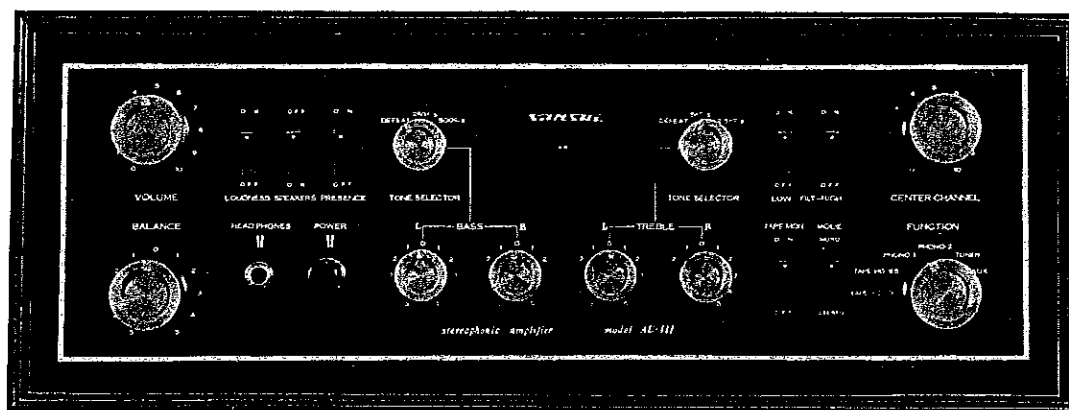


# OPERATING INSTRUCTIONS & SERVICE MANUAL

## STEREO CONTROL AMPLIFIER

SANSUI MODEL AU-111



*Sansui*®

SANSUI ELECTRIC COMPANY LIMITED

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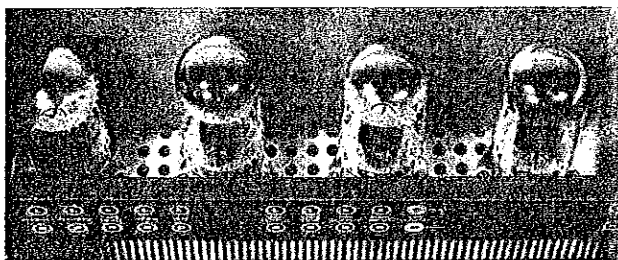
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# FEATURES

## MORE POWER WITH LESS DISTORTION

The Model AU-111 employs the latest 6L6GC power tubes and push-pull AB<sub>1</sub> type amplifying system with fixed bias which produce RMS stereo power up to 40 watts×2 with less than 0.8% distortion. The multi-negative feedback circuits provide the flat characteristic in all the frequency bands.



## NEGATIVE FEEDBACK FOR ALL AMPLIFICATION CIRCUITS

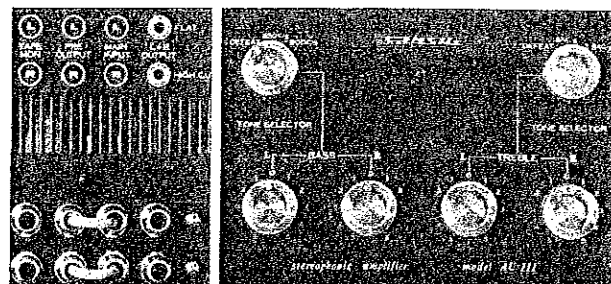
The Model AU-111 is designed to completely eliminate the distortion and noise not only in the main amplifier section but also in the control amplifier section. For instance, the latter has 4-stage amplifier circuits including cathode followers and uses the negative feedback for all of them.

## SEPARATE USE OF EITHER OF PRE-AMPLIFIER AND MAIN-AMPLIFIER

The Model AU-111 is designed especially for hi-fi enthusiasts so that the pre-amplifier and the main-amplifier can be used separately from each other. This extends the use of AU-111 for top-quality channel amplifier recording and controlling in a studio.

## 4-WAY ADJUSTABLE TONE RANGES

The Model AU-111 is provided with the tone



circuits which can freely change the upper or lower limit of the adjustable frequency range in four ways: 2 500 and 5,000 cps in high frequencies and 250 and 500 cps in low frequencies. With this, the changeable range of tone is very greatly extended. In addition the high and low notes are precisely adjusted independently of each other in each channel.

## INDEPENDENT DEFEAT IN BASS AND TREBLE IN EACH CHANNEL

The independent defeat in bass and treble in each channel makes it possible to obtain the perfectly flat frequency response unlike the mechanical one of the tone volume.

## USE OF LOW-OUTPUT MOVING-COIL CARTRIDGE

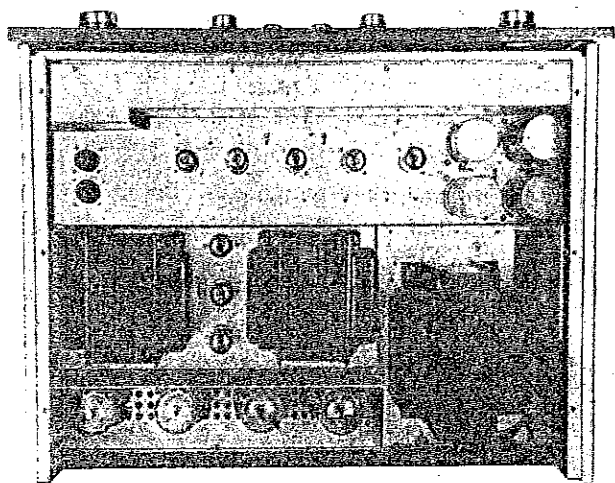
The MC pickup cartridge with the lowest output can be used simply by installing the Sansui A-603 or A-604 input transformer in the MT9P socket.

## EQUIPPED WITH TOP-QUALITY TRANSFORMERS

The performance and life of the amplifier depend largely on the quality of the transformer used.

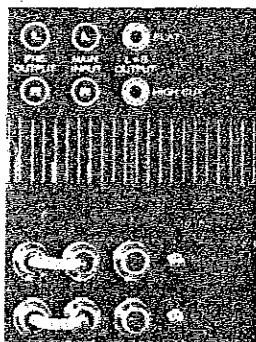


The Model AU-111 is equipped with a super wide band type output transformer with large capacity and a power transformer with excellent regulation ability to obtain high power without any power loss and distortion.



### THREE-DIMENSIONAL PERFORMANCE POSSIBLE WITH CENTER-CHANNEL OUTPUT TERMINALS

The Model AU-111 has output terminals for the center channel amplifier. Connect them to a monaural amplifier to produce a three dimensional effect.



### SILICON-TRANSISTORIZED HEAD AMPLIFIER

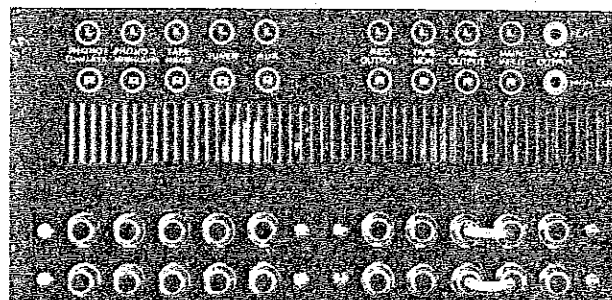
The head amplifier employs new silicon transistors to eliminate hum and noise completely. With this, a low-output MC pickup cartridge and a tape deck can be used.

### CATHODE FOLLOWER CIRCUIT IDEAL FOR FIRST STAGE OF INTERMEDIATE AMPLIFIER

For better performance the first stage of the intermediate amplifier employs the cathode follower circuit in which the input impedance is higher and the output one is lower. The TAPE REC terminal is connected to this circuit so that there occurs no trouble that was caused by too low input impedance of the tape recorder.

### 4-OUTPUT AND 7-INPUT CIRCUITS

The Model AU-111 can be used for almost all purposes by means of 4 output and 7 input circuits: PRE AMP., TAPE REC., CENTER CHANNEL ( $\times 2$ ) PHONO ( $\times 2$ ), TAPE TERMINAL etc.



### COMPLETE RANGE OF ACCESSORY CIRCUITS

The Model AU-111 has the complete range of accessory circuits: tape equalizer, CR feedback type low and high filters, loudness control tape monitor tape recording output terminal (cathode follower) presence control, center channel output terminals, phasing switch sub volume, headphone jack etc.

### BEST DESIGN FOR STEREO ENTHUSIASTS

The Model AU-111 is designed especially for ease of operation and beauty of appearance. Black-matted finishing of the front panel plus gold-plated knobs will enhance the beauty of your room.

# SPECIFICATIONS/CHARACTERISTICS

## SPECIFICATIONS

### POWER OUTPUT:

- a. MUSIC POWER (IHFM) 96W
- b. RMS POWER, L/R 45/45W
- c. RMS STEREO POWER 40W x 2

HARMONIC DISTORTION 0.8%

INTERMODULATION DISTORTION (50 + 5,500 Hz)  
0.8%

POWER BANDWIDTH (IHFM) 20 to 20,000 Hz

FREQUENCY RESPONSE (AUX) 20 to 50,000 Hz  $\pm 1$  dB

HUM AND NOISE (IHFM)

- a. AUX -80 dB
- b. PHONO -70 dB

CHANNEL SEPARATION 45 dB at PHONO terminal  
50 dB at AUX terminal

RESIDUAL NOISE 2 mV at 8- $\Omega$  terminal

OUTPUT IMPEDANCE 8 and 16 $\Omega$

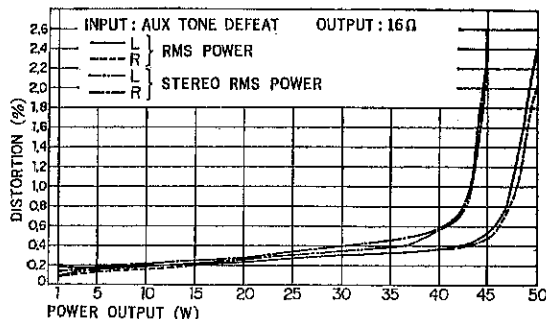
DAMPING FACTOR 15

### INPUT SENSITIVITY:

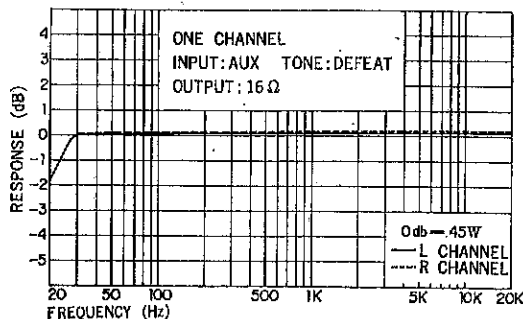
- a. PHONO-1 0.06 mV with A-604 (3.5 $\Omega$ ) installed  
0.2 mV with A-603 (30-100 $\Omega$ ) installed
- b. PHONO-2: 100K $\Omega$  2 mV
- c. TAPE HEAD: 100K $\Omega$  (19 & 9.5 cm/sec) 1.8 mV
- d. TUNER: 500K $\Omega$  220 mV
- e. AUX: 500K $\Omega$  220 mV
- f. TAPE MONITOR: PIN 500K $\Omega$  250 mV

## CHARACTERISTICS

### POWER OUTPUT HARMONIC DISTORTION



### POWER BAND WIDTH



# RECORDING OUTPUT :

## PIN CATHODE FOLLOWER OUTPUT

40 dB for PHONO-2 input  
( × 100)  
41 dB for TAPE HEAD input  
( × 115)

## CENTER CHANNEL OUTPUT : 34K $\Omega$

12V (for RMS power)

