| C148, C149 | VCQYKU1HM102J | .001MFD, 50V, ±5%, Mylar | AB |
| C150 | VCQYKU1HM273J | .027MFD, 50V, ±5%, Mylar | AB |
| C151 | VCQYKU1HM472J | .0047MFD, 50V, ±5%, Mylar | AB |
| C152 | VCQYKU1HM182J | .0018MFD, 50V, ±5%, Mylar | AB |
| C153, C154 | VCQYKU1HM102J | .001MFD, 50V, ±5%, Mylar | AB |
| C155 | VCQYKU1HM123J | .012MFD, 50V, ±5%, Mylar | AB |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| C157, C158 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C160, C161 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C163, C164 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C166, C167 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C169, C170 | VCQYKU1HM333J | .033MFD, 50V, ±5%, Mylar | AB |
| C206 | VCQYKU1HM393J | .039MFD, 50V, ±5%, Mylar | AB |
| C209 | VCQYKU1HM393J | .039MFD, 50V, ±5%, Mylar | AB |
| C301, C302, C303 | VCQYKU1HM103M | .01MFD, 50V, ±20%, Mylar | AB |
| C401 | VCQYSH1HM102J | 1000PF, 50V, ±5%, Mylar | AB |
| C402 | VCMZYU1HC101J | 100PF, 50V, ±5%, Mica | |
| C504, C505 | VCQYKU1HM223J | .022MFD, 50V, +50 −10%, Mylar | AB |
| C609 | VCQYKU1HM223K | .022MFD, 50V, ±10%, Mylar | |
| C701, C702 | VCFYSU2JB103M | .01MFD, 630V, ±20%, Metalized Film | |
| ⚠C901 | RC-HZ064CAFZZ | .047MFD, 250VAC, ±20%, Metalized Paper | AG |

## RESISTORS

(Unless otherwise specified resistors are 1/4W, ±5%, Carbon type)

| | | | |
|---|---|---|---|
| R1, R2 | VRD-ST2EE223J | 22K ohm | |
| R3 | VRD-ST2EE105J | 1Meg ohm | |
| R4 | VRD-ST2EE105J | 1Meg ohm | |
| R5, R6 | VRD-ST2EE102J | 1K ohm | |
| R7, R8 | VRD-ST2EE684J | 680K ohm | |
| R9, R10, R11, R12 | VRD-ST2EE392J | 3.9K ohm | |
| R13, R14 | VRD-ST2EE823J | 82K ohm | |
| R15, R16 | VRD-ST2EE183J | 18K ohm | |
| R17, R18 | VRD-ST2EE822J | 8.2K ohm | |
| R19, R20 | VRD-ST2EE182J | 1.8K ohm | |
| R21, R22 | VRD-ST2EE221J | 220 ohm | |
| R23, R24, R25, R26 | VRD-ST2EE123J | 12K ohm | |
| R27, R28 | VRD-ST2EE472J | 4.7K ohm | |
| ⚠R29, R30 | VRG-MU2EB331J | 330 ohm, 1/4W, ±5%, Fusible | |
| R31, R32 | VRD-ST2EE822J | 8.2K ohm | |
| R33, R34 | VRD-ST2EE124J | 120K ohm | |
| R35, R36 | VRD-ST2EE822J | 8.2K ohm | |
| R37, ⚠R38, R39, R40 | VRD-ST2EE561J | 560 ohm | |
| R41, R42, R43, R44, R45, R46, R47, R48 | VRG-MU2EB221J | 220 ohm, 1/4W, ±5%, Fusible | AD |
| R49, R50, R51, R52, R53, R54, R55, R56 | RR-FZ1004AFZZ | .22 ohm, 5W, ±10%, Metal Plate (MPC74) | AC |
| ⚠R57, R58 | VRG-ST3AA3R3J | 3.3 ohm, 1W, ±5%, Fusible | AB |
| R61, R62 | VRD-ST2EE183J | 18K ohm | |
| R63, R64 | VRD-ST2EE103J | 10K ohm | |
| ⚠R65, R66 | VRG-MU2EB470J | 47 ohm, 1/4W, ±5%, Fusible | AD |
| R67, R68 | VRD-ST2EE183J | 18K ohm | |
| R69, R70 | VRD-ST2EE182J | 1.8K ohm | |
| R71, R72 | VRD-ST2EE563J | 56K ohm | |
