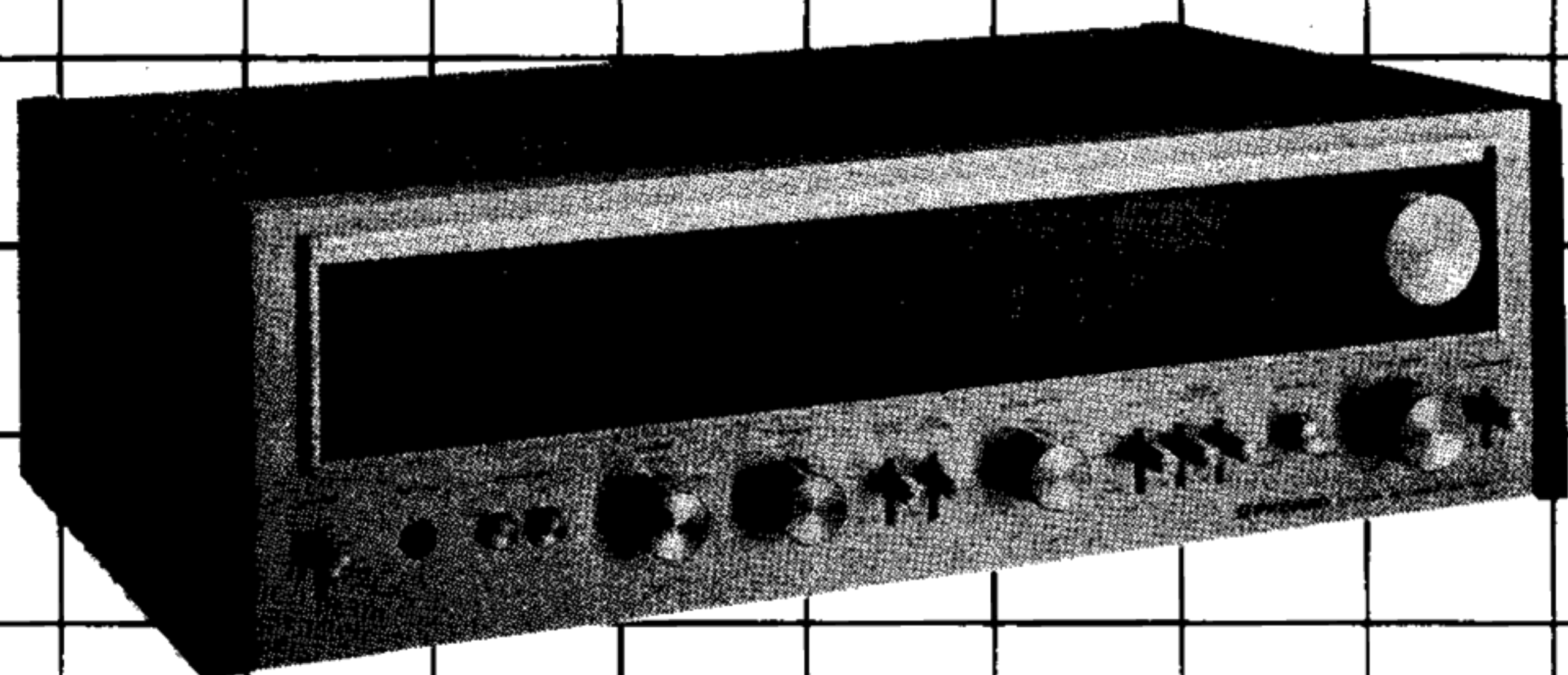


AM/FM STEREO RECEIVER

SX-790

OPERATING INSTRUCTIONS

HG
HGW4



These Operating Instructions apply to two versions of the stereo receiver; the SX-790/HG with the walnut grained side panels and the SX-790/HGW4 with the black side panels. Although the cabinet appearance differs, the performance and functions remain the same. These Operating Instructions are based on the SX-790/HGW4.

NOTE

This receiver provides a line voltage selector switch on the rear panel, so please confirm the setting of the switch before turning on the power switch, referring to the section "LINE VOLTAGE SELECTOR SWITCH" on page 5.

 PIONEER®

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FEATURES

High-Output, Low-Distortion High-Power Amplifier

The differential amplifier with its current mirror load employing PNP dual transistors in the first stage helps to yield a high gain even in the high-frequency range. The pre-driver stage features a constant current circuit as the load for upgraded gain. The power stage uses Darlington power ICs which provide stable characteristics and eliminate the effects of the transient response. The NFB circuit is configured as a DC amplifier without the use of capacitors for improved dynamic characteristics and a stable output. The SX-790 delivers a **Continuous Power Output of 45 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.05% total harmonic distortion.**

This is more than enough power for satisfying music listening requirements.

High-Stability FM Tuner

The first stage of the front end is configured with a 3-gang variable capacitor and a 3-stage RF amplifier with a dual gate MOS FET for a high sensitivity of 1.8 μ V (IHF). The IF stage packs two ICs and three dual-element ceramic filters which feature superb phase characteristics. These produce a sufficient gain and excellent limiter characteristics as well as a low distortion of 0.07% (1kHz, mono) and a high signal-to-noise ratio of 80dB (mono). The MPX stage contains a 19kHz pilot signal auto canceller IC which extends the frequency response up to the high-frequency range and produces an extremely clear FM sound. There is also an FM muting circuit which cuts out all that irritating noise when detuning or when setting the FUNCTION switch.

High-Fidelity Equalizer Amplifier

The SX-790 has an IC-configured NFB-type equalizer amplifier which is characterized by its low noise and high gain. The maximum allowable input level is 200mV (at 1kHz) and only precision parts are used for the RIAA elements for an RIAA deviation of only ± 0.2 dB across a frequency range of 20Hz to 20kHz.

Tone Controls with Tone Defeat Function

When the CR-type bass and treble tone control knobs are set to the center position (OFF), the tone control networks are automatically disengaged and uniformly flat frequency response is yielded. There is also a low cut filter which cuts out the ultra-low-frequency noise at frequencies below 15Hz.

Built-in Protection Circuits

The IC-based protection circuit protects the power amplifier and the speakers from unforeseen accidents and mishaps. This circuit cuts out the unpleasant noise generated when the power switch is turned on and off.

Independent Power Meters

The independent left and right channel power meters enable the strength of the output signal to be read out directly, thanks to their logarithmic compression circuitry, from 0.01W up to 100W without any switches having to be thrown.

**Measured pursuant to Federal Trade Commission's Trade Regulation Rule on Power Output Claims for Amplifiers.*

STEREO SYSTEM COMPOSITIONS

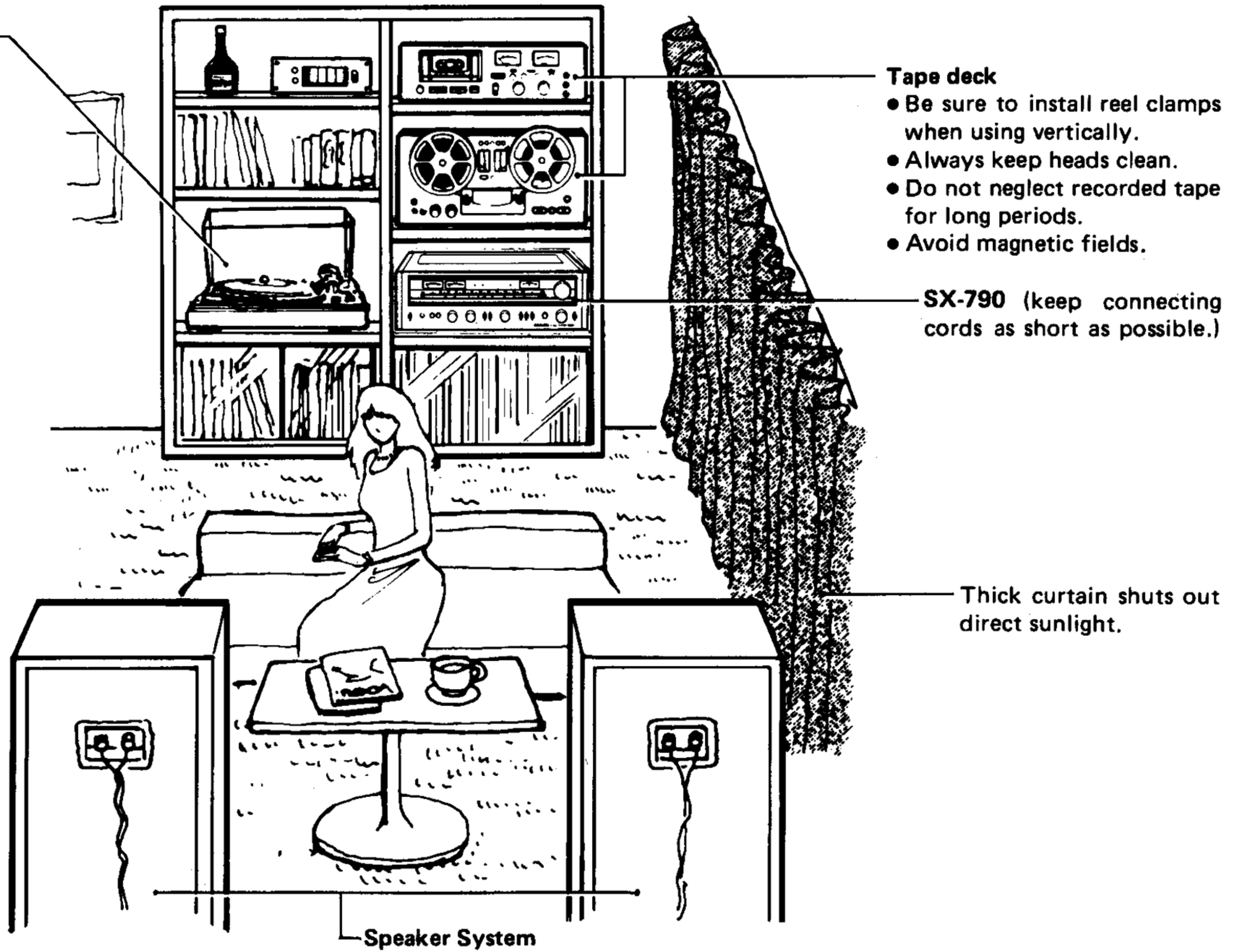
Turntable

- Protect from vibrations and close dust cover whenever possible.
- Store records vertically and protect from dust and dirt.

