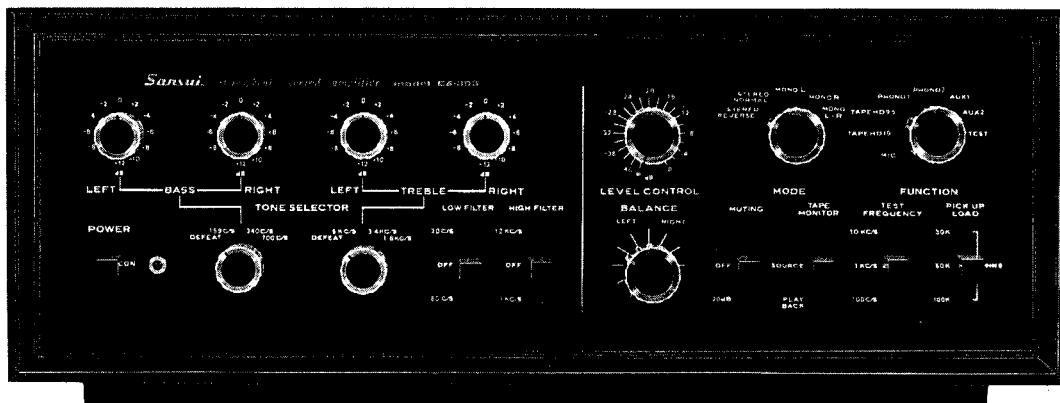


# SERVICE MANUAL

## STEREOPHONIC CONTROL AMPLIFIER

### SANSUI CA-303



*Sansui®*

SANSUI ELECTRIC COMPANY LIMITED

## **HOW TO USE THIS SERVICE MANUAL**

1. Look up the type of trouble you are confronted with in either the General or Troubleshooting charts provided in this manual from pp 2-10.
2. By referring to the charts, isolate the trouble to a particular unit or part. (See the column titled "What to Do" in the General Chart and "Check Point" in the Troubleshooting Chart.)
3. Locate the section of the chassis (Parts Layout pp 11, 12) in which the parts is located by using the co-ordinates (Column D) in the Parts List pp 23-26.
4. Using the co-ordinates given in the Parts List (Column C), pinpoint the position of the parts in the Schematic Diagram of Circuits, pp 13, 14.

NOTE: Much of the information contained in this manual has been prepared for use by qualified service repairmen. Please read your Warranty thoroughly before attempting any internal adjustments on your own.

## **CONTENTS**

---

GENERAL CHART .....	2, 3
TROUBLESHOOTING CHART	
Common to All Program Sources.....	4, 5
Program Source: Record Player Using Magnetic Cartridge, Tape Deck or Microphone.....	6, 7
Channel Divider Troubleshooting Chart .....	8, 9, 10
PARTS LAYOUT .....	11, 12
CIRCUIT DIAGRAM .....	13, 14
BLOCK DIAGRAM .....	15
EXPLODED VIEW OF CA-303 .....	16
SELECTOR CHART .....	17, 18, 19
PARTS LAYOUT IN PRINTED CIRCUITS .....	20, 21, 22
PARTS LIST .....	23, 24, 25, 26

# GENERAL CHART

If the amplifier is not operating satisfactorily, the trouble may be attributed to any of the following:

1. Loose terminal contact or incorrect connections of components;
2. Incorrect operation of component or components;

3. Improper placement of components, such as speakers and record player;

4. Defective component or components connected to the CA-303.

If the cause of trouble is not found in any of the above steps, the next steps to do are listed below:

PROGRAM SOURCE	SYMPTOM	PROBABLE CAUSE	WHAT TO DO
Tuner	A. Constant or intermittent noise heard at times or in a certain area	<ul style="list-style-type: none"> <li>* Discharge or oscillation caused by electrical appliances, such as fluorescent lamp, TV set, D.C. motor, rectifier and oscillator</li> <li>* Insufficient antenna input due to thick reinforced concrete wall of building or long distance from station</li> <li>* Wave interference</li> <li>* Natural phenomena, such as atmospherics, statics, strays and thunderbolt</li> </ul>	<ul style="list-style-type: none"> <li>* Attach a noise limiter to the electrical appliance that causes such noise or attach it to the tuner.</li> <li>* Keep the tuner well away from the electrical appliance that causes such noise.</li> <li>* Install an outdoor antenna and ground the amp to raise the signal-to-noise ratio.</li> <li>* If the noise occurs at a certain frequency, attach a wave trap to the ANT. input.</li> <li>* Reverse the power cord plug/receptacle connections.</li> </ul>
	B. During AM reception noise is heard at a particular time of a day, in a certain area or over part of dial.	<ul style="list-style-type: none"> <li>* Field intensity of AM broadcast</li> </ul>	<ul style="list-style-type: none"> <li>* Install antenna for maximum antenna efficiency.</li> <li>* In some cases, the noise can be eliminated by grounding the amp or reversing the power cord plug/receptacle connections.</li> </ul>
	C. High-frequency noise during AM reception	<ul style="list-style-type: none"> <li>* Adjacent-channel interference or beat interference</li> <li>* TV set too close to the audio system</li> </ul>	<ul style="list-style-type: none"> <li>* Although such noise cannot be completely eliminated by the amp, it is advisable to turn the TREBLE controls to the minimum counterclockwise position possible and set the HIGH FILTER to 7KHz or 12KHz.</li> <li>* Keep the TV set well away from the audio system.</li> </ul>
	D. Noisy during FM reception	<ul style="list-style-type: none"> <li>* Insufficient antenna input</li> </ul> <p>NOTE: FM reception is affected considerably by the conditions of transmission by stations, power and antenna efficiency. As a result, you may receive one station quite well while having difficulty in receiving another station.</p>	<ul style="list-style-type: none"> <li>* Install antenna for maximum signal strength.</li> <li>* If this procedure does not prove effective, use an outdoor antenna designed exclusively for FM.</li> <li>* When you will use a TV antenna as a FM antenna with help of a divider, make sure the TV reception is not affected.</li> <li>* Excessive long antenna may rather cause a noise.</li> </ul>
	E. An accompanying series of pops is heard during FM reception.	<ul style="list-style-type: none"> <li>* Electrical noise produced by the ignition systems of automobile engines and other internal combustion engines</li> </ul>	<ul style="list-style-type: none"> <li>* Increase the height of antenna.</li> </ul>

# GENERAL CHART

<b>PROGRAM SOURCE</b>	<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>WHAT TO DO</b>
Tuner (Continued from the preceding page)	F. Noisy not during FM mono reception but during FM stereo.	* The service area of the FM stereo broadcast is only half as much as that of the FM mono.	* Install antenna for maximum signal strength. * Turn the TREBLE controls to the minimum counterclockwise position possible and set the HIGH FILTER to 7Kc/s or 12Kc/s.
Record player, tape recorder or deck	A. Hum or howl	<ul style="list-style-type: none"> <li>* Record player placed directly on, or too close to the speaker box</li> <li>* Connecting wire not shielded</li> <li>* Loose terminal contact</li> <li>* Connecting cord too near to power cord, fluorescent lamp or other electrical appliances</li> <li>* Nearby amateur radio station or TV transmission antenna</li> </ul>	<ul style="list-style-type: none"> <li>* Place a cushion between player and enclosure or place them away from each other.</li> <li>* Use shielded wire.</li> <li>* Set the LOW FILTER to 30c/s or 60c/s.</li> <li>* Connecting cord should be as short as possible.</li> <li>* Don't emphasize bass tones excessively.</li> <li>* Consult the nearest Radio Regulatory Bureau</li> </ul>
	B. Surface noise	<ul style="list-style-type: none"> <li>* Worn or old record</li> <li>* Worn pick-up needle</li> <li>* Improper needle pressure</li> <li>* Worn or dusty playback head</li> </ul>	<ul style="list-style-type: none"> <li>* Turn the TREBLE controls properly from mid-position to left and/or set the HIGH FILTER to 7Kc/s or 12Kc/s.</li> <li>* Replace needle or head.</li> </ul>
Common to all program sources	C. The BALANCE control is not in mid-position when equal sound comes from left and right channels.	* Imperfections in program material, variations in speaker output and vagaries of room acoustics	* Turn the MODE switch to MONO L R and adjust the BALANCE control so that the sound originates at a point midway between speakers.

# TROUBLESHOOTING CHART

## COMMON TO ALL PROGRAM SOURCES

SYMPTOM	PROBABLE CAUSE	CHECK POINT
No output signal	<p>A. No power</p> <ul style="list-style-type: none"> <li>1. No power comes to the power source.</li> <li>2. Defective POWER switch</li> <li>3. Defective line cord</li> <li>4. Blown fuse</li> <li>5. If the fuse should blow out as soon as it is replaced, the trouble may be attributed to:           <ul style="list-style-type: none"> <li>a. Shorted power transformer;</li> <li>b. Shorted electrolytic capacitor</li> <li>c. Shorted d.c. power supply circuit</li> <li>d. Shorted diode</li> </ul> </li> <li>6. Disconnected power transformer</li> </ul> <p>B. Defective power circuit</p> <p>C. Defective low-frequency circuit</p> <p>D. Error in operation</p>	<p>S<sub>13</sub></p> <p>F<sub>001</sub></p> <p>T<sub>001</sub></p> <p>C<sub>057</sub></p> <p>d.c. power supply circuit Use a tester</p> <p>D<sub>001</sub>~D<sub>008</sub></p> <p>T<sub>001</sub></p> <p>Measure voltage in power circuit and replace defective element.</p> <p>Measure voltage in low-frequency circuit and replace defective element.</p> <p>V<sub>701</sub>~V<sub>706</sub></p> <p>C<sub>056</sub>~C<sub>064</sub></p> <p>Turn TAPE MONITOR switch to SOURCE.</p>
Weak output signal	<p>A. Defective power circuit</p> <p>B. Defective low-frequency circuit</p>	<p>Measure voltage in power circuit and replace defective element.</p> <p>Measure voltage in low-frequency circuit and replace defective element.</p> <p>C<sub>701</sub>~C<sub>704</sub>, C<sub>729</sub>, C<sub>730</sub>, C<sub>739</sub>, C<sub>740</sub>, C<sub>749</sub>, C<sub>750</sub></p> <p>V<sub>701</sub>~V<sub>706</sub></p>
Distortion	<p>A. Defective power circuit</p> <p>B. Defective low-frequency circuit</p>	<p>Measure voltage in power circuit and replace defective element.</p> <p>Measure voltage in low-frequency circuit and replace defective element.</p> <p>V<sub>701</sub>~V<sub>706</sub></p> <p>R<sub>739</sub>, R<sub>740</sub> and others.</p>

# TROUBLESHOOTING CHART

## COMMON TO ALL PROGRAM SOURCES (cont'd)

SYMPTOM	PROBABLE CAUSE		CHECK POINT
Hum	A. Defective power circuit	Poor capacitance of electrolytic capacitor	$C_{056} \sim C_{064}$
	B. Defective low-frequency circuit	Weak tube	$V_{701} \sim V_{706}$
Noisy	A. Defective power circuit	Measured voltage differs from voltage specified in Circuit Diagram.	Measure voltage in power circuit and replace defective element.
	B. Defective low-frequency circuit	1. Weak tube 2. Fixed resistor, defective 3. Defective capacitor	$V_{701} \sim V_{706}$ $R_{705}, R_{706}, R_{711}, R_{712}, R_{771}, R_{772}$ $C_{701} \sim C_{704}, C_{729}, C_{730}, C_{739}, C_{740}, C_{749}, C_{750}$
LOW FILTER switch does not work at all.	A. Defective low filter circuit B. Defective switch		LF-1 ( $C_{781} \sim C_{788}, R_{759}, R_{760}$ ) $S_{11a}, S_{11b}$
HIGH FILTER switch does not work at all.	A. Defective high-filter circuit B. Defective switch		HF-1 ( $C_{741} \sim C_{744}, R_{765} \sim R_{768}$ ) $S_{12a}, S_{12b}$
MUTING switch does not work at all.	A. Defective muting circuit B. Defective switch		$R_{701}, R_{702}$ $S_{6a}, S_{6b}$
TEST FREQUENCY switch does not work at all.	A. Oscillation frequency switching circuit defective B. Defective switch		$C_{047} \sim C_{052}, R_{078}, R_{079}$ $S_3$
PICK-UP LOAD switch does not work at all.	A. Pick-up load circuit defective B. Defective switch		PU-R ( $R_{608} \sim R_{614}$ ) $S_{2a}, S_{2b}$
TONE CONTROL switch does not work at all.	A. Tone control circuit defective B. Defective switch		$R_{713} \sim R_{758}$ $S_{8a} \sim S_d, S_{10a} \sim S_{10d}$
TONE SELECTOR switch does not work at all.	A. Tone selector circuit defective B. Defective switch		$C_{705} \sim C_{728}$ $S_{7a} \sim S_d, S_{9a} \sim S_d$

