



NATIONAL

MODEL SA-52H

INSTRUCTION BOOK

FM MULTIPLEX M.F.B. STEREO AMPLIFIER



SPECIFICATIONS

Frequency Range:	MW.....525~1605 kc
	SW3.9~12Mc
	FM88~108Mc
Intermediate Frequency:	AM455 kc
	FM10.7 Mc
Tubes & Diodes:	6AB9 ×1 FM RFA & CONV.
	6BE6 ×1 AM CONV.
	6BA6 ×1 FM & AM IF Amp.
	6AU6 ×2 FM LIM.
	6BA6 ×1 FM MPX AF Amp.
	12AT7 ×1 FM MPX 19 & 38,Kc Amp.
	12AX7 ×1 FM MPX AF Amp.
	12AX7 ×3 AF Amp.
	12AU7 ×3 AF Amp.
	6BQ5 ×4 Power Amp.
	SD-1A ×4 Rectifier
	OA70 ×2 MPX RECT.
	OA79 ×5 AM FM DET. & MPX Doubler
	SC15 ×1 AFC

Sensitivity:	FM 5 μ V / IHFM 300 Ω
	MW..... 20 μ V / 50mW
	SW 30 μ V / 50mW
AF Input Sensitivity:	AUX..... 120mV / 500K Ω for 16W
	MAG 3.5mV / 33 K Ω for 16W
	CRYSTAL... 14mV / 133 K Ω for 16W
	REC-OUT... 0.1V / 500 K Ω
OUTPUT:	30W - 30W (Peak music power)
Frequency Response:	20~20000c/s \pm 0.5 dB...Amplifier section
S / N:	60 dB AUX input
Separation:	-35 dB
Power Source:	117V-220V 50~60 c/s
Power Consumption:	98W
Dimensions:	W 470mm, H 161mm, D 328 mm (W 18 $\frac{1}{2}$ " H 6 $\frac{1}{4}$ " D 12 $\frac{7}{8}$ ").
Weight:	15.0 kg (33 lb. 1 oz.)

OUTSTANDING FEATURES

HIGH POWER OUTPUT CIRCUIT

6BQ5 push-pull circuit, has high power output with little power consumption.

Have output terminals for MFB speakers as well as ordinary speakers from 4 to 32 ohms.

MFB CIRCUIT

When combined with MFB (motional feed back) speakers, the built-in MFB circuit automatically corrects distortion and insures full-throated bass.

DC OPERATED PRE-AMPLIFIER

To amplify magnetic and crystal pickup output, pre-amplifier must be highly sensitive. Tubes used in the pre-amplifier stage are all DC operated, to insure record reproduction at very low noise level.

LOUDNESS CONTROL SWITCH

To compensate for the aural sensitivity of human ears, which have less sensitivity to bass as the volume decreases, loudness control is provided for sufficient lows even played at low volume level.

STEREO RECORDING TERMINAL

Broadcasts or phono records can be recorded on your taperecorder, while listening, via the taperecorder recording terminal, regardless of the volume level at which it is being played.

3-BAND TUNER WITH BUILT-IN FM MULTIPLEX CIRCUIT

Highly sensitive (10 microvolts at 30 dB quieting) FM reception, free from noise or interference. FM stereo from the built-in FM multiplex circuit. Also enjoy overseas broadcasts on the short wave band.

TUNING INDICATOR

When the pointer of the meter rests in the middle of the scale, it means that an FM station is accurately tuned. On MW or SW bands when the meter points to the maximum on the scale, it is accurately tuned.

FM AFC CIRCUIT

Built-in AFC (automatic frequency control) circuit automatically corrects detuning and keeps the set accurately tuned to an FM station, for distortion-free reception.

FLYWHEEL TUNING MECHANISM

Flywheel on the tuning axis makes tuning much easier. With a twist of the tuning knob, the pointer effortlessly glides along the dial, from end to end.

FM STEREO EYE

When the set is tuned to an FM station broadcasting program in stereo, the STEREO EYE on the dial lights up in red. This indicates that the particular program is being broadcast in stereo. If the MODE switch has been set to MONO, turn the MODE switch to STEREO for full stereo reproduction.

FERRITE ANTENNA

Built-in ferrite antenna has outstanding high sensitivity and low noise characteristic. Ideal for reception on MW band.