Furnishing materials can improve tone.

Positioning is slightly to the rear of the apex of an equilateral triangle formed with left and right speakers.

Carpet
Absorbs sound and vibration. (Placing on floor in front of speakers is also effective.)



- Tape deck**
- Be sure to install reel clamps when using vertically.
 - Always keep heads clean.
 - Do not neglect recorded tape for long periods.
 - Avoid magnetic fields.

SX-790 (keep connecting cords as short as possible.)

Thick curtain shuts out direct sunlight.

Speaker System

Rear and side panels of left and right speakers should have the same surroundings. (Placing with rear panel against a wall improves bass.)
Install speakers so that vibrations are not transferred directly to the floor. (Employ stands or concrete blocks with bookshelf-type speakers.)

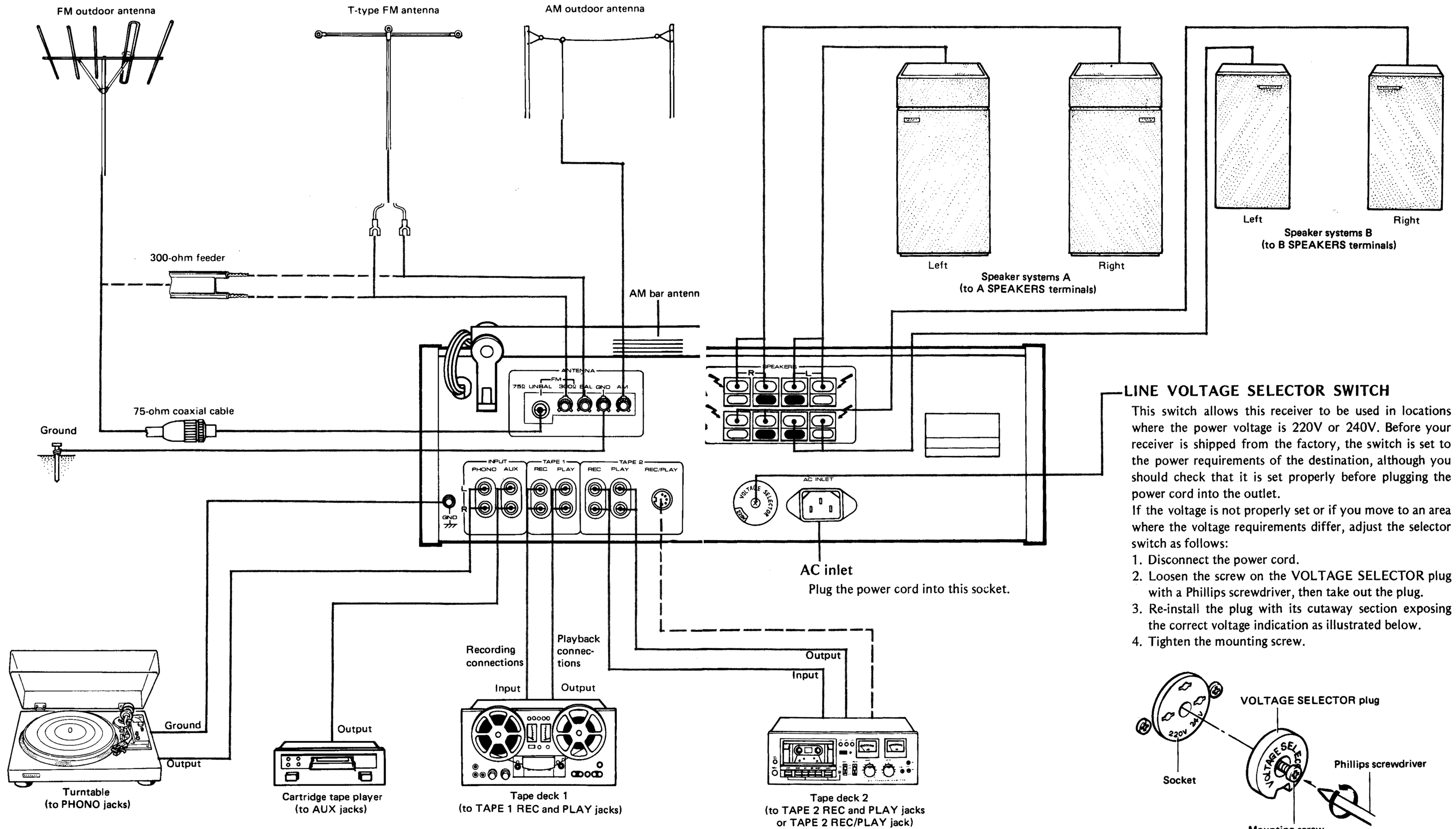
INSTALLATION CAUTIONS

To ensure the best sound quality and trouble-free operation, avoid setting up the receiver in any of the locations described below:

Locations liable to downgrade performance and result in breakdowns	Resulting trouble
<ol style="list-style-type: none"> 1. Locations exposed to direct sunlight, or near heaters. 2. Locations with poor ventilation, with high humidity or moisture contents, or dusty locations. 3. Locations susceptible to vibration. 4. Locations where an AM radio or TV set is being used simultaneously. 	<ol style="list-style-type: none"> 1. External heat causes the performance of the electronic parts to deteriorate, and operation becomes unstable. 2. Cause of faulty contact in input-output terminals, and rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in the circuit parts. Dust or grease in the rotating parts causes them to deteriorate. 3. These locations affect the precision parts adversely. 4. Mutual interference can occur from the oscillator circuits used in these products.

Don't put anything on the top of the receiver because a high-power receiver will produce a lot of heat. Also leave sufficient space around the receiver for adequate ventilation.