# PROGRAM SOURCE: RECORD PLAYER USING MAGNETIC CARTRIDGE, TAPE DECK OR MICROPHONE

SYMPTOM	PROBABLE CAUSE	CHECK POINT
No output signal	<p>A. Record player, tape deck or microphone defective</p> <p>B. Trouble common to all program sources</p> <p>C. Equalizer amplifier defective</p> <ol style="list-style-type: none"> <li>1. Measured voltage differs from voltage specified in Circuit Diagram.</li> <li>2. Capacitor, shorted or open</li> <li>3. Defective resistor</li> <li>4. Defective tube</li> <li>5. Bad contact at rotary switch</li> <li>6. Loose contact at input terminals or pin jacks</li> </ol>	<p>Check each component connected to CA-303.</p> <p>See "CONTROL AMP TROUBLESHOOTING CHART: Common to All Program Sources".</p> <p>Measure voltage in equalizer amplifier and replace defective element.</p> <p><math>C_{601}, C_{602}, C_{605}, C_{606}, C_{611}, C_{612}</math>  <math>R_{612}, R_{613}, R_{627} \sim R_{630}, R_{633}, R_{634}</math>  <math>V_{601} \sim V_{606}</math>  <math>S_{1a} \sim S_{1e}, S_{1g} \sim S_{1k}</math></p>
Weak output signal	<p>A. Record player, tape deck or microphone defective</p> <p>B. Trouble common to all program sources</p> <p>C. Equalizer amplifier defective</p> <ol style="list-style-type: none"> <li>1. Measured voltage differs from voltage specified in Circuit Diagram.</li> <li>2. Weak capacitor</li> <li>3. Weak tube</li> <li>4. Bad contact at rotary switch</li> <li>5. Loose contact at input terminals or pin jacks</li> </ol>	<p>Check each component connected to CA-303.</p> <p>See the column "Weak output signal" in the troubleshooting chart "Common to All Program Sources".</p> <p>Measure voltage in equalizer amplifier and replace defective element.</p> <p><math>C_{603}, C_{604}, C_{625}, C_{626}</math>  <math>V_{601} \sim V_{606}</math>  <math>S_{1a} \sim S_{1e}, S_{1g} \sim S_{1k}</math></p>
Distortion	<p>A. Program source defective</p> <p>B. Trouble common to all program sources</p> <p>C. Equalizer amplifier defective</p> <ol style="list-style-type: none"> <li>1. Measured voltage differs from voltage specified in Circuit Diagram.</li> <li>2. Weak capacitor</li> <li>3. Weak tube</li> <li>4. Defective resistor</li> </ol>	<p>Check each component connected to CA-303.</p> <p>See the column "Distortion" in the troubleshooting chart: "Common to All Program Sources".</p> <p>Measure voltage in equalizer amplifier and replace defective element.</p> <p><math>C_{603}, C_{604}, C_{605}, C_{606}, C_{609} \sim C_{618}</math>  <math>V_{601} \sim V_{606}</math>  <math>R_{615} \sim R_{632}, R_{635} \sim R_{648}</math></p>
Hum	<p>A. Program source defective</p> <p>B. Trouble is not in CA-303.</p>	<p>Check each component connected to CA-303.</p> <p>Incorrect or improper connections</p>

# TROUBLESHOOTING CHART

## PROGRAM SOURCE: RECORD PLAYER USING MAGNETIC CARTRIDGE, TAPE DECK OR MICROPHONE (cont'd)

SYMPTOM	PROBABLE CAUSE	CHECK POINT
Hum (Continued from the preceding page)	C. Trouble common to all program sources	See the column "Hum" in the troubleshooting chart: "Common to All Program Sources".
	D. Equalizer amplifier defective   Weak tube	V <sub>601</sub> ~V <sub>606</sub>
Noisy	A. Program source defective	Check each component connected to CA-303.
	B. Trouble is not in CA-303.	See the TROUBLESHOOTING AUDIO SYSTEM.
	C. Trouble common to all program sources	See the column "Noisy" in the troubleshooting chart: "Common to All Program Sources".
	D. Equalizer amplifier defective 1. Weak tube 2. Fixed resistor defective 3. Weak capacitor	V <sub>601</sub> ~V <sub>606</sub> R <sub>621</sub> , R <sub>622</sub> , R <sub>627</sub> , R <sub>628</sub> , R <sub>629</sub> , R <sub>630</sub> , R <sub>633</sub> , R <sub>634</sub> C <sub>605</sub> , C <sub>606</sub> , C <sub>611</sub> , C <sub>612</sub> and others

## PROGRAM SOURCE: OTHERS

SYMPTOM	PROBABLE CAUSE	CHECK POINT
Tuner and other components connected to AUX inputs of CA-303 don't work well.	1. Program source defective 2. Incorrect or improper connections	Check and repair or replace.
Tape recorder connected to CA-303 does not play well.	1. Program source defective 2. Incorrect or improper connections	Check and repair or replace. See the troubleshooting chart on "Common to All Program Sources".
Broadcast recording is not well done.	1. Defective tuner 2. Defective tape or recorder 3. Incorrect or improper connections	Check and repair or replace.
Disc, tape and other sources connected to AUX inputs of CA-303 are not well recorded on tape.	1. Defective tape or recorder 2. Incorrect or improper connections 3. Defective record player or worn record 4. Defective AUX inputs 5. Equalizer amp section defective	Check and repair or replace.  See preceding chart.

# CHANNEL DIVIDER TROUBLE SHOOTING CHART

SYMPTOM	PROBABLE CAUSE		CHECK POINT
No output signal over all filter pass bands	A. Power circuit defective	Measured voltage differs from voltage specified in Circuit diagram.	Measure voltage in power circuit and replace defective element.
	B. Filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Electrolytic capacitor shorted 3. Defective transistor	Measure voltage in filter amp and replace defective element. Check each element for abnormal voltage. Check TR <sub>001</sub> and TR <sub>002</sub> for abnormal voltage
	C. Improper or incorrect input connections		
No output signal over high-pass filter band	A. High-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Defective transistor	Measure voltage in high-pass filter amp and replace defective element. Check TR <sub>003</sub> ~TR <sub>006</sub> for abnormal voltage.
	B. Improper or incorrect output connections		
No output signal over medium-pass filter band	A. Medium-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Defective transistor	Measure voltage in medium-pass filter amp and replace defective element. Check TR <sub>007</sub> ~TR <sub>014</sub> for abnormal voltage.
	B. Improper or incorrect output connections		
No output signal over low-pass filter band	A. Low-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Defective transistor	Measure voltage in low-pass filter amp and replace defective element. Check TR <sub>015</sub> ~TR <sub>018</sub> for abnormal voltage
	B. Improper or incorrect output connections		
Weak output signal over all filter pass bands	A. Power circuit defective	Measured voltage differs from voltage specified in Circuit Diagram.	Measure voltage in power circuit and replace defective element.
	B. Buffer amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in buffer amp and replace defective element. TR <sub>001</sub> , TR <sub>002</sub>
Weak output signal over high-pass filter band	A. High-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in high-pass filter amp and replace defective element. TR <sub>003</sub> ~TR <sub>006</sub>

# TROUBLESHOOTING CHART

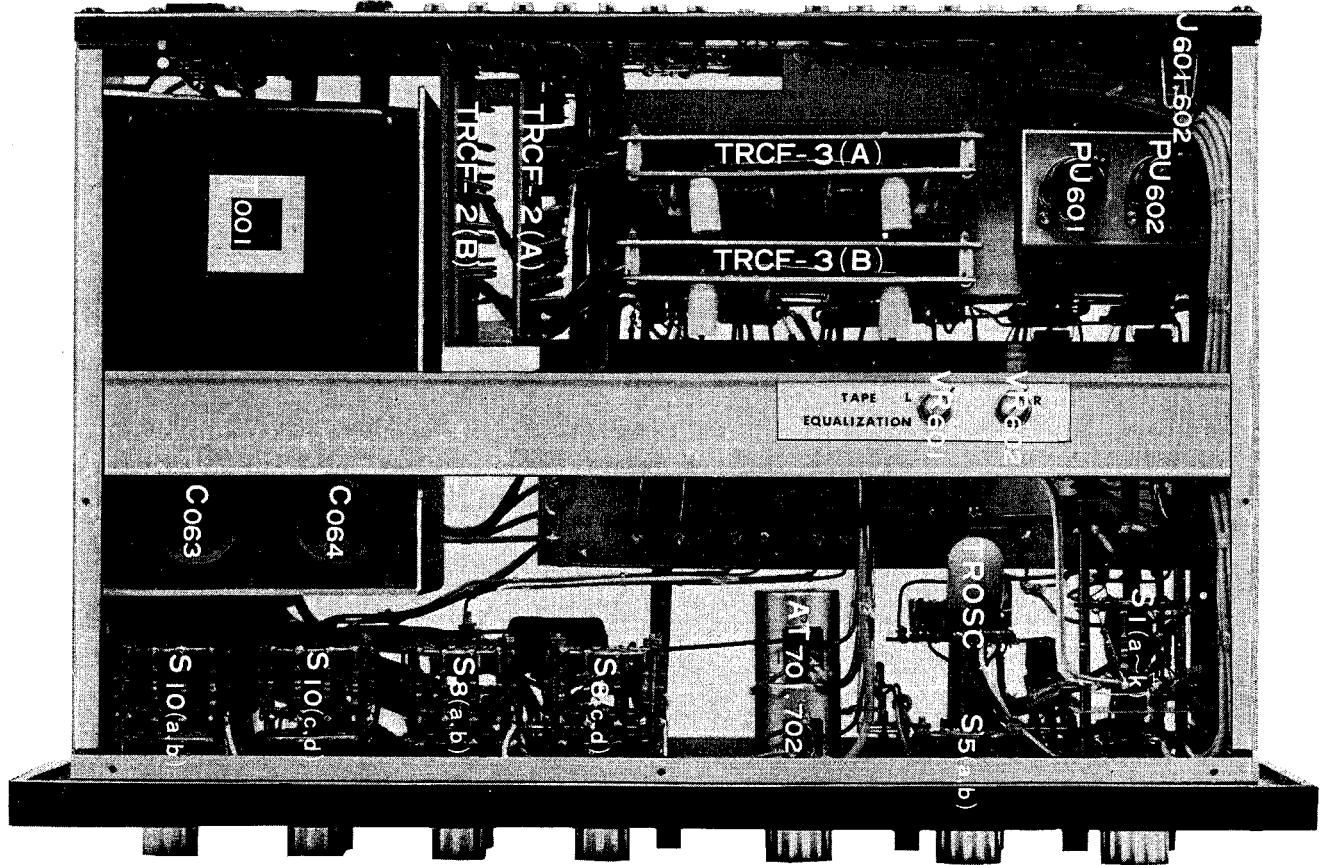
## CHANNEL DIVER TROUBLESHOOTING CHART (cont'd)

SYMPTOM	PROBABLE CAUSE		CHECK POINT
Weak output signal over medium-pass filter band	A. Medium-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in medium-pass filter amp and replace defective element.  TR <sub>007</sub> ~TR <sub>014</sub>
Weak output signal over low-pass filter band	A. Low-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in low-pass filter amp and replace defective element.  TR <sub>015</sub> ~TR <sub>018</sub>
Distortion over all filter pass band	A. Power circuit defective  B. Buffer amp defective	Measured voltage differs from voltage specified in Circuit Diagram.  1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in power circuit and replace defective element.  Measure voltage in buffer amp and replace defective element.  TR <sub>001</sub> , TR <sub>002</sub>
Distortion over high-pass filter band	A. High-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in high-pass filter amp and replace defective element.  TR <sub>003</sub> ~TR <sub>006</sub>
Distortion over medium-pass filter band	A. Medium-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in medium-pass filter amp and replace defective element.  TR <sub>007</sub> ~TR <sub>014</sub>
Distortion over low-pass filter band	A. Low-pass filter amp defective	1. Measured voltage differs from voltage specified in Circuit Diagram. 2. Transistor aging	Measure voltage in low-pass filter amp and replace defective element.  TR <sub>015</sub> ~TR <sub>018</sub>
Hum over all filter pass bands	A. Power circuit defective  B. Filter amp defective  C. Improper or incorrect input connections	Poor capacitance of electrolytic capacitor  Poor capacitance of electrolytic capacitor	C <sub>063</sub> , C <sub>065</sub> , C <sub>066</sub>  C <sub>023</sub> , C <sub>024</sub> , C <sub>045</sub> , C <sub>046</sub>
Noisy over all filter pass band	A. Power circuit defective  B. Buffer amp defective	Measured voltage differs from voltage specified in Circuit Diagram.  Transistor aging	Measure voltage in power circuit and replace defective element.  TR <sub>001</sub> , TR <sub>002</sub>
Noisy over high-pass filter bands	A. High-pass filter amp defective	1. Transistor aging 2. Output volume defective	TR <sub>003</sub> ~TR <sub>006</sub>  VR <sub>003</sub> , VR <sub>004</sub>
Noisy over medium-pass filter band	A. Medium-pass filter amp defective	1. Transistor aging 2. Output volume defective	TR <sub>007</sub> ~TR <sub>014</sub>  VR <sub>001</sub> , VR <sub>002</sub>