## EQUALIZER CHARACTERISTIC:

PHONO-1 & 2 RIAA  
TAPE HEAD NAB (19 & 9.5 cm/sec)

## PRE-AMPLIFIER OUTPUT : 710 $\Omega$

2.1V (for RMS power)

## CONTROLS AND SWITCHES:

### a. TONE SELECTOR : LOW

1. DEFEAT 2.  $f_o=250\text{Hz}$  3.  $f_o=500\text{Hz}$

### b. TONE SELECTOR : HIGH

1. DEFEAT 2.  $f_o=5\text{KHz}$  3.  $f_o=2.5\text{KHz}$

### c. TONE CONTROLS:

BASS 50Hz +11.5dB ~ -10dB ( $f_o=250\text{Hz}$ )

TREBLE 10,000Hz +7.5dB ~ -6dB ( $f_o=5,000\text{Hz}$ )

BASS 50Hz +16dB ~ -14.5dB ( $f_o=500\text{Hz}$ )

TREBLE 10,000Hz +12.5dB ~ -11dB ( $f_o=2,500\text{Hz}$ )

### d. LOUDNESS CONTROL 50Hz +9.5dB, 10,000 Hz +5dB (for -30dB volume control)

### e. HIGH FILTER 20,000 Hz -25 dB $f_o=6,000\text{Hz}$

### f. LOW FILTER

20 Hz -26 dB  $f_o=70\text{Hz}$

### g. PRESENCE SWITCH 20 Hz +7.5 dB $f_o=125\text{Hz}$

### h. MODE SWITCH 1. STEREO 2. MONO(L+R)

### i. IMPEDANCE SWITCH 1. 8 $\Omega$ 2. 16 $\Omega$

### j. PHASING SWITCH 1. NORM 2. REV

### k. FUNCTION SWITCH 1. TAPE HD 19 cm/sec 2. TAPE HD 9.5 cm/sec 3. PHONO-1 4. PHONO-2 5. TUNER 6. AUX

## OTHERS:

TAPE MONITOR SWITCH & HEADPHONE JACK

## TUBES, TRANSISTORS & DIODES USED:

### TUBES

6L6GC  $\times 4$ , 12AX7  $\times 5$ , 12BH7A  $\times 2$  & 6AQ8  $\times 1$

### TRANSISTORS

2SC-402(2SC650)  $\times 2$

### DIODES

SW0503  $\times 1$  & SW-0.5d  $\times 2$

## POWER VOLTAGE

100, 117 & 240V 50~60 Hz

## POWER CONSUMPTION 280VA (MAX)

## DIMENSIONS:

### WIDTH

459 m/m / 18  $\frac{1}{16}$ "

### DEPTH

345 m/m / 13  $\frac{9}{16}$ " (excluding knobs)

### HEIGHT

170 m/m / 6  $\frac{11}{16}$ " (excluding rubber stand)

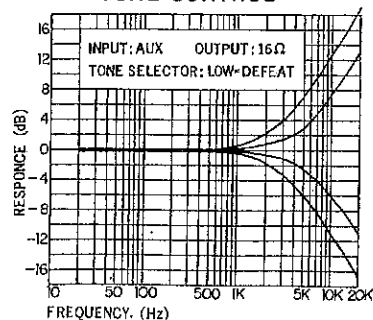
### HEIGHT OF FRONT PANEL 175 m/m / 16 $\frac{14}{16}$ "

## WEIGHT:

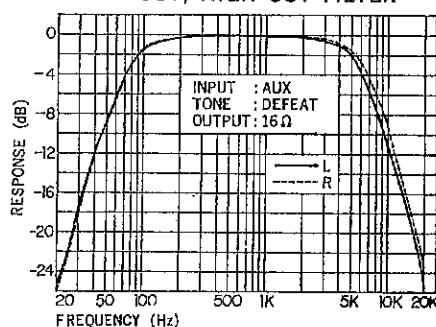
24.5 kg / 54 lbs

(These specifications may be improved without permission.)

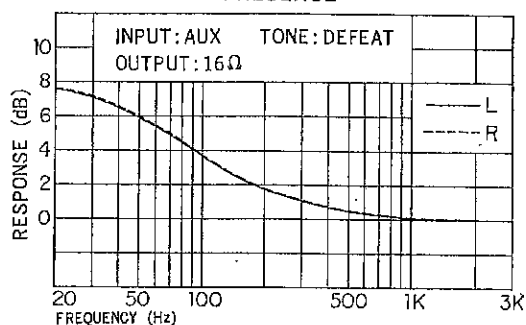
TONE CONTROL



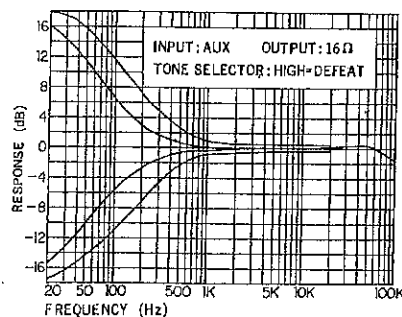
LOW CUT, HIGH CUT FILTER



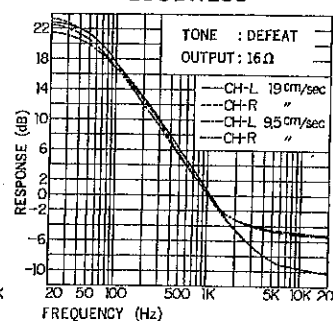
PRESENCE



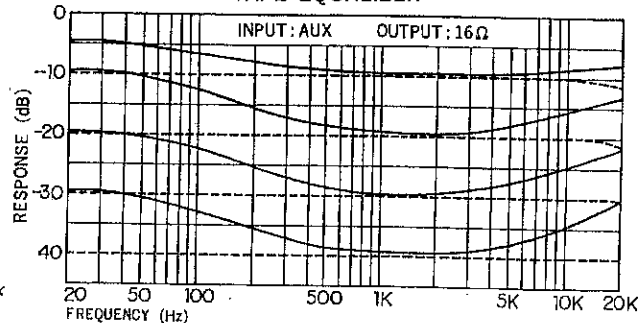
TONE CONTROL



LOUDNESS



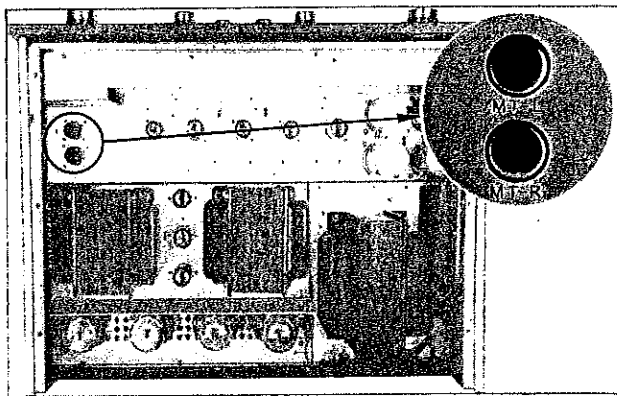
TAPE EQUALIZER



# CONNECTIONS

## CONNECTING A RECORD PLAYER

1. Connect record player outputs properly to the PHONO-2 input terminals L and R by using a shield wire. For a monaural record player, connect its output to either of the PHONO-2 terminals.
2. The AU-111 can use even a moving-coil pickup cartridge whose output voltage is lower than 2mV simply by installing the Sansui input transformer A-604 (3.5 ohms: OPEN) or A-603 (30 to 100 ohms: OPEN) as described in the Section INPUT TRANSFORMER".



In this case, connect the record player outputs to the PHONO-1 input terminals L and R.

3. When using a X-TAL pick-up cartridge connect the record player outputs to the AUX terminals L and R. For the monaural, connect its output to either of the AUX terminals.

## CONNECTING A TAPE RECORDER OR A TAPE DECK

### 1. RECORDING ON TAPE

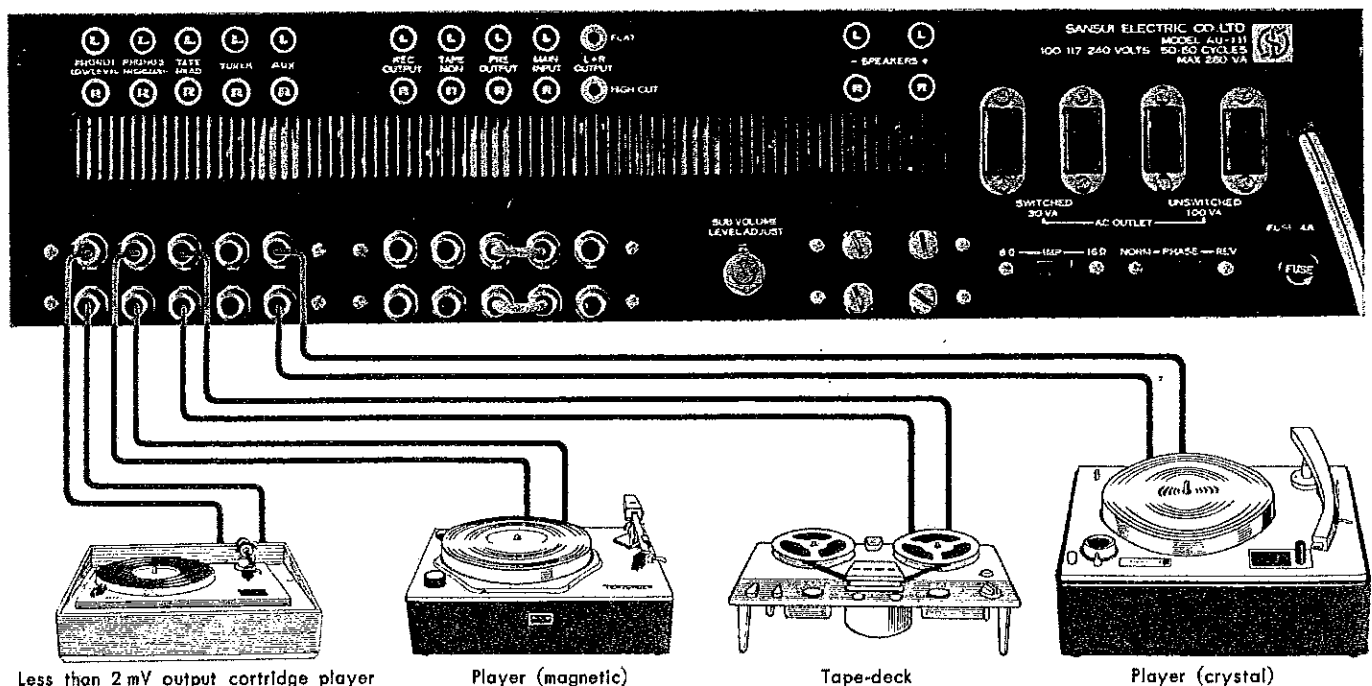
Connect the recording inputs of the tape recorder to the REC OUTPUT terminals L and R. For the monaural, connect its input to either of the REC OUTPUT terminals.

### 2. PLAYBACK OF TAPE RECORDER

Connect the tape recorder outputs to the TAPE MON terminals L and R.

### 3. PLAYBACK OF TAPE DECK

Connect the tape deck outputs to the TAPE HEAD terminals L and R. For the monaural connect its output to either of the TAPE HEAD terminals.



#### 4. MONITORING 3-HEAD TAPE RECORDER

Connect the recording inputs of the 3-head tape recorder to the REC OUTPUT terminals L and R and then the recorder outputs to the TAPE MON terminals L and R. For the monaural, connect its input to either of the TAPE MON terminals.

### CONNECTING A TUNER

#### 1. STEREO TUNER

Connect the tuner outputs to the TUNER terminals L and R.