REAL WOOD CABINET

The cabinet is made of real, oil-finished walnut with metal front panel in gold. A deluxe and handsome control center for your hi-fi system. The oil finish protects the cabinet from scratches and smear.

PUSH-PUSH POWER SWITCH

PUSH-it is switched on. PUSH again-it is switched off. The switch button glows when the set is switched on.

THE BEST PLACE IN YOUR HOUSE FOR YOUR STEREO SYSTEM IS WHERE:

- * The floor is level and solid
- * There is easy access to an electric outlet, ground wire, easy leading-in of FM and short-wave antennas
- * It is away from fluorescent lamps, electric appliances and other noise sources
- * The rear of the amplifier is to be approximately 10cm away from the wall (for ventilation).
- * It is free from humidity, direct rays of the sun and room heats.

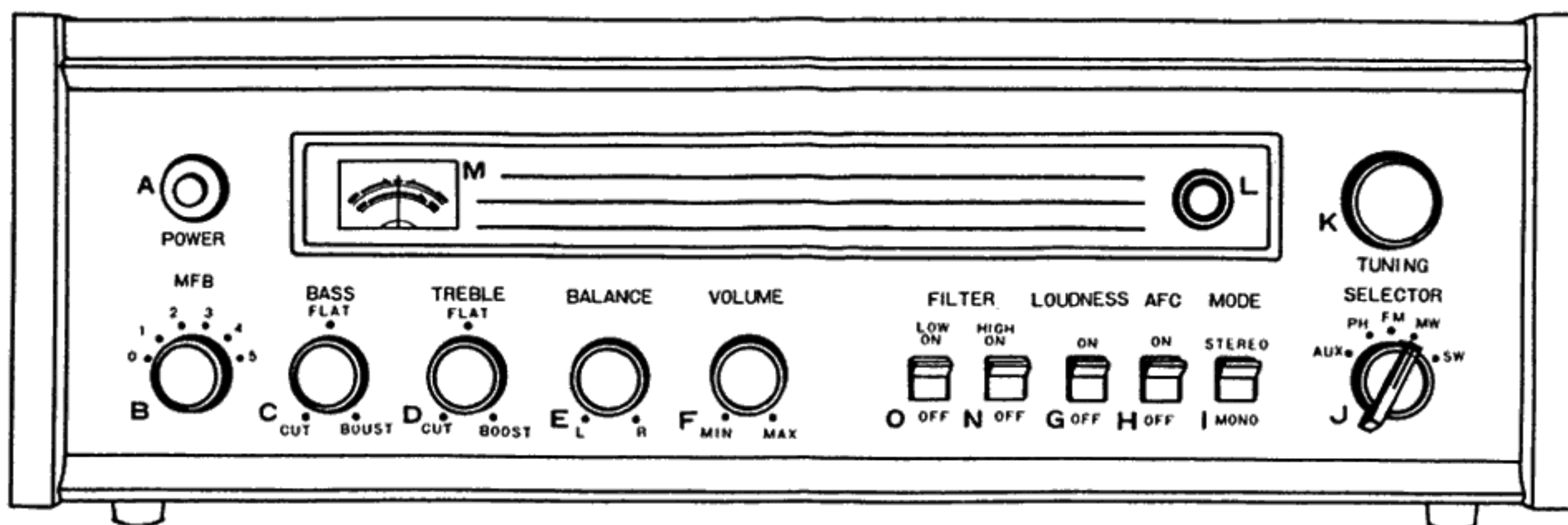


Fig. 1

CONTROLS

* A POWER

Push the button and the set will begin to work.
To turn the set off, push the button again.

* B MFB

If you are using MFB speaker systems, you can enjoy the MFB effect as follow,

"0" position.....MFB circuit does not work.

"1"~"5" position.....MFB circuit works.

From 1 to 5 the MFB effect increases step by step.

* C BASS

This knob can be adjusted to the level of the low frequency range.

* D TREBLE

This knob can be adjusted to the level of the high frequency range.

* E BALANCE

When you want to balance the volume level of an FM broadcast or while playing a stereo record, you can get proper balance by turning this knob clockwise to raise the right volume, or counterclockwise to raise the left one.

* F VOLUME

You can get desired volume by turning this knob clockwise to raise the volume, or counterclockwise to lower it.