| ⚠R73, R74 | VRG-ST2EA100J | 10 ohm, 1/4W, ±5%, Fusible | AD |
| R75, R76 | VRD-ST2EE221J | 220 ohm | |
| ⚠R77, R78 | VRG-ST3AA3R3J | 3.3 ohm, 1W, ±5%, Fusible | AB |
| ⚠R79, R80 | VRG-ST2EA100J | 10 ohm, 1/4W, ±5%, Fusible | |
| R81, R82 | VRD-ST2EE472J | 4.7K ohm | |
| R83, R84 | VRD-ST2EE330J | 33 ohm | |
| R101 | VRD-ST2EE472J | 4.7K ohm | |
| R102 | VRD-ST2EE473J | 47K ohm | |
| R103 | VRD-ST2EE272J | 2.7K ohm | |
| R104 | VRD-ST2EE105J | 1Meg ohm | |
| R105 | VRD-ST2EE392J | 3.9K ohm | |
| R106 | VRD-ST2EE473J | 47K ohm | |
| R107 | VRD-ST2EE222J | 2.2K ohm | |
| R108 | VRD-ST2EE105J | 1Meg ohm | |
| R109 | VRD-ST2EE392J | 3.9K ohm | |
| R110 | VRD-ST2EE393J | 39K ohm | |
| R112 | VRD-ST2EE222J | 2.2K ohm | |
| R113, R114 | VRD-ST2EE155J | 1.5Meg ohm | |
| R115 | VRD-ST2EE332J | 3.3K ohm | |
| R116 | VRD-ST2EE333J | 33K ohm | |
| R117 | VRD-ST2EE182J | 1.8K ohm | |
| R118 | VRD-ST2EE684J | 680K ohm | |
| R119 | VRD-ST2EE332J | 3.3K ohm | |
| R120 | VRD-ST2EE333J | 33K ohm | |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| R121 | VRD-ST2EE182J | 1.8K ohm | |
| R122 | VRD-ST2EE684J | 680K ohm | |
| R123 | VRD-ST2EE272J | 2.7K ohm | |
| R124 | VRD-ST2EE273J | 27K ohm | |
| R125 | VRD-ST2EE152J | 1.5K ohm | |
| R126 | VRD-ST2EE564J | 560K ohm | |
| R127 | VRD-ST2EE222J | 2.2K ohm | |
| R128 | VRD-ST2EE273J | 27K ohm | |
| R129 | VRD-ST2EE122J | 1.2K ohm | |
| R130 | VRD-ST2EE474J | 470K ohm | |
| R131 | VRD-ST2EE222J | 2.2K ohm | |
| R132 | VRD-ST2EE223J | 22K ohm | |
| R133 | VRD-ST2EE122J | 1.2K ohm | |
| R134 | VRD-ST2EE474J | 470K ohm | |
| R135 | VRD-ST2EE182J | 1.8K ohm | |
| R136 | VRD-ST2EE183J | 18K ohm | |
| R137 | VRD-ST2EE102J | 1K ohm | |
| R138 | VRD-ST2EE394J | 390K ohm | |
| R139 | VRD-ST2EE102J | 1K ohm | |
| R140 | VRD-ST2DE822J | 8.2K ohm | |
| R141 | VRD-ST2EE471J | 470 ohm | |
| R142 | VRD-ST2EE184J | 180K ohm | |
| R143, R144 | VRD-ST2EE681J | 680 ohm | |
| R145 | VRD-ST2EE821J | 820 ohm | |
| R146, R147 | VRD-ST2EE681J | 680 ohm | |
| R148 | VRD-ST2EE821J | 820 ohm | |
| R149, R150 | VRD-ST2EE681J | 680 ohm | |
| R151 | VRD-ST2EE821J | 820 ohm | |
| R152, R153 | VRD-ST2EE681J | 680 ohm | |
| R154 | VRD-ST2EE821J | 820 ohm | |
| R155, R156 | VRD-ST2EE681J | 680 ohm | |
| R157 | VRD-ST2EE821J | 820 ohm | |
| R158, R159 | VRG-MU2EB101J | 100 ohm, 1/4W, ±5%, Fusible | AD |
| R201 | VRD-ST2EE103J | 10K ohm | |
| R202 | VRD-ST2EE183J | 18K ohm | |
| R203 | VRD-ST2HD820J | 82 ohm, 1/2W, ±5% | |
| R204 | VRS-PT3AB820K | 82 ohm, 1W, ±10%, Metal Oxide Film | |
| R205 | VRD-ST2EE682J | 6.8K ohm | |
| R206 | VRD-ST2EE273J | 27K ohm | |
| R207 | VRS-PT3DB561K | 560 ohm, 2W, ±10%, Metal Oxide Film | |
| R208 | VRD-ST2EE393J | 39K ohm | |