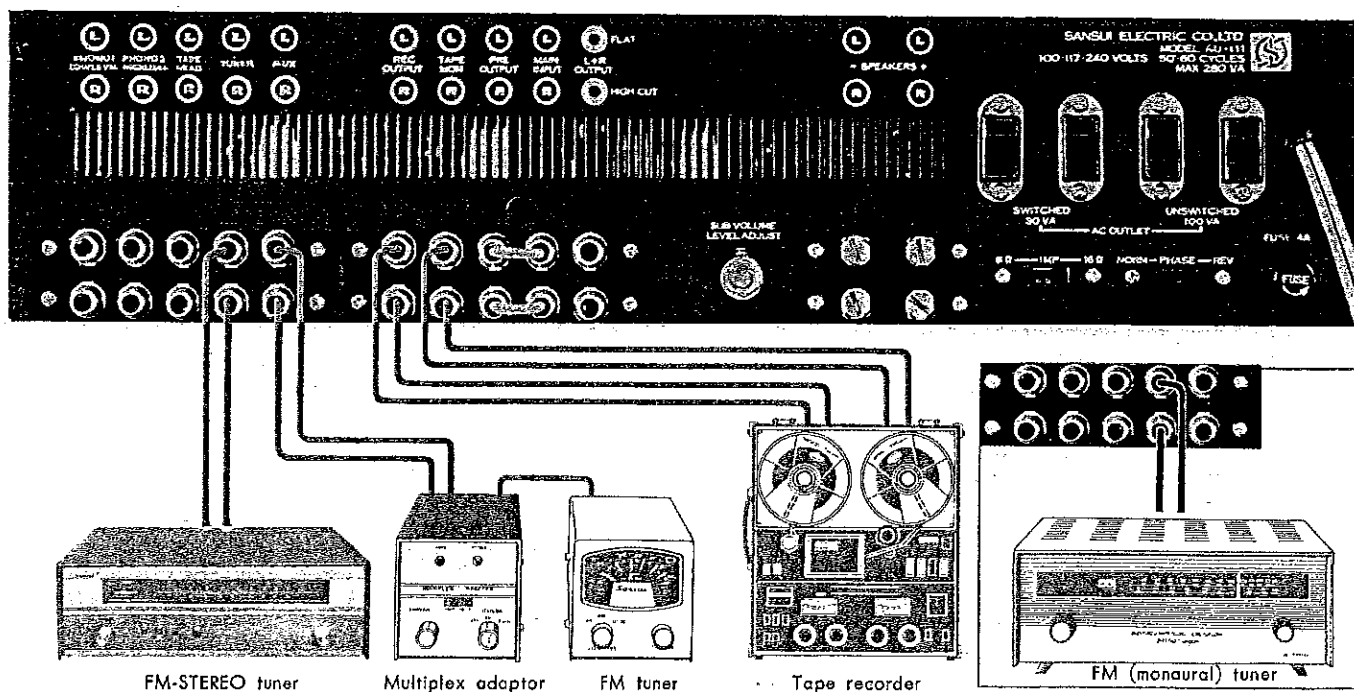
#### 2. MONAURAL TUNER

Connect the tuner output to either of the TUNER terminals.

#### 3. FM-MONAURAL TUNER AND FM-MULTIPLEX ADAPTOR

Connect the FM monaural tuner output to the FM-MULTIPLEX adaptor input and then the adaptor outputs L and R to the AUX terminals L and R of the unit respectively.

\* \* \* \* \*



# CONNECTIONS

## CONNECTING LOUDSPEAKERS

1. Connect the left speaker system to the SPEAKER terminals L located on the back of the unit. Be sure to connect the "+" mark of the speaker to the "+" terminal of the amplifier and the "-" mark to the "-" terminal.
2. Connect the right speaker system to the SPEAKER terminals R. Be sure to connect the "+" mark of the speaker to the "+" terminal of the amplifier and the "-" mark to the "-" terminal.
3. To match the speaker impedance to the amplifier, set the IMPEDANCE switch to 8 or 16 ohms.
4. Set the PHASE switch to NORM position except when the phase is reverse.

**NOTES :**

1. After connecting check whether the right and left speakers are properly phased. Incorrect phasing is evidenced by loss of bass or sound hole in the middle when you are listening to a record at a point midway between the two-speaker system. If the phasing is incorrect the PHASE switch should be turned from NORM

to REV or from REV to NORM.

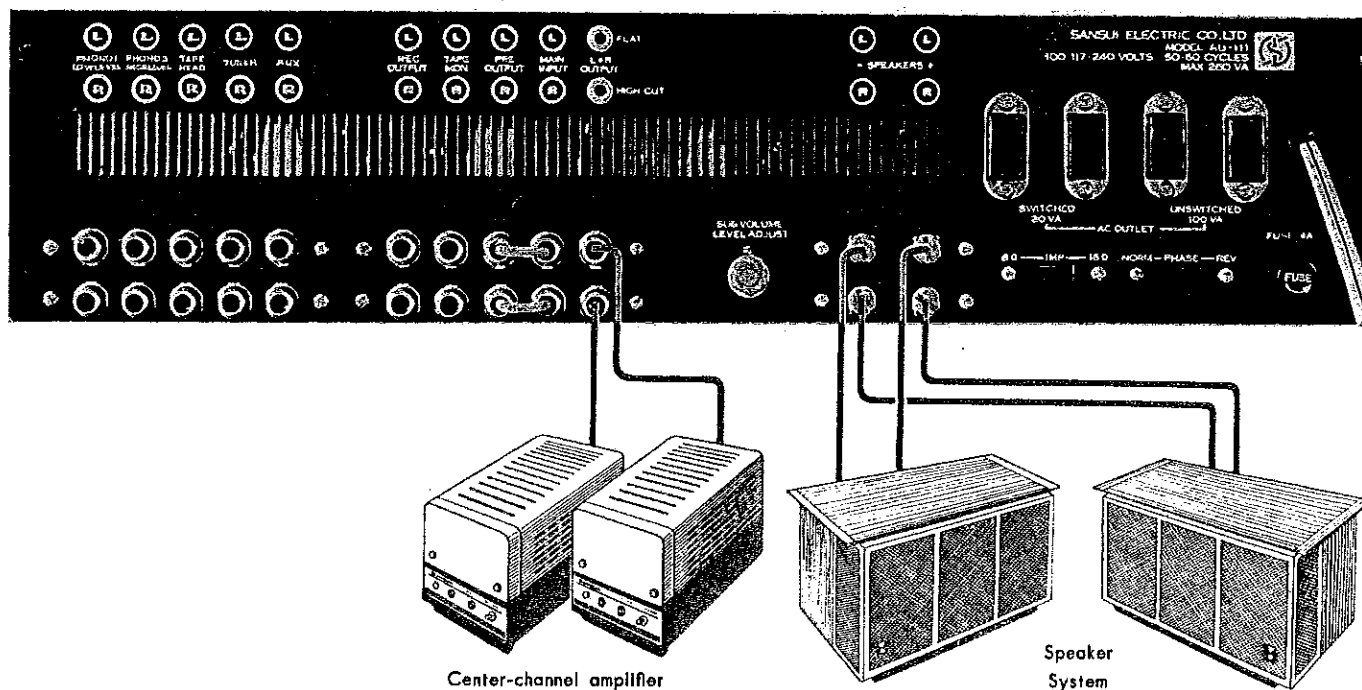
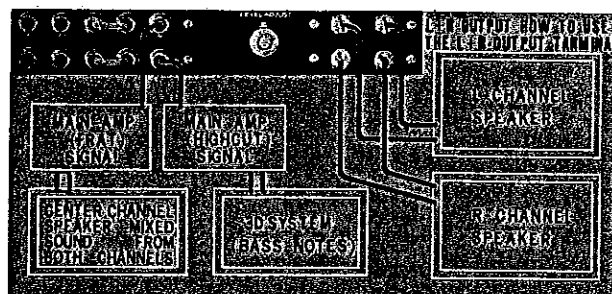
**CAUTION:** Never attempt to use the PHASE switch when the phasing is correct.

2. When two groups of speakers are used for stereo, their output terminals should be carefully checked for correct connection. The improper connection may cause a trouble or poor performance.

## 3-CHANNEL STEREO

The AU-111 is provided with output terminals for a center channel amplifier.

By using a shield wire connect a bass-note amplifier to the HIGH CUT terminal which is in



connection with the filter circuit designed to separate more than 200 cps. Then, connect an additional speaker for the center channel to the above-mentioned amplifier. And the mixed bass-notes from the two channels are reproduced from the center speaker system. This stereo system features real stereophonic sounds with emphasized bass-notes.

Otherwise, connect a monaural main amplifier to the FLAT terminal of the unit and then the center speaker to the former. And the mixed sounds from the two channels are reproduced from the center speaker. In this case, the filter circuit remains off.

The center channel speaker is adjusted in volume by the CENTER CHANNEL volume control located on the front panel.

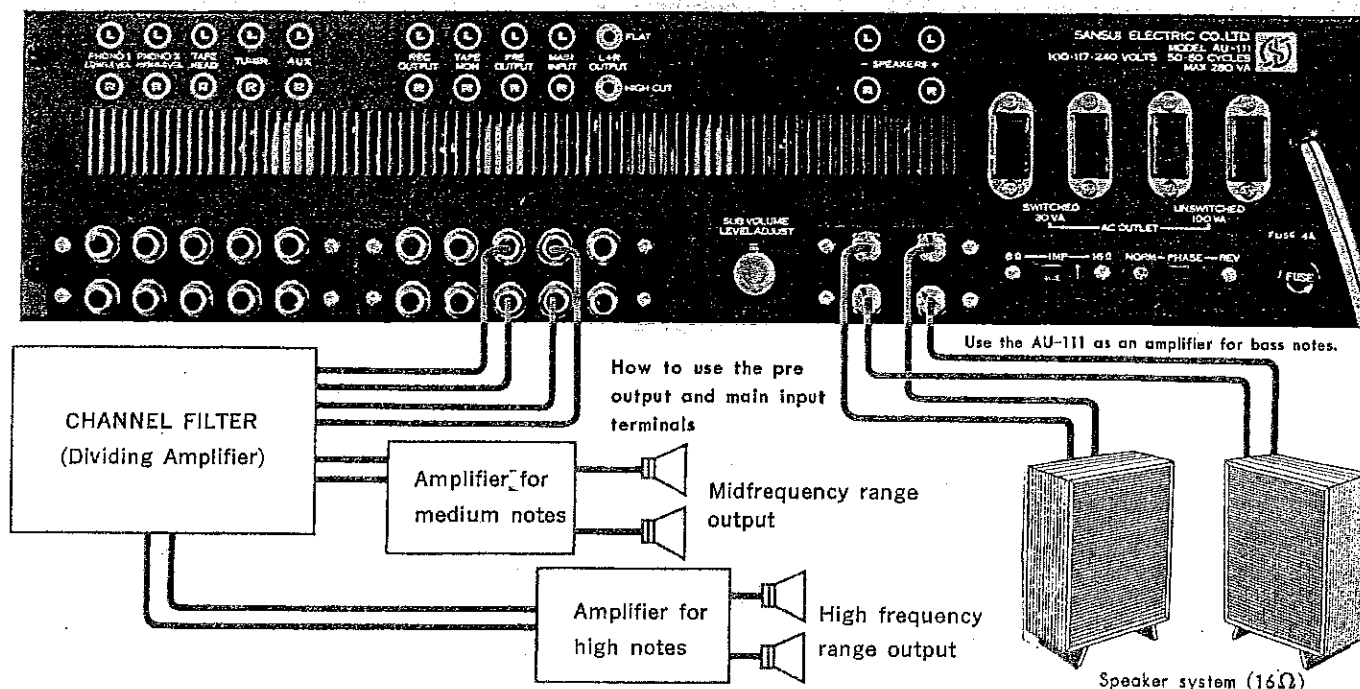
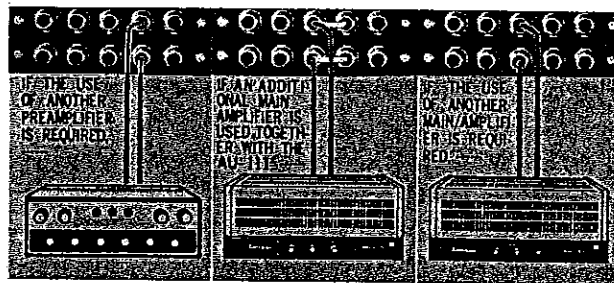
## PRE-AMPLIFIER AND MAIN-AMPLIFIER

The AU-111 is provided with a pre-amplifier output circuit which selects the output of another pre-amplifier and with a main-amplifier circuit which drives another main-amplifier alone.