CONNECTION DIAGRAM

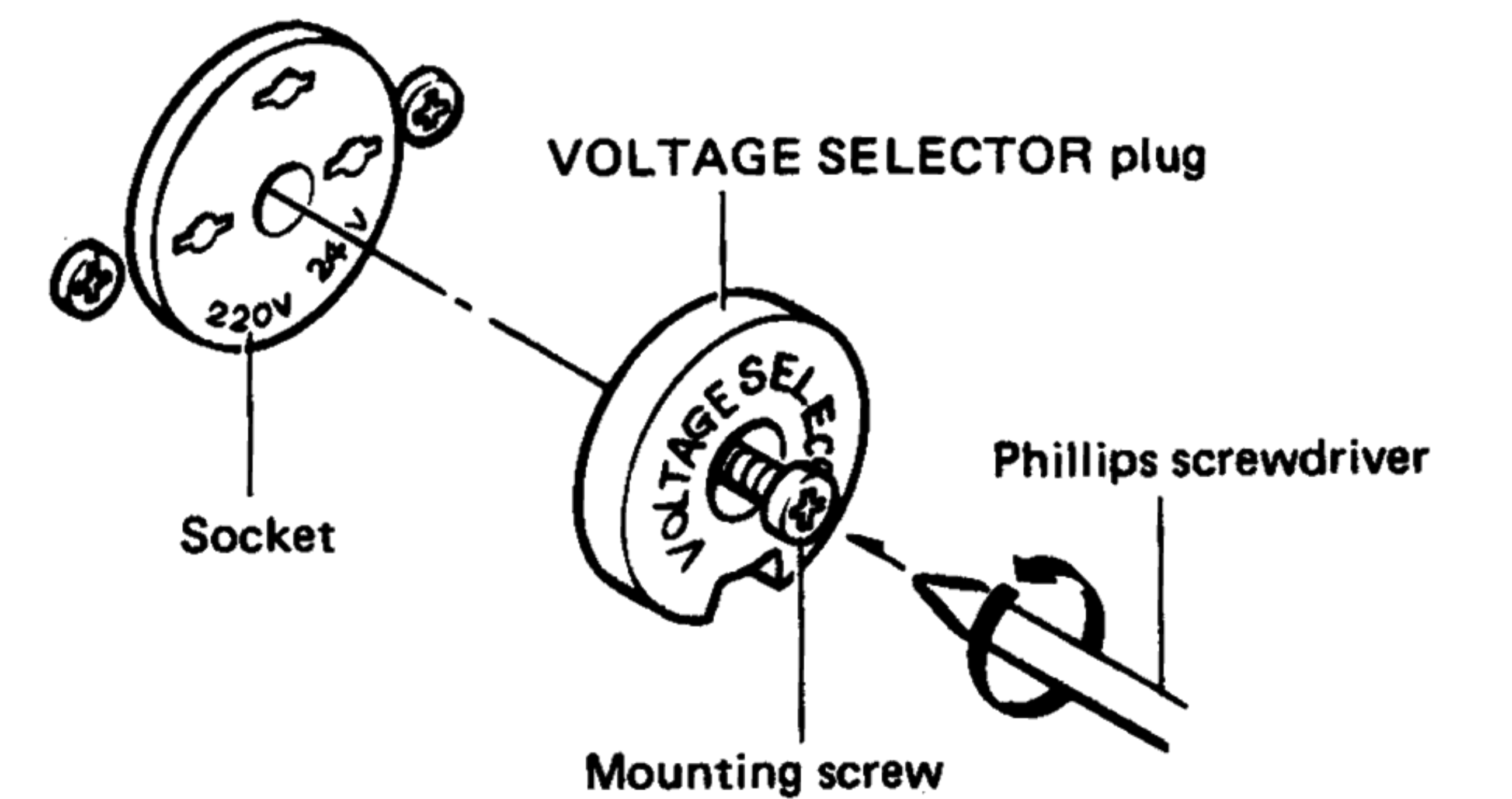


LINE VOLTAGE SELECTOR SWITCH

This switch allows this receiver to be used in locations where the power voltage is 220V or 240V. Before your receiver is shipped from the factory, the switch is set to the power requirements of the destination, although you should check that it is set properly before plugging the power cord into the outlet.

If the voltage is not properly set or if you move to an area where the voltage requirements differ, adjust the selector switch as follows:

1. Disconnect the power cord.
2. Loosen the screw on the VOLTAGE SELECTOR plug with a Phillips screwdriver, then take out the plug.
3. Re-install the plug with its cutaway section exposing the correct voltage indication as illustrated below.
4. Tighten the mounting screw.



CONNECTIONS

PRECAUTIONS

- Set the POWER switch to ON only when you have completed all the connections of the stereo system. Always set this switch to its bottom position (OFF) if you want to change the connections.
- All the receiver's jacks are aligned for easy connection in two rows: the upper row for L (left channel) and the lower row for R (right channel). Always connect L to L and R to R with the audio component output and input jacks.
- Make sure that the connections are secure. Improper connections can generate noise or cause the sound to be cut off.

SPEAKER SYSTEMS

The receiver is provided with two sets of SPEAKERS output terminals. Use the A set when connecting only one set of speaker systems.

Viewed from the front, the R (right channel) SPEAKERS terminals are on the right and the L (left channel) SPEAKERS terminals are on the left. Connect the left channel speaker to the L terminals and the right channel speaker to the R terminals. The red L and R SPEAKERS terminals have a plus polarity and the black terminals have a minus polarity. The speaker systems also have two polarities (plus, minus). When connecting, always connect minus to minus and plus to plus (Fig. 1).

Connecting the speaker cord to the SPEAKERS terminals

1. Strip about 10mm of the insulation from the end of the speaker cord. If the conductor is stranded, twist the strands together so that they do not come into contact with other terminals.
2. Depress the terminal buttons and insert the cords into the terminal holes.
3. Release the buttons and check that the cords are secure.

NOTES:

1. The high output power of this receiver requires that the speaker cords have an ample current-carrying capacity. Use cords with a high capacity and connect them securely. If you use low-capacity cords and do not connect them properly, the reproduced sound will be adversely affected and heat generation or short-circuits may be caused.
2. This receiver delivers a high output power and so make sure that you use speakers with a high allowable input.
3. If you want to use two sets of speaker systems, make sure that the impedance of each system is 8 ohms or more. If the impedance is less than 8 ohms, the

protection circuit will be actuated when the volume is turned up and you will not be able to enjoy proper stereo performance.

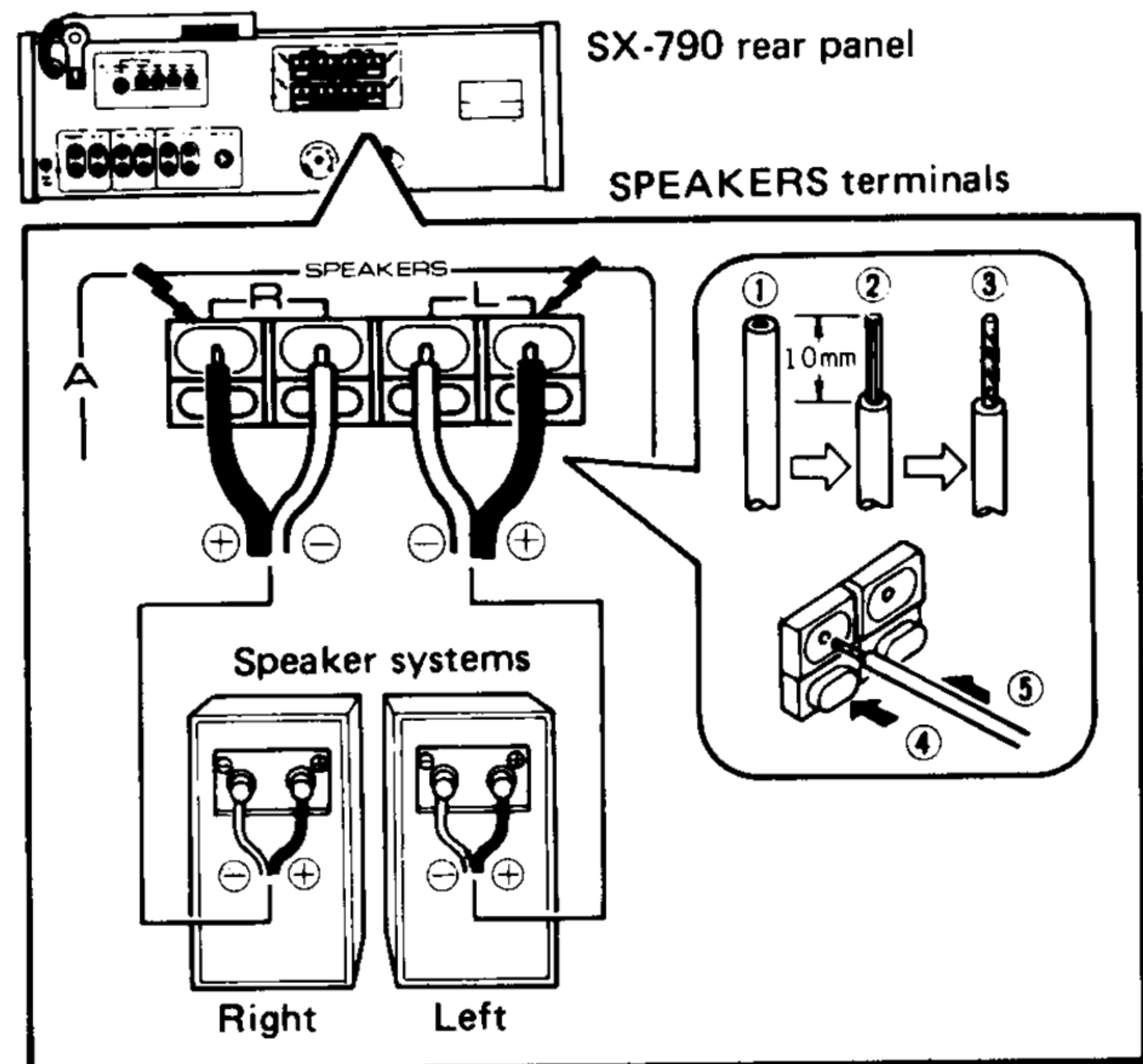


Fig. 1

TURNTABLE CONNECTIONS

Connect the output cords of a turntable to the PHONO input jacks. Be sure to connect left (L) channel and right (R) channel correctly. Connect the ground lead of the turntable to the GND terminal on the receiver (Fig. 2).

NOTE:

The way in which the output cords are attached will depend on the type of cartridge used. If you intend to use a low-output moving coil (MC) cartridge, always provide a special MC cartridge boosting transformer or head amplifier.