* G LOUDNESS

When "ON" provides the frequency response change required by the ear at low listening levels. This action then permits the volume controls to function as a compensated loudness control. In the "OFF" position, the loudness circuit is inoperative, and the volume control functions as a normal gain control

* H AFC

After tuning in an FM broadcast, turn this switch to "ON", then tuner automatically and precisely locks to the absolute center of the incoming signal

* I MODE

This is the mode select switch. Set the switch in stereo position for stereo record playing or FM broadcast reception. During MW and SW reception, this switch has no function.

* J SELECTOR

Select the program source,
for listening to external programs....."AUX" position
for playing records..... "PH" position
for listening to FM or FM stereo broadcasts..... "FM" position
for listening to MW (medium wave) broadcasts..."MW" position
for listening to SW (short wave) broadcasts..... "SW" position

* K TUNING

This is to select the desired station. In the short-wave band, broadcasting stations are tuned in on the thick lines marked 75, 60, 49, 41, 31 and 25.

* L STEREO EYE

* M TUNING METER

On the FM band, the center position will give the best reception. On the MW and SW bands, the meter works in the regular manner the point tuned in is the max position.

How to enjoy the M.F.B. (Motional Feed Back) effect

Our ears can usually hear sound having a wide frequency range... 16~20,000 cycles.

For radio or stereo reproducing systems, it is very difficult to reproduce sound of this frequency range perfectly.

This means that no speaker can have such a perfect reproducing ability.

For instance, even a 32 inch speaker cannot reproduce bass sound perfectly. You can always control the tone of the amplifier with the tone knob, but it is only electrical control, not acoustic control.

There is a limit of reproduction of perfect bass sound, according to the characteristics of the speaker.

By the "M.F.B." circuit, which may be called an artificial brain of sound, we can spread the lower frequency range, and raise the bass sound level, varying the characteristics of a speaker.

This circuit works to improve the frequency response and distortion characteristics of the speaker, electrically detecting the motion of the speaker cone with a special coil and feeding it back to the amplifier.

You can enjoy better bass with the MFB knob at the front of the set.

If you want to enjoy brilliant bass, set the MFB knob to the "4 or 5" position.

To enjoy clear sound, set the the knob to the "1 or 2" position.

How to listen to FM STEREO broadcasting

* FM stereo broadcasting is a very convenient system because it uses only one channel of carrier frequency but is modulated with two different signals so that we can enjoy stereo sound from one broadcasting station.

* For reproduction of FM stereo, a "FM MPX adaptor" to demodulate the MPX signal to two different signal of left and right channel is necessary.

* This set has a built-in FM MPX circuit, so you can enjoy FM stereo broadcasting.

* When you tune in to an FM broadcasting station, the "STEREO EYE" at the right side of dial will light up. Then switch "MODE" from "MONO" to "STEREO".

The reception is then in stereo.

* In some areas where signal strength is very weak noise may increase. If so, change the antenna to a higher-gain outdoor antenna and tune in accurately to the station.

HOW TO CONNECT LEAD WIRES

* 1. AC (Power source socket)

Those sockets provide outlets for record player, a TV set, or a tape-recorder, etc.

* 2. HUMBAL (Hum-balancer)

Most of the humming noise comes from reverse insertion of the power plug into the power outlet.

If humming noise is excessive, reverse the power plug insertion.

When humming noises become excessive after a tube or some other part is replaced, you can reduce them by turning the "HUMBAL" knob.

* 3. M.F.B. (Motional feed back speaker system)

These are terminals only for MFB speaker systems, for example, NATIONAL SB-88H, SB-105H etc.

Its voice coil impedance is 8Ω , and this terminal is already connected to 8Ω .

* 4. NORMAL SP

These are terminals for normal speakers of which voice coil impedance may be 4, 8, 16 or 32Ω .

If you use MFB speaker systems, do not connect any other speaker here.

* 5. OUT. IMP. (Speaker voice coil impedance select switch)

Adjust the output impedance according to your regular speaker.

* 6. SEPARATION

This is the FM stereo separation adjustor, but, in order to adjust it, adjusting equipment must be used.

* 7. DX-LOCAL

This set has a built-in ferrite antenna for MW band, so you can enjoy high quality reception, free from noises caused by other electrical appliances.