Remove the two PM connectors from the PRE OUTPUT and MAIN INPUT terminals. And then, connect the input of the additional main-amplifier to the PRE OUT terminals and the outputs of the additional pre-amplifier to the MAIN INPUT terminals. Four examples of use of these terminals are illustrated on the opposite page.

**NOTE:** When connecting the additional amplifier to the MAIN INPUT, all the controls and switches except the PRESENCE switch and HEADPHONE JACK are turned off. To adjust the tone and volume, use the controls of the amplifier added.

When connecting another main-amplifier to the PRE OUTPUT, the tone and volume should be adjusted by the controls of the AU-111.



# SWITCHES AND CONTROLS

## VOLUME CONTROL (1)

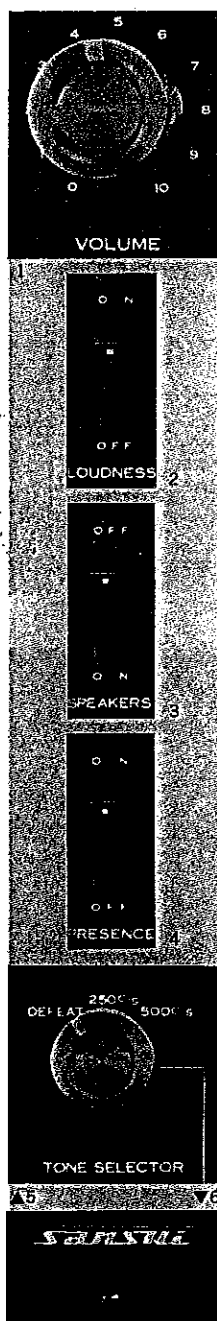
The VOLUME control is used to get the desired amount of sound from the radio, record and tape connected to the unit. Turn it clockwise and the volume is increased, turn it counterclockwise and the volume is decreased.

## LOUDNESS SWITCH (2)

As the volume is reduced the ear is more sensitive to the midfrequency range. This means that if one is to hear the sound in proper proportion, the high and low frequencies must be amplified more than the midfrequencies. This effect is obtained by setting the LOUDNESS switch on.

## SPEAKERS SWITCH (3)

To use a headphone set, plug in the headphone jack and set the SPEAKERS switch off. The speaker circuits are turned off so that you can enjoy a stereo music without any disturbance even at dead of night.



## PRESENCE SWITCH (4)

When the TONE controls compensate the low frequencies these affect the midfrequencies at the same time making not flat, but boomy sound. The PRESENCE switch is designed to improve the speaker damping at lower than 125 cps of turnover frequency and to help reproduce crisp bass-notes effectively and efficiently. The effective use of the selective NF in this circuit improves the frequency response of the speakers.

## TONE SELECTOR, BASS (5)

The TONE SELECTOR BASS can change the frequency range of bass-notes covered by the BASS tone controls:

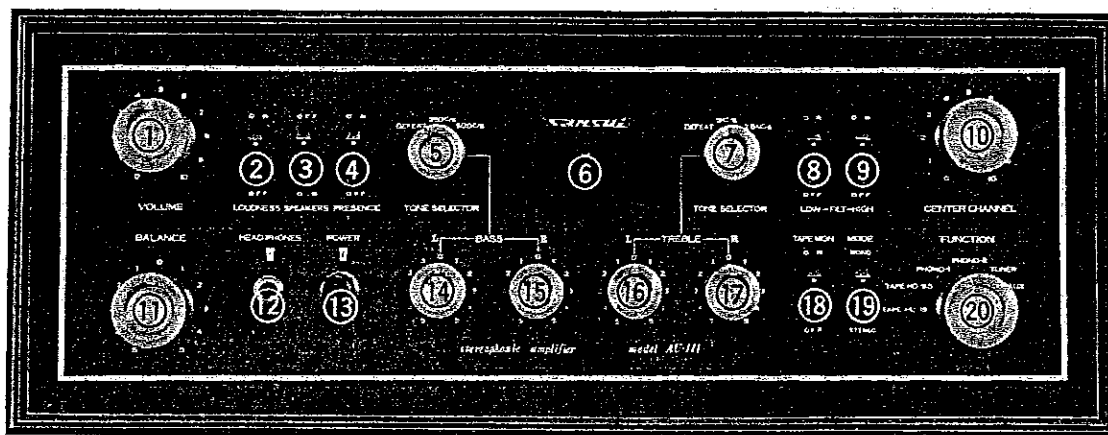
**DEFEAT:** The bass tone control circuit is turned off and the completely flat frequency response characteristic is obtained in the bass-notes alone.

**250 cps:** The upper or lower limit of the frequency range of the BASS tone controls is changed to 250 cps.

**500 cps:** The upper or lower limit of the frequency range of the BASS tone controls is changed to 500 cps.

## POWER INDICATOR (6)

The lamp is lit when the power switch is pushed on. It indicates whether the unit is on or off.



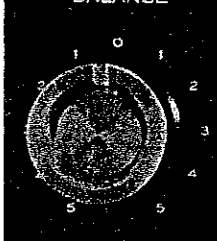
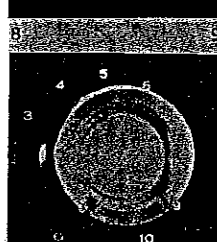
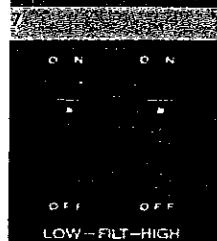
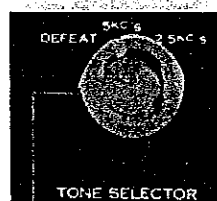
## TONE SELECTOR, TREBLE (7)

The TONE SELECTOR, TREBLE can change the frequency range of high-notes covered by the TREBLE tone controls:

**DEFEAT:** The treble tone control circuit is turned off and the completely flat frequency response characteristic is obtained in the high notes alone.

**5 Kcps:** The upper or lower limit of the frequency range of the TREBLE tone controls is changed to 5 000 cps.

**2.5 Kcps:** The upper or lower limit of the frequency range of the TREBLE tone controls is changed to 2,500 cps.



## CENTER CHANNEL VOLUME CONTROL (10)

The CENTER CHANNEL volume control is used to adjust the output level at the center channel terminal located at the back of the unit. Turn it clockwise and the volume is increased; turn it counterclockwise and the volume is decreased. For the 3-channel stereo adjust it to the same output (volume) as the unit depending on the input level of the additional main amplifier connected to the center channel terminal.

### CAUTION:

The CENTER CHANNEL volume control must be in no control position unless the unit is used for 3-channel stereo.

## LOW FILTER (8)

To eliminate buzz hum and other noises at the low frequencies set the LOW FILTER switch on.

## HIGH FILTER (9)

To eliminate the surface noise in a disk radio noise caused by a fluorescent lamp and other noises at the high frequencies set the HIGH FILTER switch on.

## BALANCE CONTROL (11)

Proper balance for a stereo exists when the sound seems to originate at a point midway between the right and left speaker system. If one speaker system is louder than the other, the adjusting of balance is necessary.

## HEADPHONE JACK (12)

To use a headphone set, plug in the HEADPHONE jack. Although any type of headphone is usable for the unit (if its plug fits well in the jack), a dynamic stereo headphone is recommended for use.

# SWITCHES AND CONTROLS

## POWER SWITCH (13)

To switch on the unit, push the button. To switch it off, push the button again. It also switches on and off the two (on output terminal side) of four outlets at the back of the unit.

## BASS TONE CONTROLS, L (14) & R (15)

The BASS tone controls L and R are used to adjust the sound level of the bass-notes from the left and right channels respectively. Turn them from the midposition marked zero (flat) to right and the sound level grows higher; turn from zero to left and the sound level is lowered.

### NOTE :

The BASS tone controls are in close relation with the BASS tone selector. For better performance, carefully read the Section "TONE CONTROLS AND TONE SELECTORS".

## TREBLE TONE CONTROLS, L (16) & R (17)

The TREBLE tone controls L and R are used to adjust the sound level of the high-notes from the left and right channels respectively. Turn them from the midposition marked zero (flat) to right and the sound level grows higher; turn from zero to left and the sound level is lowered.

### NOTE :

The TREBLE tone controls are in close relation with the TREBLE tone selector. For

better performance, carefully read the Section "TONE CONTROLS AND TONE SELECTORS".

## TAPE MONITOR SWITCH (18)

When recording on the tape by using a 3-head tape recorder, the TAPE MON switch should be turned on to close the tape monitor circuit. During the recording, the sound is simultaneously reproduced by the unit.

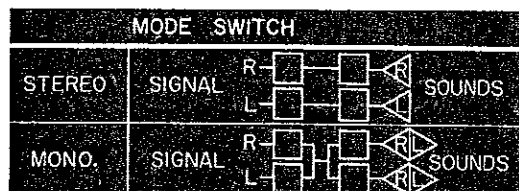
NOTE : During playback, the TAPE MON switch should remain on.

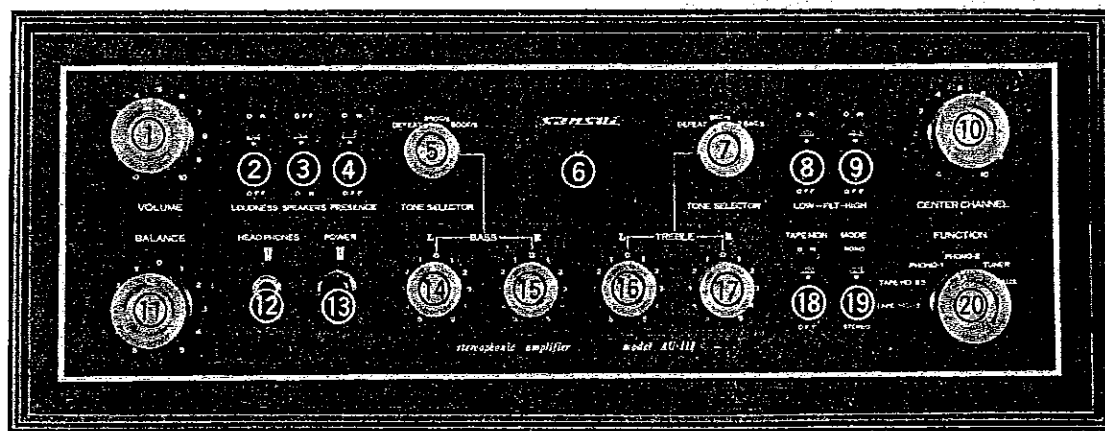
CAUTION : Except as described above, the switch must be in off position.