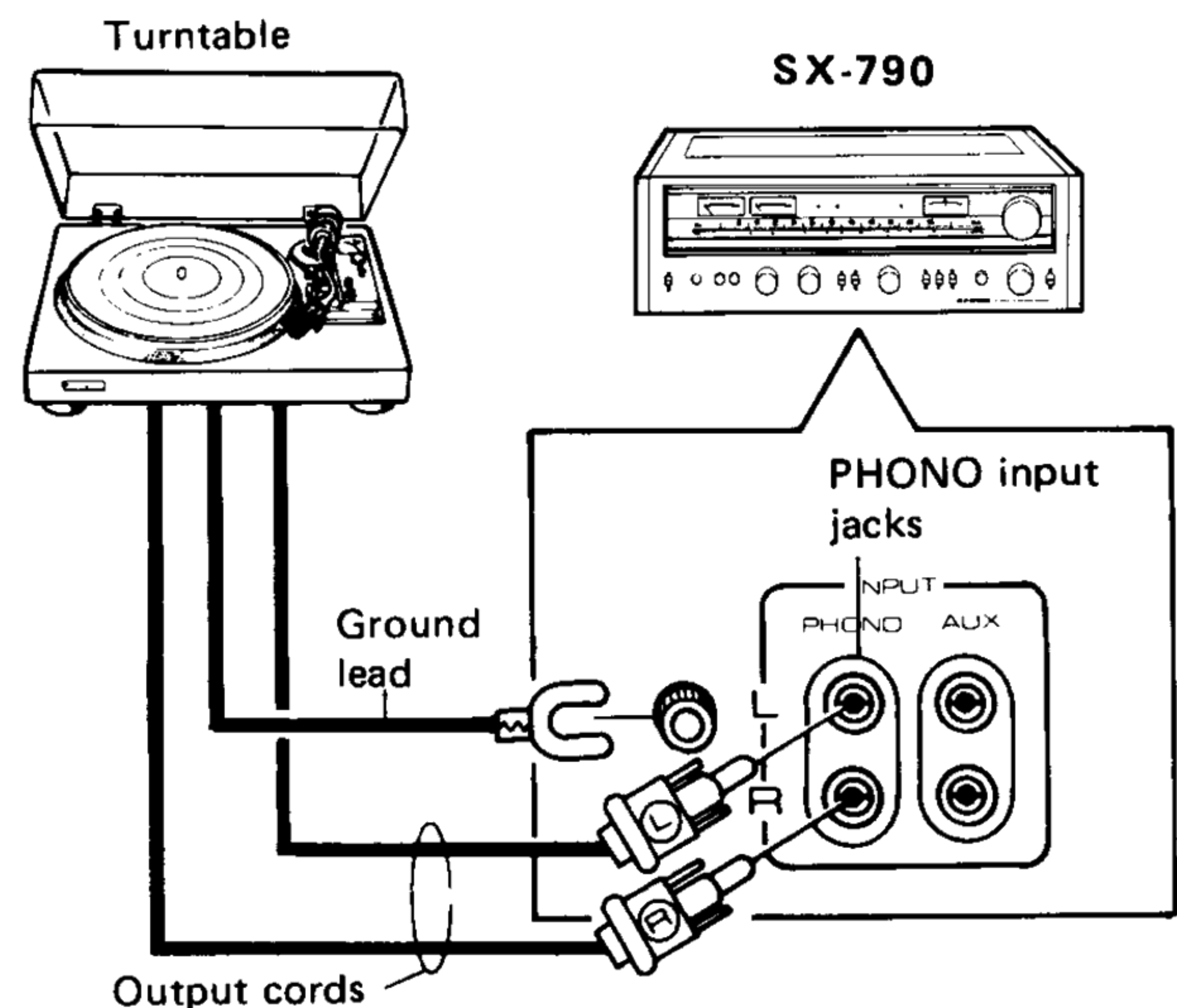


Fig. 2

USING THE AUX JACKS

You can connect an 8-track cartridge tape player, TV tuner, second tuner, or tape-deck playback output to these jacks. Be sure to connect both left channel (L) and right channel (R) correctly (Fig. 3).

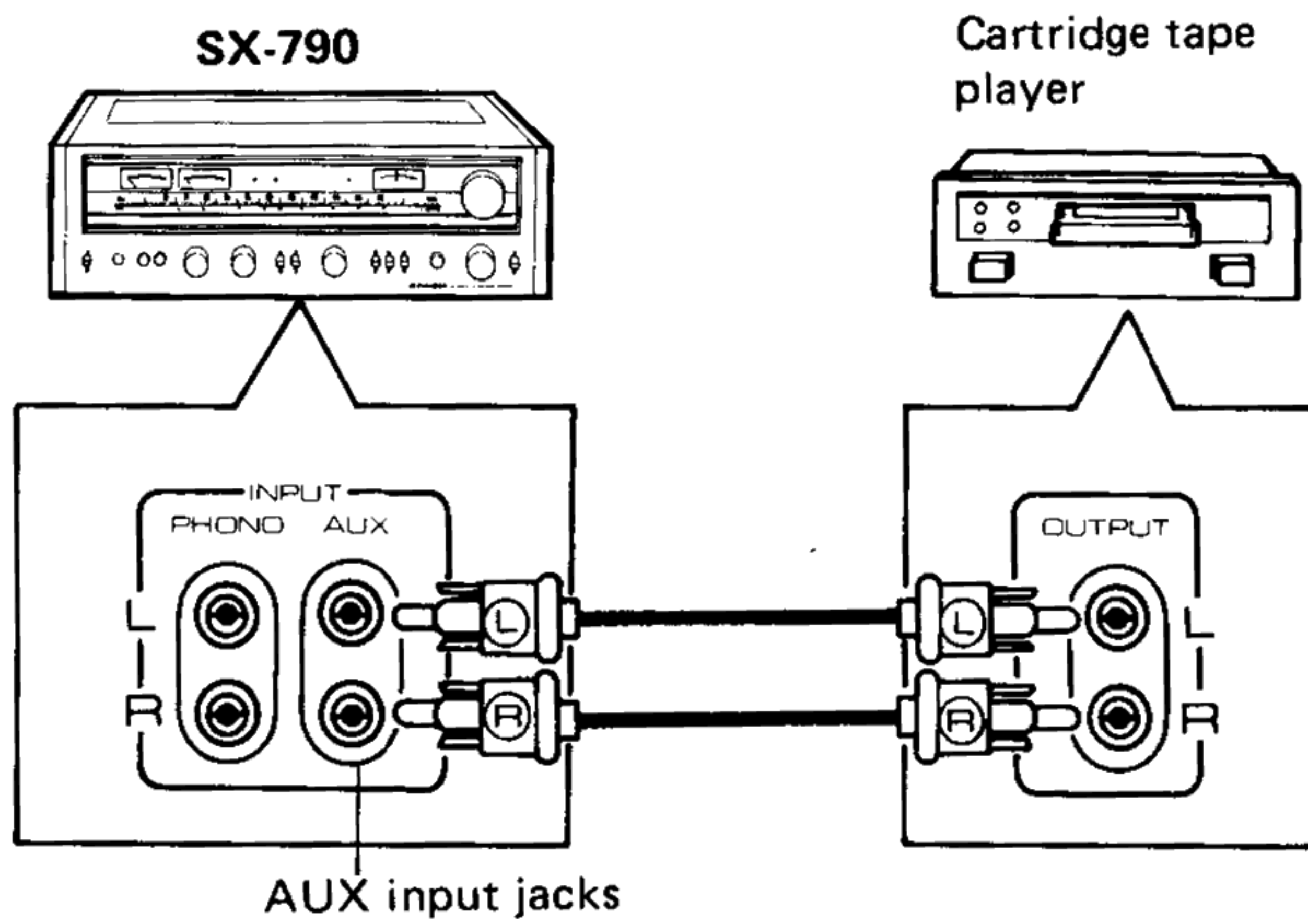


Fig. 3

TAPE DECK CONNECTIONS

The receiver is provided with two sets of recording (TAPE REC) output jacks and playback (TAPE PLAY) input jacks. Connect each of the jacks in the following way using the connecting cords which come with the tape deck. The upper row of jacks is for the left channel (L) and the lower row for the right channel (R) (Fig. 4).

Connections for recording

Connect the recording input jacks (LINE INPUT) on the tape deck to the TAPE 1 REC jacks on the receiver.

Connections for playback

Connect the playback output jacks (LINE OUTPUT) on the tape deck to the TAPE 1 PLAY jacks on the receiver.

NOTE:

Connect your second tape deck to the TAPE 2 jacks (REC and PLAY).