| R209 | VRD-ST2EE333J | 33K ohm | |
| R210, R211 | VRD-ST2EE123J | 12K ohm | |
| R212 | VRD-ST2EE473J | 47K ohm | |
| R213, R214 | VRD-ST2EE472J | 4.7K ohm | |
| R215 | VRD-ST2EE473J | 47K ohm | |
| R216 | VRD-ST2EE124J | 120K ohm | |
| R217 | VRD-ST2EE470J | 47 ohm | |
| R218 | VRD-ST2EE122J | 1.2K ohm | |
| R219 | VRD-ST2EE221J | 220 ohm | |
| R220, R221 | VRD-ST2EE222J | 2.2K ohm | |
| R222 | VRD-ST2EE183J | 18K ohm | |
| R223 | VRD-ST2EE103J | 10K ohm | |
| R224 | VRD-ST2EE332J | 3.3K ohm | |
| ⚠R225 | VRG-MU2EB471J | 470 ohm, 1/4W, ±5%, Fusible | AD |
| R226 | VRD-ST2EE333J | 33K ohm | |
| R227 | VRD-ST2EE273J | 27K ohm | |
| ⚠R229 | VRG-ST2EA100J | 10 ohm, 1/4W, ±5%, Fusible | AD |
| R230 | VRD-ST2EE332J | 3.3K ohm | |
| R231, R232, R233 | VRD-ST2EE333J | 33K ohm | |
| R234, R235 | VRS-PT3DB271K | 270 ohm, 2W, ±10%, Metal Oxide Film | |
| R236 | VRG-MU2EB560J | 56 ohm, 1/4W, ±5%, Fusible | AD |
| R237 | VRD-ST2EE273J | 27K ohm | |
| R301 | VRG-ST3AA1R0J | 1 ohm, 1W, ±5%, Fusible | AC |
| ⚠R302, R303 | VRG-ST2HA1R0J | 1 ohm, 1/2W, ±5%, Fusible | AB |
| R304 | VRG-ST2EA4R7J | 4.7 ohm, 1/4W, ±5%, Fusible | AB |
| R305 | VRD-ST2EE330J | 33 ohm | |
| R306 | VRD-ST2EE122J | 1.2K ohm | |
| R307 | VRD-ST2EE153J | 15K ohm | |
| R308, R309 | VRD-ST2EE124J | 120K ohm | |
| R310 | VRD-ST2EE222J | 2.2K ohm | |
| R311 | VRD-ST2EE224J | 220K ohm | |
| R312 | VRD-ST2EE223J | 22K ohm | |
| R313, R314 | VRD-ST2EE393J | 39K ohm | |
| R401 | VRD-ST2EE153J | 15K ohm | |
| R402 | VRD-ST2EE474J | 470K ohm | |
| R403, R404 | VRD-ST2EE473J | 47K ohm | |
| R405 | VRD-ST2EE103J | 10K ohm | |
| R406 | VRD-ST2EE104J | 100K ohm | |
| R407 | VRD-ST2EE103J | 10K ohm | |
| R408, R409 | VRD-ST2EE473J | 47K ohm | |
| R410 | VRD-ST2EE331J | 330 ohm | |
| R411 | VRD-ST2EE104J | 100K ohm | |
| R501, R502 | VRD-ST2EE333J | 33K ohm | |
| R503 | VRD-ST2EE681J | 680 ohm | |
| R504 | VRD-ST2EE332J | 3.3K ohm | |
| R601, R602, R603, R604 | VRD-ST2HD822J | 8.2K ohm 1/2W, ±5% | |
| R703, ⚠R704, R705, R706 | VRG-ST3AA3R3J | 3.3 ohm, 1W, ±5%, Fusible | AB |
| R707 | RR-WZ1004AFZZ | 3.3 ohm, 10W, ±10%, Cement (RGB10PH) | AD |

## MISCELLANEOUS

| | | | |
|---|---|---|---|
| 1 | GCAB-3080AFSA | Cabinet | AY |
| 2 | GFTAU3087AFZZ | Lid, Bottom (Small) | AH |
| 3 | GFTAU3088AFZZ | Lid, Bottom (Large) | AN |
| 4 | GLEGP0065AF00 | Leg, Outer | AB |
| 5 | GLEGP0066AF00 | Leg, Inner | AA |
| 6 | HDALP0426AFSA | Dial Scale | AS |
| 7 | HDECA0343AFSA | Bracket, L.E.D. (Light Emitting Diode) | AF |
| 8 | HDECA0344AFSA | Bracket, Dial Scale Retaining | AL |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| 9 | HPNLC3398AFSA | Panel, Front (SX-9100H) | BB |
| | PSPAS0084AFSA | Spacer, Push Switch Knobs | AA |