## MODE(STEREO-MONO) SWITCH (19)

STEREO : To listen to stereo broadcast, record and tape, set the MODE switch to STEREO.

MONO : To listen to monophonic broadcast, record and tape, set the MODE switch to MONO. Note that, no matter whether the input signals are fed to either channel or both, the sound from the two speaker systems is the same.





## FUNCTION SWITCH (20)

The FUNCTION switch is used to connect the unit to the program source such as record player tape deck and tuner.

TAPE HD, 19: To play back the tape at 19 cm per second by means of the tape deck set the FUNCTION switch to TAPE HD 19.

TAPE HD, 9.5: To play back the tape at 9.5 cm per second by means of the tape deck set to TAPE HD 9.5.

PHONO-1: To play a record by using a low-level pickup cartridge and a matching transformer set to PHONO-1.

PHONO-2: To play a record by using an ordinary pickup, set to PHONO-2.

TUNER: To listen to a radio broadcast by connecting a tuner to the unit set to TUNER.

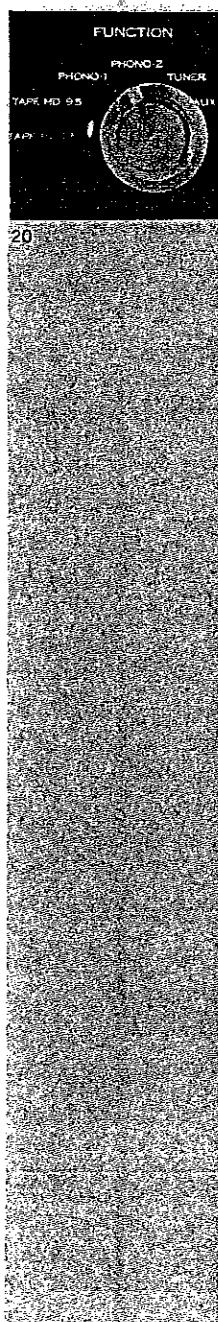
AUX: To use a FM-MPX adaptor or a cristal pickup cartridge or to play back including voice input set to AUX.

\* \* \* \* \*

## RELATION BETWEEN TONE CONTROLS AND TONE SELECTORS

The AU-111 has entirely new tone control circuits capable of changing the adjustable range of frequency. You can enjoy the desired tone depending on your taste now.

Many ways of combination of the tone control circuits are made just by using both tone controls and selectors. In the figure below, the triangles A, B, E and F indicate the



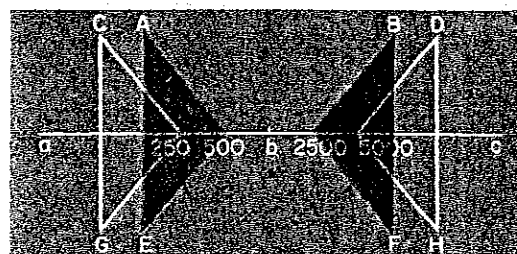
adjustable frequency range in the conventional tone control circuit; the triangles "C", "G", "D" and "H" show the range newly added to the AU-111. The triangles "A", "E", "C" and G indicate the adjustable range of bass-notes; "B", "D", "F" and "H" indicate that of high-notes. "a", "b" and "c" are the point obtained when the tone selectors are set to DEFEAT. The adjustable range of sound in the AU-111 and the conventional circuits is compared below by the combination of triangles:

|                           | up<br>ward               | down<br>ward             | up ward &<br>down ward                               |
|---------------------------|--------------------------|--------------------------|------------------------------------------------------|
| CONVENTIONAL<br>AMPLIFIER | A—B                      | E—F                      | A—F B—E                                              |
| AU-111                    | A—B<br>A—D<br>C—B<br>C—D | E—F<br>E—H<br>G—F<br>G—H | A—F<br>A—H<br>C—F<br>C—H<br>B—E<br>B—G<br>D—E<br>D—H |

There are 16 ways of combination in the AU-111 (4 times as much as the conventional one). In addition, the tone defeat circuits for both high and low notes increase the AU-111 in combination as follows:

a, b—B      b, c—A      a, b—b, c  
a, b—D      b, c—C  
a, b—F      b, c—E  
a, b—H      b, c—G

Therefore, the adjustable range of tone of the AU-111 is incredibly extended.



# OPERATIONS

## FOR RADIO RECEPTION

### A) STEREO TUNER

1. Set the FUNCTION switch to TUNER.
2. Set the MODE switch to STEREO.
3. Select the signals of the desired station with the tuner.
4. Adjust the controls and switches properly.

### B) MONOPHONIC TUNER

1. Set the FUNCTION switch to TUNER.
2. Set the MODE switch to MONO.
3. Select the signals of the desired station with the tuner.
4. Adjust the controls and switches properly.

### C) FM-MONOPHONIC TUNER AND FM-MPX ADAPTOR

1. Set the FUNCTION switch to AUX.
2. Set the MODE switch to STEREO.
3. Select the signals of the desired station with the tuner.
4. Adjust the FM-MPX adaptor for stereo reception.
5. Adjust the controls and switches properly.

**NOTE:** Before connecting and operating the tuner and FM-MPX adaptor, be sure to look up the manufacturer's information.

If the Sansui TU-70 is used, follow the procedure A).

## FOR PLAYING OF RECORDS

1. Set the FUNCTION switch:
  - a) to PHONO-2 if your pickup cartridge used is of an ordinary type;
  - b) to PHONO-1 if your pickup cartridge used is of a low-output type;
  - c) to AUX if your pickup cartridge is of a crystal type.
2. Set the MODE switch to STEREO or MONO, depending on whether your record player used is stereo or monaural.
3. Switch on the record player; check its speed of rotation (RPM); and then set the needle down on the record.
4. Adjust the BALANCE control to the proper position where the balance of sound is kept between the two speaker systems.
5. Adjust the VOLUME control to give the desired amount of sound. Lastly, adjust other controls and switches properly.

### NOTES:

1. When a monophonic record is used for a stereo record player, the same procedure as for a stereo record is recommended for good effect.
2. If the sound from the right channel seems heard from the left speaker system, and vice versa, reverse the connection to the L and R terminals.
3. Be sure to set the BALANCE control to its proper position. Step back and listen. Proper balance exists when the sound seems to originate at a point midway between the two speaker systems.
4. When a moving-coil pickup is used by the help of a matching transformer, the FUNCTION switch must be set to PHONO-1 and the record player must be connected to the PHONO-1 terminals at the back of the unit. The PHONO-1 of the FUNCTION switch is also usable for the ordinary moving-magnet pickup unless the matching transformer is installed.

## FOR RECORDING AND PLAYBACK OF TAPE RECORDING

1. Set the FUNCTION switch to the proper position, depending on the program source used.
2. Set the MODE switch to STEREO or MONO, depending on whether the recording is stereo or monaural.
3. Set the tape recorder for recording.
4. Adjust the controls and switches properly.

## PLAYBACK

1. When the tape is played back by the tape deck, the FUNCTION switch should be set to TAPE HD.-19 or 9.5, depending on the speed of the tape deck used.  
When the tape is played back by the tape recorder, the TAPE MON switch should be set on.
2. Set the MODE switch to STEREO or MONO.
3. Set the tape recorder for playback operation.
4. Adjust the controls and switches properly.

## TAPE MONITORING

The procedure for monitoring by means of the 3-head tape recorder is the same as for playing back by means of the tape recorder.

### NOTES:

1. The sound is recorded regardless of the controls of the unit.
2. To obtain better recording result, record on the tape through the amplifier rather than through a microphone placed in front of the speakers.
3. It is best to look up the service data on the tape recorder before connecting and operating it.
4. The TAPE MON switch must be in off position except when the tape is being monitored or played back by the tape recorder.
5. When monitoring, set the TONE SELECTORS to DEFEAT. And the sound recorded is reproduced just as it is without any compensation in the tone circuits.

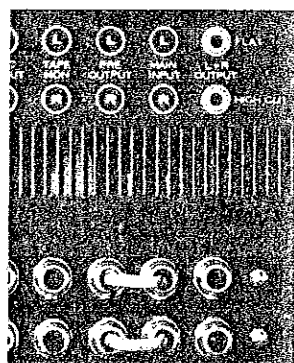
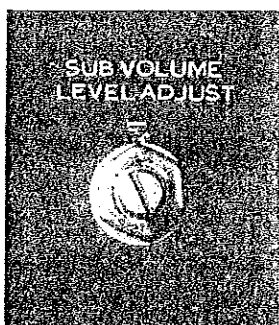
\* \* \* \* \*

# HOW TO KEEP YOUR AU-111 IN TOP CONDITION

## SUB VOLUME LEVEL ADJUST

If the sound is distorted due to excessively high output level or weak due to too small input gain, adjust the input level by means of the SUB VOLUME. Turn it clockwise and the input signal grows higher; turn it counterclockwise and it is lowered. To turn it, use a screwdriver.

**CAUTION:** Never attempt to use the SUB VOLUME except as described above.



## PM CONNECTOR

The AU-111 employs a PM connector between the PRE OUTPUT and the MAIN INPUT terminals so that the main-amplifier and pre-amplifier sections can work independently of each other. The main-amplifier and pre-amplifier circuits are designed to be broken when the PM connector is removed.

The connection to the PRE OUT and the MAIN INPUT terminals is described in the Section "CONNECTION" to the AU-111.

## INPUT TRANSFORMER

The AU-111 makes it possible even to use a moving-coil pick-up whose output voltage is lower than 2 mV:

1. Remove the top plate from the unit.
2. Remove the MP 9P plug from the socket circled in Illus. below.

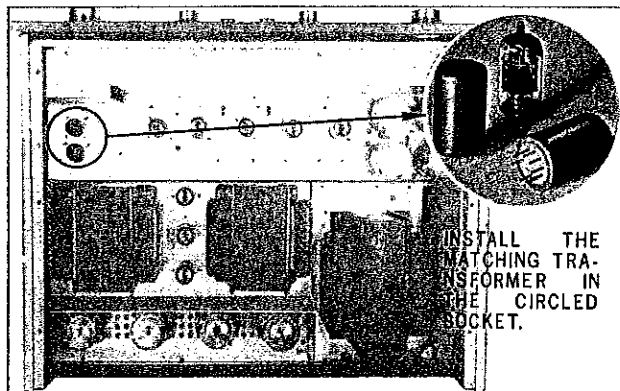
3. Insert the input transformer Sansui A-603 or A-604 in the socket.

4. Lastly, connect the record player output to the PHONO-1 input terminal of the unit.

The Sansui A-604 and A-603 are available at your nearest Sansui dealer.

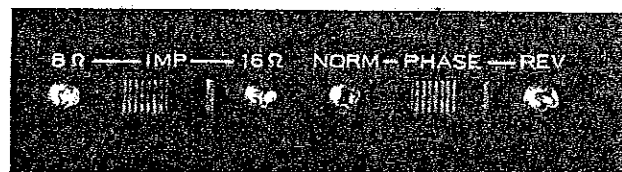
## SPECIFICATIONS

|                    | A-604                    | A-603                    |
|--------------------|--------------------------|--------------------------|
| FREQUENCY RESPONSE | 20 to 20,000 cps (-1 dB) | 20 to 20,000 cps (-2 dB) |
| PRIMARY IMPEDANCE  | 3.5 ohms                 | 600, 150 ohms (CT)       |
| TURN RATIO         | 1 : 40                   | 1 : 10, 1 : 20           |
| GAIN               | 32 dB                    | 19, 25 dB                |
| TYPE & WEIGHT      | MT-9P 43 gr              | MT-9P 43 gr              |



## SPEAKER IMPEDANCE SWITCH

Be sure to set the IMPEDANCE switch to 8 or 16 ohms, depending on the impedance of the speakers used, because the SPEAKER terminals are marked only "+" and "-".