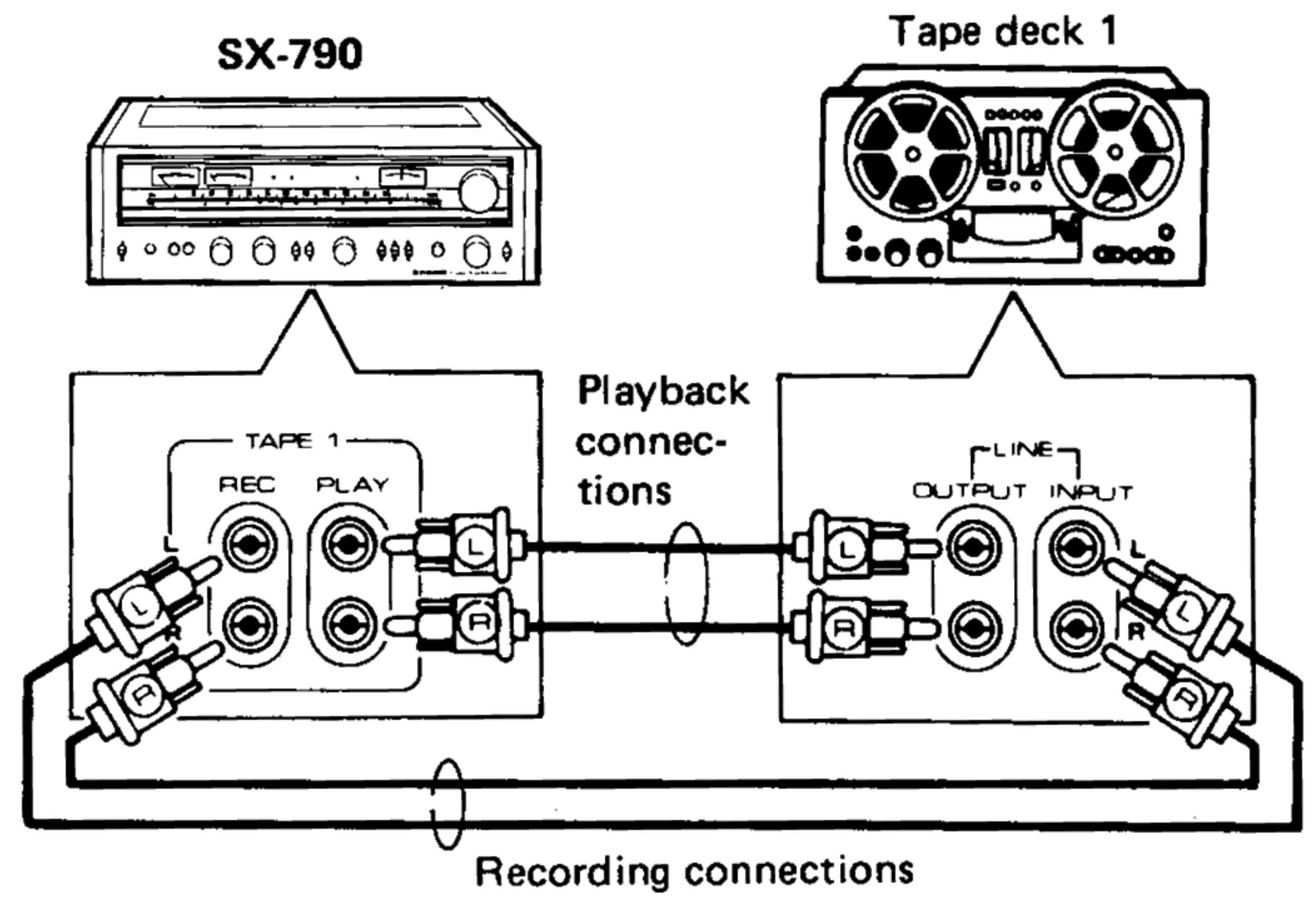


Fig. 4

Connections using the recording/playback connector (DIN cord)

If your tape deck is equipped with a recording/playback connector (DIN-type), use the optional recording/playback cord to connect this connector with the TAPE 2 REC/PLAY jack on the receiver. This means that the tape deck and the receiver are now set up for both recording and playback (Fig. 5).

In such cases, do not connect pin cord (ordinary pin plug cords) to the TAPE 2 REC and PLAY jacks.

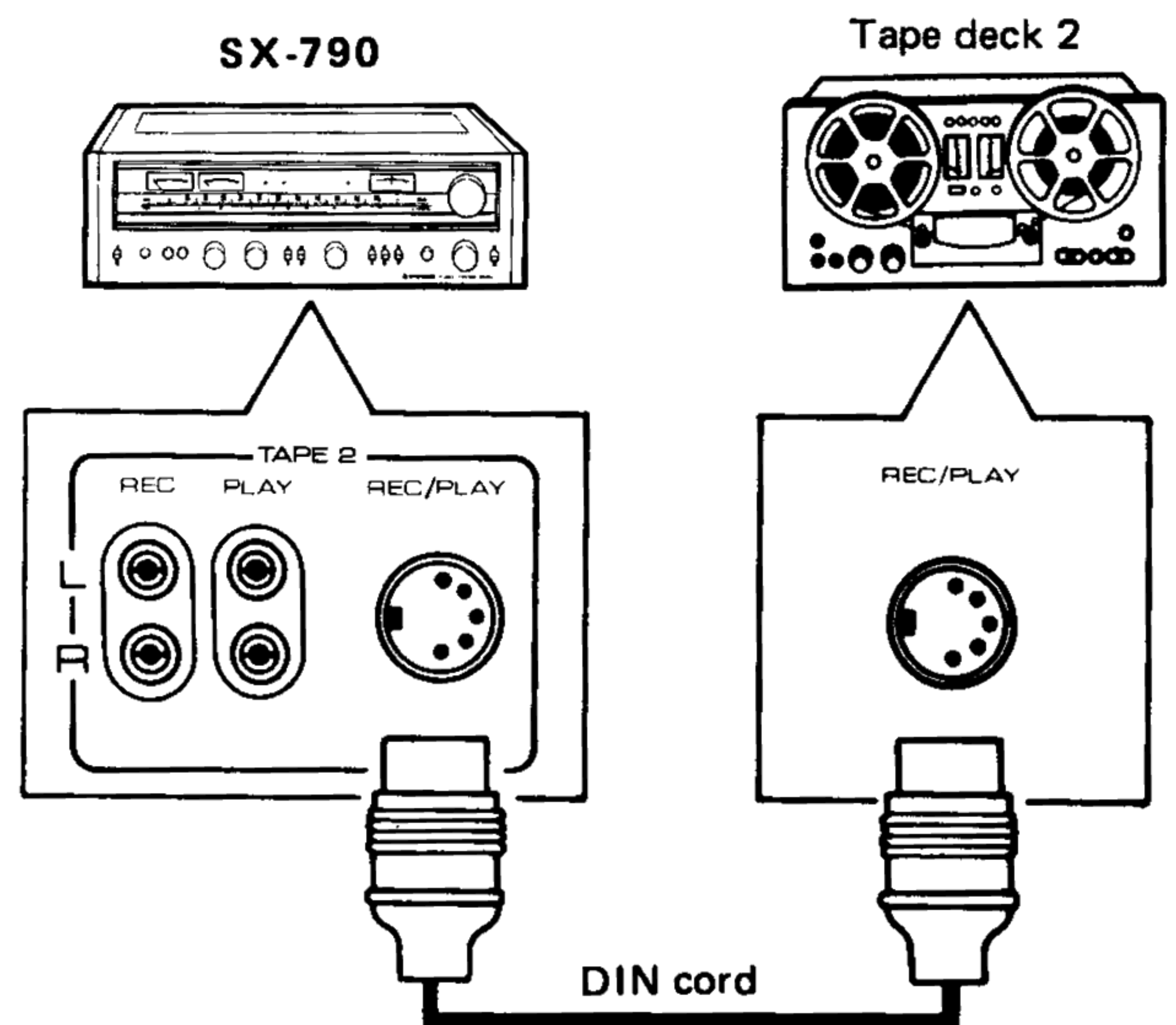


Fig. 5

ANTENNA AND GROUND CONNECTIONS

FM ANTENNA CONNECTIONS

The signals transmitted by an FM broadcasting station inevitably become weak when received behind mountains, between buildings and inside reinforced concrete structures. In weak-signal areas, signals which are reflected off mountains and other obstacles in their path may be picked up by the antenna, which causes a multipath effect. This adversely affects the sound received. This is why it is necessary to choose an antenna and an installation location which are best suited to cope with the ambient conditions and the strength of the signals.