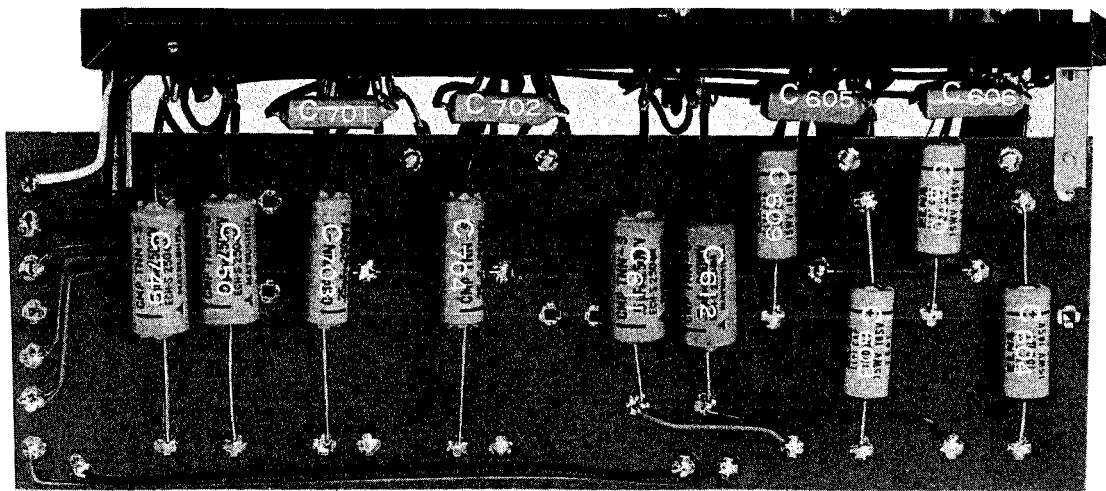
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>			<b>CHECK POINT</b>
Noisy over low-pass filter band	A. Low-pass filter amp defective	1. Transistor aging 2. Output volume defective		TR <sub>015</sub> ~TR <sub>018</sub> VR <sub>005</sub> , VR <sub>006</sub>
Frequency is not divided at all.	A. Plug-in unit defective	1. Defective capacitor 2. Defective resistor 3. Multi-connector not connected properly		C <sub>005</sub> ~C <sub>010</sub> , C <sub>013</sub> ~C <sub>018</sub> , C <sub>025</sub> ~C <sub>030</sub> , C <sub>035</sub> ~C <sub>040</sub> R <sub>013</sub> , R <sub>014</sub> , R <sub>027</sub> , R <sub>028</sub> R <sub>041</sub> , R <sub>042</sub> , R <sub>059</sub> , R <sub>060</sub>
	B. Refer to the column on defective filter amp.			
Frequency is not divided at cross-over between high and mid-ranges	A. Plug-in unit defective	1. Defective capacitor 2. Defective resistor 3. Multi-connector not connected properly		C <sub>005</sub> ~C <sub>010</sub> , C <sub>013</sub> ~C <sub>018</sub> R <sub>013</sub> , R <sub>014</sub> , R <sub>027</sub> , R <sub>028</sub>
	Refer to the columns on defective high-and medium-pass filter amplifiers.			
Frequency is not divided at cross-over between mid and low ranges.	A. Plug-in unit defective	1. Defective capacitor 2. Defective resistor 3. Multi-connector not connected properly		C <sub>025</sub> ~C <sub>030</sub> , C <sub>035</sub> ~C <sub>040</sub> R <sub>041</sub> , R <sub>042</sub> , R <sub>059</sub> , R <sub>060</sub>
	Refer to the columns on defective mid- and low-pass filter amplifier			