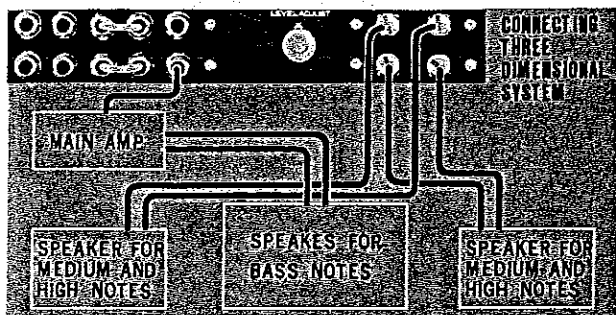


## CONNECTING TAPE RECORDER, TUNER ETC.

Thick shield wire is recommended for connecting the tape recorder, tuner etc. because of the protection against hum. Since the damping increases in the high frequencies as the wire is longer, the wire length should be less than 2 meters (6.5 ft).

## 3-CHANNEL STEREO SYSTEM

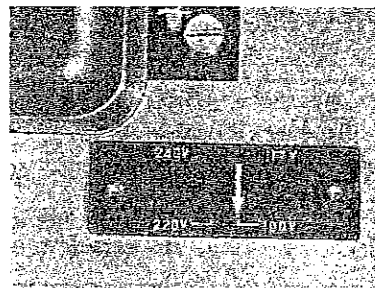
Many hi-fi stereo enthusiasts' favorite is the 3-channel stereo system in which the woofer system, reproduction of the low frequencies, is connected to the center channel and the tweeter system reproduction of the high and middle frequencies is connected to the right and left channels. This idea is based on the fact human ears are not sensitive to the direction of bass-notes, lower than 200-300 cps. The advantage is that only one woofer (not two or more) is required for this stereo system and that the bass-notes are reproduced more effectively. For more stereo effect and economy this system is being widely used throughout the world. Refer to the Section 'CONNECTING TO THE AU-111.'



## VOLTAGE SELECTOR PRUG

The voltage selector plug allows you to use this amplifier at any of the four different supply voltages: 100, 117, 220 and 240 volts. If you'll move

to the area where the supply voltage is not the same as before, pull out the plug and reset the arrow (→) marked on it to the figure of volts in the new area. (Fig. 5)



## HUM AND HOWLING ON PLAYING OF RECORD

Almost all the hums and howlings on playing a record are caused not by the amplifier itself but by:

1. Record player placed directly on or near the speaker box (Keep proper distance between them or put a thick cushion between them.);
2. Insufficient insulation of cord (Use a thick shield wire);
3. Bad connection;
4. Pickup arm not grounded.

Refer to "TROUBLESHOOTING".

## BLOWN FUSE

If the unit does not work at all due to the blown fuse, remove the line cord and then replace the fuse. Be sure to check the trouble source and recondition it before replacing. Use a 4A fuse.



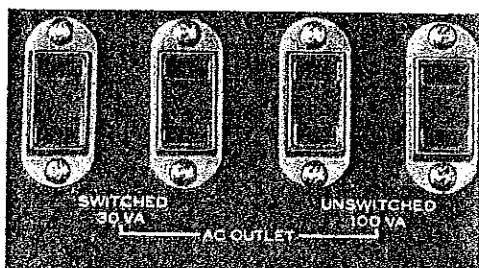
# HOW TO KEEP YOUR AU-111 IN CONDITION

## AC OUTLETS

The AU-111 is provided with four AC outlets: two outlets marked SWITCHED are switched on and off by the POWER switch; another two outlets marked UNSWITCHED are independent of the POWER switch.

| OUTLET     | CAPACITY | REMARKS                                              |
|------------|----------|------------------------------------------------------|
| SWITCHED   | 30VA×2   | If either of outlets is used, its capacity is 60VA.  |
| UNSWITCHED | 100VA×2  | If either of outlets is used, its capacity is 200VA. |

**CAUTION:** Don't use the outlet beyond the rated capacity listed above.



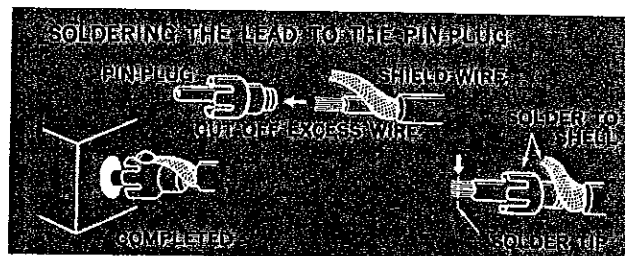
## EMISSION OF HEAT FROM AMPLIFIER

The top plate of the amplifier case will be warm after a long, continuous use. No trouble at all, due to safety design of the unit. However, nothing should be placed on it. Or it should not be installed in the box or the like.

## PHASING

The right and left speakers must be properly phased. The speakers for the two channels must push the sound wave out together. If one pushes while the other pulls, there is sound cancellation at some frequencies or in some listening locations. Incorrect phasing is evidenced by loss of bass when you are listening to a monophonic record on a stereo record player at a point midway between the two speaker systems. If incorrect, turn the PHASE switch from NORM to REV or from REV to NORM.

**CAUTION:** The PHASE switch must be in NORM position under the normal condition. In the monophonic system the PHASE switch must be always in NORM position.



\* \* \* \* \*

# SERVICE NOTE

| Symptom                                                                                          | Probable Cause                                                                                                                                                                                                                                                                                                                                                                                            | What to Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No power when power switch is pushed on                                                          | <ol style="list-style-type: none"> <li>1. Defective power switch</li> <li>2. Defective line cord</li> <li>3. Loose contact between plug and socket or defective plug</li> <li>4. Blown fuse</li> </ol>                                                                                                                                                                                                    | <p>Replace.</p> <p>Replace.</p> <p>Recondition or replace.</p> <p>Replace.</p> <p>If again blown after replacing, check power transformer (T<sub>2</sub>) &amp; path condenser (C<sub>80</sub>) in power circuit for short-circuit.</p>                                                                                                                                                                                                                                                                                                                                                                                                               |
| Power indicator is lit when power switch is pushed on, but;<br>A) the unit does not work at all. | <ol style="list-style-type: none"> <li>1. Defective tube</li> <li>2. Abnormal voltage in tubes and other parts</li> </ol>                                                                                                                                                                                                                                                                                 | <p>Check V<sub>1</sub>-V<sub>12</sub> and silicon diodes.</p> <p>Check voltage in tube and other parts and replace, if necessary. If voltage is OK, check AUX input circuit and hereafter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| B) PHONO and TAPE does not function.                                                             | <ol style="list-style-type: none"> <li>1. Defective head amplifier (transistor section)</li> <li>2. Defective head amplifier (tube section)</li> <li>3. Defective selector switch</li> <li>4. Loose contact or short-circuit between input terminal and pin jack</li> <li>5. Defective record player, tape recorder, or others, connected to the unit</li> <li>6. Defective coupling condenser</li> </ol> | <p>Replace transistor head amplifier unit.</p> <p>Replace V<sub>1a</sub> and/or V<sub>1b</sub>.</p> <p>Replace or repair S<sub>1a</sub> and/or S<sub>1b</sub>.</p> <p>Replace or repair.</p> <p>Replace.</p> <p>Replace C<sub>8</sub> and/or C<sub>9</sub>.</p>                                                                                                                                                                                                                                                                                                                                                                                       |
| C) Weak sound on AUX, PHONO and TAPE                                                             | <ol style="list-style-type: none"> <li>1. Abnormal voltage in power circuit and other parts</li> </ol>                                                                                                                                                                                                                                                                                                    | <p>Check and repair.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| A) Normal voltage at every part but weak sound on AUX                                            | <ol style="list-style-type: none"> <li>1. Defective fixed resistance</li> <li>2. Short-circuit in output transformer</li> <li>3. Discharged capacitor</li> <li>4. Aged tube</li> <li>5. Half-fixed resistance not properly adjusted</li> </ol>                                                                                                                                                            | <p>Check R<sub>46</sub>, R<sub>47</sub>, R<sub>48</sub>, R<sub>49</sub>, R<sub>52</sub> and R<sub>53</sub>.</p> <p>Check T<sub>1</sub> and T<sub>2</sub>.</p> <p>Check C<sub>17</sub>, C<sub>18</sub>, C<sub>19</sub>, C<sub>20</sub>, C<sub>39</sub>, C<sub>40</sub>, C<sub>43</sub>, C<sub>55</sub>, C<sub>56</sub>, C<sub>57</sub>, C<sub>68</sub>, C<sub>70</sub>, C<sub>71</sub> and C<sub>72</sub>; tubular electrolytic capacitor C<sub>35</sub>, C<sub>36</sub>, C<sub>57</sub>, C<sub>58</sub>, C<sub>59</sub> and C<sub>60</sub>.</p> <p>Check V<sub>2</sub>~V<sub>12</sub>.</p> <p>Check and adjust VR<sub>1</sub> and VR<sub>2</sub>.</p> |
| B) Normal voltage at every part but weak sound on PHONO and TAPE                                 | <ol style="list-style-type: none"> <li>1. Defective selector switch</li> <li>2. Abnormal input circuit: loose contact between input terminal and pin jack; defective shield wire</li> <li>3. Defective record player, tape recorder or others, connected to the unit</li> <li>4. Defective coupling condenser</li> <li>5. Discharged bypass condenser</li> </ol>                                          | <p>Replace or repair S<sub>1a</sub> and/or S<sub>1b</sub>.</p> <p>Replace or repair.</p> <p>Replace.</p> <p>Check C<sub>1</sub>, C<sub>2</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>8</sub> and C<sub>9</sub>.</p> <p>Check C<sub>6</sub> and C<sub>7</sub>.</p>                                                                                                                                                                                                                                                                                                                                                                                      |