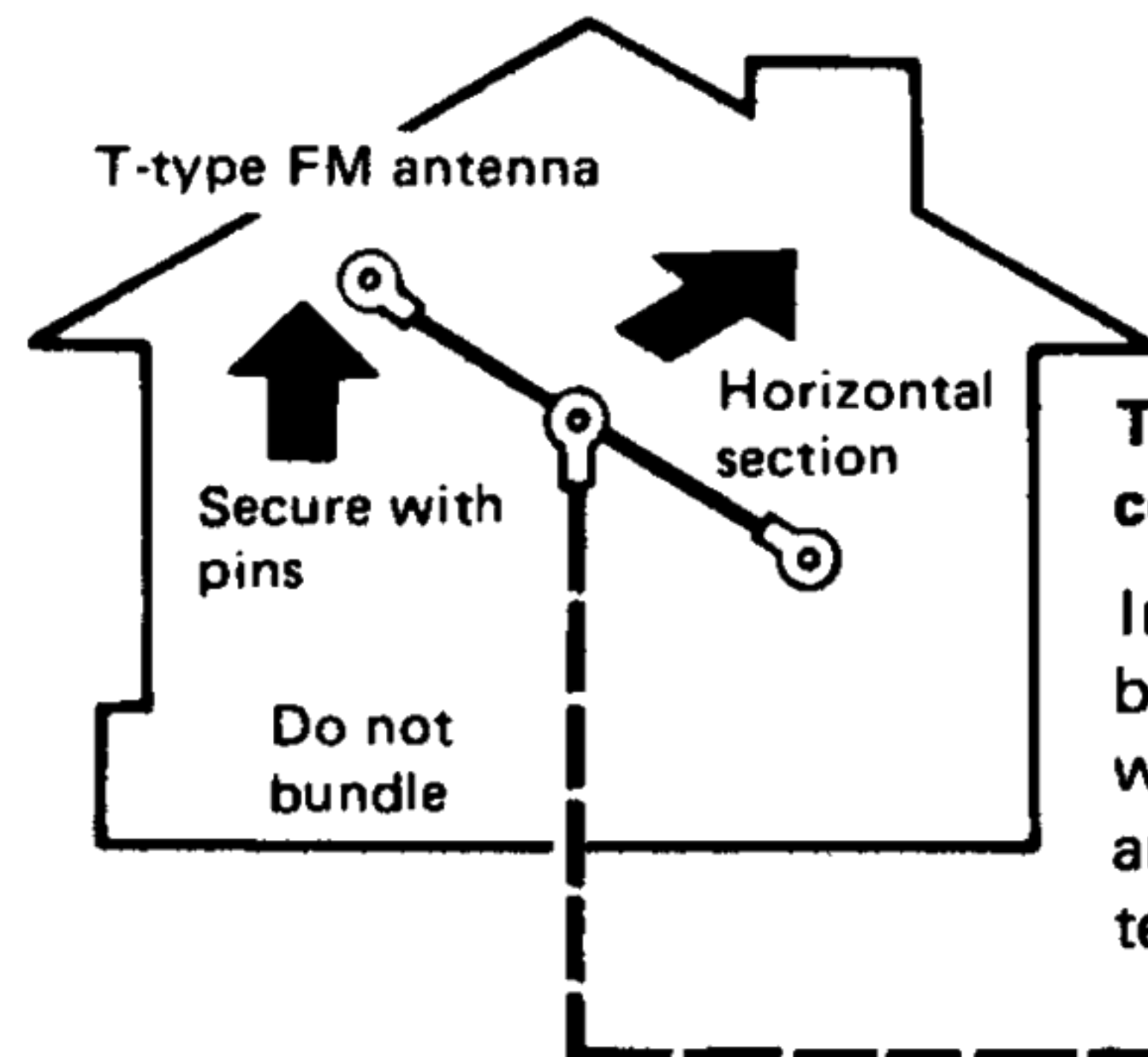
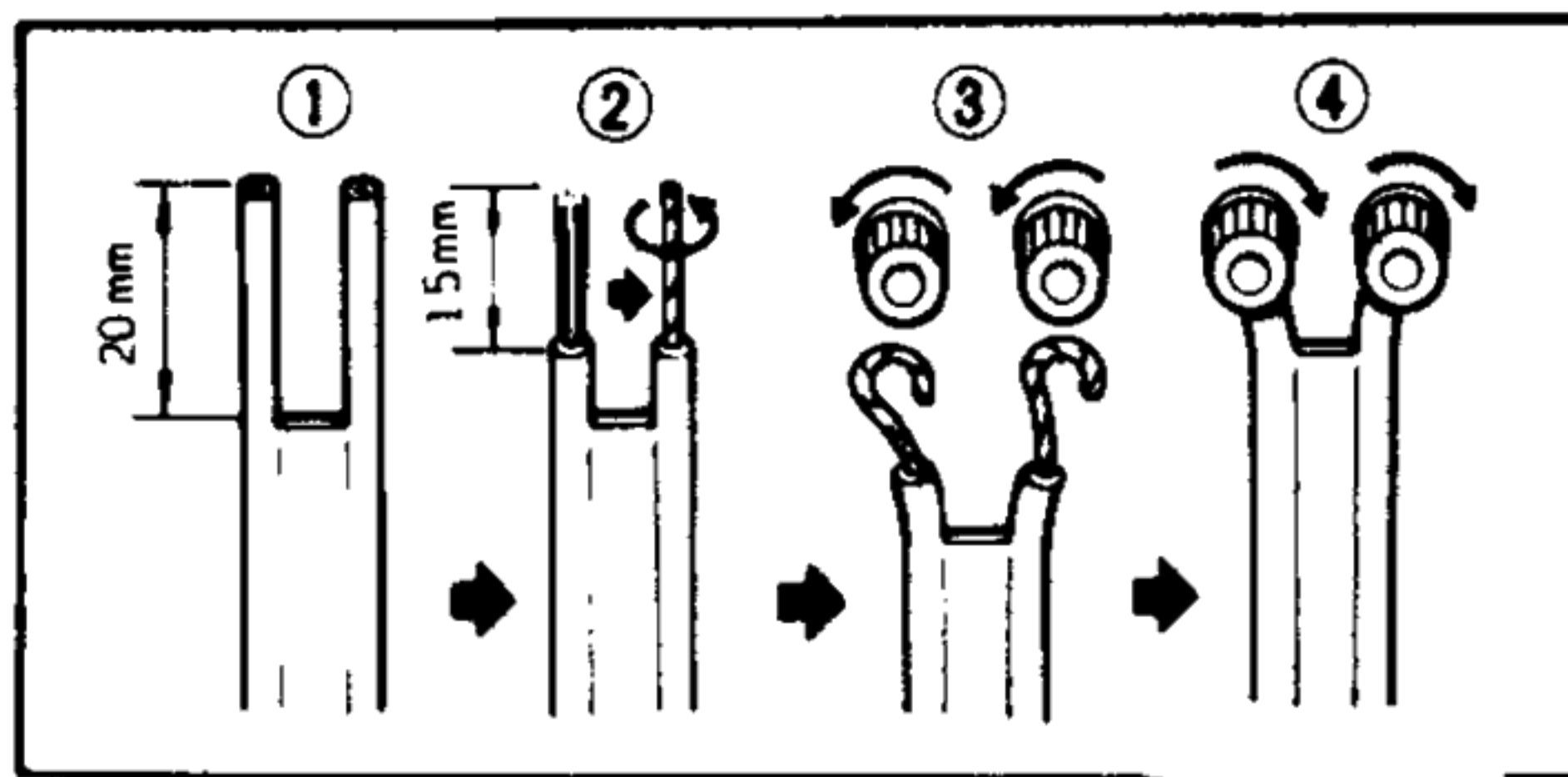
Special FM Antennas

It is recommended that you use a special FM antenna in order to obtain input signals which will allow your receiver to display its capabilities to the full.

- When installing your antenna, refer to the instructions in "FM RECEPTION" on page 12 and determine in which direction the antenna should point for the best reception, all the while listening to a broadcast to check the reception. Mount the antenna securely.
- In accordance with the application of the antenna, use a 75-ohm coaxial cable or a 300-ohm feeder to connect the antenna to the receiver.

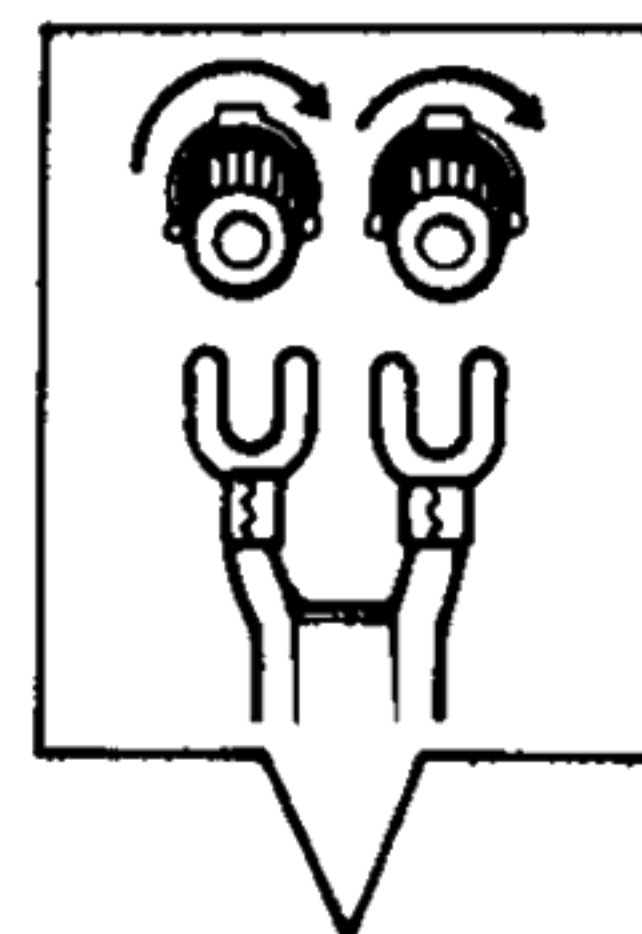
300-ohm feeder preparation

1. Cut out the center portion.
2. Twist the lead wire.
3. Unscrew the terminal cap and wind the wire around the stud, between the toother washer and the base.
4. Tighten the terminal cap.



T-type antenna connection

Insert the Y-tips between the toothed washer and the base, and tighten the terminal cap.



75-ohm coaxial cable: As shown in Fig. 6, connect the cable to the 75Ω UNBAL terminal of the receiver. This cable is used in locations near roads with a great deal of traffic, and near overhead high-tension power lines which generate a lot of noise. It is also used when the antenna and the receiver are far apart.

300-ohm feeder: As shown in Fig. 6, connect the feeder to the 300Ω BAL terminals. Use it when there is little external noise and when the antenna and the receiver are not far apart.

NOTE:

Consult your nearest PIONEER audio dealer concerning the special FM antenna and the 75-ohm coaxial cable.

T-type Antenna

When the broadcasting station is located nearby and when the FM signals are strong in wooden frame buildings and the like, you can use the accessory T-type antenna (Fig. 6).