# PARTS LAYOUT

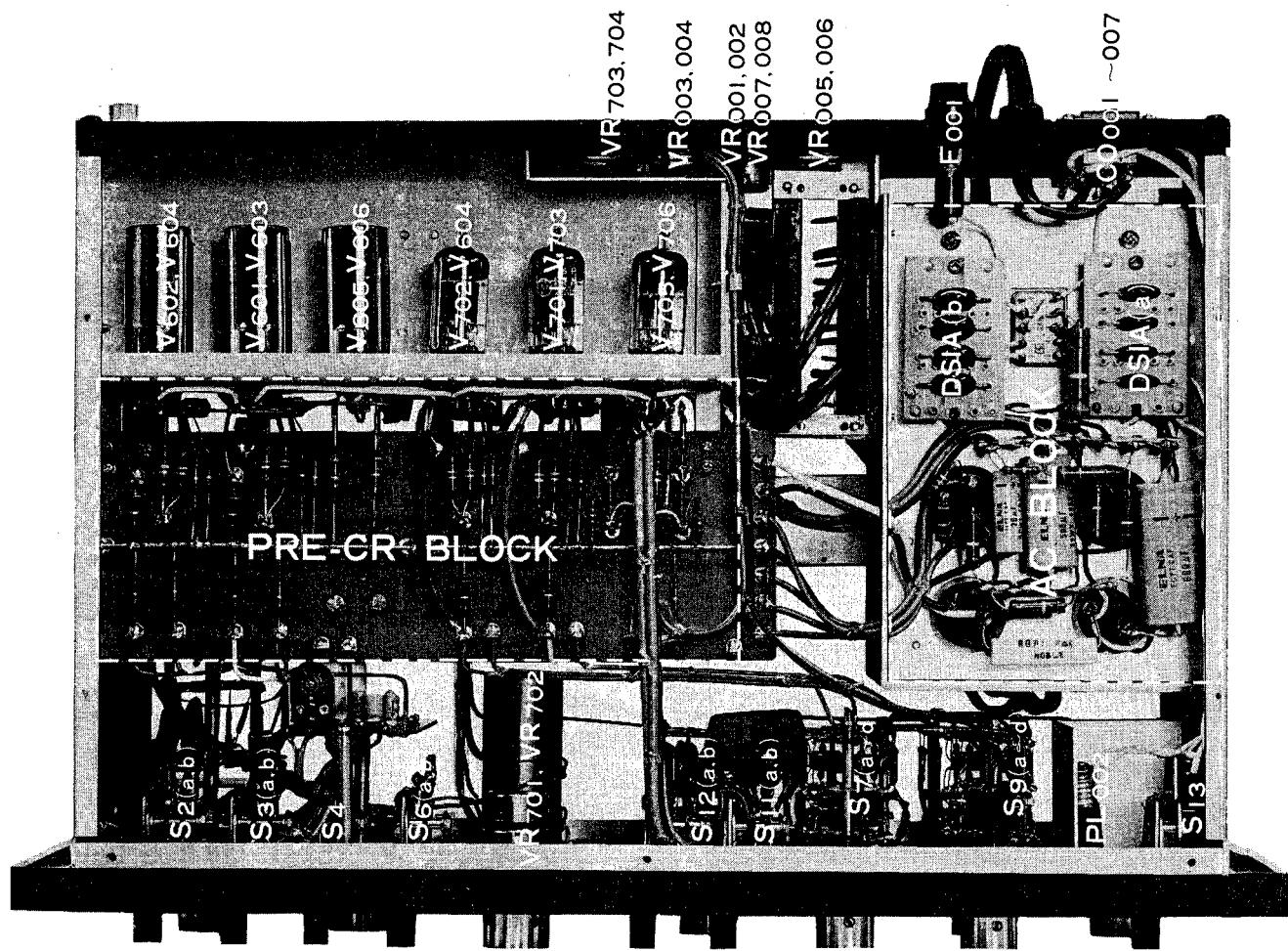
## **UPPER SECTION OF AMPLIFIER**



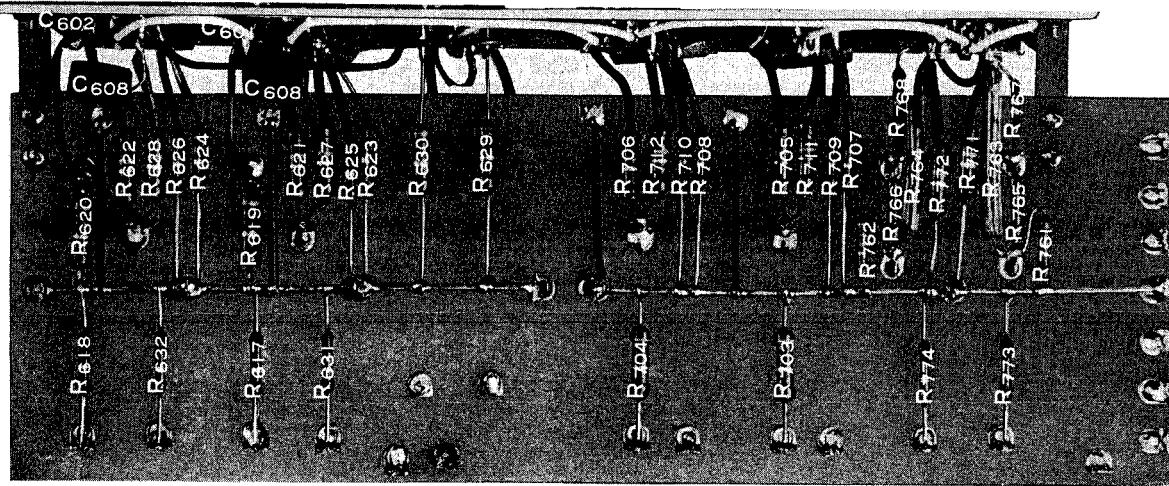
## **PRE-CR BLOCK (A)**



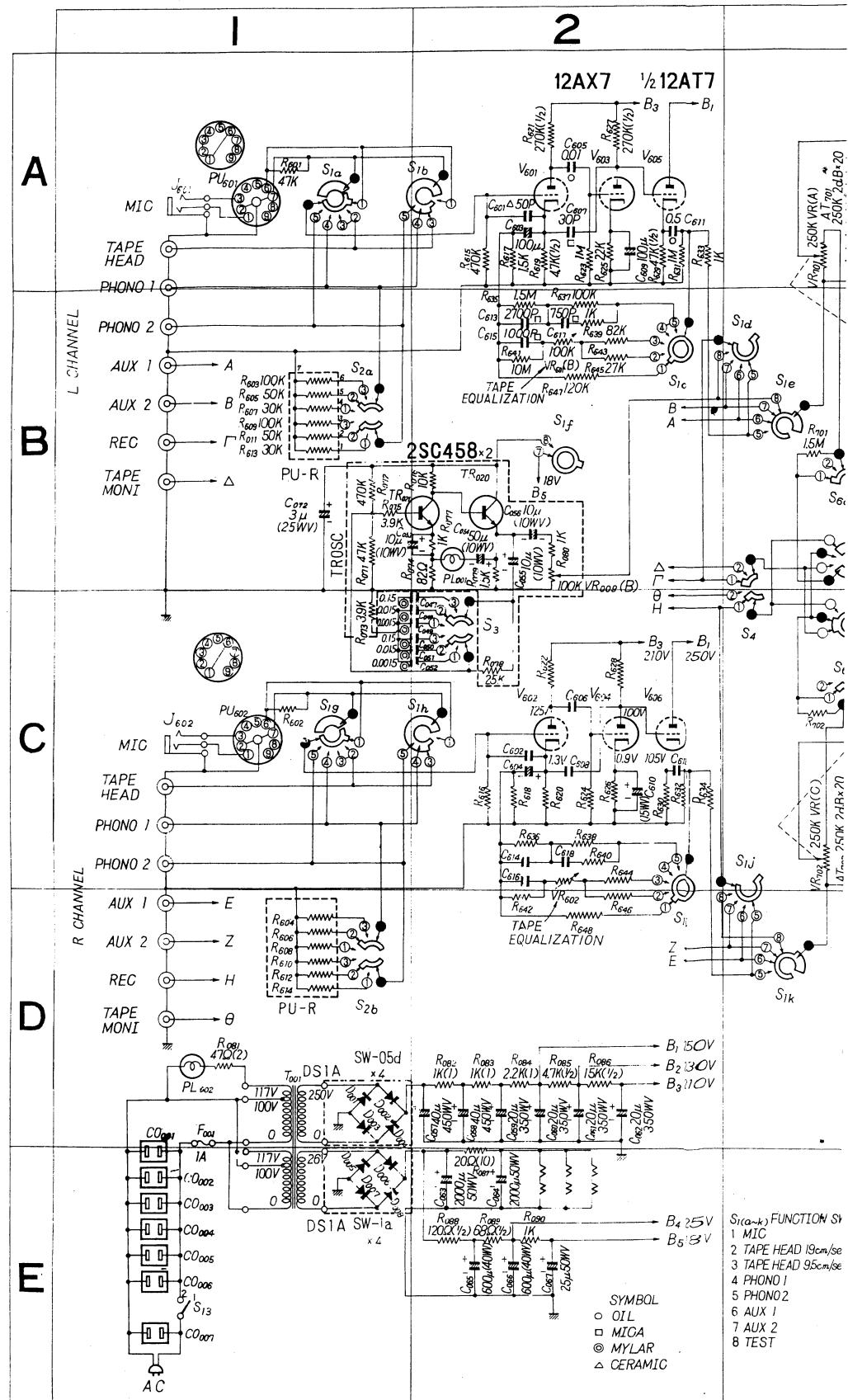
## **LOWER SECTION OF AMPLIFIER**



## **PRE-CR BLOCK (B)**



# CIRCUIT DIAGRAM

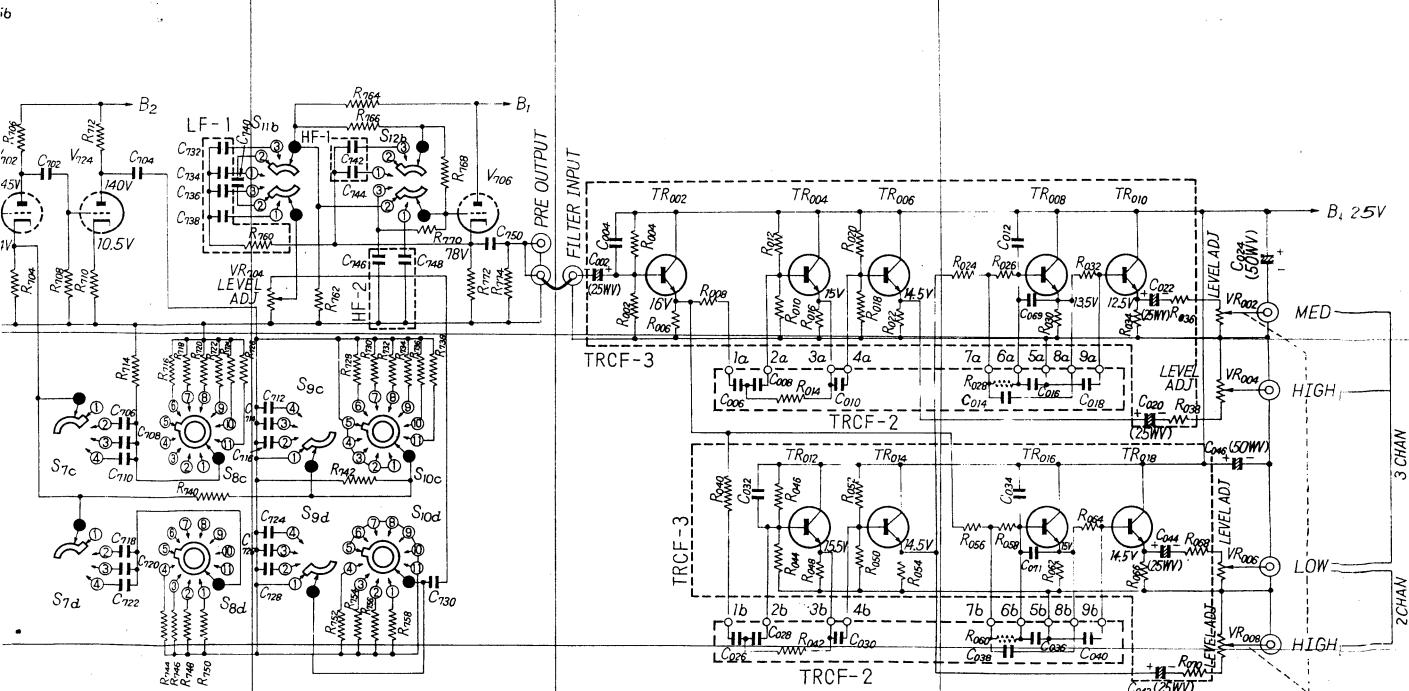
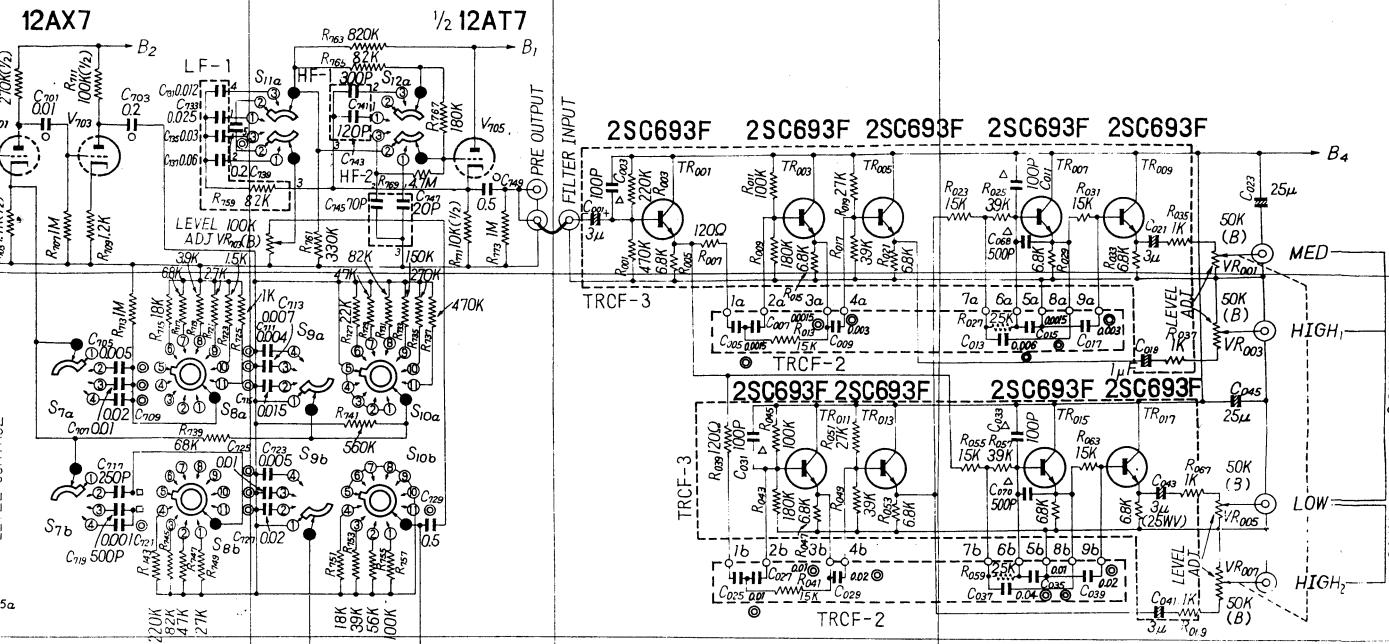


3

4

5

6



**S<sub>2(a-b)</sub>** PICKUP LOAD SW  
1 30KΩ  
2 50KΩ  
3 100KΩ

**i<sub>3</sub>** TEST FREQUENCY SW  
1 10kc  
2 1kc  
3 100%<sub>s</sub>

**S<sub>4</sub>** TAPE MONITOR SW  
1 SOURCE  
2 PLAY BACK

**S<sub>5(a-b)</sub>** MODE SW  
1 STEREO REVERSE  
2 STEREO NORMAL  
3 MONO L  
4 MONO R  
5 MONO L+R

**S<sub>6(a-b)</sub>** MUTING SW

**S<sub>7(a-d)</sub>** TONE SELECTOR  
1 DEFEAT  
2 6kc  
3 3.4kc  
4 1.8kc  
5 700%<sub>s</sub>

**S<sub>8(a-d)</sub>** TREBLE SW

1~4 CUT  
5 FLAT  
6~11 BOOST

**S<sub>10(a-d)</sub>** BASS SW

1~4 CUT  
5 FLAT  
6~11 BOOST

**S<sub>12(a-b)</sub>** HIGH FILTER SW

1 12kc  
2 OFF  
3 7kc

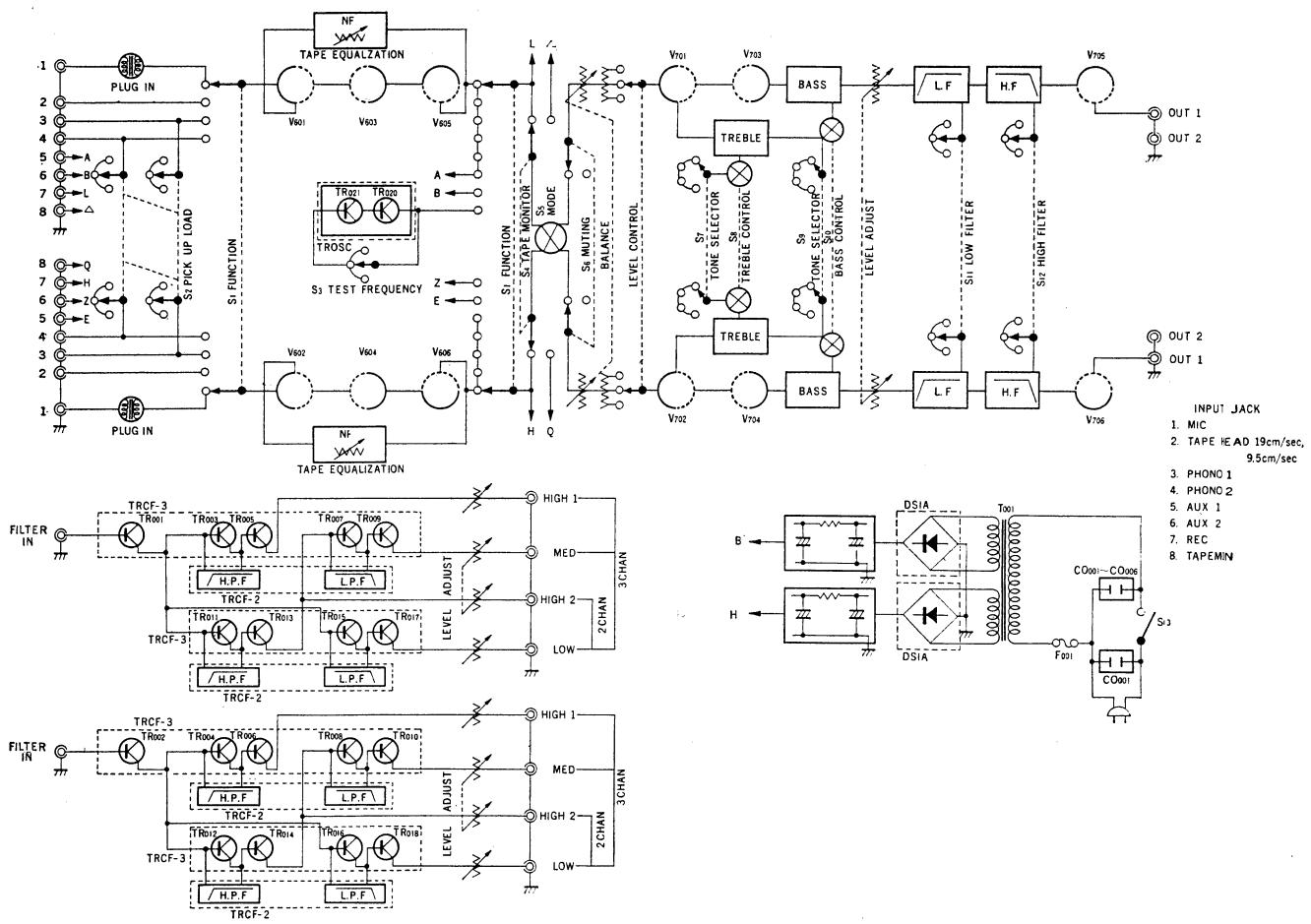
**S<sub>11(a-b)</sub>** LOWFILTER SW

1 30%<sub>s</sub>  
2 OFF  
3 60%<sub>s</sub>

**S<sub>13</sub>** POWER SW

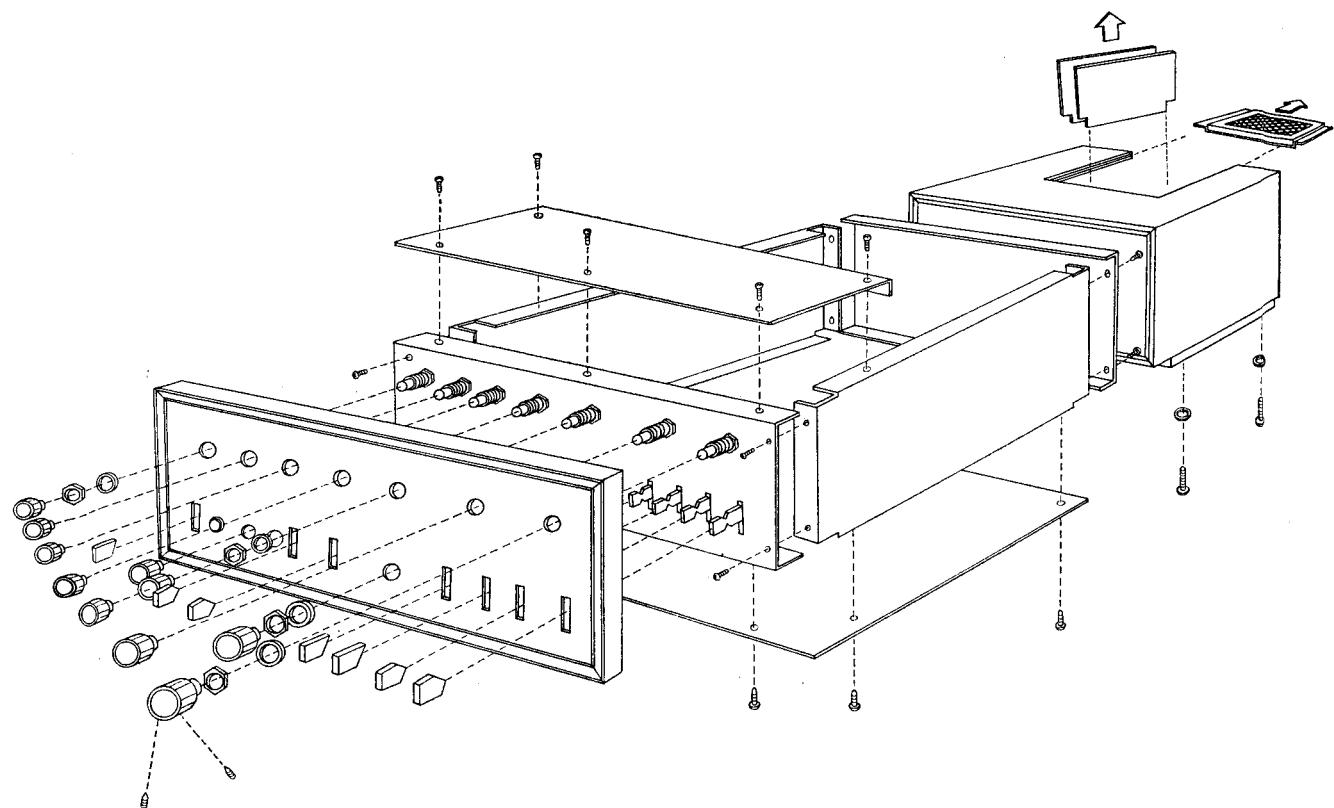
1 OFF  
2 ON

# BLOCK DIAGRAM



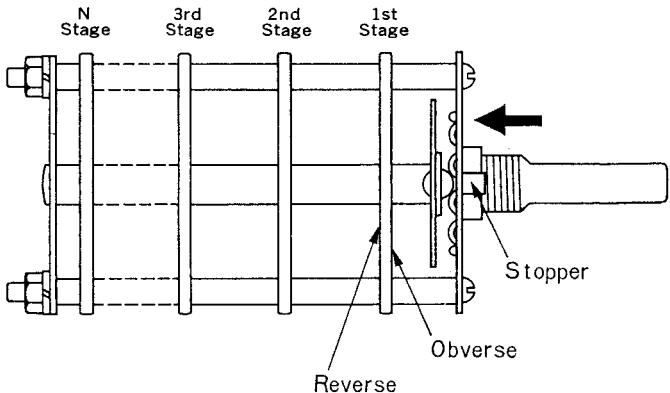
# EXPLODED VIEW OF CA-303

---

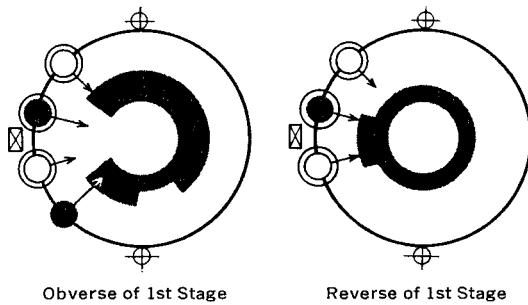


# SELECTOR CHART

- \* The side view of the selector switch is given right.
  - \* The selector switch viewed from the arrow side is given in Circuit Diagram.
  - \* To replace or check the selector switch, refer to the diagrams below:
- : Contact point;  
 ● : Supporting point;  
 △ : Repeating terminal;  
 ◎ : Through type clip;  
 ☒ : Location of stopper.