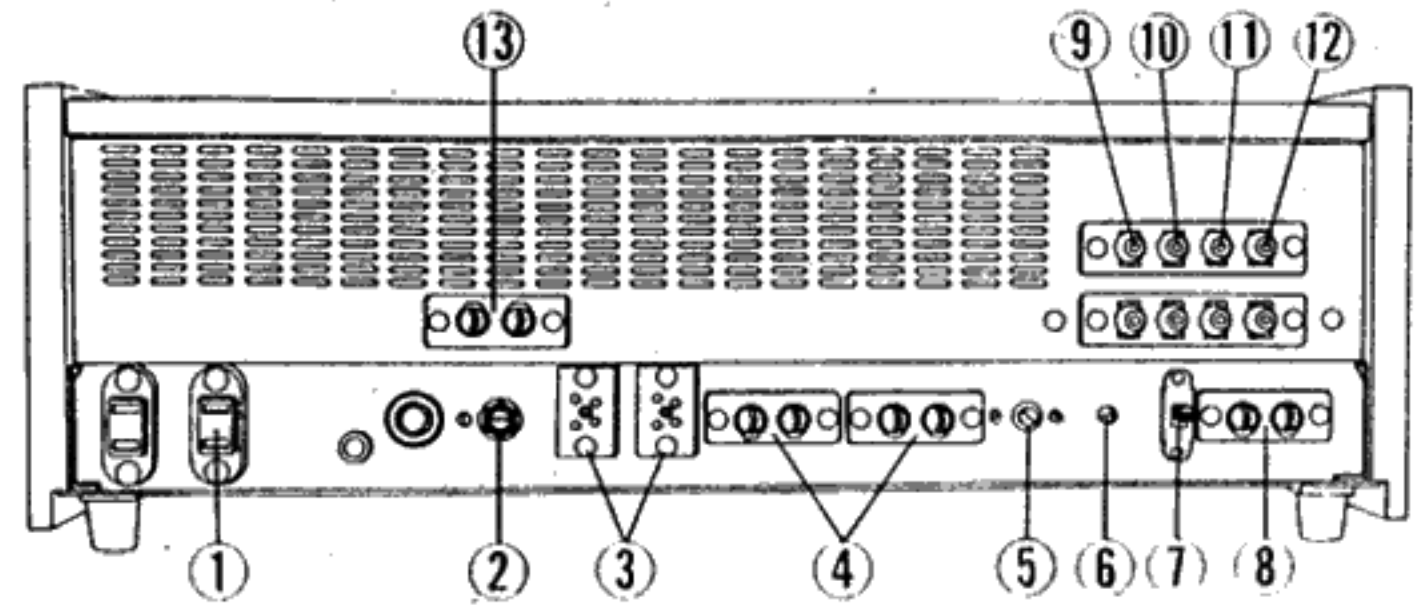


Fig. 2

When you want to listen to distant broadcasts, switch the "DX-LOCAL" at the rear of the set, to "DX", then connect your outdoor antenna (about 36 feet long and 24 feet high) to the "AM ANT" terminal.

This DX-LOCAL switch does not work on SW band.

* 8. AM. ANT

* 9. REC-OUT

When you want to record from the set to your tape recorder, plug the appropriate cord into the "REC-OUT" terminal.

* 10. MAG

Use for reproducing records by magnetic pickup.

You can enjoy record playing at PH position of SELECT switch.

* 11. CRYSTAL

Use for ceramic or crystal pickup.

You can enjoy record playing at PH position of SELECT switch.

* 12. AUX

Use for reproducing high level signals of a tape recorder or a TV set.

You can enjoy them at AUX position of SELECT switch.

* 13. FM ANT

Connect an external 300Ω antenna.

ANTENNA AND EARTH

* This set has a built-in ferrite antenna for MW band, so that you can enjoy high quality reception free from noise caused by other electrical appliances.

* When you want to listen to distant broadcasts, switch the "DX-LOCAL" at the rear of the set to "DX", then connect your outdoor antenna (about 36 feet long and 24 feet high) to the antenna terminal ("A" of AM. ANT) at the back of the set. (Fig. 3) This DX-LOCAL switch does not work on the SW band.