As shown in Fig. 6 connect the end of the T-type antenna to the 300Ω BAL terminals. Spread the two arms of the antenna horizontally and while listening to an FM broadcast, rotate the antenna through 180 degrees and position it for the best reception. Tape the antenna to a wall or ceiling.

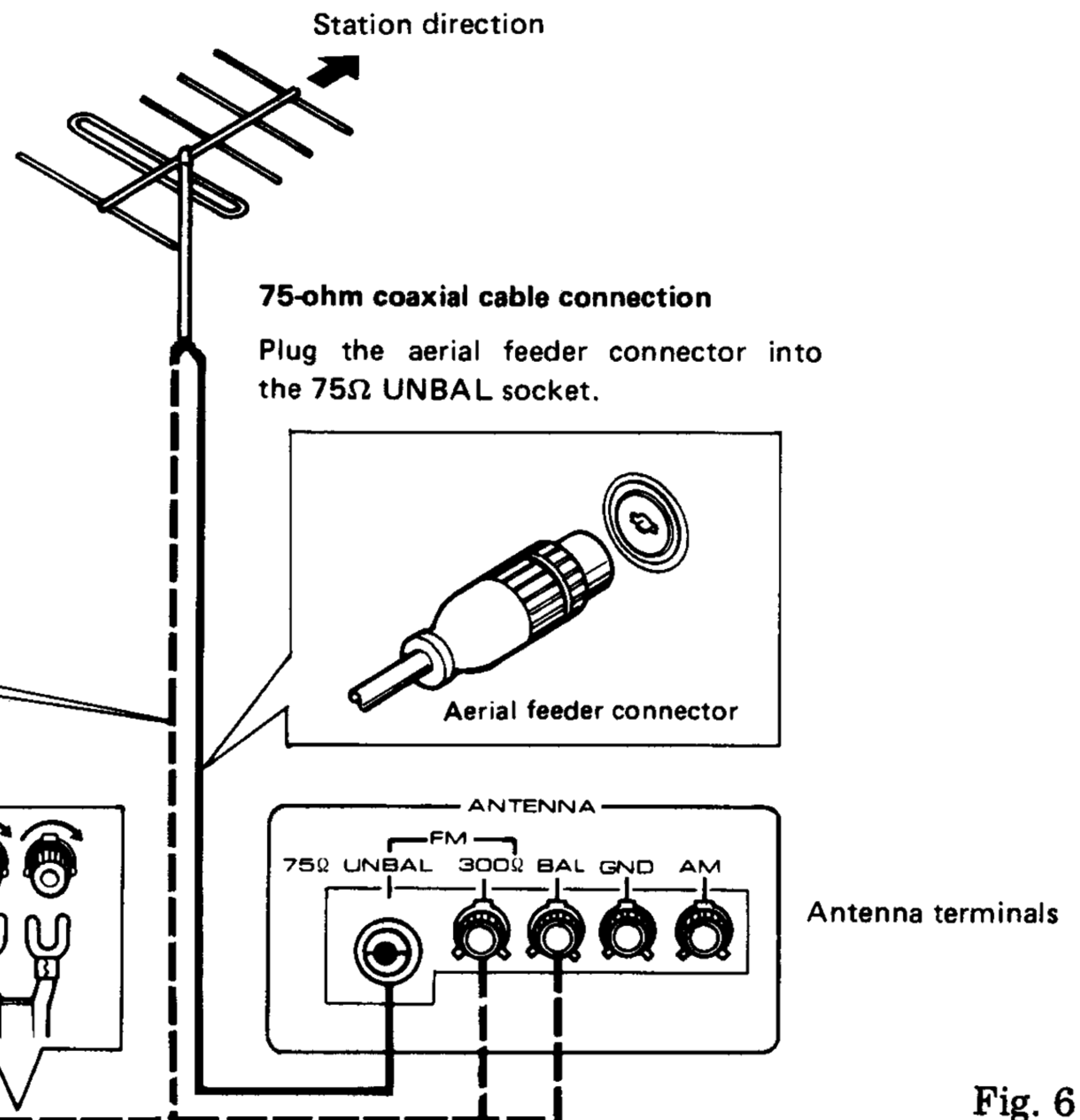


Fig. 6

AM ANTENNA CONNECTION

Move the AM bar antenna on the rear panel of the receiver and find the best reception position (Fig. 7), all the while following the instructions outlined on page 12 under "AM RECEPTION"

NOTE:

- The AM bar antenna on the receiver's rear panel displays directivity, so some stations may be poorly received. In such cases, change the installation of the receiver.
- If you still cannot obtain good reception even by moving the AM bar antenna, erect an indoor AM antenna with a vinyl-insulated wire (about 5-6 meters long). As shown in Fig. 8, connect the lead wire to the AM antenna terminal, and tape it to the wall or ceiling.
- If you live in an area where the reception is poor even if you erect an indoor AM antenna, use a tree to erect an outdoor AM antenna with a vinyl-insulated wire (Fig. 8).

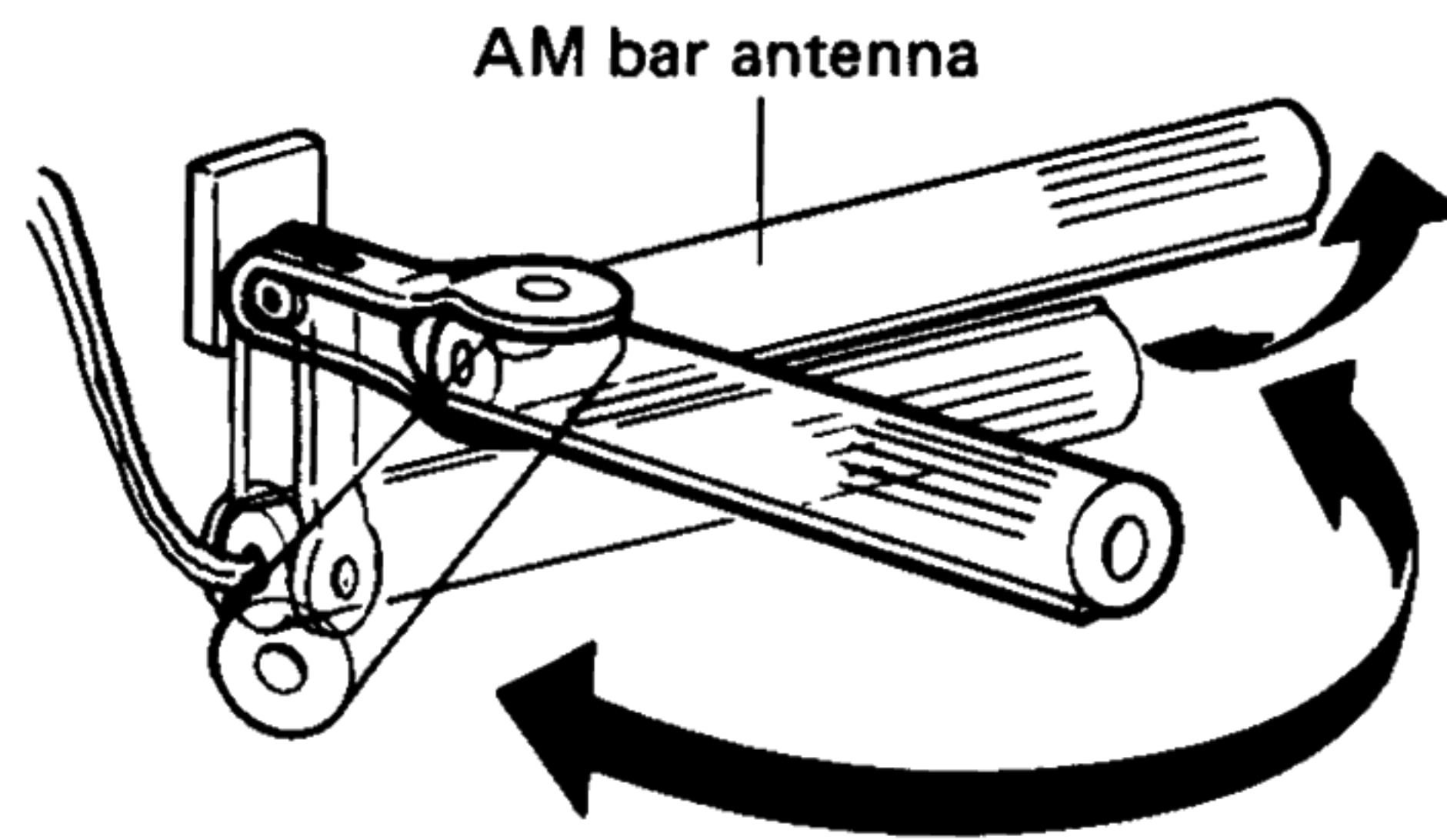


Fig. 7

GROUND

As shown in Fig. 8, connect a ground lead to the ground terminal on the receiver for maximum safety and noise reduction, never make this connection near gas pipes and other potentially dangerous locations.