## MODE <1-Stage>

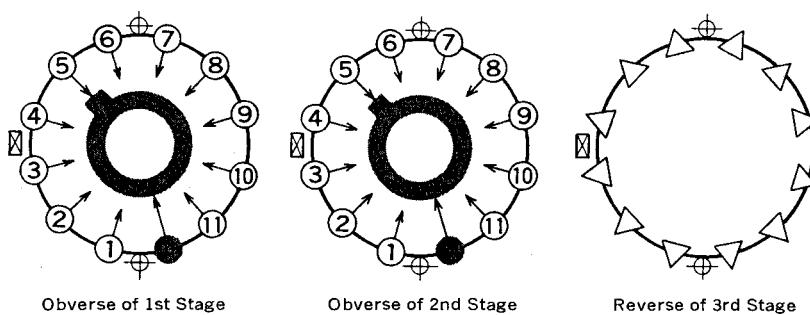


## Position of Switches in Circuit Diagram

⟨S5 (a~b)⟩

S5a....3 B	1 STEREO REVERSE (Shown)
S5b....3 C	2 STEREO NORMAL
	3 MONO L
	4 MONO R
	5 MONO L+R

## TONE CONTROL BASS-TREBLE <3-Stage>



## Position of Switches in Circuit Diagram

### BASS S8 (a~d)

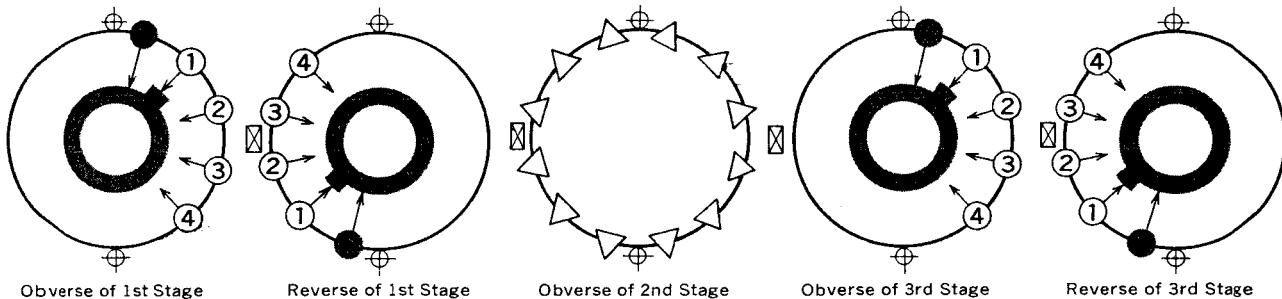
S10a....4 B (2nd Stage)	1~4 CUT
S10b....4 B (1st Stage)	5 FLAT (Shown)
S10c....4 D (2nd Stage)	6~11 BOOST
S10d....4 D (1st Stage)	

### TREBLE <S10 (a~d)>

S8a....3 B (2nd Stage)	1~4 CUT
S8b....3 B (1st Stage)	5 FLAT (Shown)
S8c....3 D (2nd Stage)	6~11 BOOST
S8d....3 D (1st Stage)	

# SELECTOR CHART

## TONE SELECTOR BASS-TREBLE <3-Stage>



## Position of Switches in Circuit Diagram

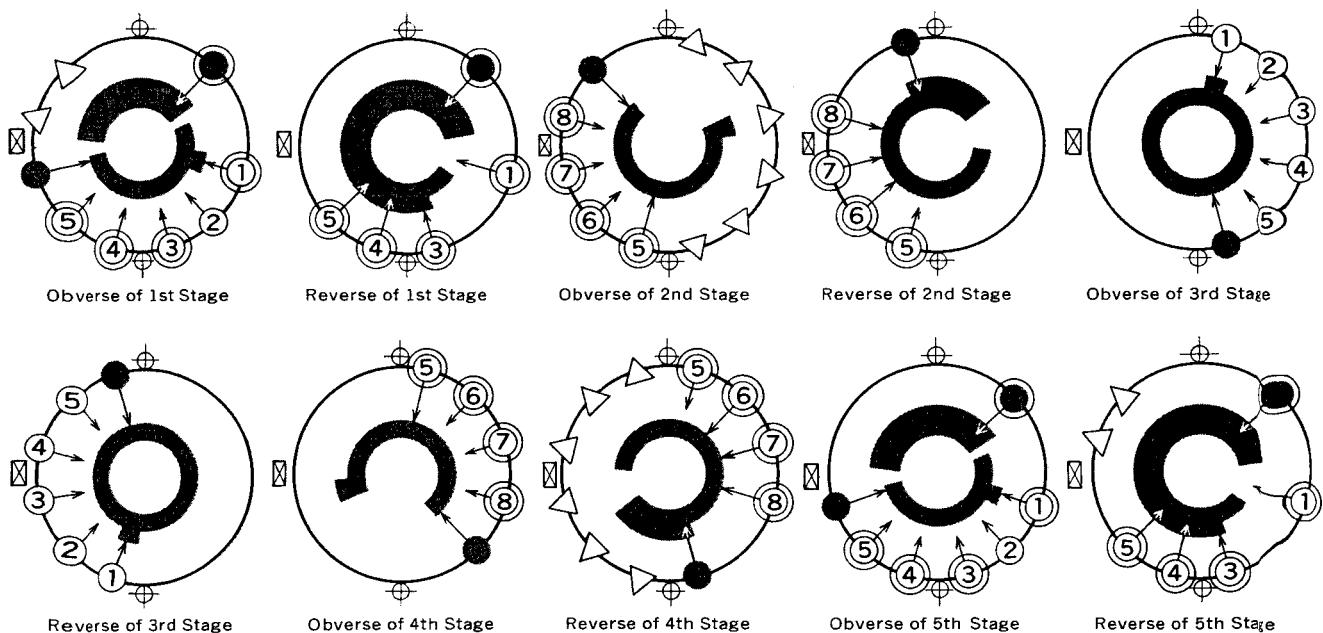
### BASS <S9(a~d)>

- S9a....4 B (3rd Stage, Reverse) 1 DEFEAT (Shown)
- S9b....4 B (1st Stage, Reverse) 2 159 Hz
- S9c....4 D (3rd Stage, Obverse) 3 340 Hz
- S9d....4 D (1st Stage, Obverse) 4 700 Hz

### TREBLE <S7(a~d)>

- S7a....3 B (3rd Stage, Reverse) 1 DEFEAT (Shown)
- S7b....3 B (1st Stage, Reverse) 2 6 KHz
- S7c....3 D (3rd Stage, Obverse) 3 3.4 KHz
- S7d....3 D (1st Stage, Obverse) 4 1.8 KHz

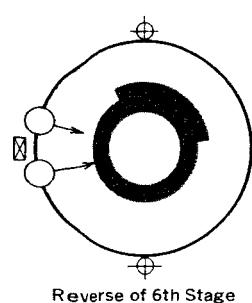
## FUNCTION <6-Stage>



## Position of Switchs in Circuit Diagram

### <S1 (a~k)>

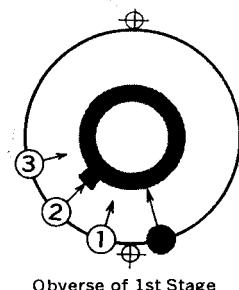
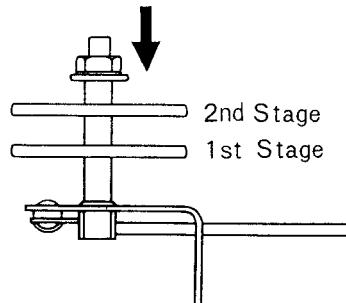
- |                                 |                                 |                       |         |
|---------------------------------|---------------------------------|-----------------------|---------|
| S1a....1 A (1st Stage, Obverse) | S1g....1 C (5th Stage, Obverse) | 1 MIC (Shown)         | 6 AUX 2 |
| S1b....2 A (1st Stage, Reverse) | S1h....2 C (5th Stage, Reverse) | 2 TAPE HEAD 19cm/sec  | 7 AUX 2 |
| S1c....2 B (3rd Stage, Obverse) | S1i....2 C (3rd Stage, Reverse) | 3 TAPE HEAD 9.5cm/sec | 8 TEST  |
| S1d....3 B (2nd Stage, Obverse) | S1j....3 D (4th Stage, Obverse) | 4 PHONO 1             |         |
| S1e....3 B (2nd Stage, Reverse) | S1k....3 D (4th Stage, Reverse) | 5 PHONO 2             |         |
| S1f....2 B (6th Stage, Reverse) |                                 |                       |         |



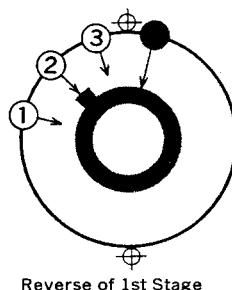
# SELECTOR CHART

The side view of the lever switch is given right. Below are its cross-sectional views. To replace or repair the lever switch, refer to the diagrams below:

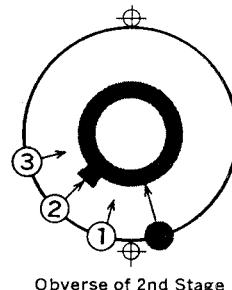
- Contact point;
- Supporting Point;



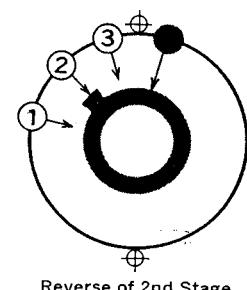
Obverse of 1st Stage



Reverse of 1st Stage



Obverse of 2nd Stage



Reverse of 2nd Stage

## PICK UP LOAD <2-Stage>

Position of Switches in Circuit Diagram

$\langle S_2(a,b) \rangle$

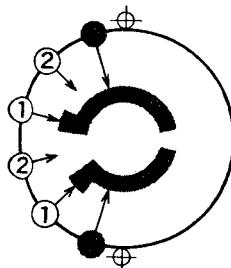
- |                               |                        |
|-------------------------------|------------------------|
| $S_{2a} \dots 4B$ (2nd Stage) | 1 30K $\Omega$         |
| $S_{2d} \dots 1D$ (1st Stage) | 2 50K $\Omega$ (Shown) |
|                               | 3 10K $\Omega$         |

## TEST FREQUENCY <2-Stage>

Position of Switches in Circuit Diagram

$\langle S_2 \rangle$

- |                                          |                 |
|------------------------------------------|-----------------|
| $S_3 \dots 2C$ (1st Stage)               | 1 10K Hz        |
| 2nd Stage is used as repeating terminals | 2 1K Hz (Shown) |
|                                          | 3 100K Hz       |



## MUTING

Position of Switches in Circuit Diagram

$\langle S_6(a,b) \rangle$

- |                   |               |
|-------------------|---------------|
| $S_{6a} \dots 3B$ | 1 OFF (Shown) |
| $S_{6b} \dots 3C$ | 2 -20dB       |

## LOW FILTER <2-Stage>

Position of Switches in Circuit Diagram

$\langle S_{11}(a,b) \rangle$

- |                                                                 |               |
|-----------------------------------------------------------------|---------------|
| $S_{11a} \dots 4A$ (Obverse of 1st Stage, Obverse of 2nd Stage) | 1 30C Hz      |
|                                                                 | 2 OFF (Shown) |
|                                                                 | 3 60 Hz       |
| $S_{11b} \dots 4C$ (Reverse of 1st Stage, Reverse of 2nd Stage) |               |