| | GMADZ0055AFSA | Window (Large) | AS |
| | GMADZ0056AFSA | Window (Small) | AP |
| | PCUSG0098AF00 | Cushion, 50mm x 10mm x 1mm | AB |
| | PCUSG0099AF00 | Cushion, 42mm x 4mm x 2mm | AA |
| | PSPAS0080AFSA | Spacer, Power Switch | AB |
| | HPNLC3398AFSB | Panel, Front (SX-9100HB) | BB |
| | PSPAS0084AFSB | Spacer, Push Switch Knobs | AA |
| | GMADZ0055AFSA | Window (Large) | AR |
| | GMADZ0056AFSA | Window (Small) | AN |
| | PCUSG0098AF00 | Cushion, 50mm x 10mm x 1mm | AB |
| | PCUSG0099AF00 | Cushion, 42mm x 4mm x 2mm | AA |
| | PSPAS0080AFSB | Spacer, Power Switch | AB |
| 10 | JKNBM0297AFSA | Knob, Power Switch (SX-9100H) | AD |
| | JKNBM0297AFSB | Knob, Power Switch (SX-9100HB) | AD |
| 11 | JKNBM0298AFSA | Knob, Push Switch (SX-9100H) | AD |
| | JKNBM0298AFSB | Knob, Push Switch (SX-9100HB) | AD |
| 12 | LANGF0516AFZZ | Bracket, Right Hand Side | AG |
| 13 | LANGF0517AFZZ | Bracket, Left Hand Side | AG |
| 14 | LANGG0066AFZZ | Lever, Power Switch | AD |
| 15 | LANGQ0650AFZZ | Bracket, Headphones Jack | AB |
| 16 | LANGQ0652AFZZ | Bracket, Power Switch | AB |
| 17 | LANGQ0700AFSA | Bracket, Terminals & Jacks (SX-9100H) | AQ |
| | LANGQ0700AFSB | Bracket, Terminals & Jacks (SX-9100HB) | AQ |
| 18 | LANGQ0701AFZZ | Bracket, Fuse Holder & Main Voltage Selector Switch | AD |
| 19 | LANGR0483AFZZ | Bracket, Dial Scale | AL |
| 20 | LANGT0859AFZZ | Bracket, Power Transformer | AQ |
| 21 | LANGT0860AFZZ | Bracket, Printed Wiring Board | AC |
| 22 | LANGT0861AFZZ | Bracket, Flourescent Lighting Tube | AH |
| 23 | LANGT0862AFZZ | Bracket, Front Panel Retaining | AC |
| 24 | LANGT0879AFZZ | Bracket, Power Rectifier (D601, D602), Retaining | AB |
| 25 | LANGT0889AFZZ | Bracket, Relay Circuit Printed Wiring Board Retaining | AD |
| 26 | LANGT0890AFZZ | Bracket, Power Supply Circuit Printed Wiring Board Retaining | AB |
| 27 | LANGT0899AFZZ | Bracket, Printed Wiring Board Retaining | AC |
| 28 | LANGT0916AFZZ | Bracket, Power Amplifier Printed Wiring Board Retaining | AE |
| 29 | LANGT0917AFZZ | Bracket, Power Amplifier Printed Wiring Board Retaining | AB |
| 30 | LANGT0918AFZZ | Bracket, Constant Voltage Circuit Printed Wiring Board Retaining | AE |
| 31 | LBSHC0004AGZZ | Bushing, Main Supply Cord | AB |
| 32 | LBSHC0007AFZZ | Bushing, Main Supply Cord | AB |
| 33 | LHLDP3062AFZZ | Holder, Dial Illumination Lamp (PL301) | AC |
| 34 | LHLDP8004AF00 | Holder, Power/Protection Indicator | AC |
| 35 | LHLDS1052AF00 | Guide, Power Switch Lever | AB |
| 36 | LHLDW1052AFZZ | Nylon Band | AA |
| 37 | LHLDW1068AFZZ | Nylon Band, 100mm | AA |
| 38 | LHLDW1075AFZZ | Nylon Band, 60mm | AA |
| 39 | LHLDW9003CEZZ | Wire Holder | AA |