# SERVICE NOTE

| Symptom                            | Probable Cause                                                                                                                                                                                                                                                                       | What to Do                                                                                                                                                                                                                                                                    |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A) Distorted sound on AUX          | <ol style="list-style-type: none"> <li>1. Aged tube</li> <li>2. Short-circuit in output transformer</li> <li>3. Defective loudspeaker</li> <li>4. Defective record player, adaptor or others, connected to the unit</li> </ol>                                                       | <p>Check <math>V_2 \sim V_{12}</math>.</p> <p>Check and repair <math>T_1</math> and <math>T_2</math>.</p> <p>Replace.</p> <p>Replace.</p>                                                                                                                                     |
| B) Distorted sound on PHONO & TAPE | <ol style="list-style-type: none"> <li>1. Defective record player, tape recorder or others, connected to the unit</li> <li>2. Defective tubular electrolytic capacitor</li> <li>3. Disconnection at fixed resistance</li> </ol>                                                      | <p>Replace.</p> <p>Replace <math>C_1</math> and/or <math>C_2</math>.</p> <p>Check <math>R_8, R_4, R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{19}, R_{20}, R_{21}</math> and <math>R_{22}</math>.</p>                                                                  |
| A) Hum on AUX                      | <ol style="list-style-type: none"> <li>1. Electrolytic capacitor discharged</li> <li>2. Defective tube</li> <li>3. Defective record player, adaptor or others, connected to the unit</li> <li>4. Hum balancer not properly adjusted</li> <li>5. Disconnected NF resistor</li> </ol>  | <p>Check <math>C_{73}, C_{74}, C_{75}, C_{76}, C_{85}</math> and <math>C_{86}</math>.</p> <p>Check <math>V_2 \sim V_{12}</math>.</p> <p>Replace.</p> <p>Check <math>VR_{15}</math> and <math>VR_{16}</math>.</p> <p>Check <math>R_{73}</math> and <math>R_{74}</math>.</p>    |
| B) Hum on PHONO and TAPE           | <ol style="list-style-type: none"> <li>1. Defective shield wire and/or wrong connection of record player, tape recorder or others</li> <li>2. Audio system and shield wire induced from outside</li> <li>3. Residual hum of audio system connected to the unit</li> </ol>            | <p>Replace and connect correctly.</p> <p>Keep proper distance between audio system and inductor.</p> <p>Replace or repair.</p>                                                                                                                                                |
| A) Noise on AUX and TUNER          | <ol style="list-style-type: none"> <li>1. Fixed resistor badly connected or touched by another part</li> <li>2. Capacitor nearly short-circuited or touched by another part</li> <li>3. Primary coil of output transformer nearly disconnected</li> <li>4. Defective tube</li> </ol> | <p>Check <math>R_{28}, R_{29}, R_{34}, R_{35}, R_{42}, R_{48}, R_{60}, R_{61}, R_{75}, R_{76}, R_{83}, R_{84}, R_{85}</math> and <math>R_{86}</math>.</p> <p>Check 1 and 2.</p> <p>Check <math>T_1</math> and <math>T_2</math></p> <p>Check <math>V_2 \sim V_{12}</math>.</p> |
| B) Noise on PHONO and TAPE         | <ol style="list-style-type: none"> <li>1. Fixed resistor defective or nearly disconnected</li> <li>2. Defective capacitor</li> <li>3. Noise or bad connection of audio system connected to the unit</li> </ol>                                                                       | <p>Check <math>R_1 \sim R_{25}</math>.</p> <p>Check <math>C_1 \sim C_2</math> and <math>C_4 \sim C_9</math>.</p> <p>Replace or repair.</p>                                                                                                                                    |

# PARTS LIST

| Part No. | Nomenclature   |          |     |        |       |          |
|----------|----------------|----------|-----|--------|-------|----------|
| R1       | 100 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R2       | 100 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R3       | 4.7 M $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R4       | 4.7 M $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R5       | 3.3 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R6       | 3.3 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R7       | 510 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R8       | 510 K $\Omega$ | 1/4 Watt | 10% | Noise  | Less  | Resistor |
| R9       | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R10      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R11      | 3.3 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R12      | 3.3 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R13      | 270 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R14      | 270 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R15      | 2.2 M $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R16      | 2.2 M $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R17      | 10 M $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R18      | 10 M $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R19      | 120 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R20      | 120 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R21      | 240 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R22      | 240 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R23      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R24      | 220 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R25      | 220 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R26      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R27      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R28      | 51 K $\Omega$  | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R29      | 51 K $\Omega$  | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R30      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R31      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R32      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R33      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R34      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R35      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R36      | 330 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R37      | 330 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R38      | 100 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R39      | 100 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R40      | 2.7 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R41      | 2.7 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R42      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R43      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R44      | 51 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R45      | 51 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R46      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |

| Part No. | Nomenclature   |          |     |        |       |          |
|----------|----------------|----------|-----|--------|-------|----------|
| R47      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R48      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R49      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R50      | 6.8 M $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R51      | 6.8 M $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R52      | 560 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R53      | 560 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R54      | 330 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R55      | 330 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R56      | 680 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R57      | 680 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R58      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R59      | 2.2 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R60      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R61      | 100 K $\Omega$ | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R62      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R63      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R65      | 100 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R66      | 100 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R67      | 470 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R68      | 470 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R69      | 390 $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R70      | 390 $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R71      | 1.5 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R72      | 1.5 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R73      | 4.7 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R74      | 4.7 K $\Omega$ | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R75      | 51 K $\Omega$  | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R76      | 51 K $\Omega$  | 1/2 Watt | 10% | Carbon | Fixed | Resistor |
| R77      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R78      | 1 M $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R79      | 12 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R80      | 12 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R81      | 12 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R82      | 12 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R83      | 33 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R84      | 33 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R85      | 47 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R86      | 47 K $\Omega$  | 2 Watt   | 10% | Carbon | Fixed | Resistor |
| R87      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R88      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R89      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R90      | 68 K $\Omega$  | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R91      | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R92      | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |
| R93      | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon | Fixed | Resistor |

| Part No. | Nomenclature   |          |     |              |             |          |
|----------|----------------|----------|-----|--------------|-------------|----------|
| R94      | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R95      | 510 $\Omega$   | 1 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R96      | 510 $\Omega$   | 1 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R97      | 820 $\Omega$   | 2 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R98      | 1 K $\Omega$   | 15 Watt  |     | Wire         | Wound       | Resistor |
| R100     | 12 K $\Omega$  | 30 Watt  |     | Wire         | Wound       | Resistor |
| R101     | 15 K $\Omega$  | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R102     | 15 K $\Omega$  | 1/4 Watt |     | Carbon       | Fixed       | Resistor |
| R103     | 47 K $\Omega$  | 2 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R104     | 22 K $\Omega$  | 2 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R105     | 4.7 K $\Omega$ | 1 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R106     | 4.7 K $\Omega$ | 1/2 Watt | 10% | Carbon       | Fixed       | Resistor |
| R107     | 27 K $\Omega$  | 1 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R108     | 8 $\Omega$     | 10 Watt  | 10% | Wire         | Wound       | Resistor |
| R109     | 8 $\Omega$     | 10 Watt  | 10% | Wire         | Wound       | Resistor |
| R110     | 39 K $\Omega$  | 1 Watt   | 10% | Carbon       | Fixed       | Resistor |
| R111     | 5.6 K $\Omega$ | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R112     | 5.6 K $\Omega$ | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R113     | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R114     | 1 K $\Omega$   | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R115     | 15 K $\Omega$  | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| R116     | 15 K $\Omega$  | 1/4 Watt | 10% | Carbon       | Fixed       | Resistor |
| C1       | 5 $\mu$ F      | 12 WV    |     | electrolytic | tubular     |          |
| C2       | 5 $\mu$ F      | 12 WV    |     | electrolytic | tubular     |          |
| C3       | 1 $\mu$ F      | 50 WV    |     | electrolytic | tubular     |          |
| C4       | 0.1 $\mu$ F    | 50 WV    | 10% | mylar        | tubular     |          |
| C5       | 0.1 $\mu$ F    | 50 WV    | 10% | mylar        | tubular     |          |
| C6       | 30 $\mu$ F     | 6 WV     |     | electrolytic | tubular     |          |
| C7       | 30 $\mu$ F     | 6 WV     |     | electrolytic | tubular     |          |
| C8       | 0.05 $\mu$ F   | 400 WV   | 10% | Oil          | tubular     |          |
| C9       | 0.05 $\mu$ F   | 400 WV   | 10% | Oil          | tubular     |          |
| C10      | 0.001 $\mu$ F  | 50 WV    | 10% | mylar        | tubular     |          |
| C11      | 0.001 $\mu$ F  | 50 WV    | 10% | mylar        | tubular     |          |
| C12      | 250 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C13      | 250 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C14      | 400 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C15      | 400 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C16      | 20 $\mu$ F     | 350 WV   |     | electrolytic | lugterminal |          |
| C17      | 0.005 $\mu$ F  | 400 WV   | 10% | Oil          | tubular     |          |
| C18      | 0.005 $\mu$ F  | 400 WV   | 10% | Oil          | tubular     |          |
| C19      | 0.5 $\mu$ F    | 250 WV   | 10% | M.P          | tubular     |          |
| C20      | 0.5 $\mu$ F    | 250 WV   | 10% | M.P          | tubular     |          |
| C21      | 500 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C22      | 500 PF         | 500 WV   | 10% | mica         | tubular     |          |
| C23      | 250 PF         | 500 WV   | 10% | mica         | tubular     |          |