## HIGH FILTER <2-Stage>

Position of Switches in Circuit Diagram

$\langle S_{12}(a,b) \rangle$

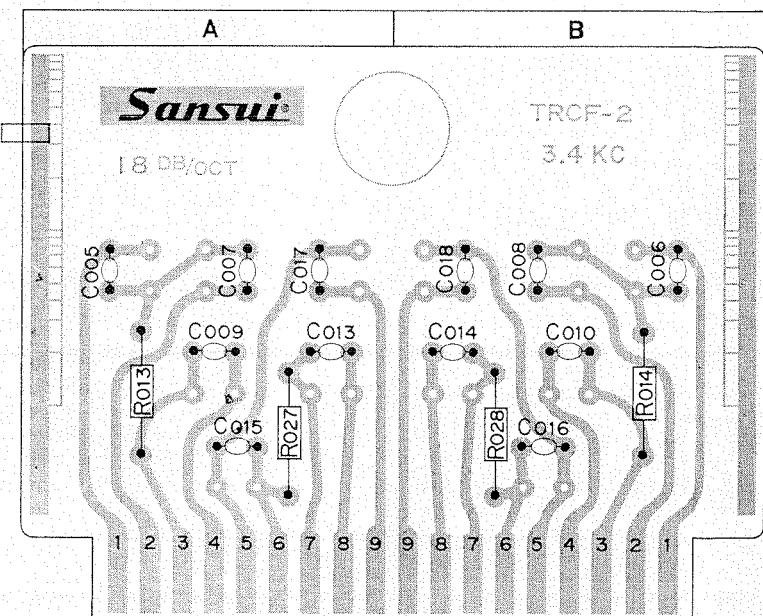
- |                                                                 |               |
|-----------------------------------------------------------------|---------------|
| $S_{12a} \dots 4A$ (Obverse of 1st Stage, Obverse of 2nd Stage) | 1 12K Hz      |
|                                                                 | 2 OFF (Shown) |
|                                                                 | 3 7K Hz       |
| $S_{12b} \dots 4C$ (Reverse of 1st Stage, Reverse of 2nd Stage) |               |

# PARTS LAYOUT IN PRINTED CIRCUITS

## PLUG-IN UNIT (TRCF-2<A>)

### POSITION OF PARTS IN CIRCUIT DIAGRAM

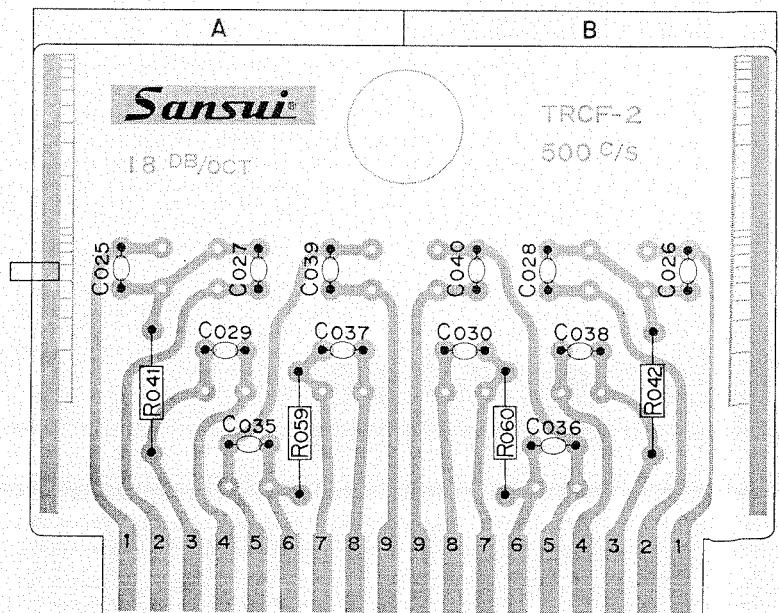
C005.... A	C016.... B
C006.... B	C017.... A
C007.... A	C018.... B
C008.... B	
C009.... A	R013.... A
C010.... B	R014.... B
C013.... A	R027.... A
C014.... B	R028.... B
C015.... A	



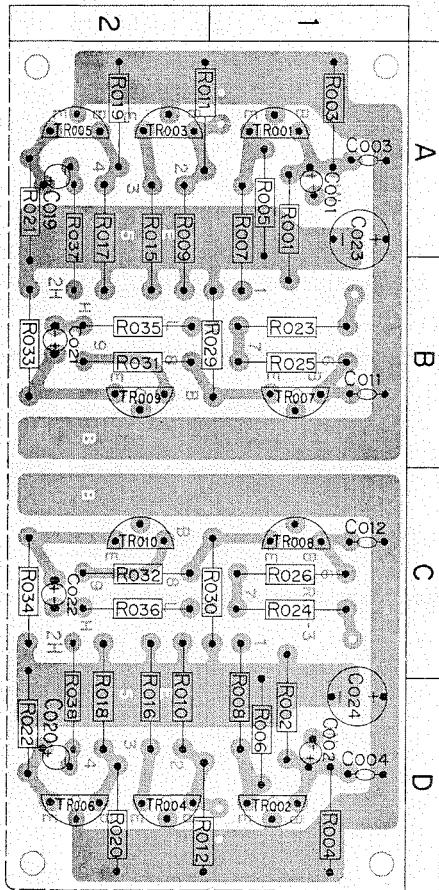
## PLUG-IN UNIT (TRCF-2<B>)

### POSITION OF PARTS IN CIRCUIT DIAGRAM

C025.... A	C038.... B
C026.... B	C039.... A
C027.... A	C040.... B
C028.... B	
C029.... A	R041.... A
C030.... B	R042.... B
C035.... A	R059.... A
C036.... B	R060.... B
C037.... A	

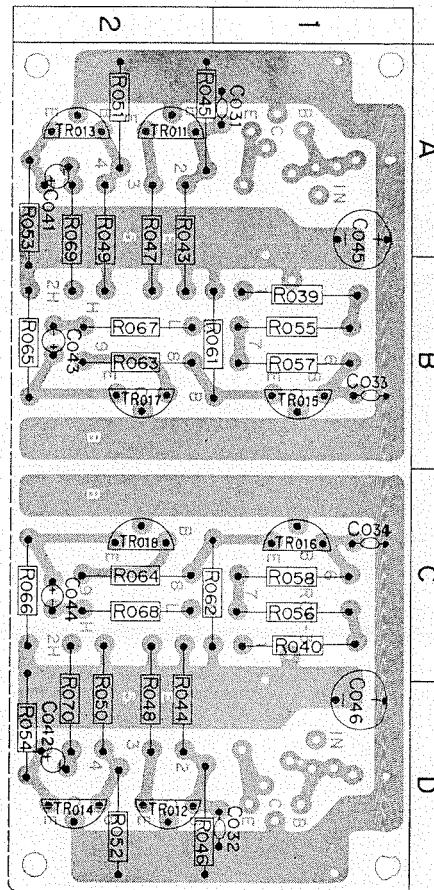


# PARTS LAYOUT IN PRINTED CIRCUITS



## FILTER AMP (TRCF-3<A>) POSITION OF PARTS IN CIRCUIT DIAGRAM

R 001....1 A	R 015....2 A	R 029....1 B	C 002....1 D	TR 001 ..1 A
R 002....1 D	R 016....2 D	R 030....1 C	C 003....1 A	TR 002 ..1 D
R 003....1 A	R 017....2 A	R 031....2 B	C 004....1 D	TR 003 ..2 A
R 004....1 D	R 018....2 D	R 032....2 C	C 011....1 B	TR 004 ..2 D
R 005....1 A	R 019....2 A	R 033....2 B	C 012....1 C	TR 005 ..2 A
R 006....1 D	R 020....2 D	R 034....2 C	C 019....2 A	TR 006 ..2 D
R 007....1 A	R 021....2 A	R 035....2 B	C 020....2 D	TR 007 ..1 B
R 008....1 D	R 022....2 D	R 036....2 C	C 021....2 B	TR 008 ..1 C
R 009....2 A	R 023....1 B	R 037....2 A	C 022....2 C	TR 009 ..2 B
R 010....2 D	R 024....1 C	R 038....2 D	C 023....1 A	TR 010 ..2 C
R 011....2 A	R 025....1 B		C 024....1 D	
R 012....2 D	R 026....1 C			



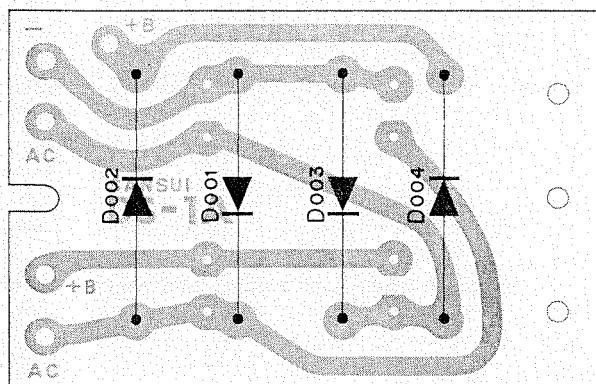
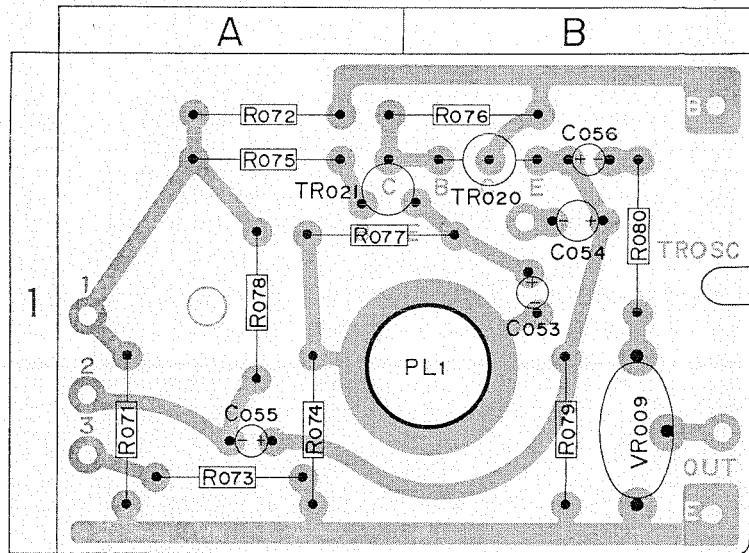
## FILTER AMP (TRCF-3<B>) POSITION OF PARTS IN CIRCUIT DIAGRAM

R 039....1 B	R 051....2 A	R 063....2 B	C 032....1 D	TR 011 ..2 A
R 040....1 C	R 052....2 D	R 064....2 C	C 033....1 B	TR 012 ..2 D
R 043....2 A	R 053....2 A	R 065....2 B	C 034....1 C	TR 013 ..2 A
R 044....2 D	R 054....2 D	R 066....2 C	C 041....2 A	TR 014 ..2 D
R 045....2 A	R 055....1 B	R 067....2 B	C 042....2 D	TR 015 ..1 B
R 046....2 D	R 056....1 C	R 068....2 C	C 043....2 B	TR 016 ..1 C
R 047....2 A	R 057....1 B	R 069....2 A	C 044....2 C	TR 017 ..2 B
R 048....2 D	R 058....1 C	R 070....2 D	C 045....1 A	TR 018 ..2 C
R 049....2 A	R 061....1 B		C 046....1 D	
R 050....2 D	R 062....1 C			

# OSCILLATION BLOCK (TROSC)

## POSITION OF PARTS IN CIRCUIT DIAGRAM

R071....1 A	R079....1 B	TR021 ..1 A
R072....1 A	R080....1 B	TR022 ..1 B
R073....1 A		
R074....1 A	C053....1 B	PL001 ..1 B
R075....1 A	C054....1 B	
R076....1 B	C055....1 A	VR009 ..1 B
R077....1 A	C056....1 B	
R078....1 A		

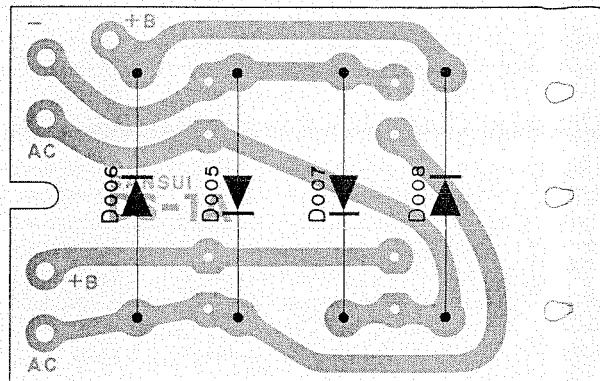


## POWER SUPPLY DIODE BRIDGE (DS-1A<a>)

D001	D003
D002	D004

## HEATER POWER SUPPLY DIODE BRIDGE (DS-1A<b>)

D005	D007
D006	D008



# PARTS LIST

**A:** Part No.  
**B:** Part Name  
**C:** Position of Parts in Circuit Diagram  
**D:** Position of Parts on Parts Layouts and Name of Printed Circuit