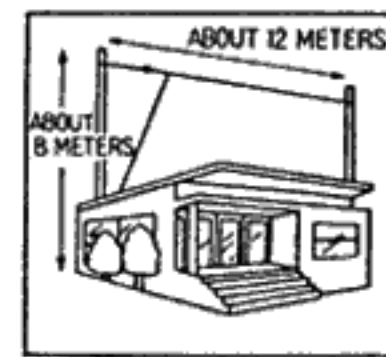
* To reduce, ground the chassis from the earth terminal ("E" of AM. ANT) at the back of the set. (Fig. 4)

* To prevent lightning damage, it is advisable to install a lightning arrester. (Fig. 5)

FM antenna

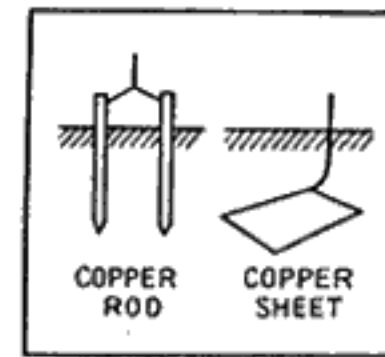
* Where signal strength is strong, the attached antenna is sufficient for good FM reception. (Fig. 6)

* Where signal strength is weak, it is desirable, for best reception, to use a TV low-band antenna or an FM dipole antenna, instead of the attached antenna. (Fig. 7)



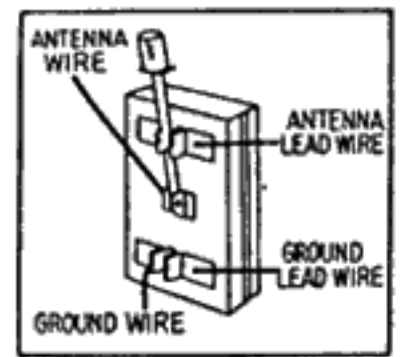
ANTENNA

Fig. 3



GROUND

Fig. 4



LIGHTNING ARRESTER

Fig. 5

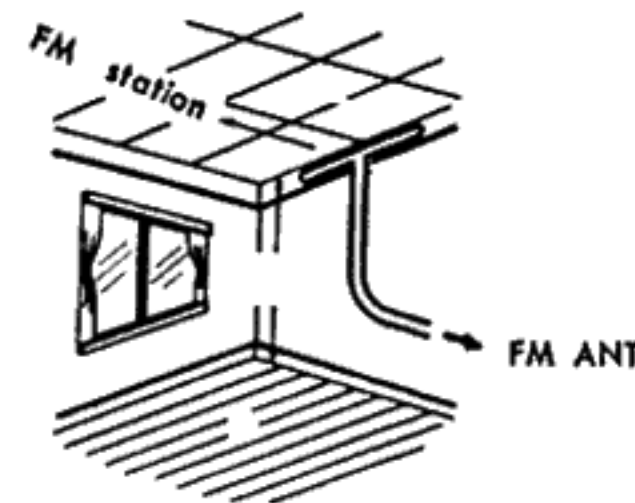


Fig. 6

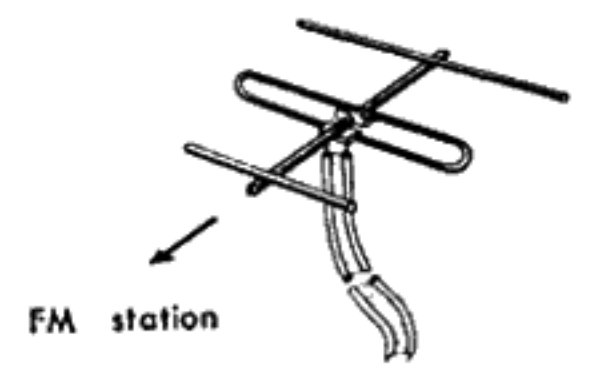


Fig. 7

HOW TO KEEP WOOD CABINET CLEAN

The wooden part of the cabinet is made of wood finished with polyester resin.

1. For dusting, wipe it with a dry cloth.

2. When it is smeared with finger prints, etc., wipe with a cloth damped with benzene.

3. When polished with "NATIONAL Eclair", the mat finish will become slightly glossy.

Do not use cleaners made for shoes or other electric appliances

Humming noise while playing records

* If there is excessive humming while playing records, Connect the earth line (or terminal) of your record player to the "E" position on the "AM ANT" terminal at the rear of this set

Don't put anything on the amplifier

Although this set may become warm after prolonged use, it is not cause for anxiety. If, however, any foreign object is placed on the set in such a way as to interfere with ventilation, the sets' performance may suffer.