| 40 | LX-BZ0261AFFD | Scerew, Front Panel Retaining | AA |
| 41 | LX-HZ0069AFFD | Screw, Power Transformer Retaining | |
| 42 | LX-LZ0051AF00 | Push Rivet | |
| 43 | LX-LZ0056AFZZ | Rivet, Fuse Holder Bracket Retaining | |
| 44 | LX-NZ0122AFFD | Nut, Power Transformer Retaining | AA |
| 45 | LX-WZ5065AGFE | Lock Washer, Fuse Holder | AA |
| 46 | PCOVU3121AFZZ | Bracket, Lamp Cover | AC |
| 47 | PCOVW7109AFZZ | Cover, Power Switch | AB |
| 48 | PCOVZ8056AFSA | Cover, Lamp | AB |
| 49 | PFILW0011AFZZ | Filter Plate | AK |
| 50 | PFLT-0330AF00 | Felt, Cabinet | AA |
| 51 | PGUMM0137AFZZ | Holder, L.E.D., Rubber | AF |
| 52 | PGUMM0139AF00 | Cushion, 22mm Dia. x 15.5mm Dia. x 2.2mm, Outer Leg | AA |
| 53 | PRDAR0204AFZZ | Heat Pipe, Power Transistor | BH |
| 54 | PRDAR0215AFZZ | Heat Sink | AB |
| 55 | PSPAN0054AFZZ | Spacer, Nylon | AB |
| 56 | PSPAN0056AFZZ | Spacer, Power Amplifier Printed Wiring Board | |
| 57 | PSPAN0057AFZZ | Spacer, Power Amplifier Printed Wiring Board | |
| 58 | PSPAZ0085AFZZ | Spacer, Power Transistor | AF |
| 59 | PSPAZ9004AGZZ | Spacer, Transistor | AA |
| 60 | QACCL0051AFZZ | Main Supply Cord, For Users in Australia | AP |
| 61 | QACCS0051AF00 | Main Supply Cord | AM |
| 62 | QACCZ0002TA0F | Main Supply Cord | AG |
| 63 | QACCZ0052AF00 | Main Supply Cord | AP |
| 64 | QACCZ0053AF00 | Main Supply Cord | AK |
| 65 | QCNW-0591AFZZ | Connecting Cable | AU |
| 66 | QFSHP1001AGZZ | Holder Fuse | AG |
| 67 | QHWS-0001CEFN | Earth Terminal | |
| 68 | QLUGP-0104AGZZ | Terminal, Tip | AA |
| 69 | QLUGP0111CEFW | Terminal, Tip, 13mm | AA |
| 70 | QLUGP9052AFZZ | Terminal, Tip | AA |
| SO1 (A-D) | QSOCJ0475AFZZ | Socket Assembly (Gold Plating) SO1-A: Direct inputs (L-ch) SO1-B: Direct inputs (R-ch) SO1-C: 10Hz inputs (L-ch) SO1-D: 10Hz inputs (R-ch) | AH |
| CNP201 | QCNCM259JAFZZ | Plug, 9 pin | AD |
| CNP202 | QCNCM094CAFZZ | Plug, 3 pin | AB |
| CNP203 | QCNCM184EAFZZ | Plug, 5 pin | AC |
| CNP204 | QCNCM233DAFZZ | Plug, 4 pin | AC |
| CNP205 | QCNCM133GAFZZ | Plug, 7 pin | AD |
| CNP301 | QCNCM132FAFZZ | Plug, 6 pin | AD |
| CNP302 | QCNCM184EAFZZ | Plug, 5 pin | AC |
| CNP303 | QCNCM233DAFZZ | Plug, 4 pin | AC |
| CNP401 | QCNCM331LAFZZ | Plug, 11 pin | AF |
| CNP501 | QCNCM328HAFZZ | Plug, 8 pin | AE |
| CNS201 | QCNCW166JAFZZ | Socket, 9 pin (Housing Only) | AB |
| CNS202 | QCNCW086CAFZZ | Socket, 3 pin (Housing Only) | AA |
| CNS203 | QCNCW155EAFZZ | Socket, 5 pin (Housing Only) | AB |
| CNS204 | QCNCW164DAFZZ | Socket, 4 pin (Housing Only) | AA |
| CNS205 | QCNCW104GAFZZ | Socket, 7 pin (Housing Only) | AB |
| CNS301 | QCNCW103FAFZZ | Socket, 6 pin (Housing Only) | AB |
| CNS302 | QCNCW155EAFZZ | Socket, 5 pin (Housing Only) | AB |