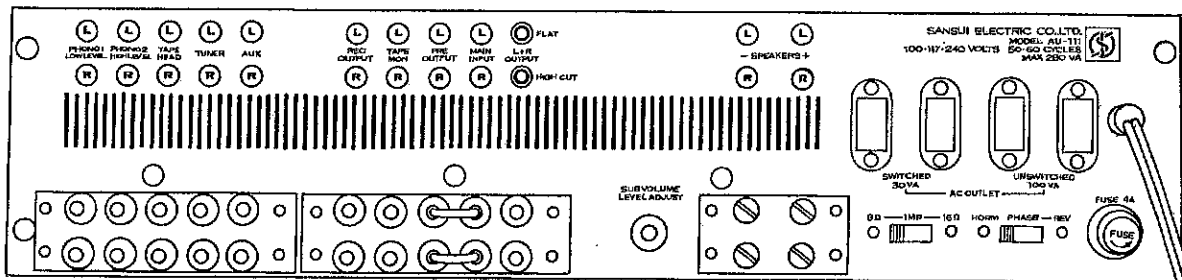
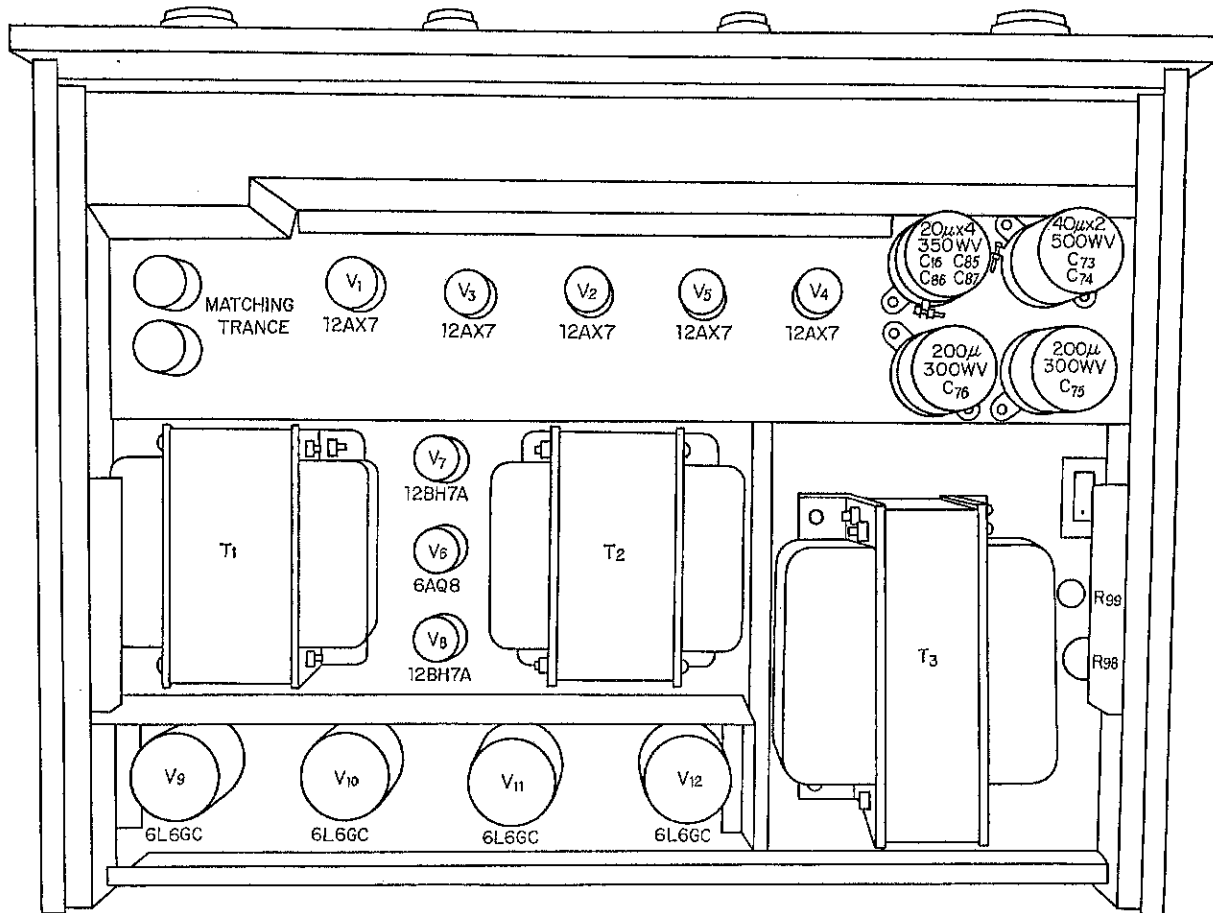
| Part No. | Nomenclature   |        |     |              |         |  |
|----------|----------------|--------|-----|--------------|---------|--|
| C24      | 250 PF         | 500 WV | 10% | mica         | tubular |  |
| C25      | 0.05 $\mu$ F   | 400 WV | 10% | Oil          | tubular |  |
| C26      | 0.05 $\mu$ F   | 400 WV | 10% | Oil          | tubular |  |
| C27      | 0.0035 $\mu$ F | 400 WV | 10% | Oil          | tubular |  |
| C28      | 0.0035 $\mu$ F | 400 WV | 10% | Oil          | tubular |  |
| C29      | 0.007 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C30      | 0.007 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C31      | 0.007 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C32      | 0.007 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C33      | 0.0035 $\mu$ F | 400 WV | 10% | Oil          | tubular |  |
| C34      | 0.0035 $\mu$ F | 400 WV | 10% | Oil          | tubular |  |
| C35      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C36      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C37      | 50 PF          | 500 WV | 10% | mica         | tubular |  |
| C38      | 50 PF          | 500 WV | 10% | mica         | tubular |  |
| C41      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C42      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C43      | 0.01 $\mu$ F   | 400 WV | 10% | Oil          | tubular |  |
| C44      | 0.01 $\mu$ F   | 400 WV | 10% | Oil          | tubular |  |
| C45      | 50 PF          | 500 WV | 10% | mica         | tubular |  |
| C46      | 50 PF          | 500 WV | 10% | mica         | tubular |  |
| C47      | 0.002 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C48      | 0.002 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C49      | 500 PF         | 500 WV | 10% | mica         | tubular |  |
| C50      | 500 PF         | 500 WV | 10% | mica         | tubular |  |
| C51      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C52      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C53      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C54      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C55      | 0.1 $\mu$ F    | 250 WV | 10% | MP           | tubular |  |
| C56      | 0.1 $\mu$ F    | 250 WV | 10% | MP           | tubular |  |
| C57      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C58      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C59      | 4 $\mu$ F      | 20 WV  |     | electrolytic | tubular |  |
| C60      | 4 $\mu$ F      | 20 WV  |     | electrolytic | tubular |  |
| C61      | 0.005 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C62      | 0.003 $\mu$ F  | 400 WV | 10% | Oil          | tubular |  |
| C63      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C64      | 30 $\mu$ F     | 6 WV   |     | electrolytic | tubular |  |
| C65      | 0.3 $\mu$ F    | 250 WV | 10% | MP           | tubular |  |
| C66      | 0.3 $\mu$ F    | 250 WV | 10% | MP           | tubular |  |
| C67      | 0.3 $\mu$ F    | 400 WV | 10% | Oil          | tubular |  |
| C68      | 0.3 $\mu$ F    | 400 WV | 10% | Oil          | tubular |  |
| C69      | 0.3 $\mu$ F    | 400 WV | 10% | Oil          | tubular |  |
| C70      | 0.3 $\mu$ F    | 400 WV | 10% | Oil          | tubular |  |
| C71      | 0.2 $\mu$ F    | 250 WV | 10% | MP           | tubular |  |

# PARTS LIST

| Part No.                           | Nomenclature                                                                                         |        |               |              |         |  |
|------------------------------------|------------------------------------------------------------------------------------------------------|--------|---------------|--------------|---------|--|
| C72                                | 0.2 $\mu$ F                                                                                          | 250 WV | 10%           | MP           | tubular |  |
| C73                                | 40 $\mu$ F                                                                                           | 500 WV |               | electrolytic | tubular |  |
| C74                                | 40 $\mu$ F                                                                                           | 500 WV |               | electrolytic | tubular |  |
| C75                                | 200 $\mu$ F                                                                                          | 300 WV |               | electrolytic | tubular |  |
| C76                                | 200 $\mu$ F                                                                                          | 300 WV |               | electrolytic | tubular |  |
| C77                                | 0.005 $\mu$ F                                                                                        | 600 WV | 10%           | Oil          | tubular |  |
| C78                                | 0.005 $\mu$ F                                                                                        | 600 WV | 10%           | Oil          | tubular |  |
| C79                                | 0.05 $\mu$ F                                                                                         | 400 WV | 10%           | Oil          | tubular |  |
| C80                                | 0.005 $\mu$ F                                                                                        | 500 WV | +100%<br>- 0% | Ceramic      | tubular |  |
| C81                                | 50 $\mu$ F                                                                                           | 100 WV |               | electrolytic | tubular |  |
| C82                                | 25 $\mu$ F                                                                                           | 50 WV  |               | electrolytic | tubular |  |
| C83                                | 25 $\mu$ F                                                                                           | 50 WV  |               | electrolytic | tubular |  |
| C84                                | 25 $\mu$ F                                                                                           | 50 WV  |               | electrolytic | tubular |  |
| C85                                | 20 $\mu$ F                                                                                           | 350 WV |               | electrolytic | tubular |  |
| C86                                | 20 $\mu$ F                                                                                           | 350 WV |               | electrolytic | tubular |  |
| C87                                | 20 $\mu$ F                                                                                           | 350 WV |               | electrolytic | tubular |  |
| C88                                | 250 PF                                                                                               | 500 WV |               | electrolytic | tubular |  |
| C89                                | 250 PF                                                                                               | 500 WV |               | electrolytic | tubular |  |
| C90                                | 0.01 $\mu$ F                                                                                         | 400 WV |               | Oil          | tubular |  |
| C91                                | 0.01 $\mu$ F                                                                                         | 400 WV |               | Oil          | tubular |  |
| C92                                | 200 pF                                                                                               | 250 WV |               | Ceramic      | tubular |  |
| C93                                | 200 pF                                                                                               | 250 WV |               | Ceramic      | tubular |  |
| C94                                | 25 $\mu$ F                                                                                           | 50 WV  |               | electrolytic | tubular |  |
| C95                                | 25 $\mu$ F                                                                                           | 50 WV  |               | electrolytic | tubular |  |
| VR <sub>1</sub> VR <sub>3</sub>    | 500 K $\Omega$ (B) Variable Resistor Driver type                                                     |        |               |              |         |  |
| VR <sub>8</sub> VR <sub>4</sub>    | 250 K $\Omega$ (B) Variable Resistor 24 $\phi$ type Roundness<br>tup 125 K $\Omega$ (tone control)   |        |               |              |         |  |
| VR <sub>5</sub> VR <sub>6</sub>    | 1M $\Omega$ (B) Variable resistor 24 $\phi$ type (tone<br>control)                                   |        |               |              |         |  |
| VR <sub>7</sub> VR <sub>8</sub>    | 250K $\Omega$ (B) Variable resistor 24 $\phi$ type Roundness<br>tup 125 K $\Omega$ (Balance control) |        |               |              |         |  |
| VR <sub>9</sub> VR <sub>10</sub>   | 500K(B,H) Variable resistor 24 $\phi$ type Roundness<br>tup 500 K $\Omega$ (Volume control)          |        |               |              |         |  |
| VR <sub>11</sub>                   | 250 K $\Omega$ (B) Variable resistor 24 $\phi$ type                                                  |        |               |              |         |  |
| VR <sub>12</sub> ~VR <sub>15</sub> | 20 K $\Omega$ (B) Variable resistor driver type                                                      |        |               |              |         |  |
| VR <sub>16</sub> ~VR <sub>19</sub> | 100 $\Omega$ Hum Balancer driver type                                                                |        |               |              |         |  |
| V <sub>1a</sub> V <sub>1b</sub>    | 12AX7 Head amplifier                                                                                 |        |               |              |         |  |
| V <sub>2</sub> ~V <sub>5</sub>     | 12AX7 pre amplifier                                                                                  |        |               |              |         |  |
| V <sub>6a</sub> V <sub>6b</sub>    | 6 AQ 8 Audio amplifier                                                                               |        |               |              |         |  |
| V <sub>7</sub> V <sub>8</sub>      | 12BH7A Phase splitter                                                                                |        |               |              |         |  |
| V <sub>9</sub> ~V <sub>12</sub>    | 6L6GC Power amplifier                                                                                |        |               |              |         |  |
| TR <sub>1</sub> TR <sub>2</sub>    | Transistor 2SC-402 (2SC650)                                                                          |        |               |              |         |  |
| T <sub>1</sub> T <sub>2</sub>      | output transformer<br>(primary 5 K $\Omega$ ) (secondary 8 $\Omega$ 16 $\Omega$ )                    |        |               |              |         |  |

| Part No.                       | Nomenclature                                      |  |  |  |  |  |
|--------------------------------|---------------------------------------------------|--|--|--|--|--|
| T <sub>3</sub>                 | Power transformer                                 |  |  |  |  |  |
| SW-05d                         | Si diode AC (RMS) 300V ID 500 mA -55°C~<br>+130°C |  |  |  |  |  |
| SW-0503                        | Si diode AC (RMS) 120V ID 500 mA -55°C~<br>+130°C |  |  |  |  |  |
| JAC-1, JAC-2                   | Head phone jack                                   |  |  |  |  |  |
| PU-1, PU-2                     | Input transformer connector                       |  |  |  |  |  |
| PU-3                           | Power adjustment for 100V/117V/240V               |  |  |  |  |  |
| PL                             | Pilot lamp 12V 60 mA                              |  |  |  |  |  |
| F                              | Fuse 4 A                                          |  |  |  |  |  |
| S <sub>1</sub> (a~f)           | Function switch Y-3-6-6                           |  |  |  |  |  |
| S <sub>2</sub> (a~b)           | Tape monitor switch                               |  |  |  |  |  |
| S <sub>3</sub> (a~b)           | Mode switch                                       |  |  |  |  |  |
| S <sub>4</sub> (a~d)           | Tone switch                                       |  |  |  |  |  |
| S <sub>5</sub> (a~b)           | Tone switch                                       |  |  |  |  |  |
| S <sub>6</sub> (a~b)           | Low filter switch                                 |  |  |  |  |  |
| S <sub>7</sub> (a~b)           | High filter switch                                |  |  |  |  |  |
| S <sub>8</sub> (a~b)           | Loudness switch                                   |  |  |  |  |  |
| S <sub>9</sub> (a~b)           | Presence switch                                   |  |  |  |  |  |
| S <sub>10</sub> (a~b)          | Impedance switch                                  |  |  |  |  |  |
| S <sub>11</sub>                | Phase switch                                      |  |  |  |  |  |
| S <sub>12</sub>                | Speaker switch                                    |  |  |  |  |  |
| S <sub>13</sub>                | Power switch                                      |  |  |  |  |  |
| CO <sub>1</sub> ~ <sub>4</sub> | AC outlet                                         |  |  |  |  |  |

# PARTS LAYOUT



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