A	B	C	D	A	B	C	D
R001	470KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R059	25KΩ 1/4W ±10% Carbon Fixed Resistor	6 B	TRCF-2(B)
R002	470KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R060	25KΩ 1/4W ±10% Carbon Fixed Resistor	6 D	TRCF-2(B)
R003	220KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R061	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)
R004	220KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R062	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)
R005	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R063	15KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)
R006	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R064	15KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)
R007	120Ω 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R065	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)
R008	120Ω 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R066	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)
R009	180KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R067	1KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)
R010	180KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R068	1KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)
R011	100KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R069	1KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)
R012	100KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R070	1KΩ 1/2W ±10% Solid Fixed Resistor	6 E	TRCF-3(B)
R013	15KΩ 1/4W ±10% Carbon Fixed Resistor	5 B	TRCF-2(A)	R071	47KΩ 1/4W ±10% Carbon Fixed Resistor	1 B	TROSC
R014	15KΩ 1/4W ±10% Carbon Fixed Resistor	5 D	TRCF-2(A)	R072	470KΩ 1/4W ±10% Carbon Fixed Resistor	1 B	TROSC
R015	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R073	3.9KΩ 1/4W ±10% Carbon Fixed Resistor	1 C	TROSC
R016	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R074	82Ω 1/4W ±10% Carbon Fixed Resistor	2 B	TROSC
R017	39KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R075	3.9KΩ 1/4W ±10% Carbon Fixed Resistor	1 B	TROSC
R018	39KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R076	10KΩ 1/4W ±10% Carbon Fixed Resistor	2 B	TROSC
R019	27KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R077	1KΩ 1/4W ±10% Carbon Fixed Resistor	2 B	TROSC
R020	27KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R078	25KΩ 1/4W ±10% Carbon Fixed Resistor	2 C	TROSC
R021	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 A	TRCF-3(A)	R079	1.5KΩ 1/4W ±10% Carbon Fixed Resistor	2 B	TROSC
R022	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 C	TRCF-3(A)	R080	1KΩ 1/4W ±10% Carbon Fixed Resistor	2 B	TROSC
R023	15KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R081	47Ω 2W ±10% Carbon Fixed Resistor	1 D	Power Supply Block
R024	15KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	R082	1KΩ 1W ±10% Carbon Fixed Resistor	2 D	Power Supply Block
R025	39KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R083	1KΩ 1W ±10% Carbon Fixed Resistor	2 D	Power Supply Block
R026	39KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	R084	2.2KΩ 1W ±10% Carbon Fixed Resistor	2 D	Power Supply Block
R027	25KΩ 1/4W ±10% Carbon Fixed Resistor	6 B	TRCF-2(A)	R085	4.7KΩ 1/2W ±10% Carbon Fixed Resistor	2 D	Power Supply Block
R028	25KΩ 1/4W ±10% Carbon Fixed Resistor	6 D	TRCF-2(A)	R086	15KΩ 1/2W ±10% Carbon Fixed Resistor	2 D	Power Supply Block
R029	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R087	20Ω 10W ±10% Cement Resistor	2 E	Power Supply Block
R030	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	R088	120Ω 1/2W ±10% Carbon Fixed Resistor	2 E	Power Supply Block
R031	15KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R089	68Ω 1/2W ±10% Carbon Fixed Resistor	2 E	Power Supply Block
R032	15KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	R090	1KΩ 1/4W ±10% Carbon Fixed Resistor	2 E	Power Supply Block
R033	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R601	47KΩ 1/4W ±10% Carbon Fixed Resistor	1 A	PU601
R034	6.8KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	R602	47KΩ 1/4W ±10% Carbon Fixed Resistor	1 C	PU602
R035	1KΩ 1/2W ±10% Solid Fixed Resistor	6 A	TRCF-3(A)	R603			
R036	1KΩ 1/2W ±10% Solid Fixed Resistor	6 C	TRCF-3(A)	605			
R037	1KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(A)	607			
R038	1KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(A)	609	Composite Resistor PU-R	1 B	S2a
R039	120Ω 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	611			
R040	120Ω 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	613			
R041	15KΩ 1/4W ±10% Carbon Fixed Resistor	5 B	TRCF-2(B)	R604			
R042	15KΩ 1/4W ±10% Carbon Fixed Resistor	5 E	TRCF-2(B)	606			
R043	180KΩ 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	608			
R044	180KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	610	Composite Resistor PU-R	1 D	S2b
R045	100KΩ 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	612			
R046	100KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	614			
R047	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	R615	470KΩ 1/4W ±10% Carbon Fixed Resistor	2 A	S1a
R048	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	R616	470KΩ 1/4W ±10% Carbon Fixed Resistor	2 C	S1g
R049	39KΩ 1/2W ±10% Solid Fixed Resistor	3 B	TRCF-3(B)	R617	1.5KΩ 1/4W ±10% Carbon Fixed Resistor	2 A	PRE-CR Block
R050	39KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	R618	1.5KΩ 1/4W ±10% Carbon Fixed Resistor	2 C	PRE-CR Block
R051	27KΩ 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	R619	4.7KΩ 1/2W ±10% Carbon Fixed Resistor	2 A	PRE-CR Block
R052	27KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	R620	4.7KΩ 1/2W ±10% Carbon Fixed Resistor	2 C	PRE-CR Block
R053	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 B	TRCF-3(B)	R621	270KΩ 1/2W ±10% Carbon Fixed Resistor	2 A	PRE-CR Block
R054	6.8KΩ 1/2W ±10% Solid Fixed Resistor	5 D	TRCF-3(B)	R622	270KΩ 1/2W ±10% Carbon Fixed Resistor	2 C	PRE-CR Block
R055	15KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)	R623	1MΩ 1/4W ±10% Carbon Fixed Resistor	2 A	PRE-CR Block
R056	15KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)				
R057	39KΩ 1/2W ±10% Solid Fixed Resistor	6 B	TRCF-3(B)				
R058	39KΩ 1/2W ±10% Solid Fixed Resistor	6 D	TRCF-3(B)				

A	B	C	D
R624	1MΩ 1/4W ±10% Carbon Fixed Resistor	2C PRE-CR Block	
R625	2.2KΩ 1/4W ±10% Carbon Fixed Resistor	2A PRE-CR Block	
R626	2.2KΩ 1/4W ±10% Carbon Fixed Resistor	2C PRE-CR Block	
R627	270KΩ 1/2W ±10% Carbon Fixed Resistor	2A PRE-CR Block	
R628	270KΩ 1/2W ±10% Carbon Fixed Resistor	2C PRE-CR Block	
R629	47KΩ 1/2W ±10% Carbon Fixed Resistor	2A PRE-CR Block	
R630	47KΩ 1/2W ±10% Carbon Fixed Resistor	2C PRE-CR Block	
R631	1MΩ 1/4W ±10% Carbon Fixed Resistor	2A PRE-CR Block	
R632	1MΩ 1/4W ±10% Carbon Fixed Resistor	2C PRE-CR Block	
R633	1KΩ 1/4W ±10% Carbon Fixed Resistor	2A S1(c,e)	
R634	1KΩ 1/4W ±10% Carbon Fixed Resistor	2C S1(i,k)	
R635	1.5MΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R636	1.5MΩ 1/4W ±10% Carbon Fixed Resistor	2C S1(i,i)	
R637	100KΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R638	100KΩ 1/4W ±10% Carbon Fixed Resistor	2C S1(i,i)	
R639	1KΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R640	1KΩ 1/4W ±10% Carbon Fixed Resistor	2C S1(i,i)	
R641	10MΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R642	10MΩ 1/4W ±10% Carbon Fixed Resistor	2D S1(i,i)	
R643	82KΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R644	82KΩ 1/4W ±10% Carbon Fixed Resistor	2C S1(i,i)	
R645	27KΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R646	27KΩ 1/4W ±10% Carbon Fixed Resistor	2D S1(i,i)	
R647	120KΩ 1/4W ±10% Carbon Fixed Resistor	2B S1(c,d)	
R648	120KΩ 1/4W ±10% Carbon Fixed Resistor	2D S1(i,i)	
R701	1.5MΩ 1/4W ±10% Carbon Fixed Resistor	3B S6a	
R702	1.5MΩ 1/4W ±10% Carbon Fixed Resistor	3C S6b	
R703	4.7KΩ 1/2W ±10% Carbon Fixed Resistor	3A PRE-CR Block	
R704	4.7KΩ 1/2W ±10% Carbon Fixed Resistor	3C PRE-CR Block	
R705	270KΩ 1/2W ±10% Carbon Fixed Resistor	3A PRE-CR Block	
R706	270KΩ 1/2W ±10% Carbon Fixed Resistor	3C PRE-CR Block	
R707	1MΩ 1/4W ±10% Carbon Fixed Resistor	3A PRE-CR Block	
R708	1MΩ 1/4W ±10% Carbon Fixed Resistor	3C PRE-CR Block	
R709	1.2KΩ 1/4W ±10% Carbon Fixed Resistor	3A PRE-CR Block	
R710	1.2KΩ 1/4W ±10% Carbon Fixed Resistor	3C PRE-CR Block	
R711	100KΩ 1/2W ±10% Carbon Fixed Resistor	3A PRE-CR Block	
R712	100KΩ 1/2W ±10% Carbon Fixed Resistor	3C PRE-CR Block	
R713	1MΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R714	1MΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R715	18KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R716	18KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R717	6.8KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R718	6.8KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R719	3.9KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R720	3.9KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R721	2.7KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R722	2.7KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R723	1.5KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R724	1.5KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R725	1KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8a	
R726	1KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R727	22KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R728	22KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R729	47KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R730	47KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R731	82KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R732	82KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	

A	B	C	D
R733	150KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R734	150KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R735	270KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R736	270KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R737	470KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R738	470KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R739	68KΩ 1/4W ±10% Carbon Fixed Resistor	3B S7c-S9a	
R740	68KΩ 1/4W ±10% Carbon Fixed Resistor	3D S7c-S9c	
R741	560KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10a	
R742	560KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10c	
R743	220KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8b	
R744	220KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8d	
R745	82KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8b	
R746	82KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R747	47KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8b	
R748	47KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8c	
R749	27KΩ 1/4W ±10% Carbon Fixed Resistor	3B S8t	
R750	27KΩ 1/4W ±10% Carbon Fixed Resistor	3D S8d	
R751	18KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10b	
R752	18KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10d	
R753	39KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10b	
R754	39KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10g	
R755	56KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10b	
R756	56KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10g	
R757	100KΩ 1/4W ±10% Carbon Fixed Resistor	4B S10g	
R758	100KΩ 1/4W ±10% Carbon Fixed Resistor	4D S10j	
R759	Composite Resistor LF-1	4A S11a	
R760	Composite Resistor LF-1	4C S11b	
R761	330KΩ 1/4W ±10% Carbon Fixed Resistor	4A PRECR Block	
R762	330KΩ 1/4W ±10% Carbon Fixed Resistor	4C PRECR Block	
R763	820KΩ 1/4W ±10% Carbon Fixed Resistor	4A PRECR Block	
R764	820KΩ 1/4W ±10% Carbon Fixed Resistor	4C PRECR Block	
R765	82KΩ 1/4W ±10% Carbon Fixed Resistor	4A PRECR Block	
R766	82KΩ 1/4W ±10% Carbon Fixed Resistor	4C PRECR Block	
R767	180KΩ 1/4W ±10% Carbon Fixed Resistor	4A PRECR Block	
R768	180KΩ 1/4W ±10% Carbon Fixed Resistor	4C PRECR Block	
R769	4.7MΩ 1/4W ±10% Carbon Fixed Resistor	4A S12a	
R770	4.7MΩ 1/4W ±10% Carbon Fixed Resistor	4C S12b	
R771	10KΩ 1/2W ±10% Carbon Fixed Resistor	4A PRECR Block	
R772	10KΩ 1/2W ±10% Carbon Fixed Resistor	4C PRECR Block	
R773	1MΩ 1/4W ±10% Carbon Fixed Resistor	4A PRECR Block	
R774	1MΩ 1/4W ±10% Carbon Fixed Resistor	4C PRECR Block	
C001	3μF 25WV +100% Electrolytic Capacitor	5A TR(F-3(A))	
C002	3μF 25WV +100% Electrolytic Capacitor	5C TR(F-3(A))	
C003	100pF 250WV ±10% Ceramic Capacitor	5A TR(F-3(A))	
C004	100pF 250WV ±10% Ceramic Capacitor	5C TR(F-3(A))	
C005	0.0015μF 50WV ±10% Mylar Capacitor	5B TR(F-2(A))	
C006	0.0015μF 50WV ±10% Mylar Capacitor	5D TR(F-2(A))	
C007	0.0015μF 50WV ±10% Mylar Capacitor	5B TR(F-2(A))	
C008	0.0015μF 50WV ±10% Mylar Capacitor	5D TR(F-2(A))	
C009	0.003μF 50WV ±10% Mylar Capacitor	5B TR(F-2(A))	
C010	0.003μF 50WV ±10% Mylar Capacitor	5D TR(F-2(A))	
C011	100pF 250WV ±10% Ceramic Capacitor	6A TR(F-3(A))	
C012	100pF 250WV ±10% Ceramic Capacitor	6C TR(F-3(A))	
C013	0.006μF 50WV ±10% Mylar Capacitor	6B TR(F-2(A))	
C014	0.006μF 50WV ±10% Mylar Capacitor	6D TR(F-2(A))	
C015	0.0015μF 50WV ±10% Mylar Capacitor	6B TR(F-2(A))	