| CNS303 | QCNCW164DAFZZ | Socket, 4 pin (Housing Only) | AA |
| CNS401 | QCNCW106LAFZZ | Socket, 11 pin (Housing Only) | AC |

# PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| CNS501 | QCNCW105HAFZZ | Socket, 8 pin (Housing Only) | AB |
| △F901, F902 | QFS-C502CAGNI | Fuse, T2.5A (220/240V) | AE |
| | QFS-C252CAGNI | Fuse, T5.0A (110V) | AE |
| SW301, SW302, SW303, SW304, SW305 | QSW-P0233AFZZ | Switch Assembly<br>SW301 (a. b); Speakers selector "a" switch<br>SW302 (a. b); Speakers selector "b" switch<br>SW303 (a. b); Audio spectrum indication selector "left" switch<br>SW304 (a. b); Audio spectrum indication selector "rihgt" switch<br>SW305 (a. b); Audio spectrum indication selector "level-20dB" switch | AP |
| SW901 △(a. b) | QSW-P0158AFZZ | Switch, Power ON/OFF | AL |
| SW902 | QSOCE0559AFZZ | Switch, Mains Voltage Selector | AL |
| TM801 | QTANN0459AFZZ | Terminal, Speaker R-ch | AQ |
| TM801 | QTANN0459AFZZ | Terminal, Speaker L-ch | AQ |
| PL301 | RLMPP0058AFZZ | Lamp, Illumination | AD |
| J301 | QJAKJ0070AFZZ | Headphone Socket | AF |
| | PCOVU9106AFZZ | Cushion, 50mm x 17mmx 5mm | AA |
| | PCUSF0012AF00 | Cushion, 38mm x 5mm x 0.45mm | AA |
| | PFLT-0379AF00 | Felt, 78mm x 24mm, Push Switch | AB |
| | PGUMS0137AF00 | Cushion, 13.5mm x 10mm x 6mm | |

| REF. NO. | PART NO. | DESCRIPTION | CODE |
|---|---|---|---|
| | PSPAG0075AFZZ | Cushion, 10mm x 6mm x 6mm | AA |
| | PSPAG0076AFZZ | Cushion, 9.8mm x 6mm x 4.8mm | |
| | PSPO-0060AFZZ | Cushion, 60mm x 20mm x 6mm | |
| | PSPO-0061AFZZ | Cushion, 45mm x 20mm x 5mm | |
| | QTIPZ0002SGZZ | Tip, Socket | AA |
| | SPAKA0586AFZZ | Cushion, Packing, Bottom | AR |
| | SPAKA0587AFZZ | Cushion, Packing, Top | AR |
| | SPAKC1344AFZZ | Individual Carton (SO-9100H) | AN |
| | SPAKC1362AFZZ | Individual Carton (SO-9100HB) | AP |
| | SSAKH0022AGZZ | Sheet, Mains Supply Cord | AB |
| | SSAKH0007SEZZ | Bag, Operation Manual | AA |
| | TCAUA0200AFZZ | Caution Sheet, Fuse (2.5A) with Pouch | |
| | TCAUA0201AFZZ | Caution Sheet, Fuse (5.0A) with Pouch | |
| | TCAUS0076AFZZ | Caution Lavel, Bottom Lid | |
| | TCAUS0052AFZZ | Caution Lavel, Bottom Lid | |
| | TINSZ0174AFZZ | Operation Manual | AQ |
| | TMAPC0595AFZZ | Schematic Diagram | |

**P.W.B. ASSEMBLY (Not replacement item)**

| | | |
|---|---|---|
| DUNTM0066AF02 (Combined assembly) | Power Amplifier Circuit | BW |
| DUNTA0092AF01 | Power Rectifier Circuit | BQ |
| DUNTZ0354AF01 | Audio Spectrum Indicator Driver | BM |
| DUNTZ0356AF02 | Output Power Indicator Driver | BC |
| DUNTL0106AF02 (Combined assembly) | Audio Spectrum Indicator Circuit, Output Power Indicator Circuit, Headphone Circuit, Constant Voltage Circuit, Switch Indicator Circuit | BU |