# PARTS LIST

**A:** Part No.

**B:** Part Name

#### **C: Position of Part in Circuit Diagram**

**D:** Position of Parts on Parts Layout and Name of Printed Circuit

A	B	C	D	A	B	C	D
C016	0.0015μF 50WV ±10% Mylar Capacitor	6 D	TRCF-2(A)	C068	500 pF 250WV ±10% Ceramic Capacitor	6 A	TRCF-3(A)
C017	0.003μF 50WV ±10% Mylar Capacitor	6 B	TRCF-2(A)	C069	500 pF 250WV ±10% Ceramic Capacitor	6 C	TRCF-3(A)
C018	0.003μF 50WV ±10% Mylar Capacitor	6 D	TRCF-2(A)	C070	500 pF 250WV ±10% Ceramic Capacitor	6 B	TRCF-3(B)
C019	1μF 25WV +100% Electrolytic Capacitor	6 B	TRCF-3(A)	C071	500 pF 250WV ±10% Ceramic Capacitor	6 D	TRCF-3(B)
C020	1μF 25WV +100% Electrolytic Capacitor	6 D	TRCF-3(A)	C072	3μF 25WV +100% Electrolytic Capacitor	1 B	TROSC
C021	3μF 25WV +100% Electrolytic Capacitor	6 A	TRCF-3(A)	C601	50 pF 250WV ±10% Ceramic Capacitor	2 A	PRE-CR Block
C022	3μF 25WV +100% Electrolytic Capacitor	6 C	TRCF-3(A)	C602	50 pF 250WV ±10% Ceramic Capacitor	2 C	PRE-CR Block
C023	25μF 50WV +100% Electrolytic Capacitor	6 A	TRCF-3(A)	C603	100μF 15WV +100% Electrolytic Capacitor	2 A	PRE-CR Block
C024	25μF 50WV +100% Electrolytic Capacitor	6 C	TRCF-3(A)	C604	100μF 15WV +100% Electrolytic Capacitor	2 C	PRE-CR Block
C025	0.01μF 50WV ±10% Mylar Capacitor	5 B	TRCF-2(B)	C605	0.01μF 400WV ±10% Oil Capacitor	2 A	PRE-CR Block
C026	0.01μF 50WV ±10% Mylar Capacitor	5 D	TRCF-2(B)	C606	0.01μF 400WV ±10% Oil Capacitor	2 C	PRE-CR Block
C027	0.01μF 50WV ±10% Mylar Capacitor	5 B	TRCF-2(B)	C607	30 pF 250WV ±10% Mica Capacitor	2 A	PRE-CR Block
C028	0.01μF 50WV ±10% Mylar Capacitor	5 D	TRCF-2(B)	C608	30 pF 250WV ±10% Mica Capacitor	2 C	PRE-CR Block
C029	0.02μF 50WV ±10% Mylar Capacitor	5 B	TRCF-2(B)	C609	100μF 15WV +100% Electrolytic Capacitor	2 A	PRE-CR Block
C030	0.02μF 50WV ±10% Mylar Capacitor	5 D	TRCF-2(B)	C610	100μF 15WV +100% Electrolytic Capacitor	2 C	PRE-CR Block
C031	100 pF 250WV ±10% Ceramic Capacitor	5 B	TRCF-3(B)	C611	0.5μF 400WV ±10% Oil Capacitor	2 A	PRE-CR Block
C032	100 pF 250WV ±10% Ceramic Capacitor	5 D	TRCF-3(B)	C612	0.5μF 400WV ±10% Oil Capacitor	2 C	PRE-CR Block
C033	100 pF 250WV ±10% Ceramic Capacitor	6 B	TRCF-3(B)	C613	2700 pF 50WV ±10% Mica Capacitor	2 B	S1(c,d)
C034	100 pF 250WV ±10% Ceramic Capacitor	6 D	TRCF-3(B)	C614	2700 pF 50WV ±10% Mica Capacitor	2 C	S1(i, i)
C035	0.01μF 50WV ±10% Mylar Capacitor	6 B	TRCF-2(B)	C615	1000 pF 50WV ±10% Mica Capacitor	2 B	S1(c,d)
C036	0.01μF 50WV ±10% Mylar Capacitor	6 D	TRCF-2(B)	C616	1000 pF 50WV ±10% Mica Capacitor	2 C	S1(i, i)
C037	0.04μF 50WV ±10% Mylar Capacitor	6 B	TRCF-2(B)	C617	750 pF 50WV ±10% Mica Capacitor	2 B	S1(c,d)
C038	0.04μF 50WV ±10% Mylar Capacitor	6 E	TRCF-2(B)	C618	750 pF 50WV ±10% Mica Capacitor	2 C	S1(i, i)
C039	0.02μF 50WV ±10% Mylar Capacitor	6 B	TRCF-2(B)	C701	0.01μF 400WV ±10% Oil Capacitor	3 A	PRE-CR Block
C040	0.02μF 50WV ±10% Mylar Capacitor	6 D	TRCF-2(B)	C702	0.01μF 400WV ±10% Oil Capacitor	3 C	PRE-CR Block
C041	3μF 25WV +100% Electrolytic Capacitor	6 B	TRCF-3(B)	C703	0.2μF 400WV ±10% Oil Capacitor	3 A	PRE-CR Block
C042	3μF 25WV +100% Electrolytic Capacitor	6 E	TRCF-3(B)	C704	0.2μF 400WV ±10% Oil Capacitor	3 C	PRE-CR Block
C043	3μF 25WV +100% Electrolytic Capacitor	6 B	TRCF-3(B)	C705	0.005μF 50WV ±10% Mylar Capacitor	3 B	S7a
C044	3μF 25WV +100% Electrolytic Capacitor	6 D	TRCF-3(B)	C706	0.005μF 50WV ±10% Mylar Capacitor	3 D	S7c
C045	25μF 50WV +100% Electrolytic Capacitor	6 B	TRCF-3(B)	C707	0.01μF 50WV ±10% Mylar Capacitor	3 B	S7a
C046	25μF 50WV +100% Electrolytic Capacitor	6 D	TRCF-3(B)	C708	0.01μF 50WV ±10% Mylar Capacitor	3 D	S7c
C047	0.15μF 50WV ±10% Mylar Capacitor	2 C	S3	C709	0.02μF 50WV ±10% Mylar Capacitor	3 B	S7a
C048	0.015μF 50WV ±10% Mylar Capacitor	2 C	S3	C710	0.02μF 50WV ±10% Mylar Capacitor	3 D	S7c
C049	0.0015μF 50WV ±10% Mylar Capacitor	2 C	S3	C711	0.004μF 50WV ±10% Mylar Capacitor	4 B	S9a
C050	0.15μF 50WV ±10% Mylar Capacitor	2 C	S3	C712	0.004μF 50WV ±10% Mylar Capacitor	4 D	S9c
C051	0.015μF 50WV ±10% Mylar Capacitor	2 C	S3	C713	0.007μF 50WV ±10% Mylar Capacitor	4 B	S9a
C052	0.0015μF 50WV ±10% Mylar Capacitor	2 C	S3	C714	0.007μF 50WV ±10% Mylar Capacitor	4 D	S9c
C053	10μF 10WV +100% Electrolytic Capacitor	2 B	TROSC	C715	0.015μF 50WV ±10% Mylar Capacitor	4 B	S9a
C054	50μF 10WV +100% Electrolytic Capacitor	2 B	TROSC	C716	0.015μF 50WV ±10% Mylar Capacitor	4 D	S9c
C055	10μF 10WV +100% Electrolytic Capacitor	2 B	TROSC	C717	250 pF 50WV ±10% Mica Capacitor	3 B	S7b
C056	10μF 10WV +100% Electrolytic Capacitor	2 B	TROSC	C718	250 pF 50WV ±10% Mica Capacitor	3 D	S7d
C057, 058	40μF × 2 450WV +100% Electrolytic Capacitor (block-type)	2 D	Power Supply Block	C719	500 pF 50WV ±10% Mica Capacitor	3 B	S7b
C059~062	20μF × 4 350WV +100% Electrolytic Capacitor (block-type)	2 D	Power Supply Block	C720	500 pF 50WV ±10% Mica Capacitor	3 D	S7d
C063	2000μF 50WV +100% Electrolytic Capacitor	2 E	Power Supply Block	C721	0.001μF 50WV ±10% Mylar Capacitor	3 B	S7b
C064	2000μF 50WV +100% Electrolytic Capacitor	2 E	Power Supply Block	C722	0.001μF 50WV ±10% Mylar Capacitor	3 D	S7d
C065	600μF 40WV +100% Electrolytic Capacitor	2 E	Power Supply Block	C723	0.005μF 50WV ±10% Mylar Capacitor	4 B	S9b
C066	600μF 40WV +100% Electrolytic Capacitor	2 E	Power Supply Block	C724	0.005μF 50WV ±10% Mylar Capacitor	4 D	S9d
C067	25μF 50WV +100% Electrolytic Capacitor	2 E	Power Supply Block	C725	0.01μF 50WV ±10% Mylar Capacitor	4 B	S9b
				C726	0.01μF 50WV ±10% Mylar Capacitor	4 D	S9d
				C727	0.02μF 50WV ±10% Mylar Capacitor	4 B	S9b
				C728	0.02μF 50WV ±10% Mylar Capacitor	4 D	S9d
				C729	0.5μF 50WV ±10% Mylar Capacitor	4 B	S9b
				C730	0.5μF 50WV ±10% Mylar Capacitor	4 D	S9d
				C731	733		Composite Resistor LF-1
					735		
					737		

A	B	C	D
C732 734 736 738	Composite Resistor LF-1	3C S11b	
C739 C740 C741 743	0.2μF 250WV ±10% Mylar Capacitor 0.2μF 250WV ±10% Mylar Capacitor Composite Resistor HF-1	3A S11a 3C S11b 4A S12a	
C742 744	Composite Resistor HF-1	4C S12b	
C745 747	Composite Resistor HF-2	4A S12a	
C746 748	Composite Resistor HF-2	4C S12b	
C749 C750	0.5μF 400WV ±10% Oil Capacitor 0.5μF 400WV ±10% Oil Capacitor	4A PRE-CR Block 4C PRE-CR Block	
TR001 TR002 TR003 TR004 TR005 TR006 TR007 TR008 TR009 TR010 TR011 TR012 TR013 TR014 TR015 TR016 TR017 TR018 TR019 TR020	2SC693(F) SiN-P-N Planar Transistor 2SC693(F) SiN-P-N Planar Transistor 2SC458(B) SiN-P-N Planar Transistor 2SC458(B) SiN-P-N Planar Transistor	5A TRCF-3(A) 5C TRCF-3(A) 5A TRCF-3(A) 5C TRCF-3(A) 5A TRCF-3(A) 5C TRCF-3(A) 6A TRCF-3(A) 6C TRCF-3(A) 6A TRCF-3(A) 6C TRCF-3(A) 5B TRCF-3(B) 5D TRCF-3(B) 5B TRCF-3(B) 5D TRCF-3(B) 6B TRCF-3(B) 6D TRCF-3(B) 6B TRCF-3(B) 6D TRCF-3(B) 2SC693(F) 2SC458(B)	
	2SC693(F) 2SC458(B)	1—Base(B) 2—Collector(O) 3—Emitter(E)  1 2 3	
D001 D002 D003 D004 D005 D006 D007 D008	SW-0.5d Silicon Diode for Rectification SW-0.5d Silicon Diode for Rectification SW-0.5d Silicon Diode for Rectification SW-0.5d Silicon Diode for Rectification SW-1a Silicon Diode for Rectification SW-1a Silicon Diode for Rectification SW-1a Silicon Diode for Rectification SW-1a Silicon Diode for Rectification	1D DSIA(a) 1D DSIA(a) 1D DSIA(a) 1D DSIA(a) 1E DSIA(b) 1E DSIA(b) 1E DSIA(b) 1E DSIA(b)	
V601, 603 V602, 604 V605, 606 V701, 703	½12AX7 ½12AX7 ½12AT7 ½12AX7	2A V601, 603 2C V602, 604 2A V605, 606 3C V701, 703	

A	B	C	D
V702, 704 V705, 706	½12AX7 ½12AT7	3A V702, 704 4A V705, 706	
	12AX7, 12AT7	H — Heater HCT — Heater Center Tap G — Grid K — Cathode P — Plate	
VR001, 007 VR002, 008	50KΩ × 2(B) Variable Resistor (2-gang) 16φ	6A VR001, 007 6C VR002, 008	
VR003 VR004 VR005 VR006 VR009	50KΩ(B) Variable Resistor (1-gang) 16φ	6B VR003 6D VR004 6B VR005 6D VR006	
VR601 VR602	100KΩ(B) Variable Resistor (1-gang) 16φ	2B VR601 2C VR602	
VR701, 702	250KΩ × 2(A,C) Variable Resistor (2-gang) 24φ	2A VR701, 702	
VR703 VR704	100KΩ(B) Variable Resistor (1-gang) 16φ	4A VR703 4C VR704	
AT701, 702	250KΩ × 2(2dB × 20, ~) Attenuator	3A AT701, 702	
S1(a~b)	Rotary Switch	110-1-5264	1A 2C S1(a~b) 3D
S2(a~b)	Lever Switch	117-2-5264	1D S2(a, b)
S3	Lever Switch	117-2-5264	2C S3
S4	Lever Switch	117-1-5264	3C S4
S5(a~b)	Rotary Switch	110-2-5264	3C S5(a, b)
S6(a~b)	Lever Switch	117-1-5264	3C S6(a, b)
S7(a~d)	Rotary Switch	110-4-5264	3D S7(a~d)
S8(a~d)	Rotary Switch	110-3-5264	3D S8(a~d)
S9(a~d)	Rotary Switch	110-4-5264	4D S9(a~d)
S10(a~d)	Rotary Switch	110-3-5264	4D S10(a~d)
S11(a~b)	Lever Switch	117-2-5264	4A S11(a, b)
S12(a~b)	Lever Switch	117-2-5264	4A S12(a, b)
S13	Lever Switch	117-3-5264	1E S13
CO001 CO002 CO003 CO004 CO005 CO006 CO007	AC Outlet	I E CO001 I E CO002 I E CO003 I E CO004 I E CO005 I E CO006 I E CO007	
F001	Fuse 1A	1D F001	
PL001 PL002	Pilot Lamp 120 V Pilot Lamp 12 V	2B TR0SC 1D PL02	
J601 J602	Coaxial Single-Head Triple-Pole Jack	1A J601 1C J602	
T001	Power Transformer 400-5264	1E T001	
PU601 PU602	9-Pin Plug	1A PU601 1C PU602	



*Sansui*®



SANSUI ELECTRIC COMPANY LIMITED



Head Office; 14-1, 2-chome, Izumi, Suginami-ku, Tokyo, Japan. TEL. 323-1111

Printed in Japan (78500M)