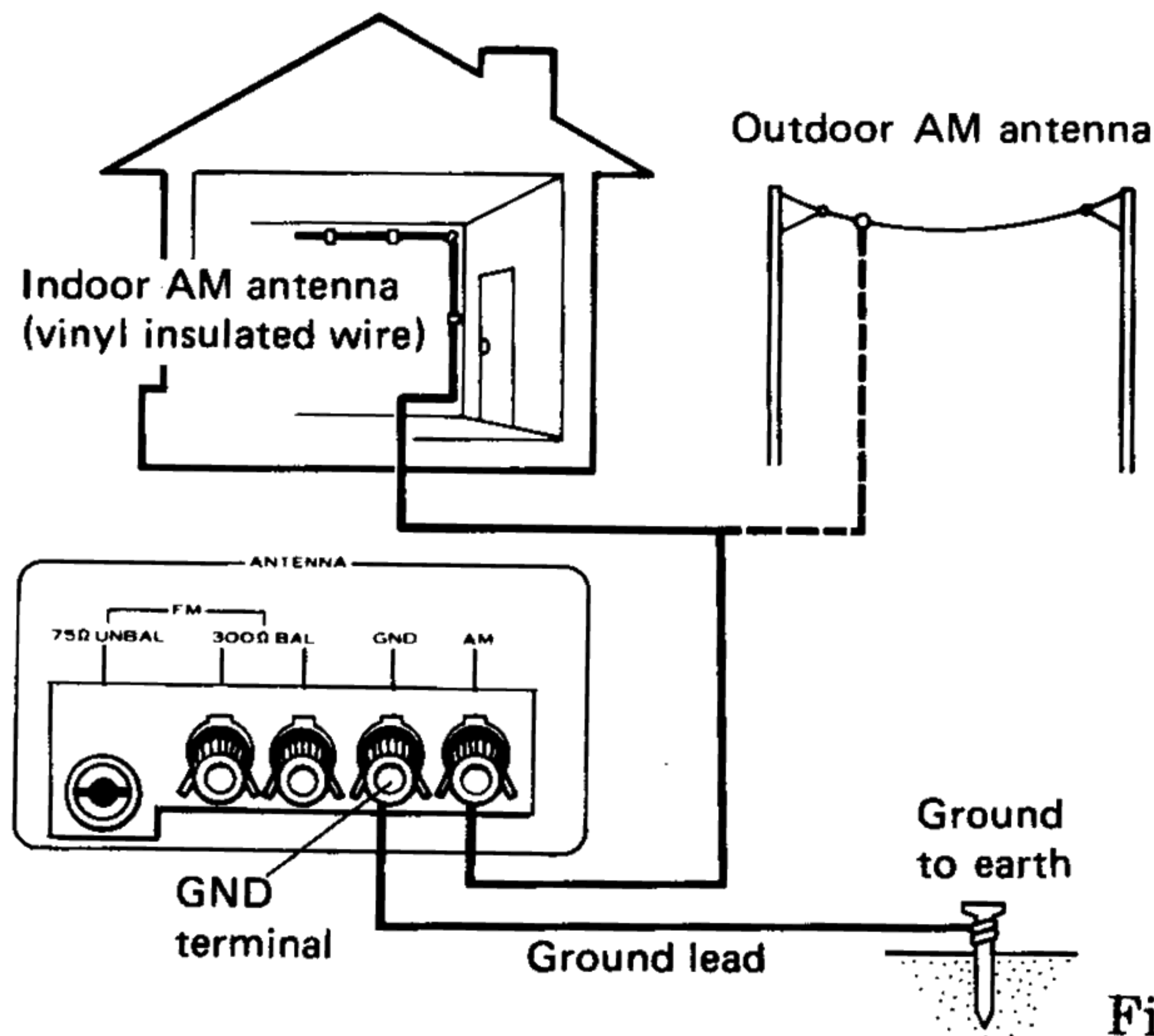
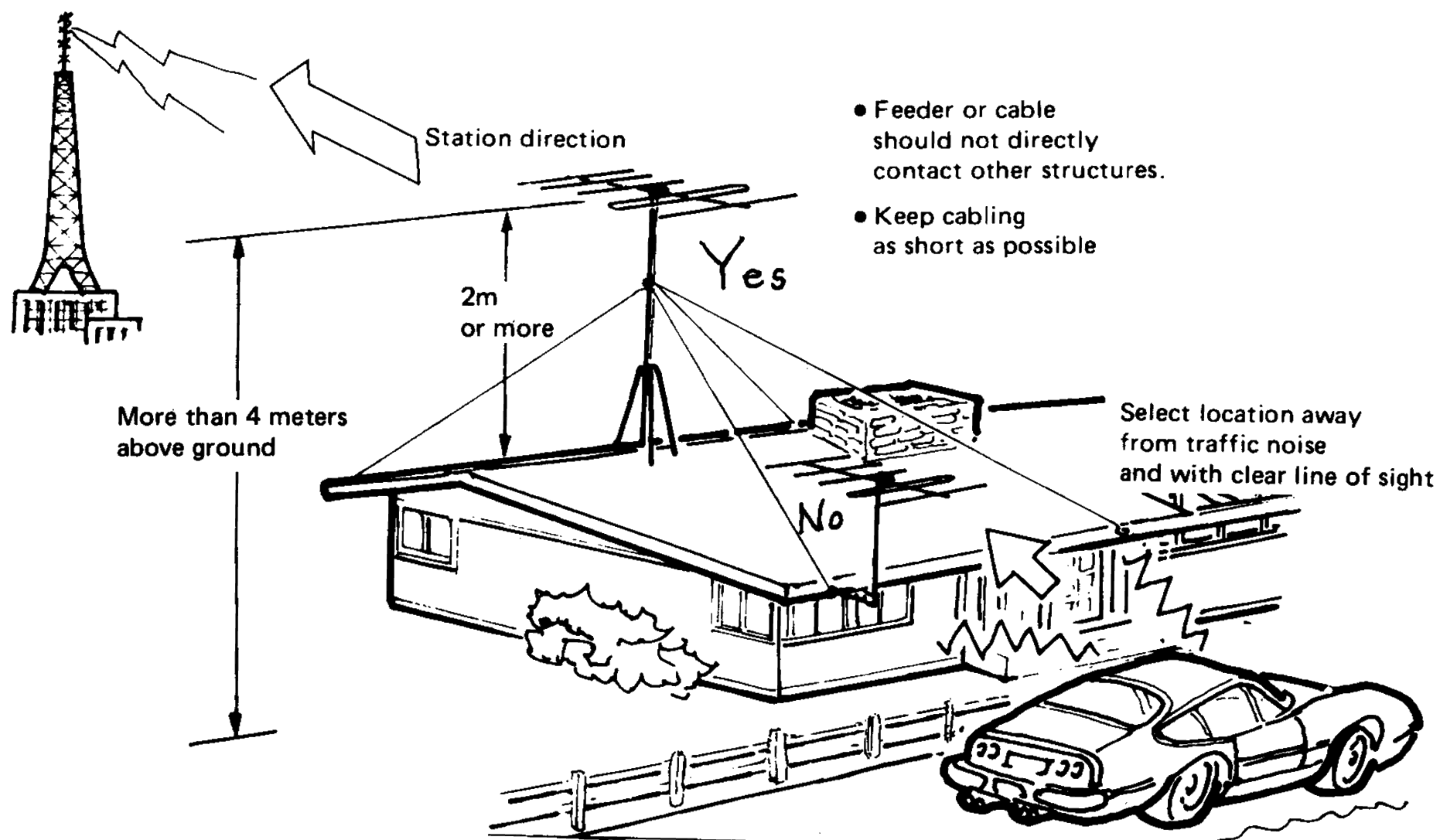


Fig. 8

FM ANTENNA LOCATION

It is important to choose the installation locations for your antenna with care for the stable reception of the signals from FM broadcasting stations and

for superior sound reproduction. Bear in mind the following points and determine the optimum location (height and direction).



FRONT PANEL FACILITIES

POWER METERS

These meters allow you to read out the rated power level when speakers with a nominal impedance of 8 ohms are connected to the receiver's speaker terminals.

NOTE:

These values are related to the impedance of the speakers and they vary according to the frequency. In order to find out the exact output level, connect an 8-ohm dummy load instead of the speakers.

POWER SWITCH

Set this switch to ON to supply power to the receiver. There will be a short delay when it is set to ON, because the muting circuit has been actuated to suppress the unpleasant noise that is sometimes generated when the power is switched on and off.

HEADPHONES JACK

Plug the headphones into this jack when you want to listen through your stereo headphones. Release both SPEAKERS buttons if you want to listen to the sound through your headphones only (This means that both buttons will be released).

SPEAKERS SWITCHES

Depress the button corresponding to the speakers connected to the SPEAKERS terminals (A or B) on the rear panel. You can depress both of these buttons to listen to sound from two pairs of speaker systems at the same time.

BASS AND TREBLE CONTROLS

When turned clockwise from the OFF position, the response in the bass or treble range, respectively, is boosted. Turning counterclockwise attenuates the response. At the OFF position the tone control circuit is bypassed and frequency response is flat.

TAPE MONITOR INDICATOR

With either of the TAPE MONITOR switches set to ON, the TAPE MONITOR indicator lights up. This lamp indicates the receiver is monitoring or playing back the tape on the tape deck connected to the TAPE jacks.

SOURCE INDICATOR

With either of the TAPE MONITOR switches set to OFF, the SOURCE indicator lights up. This lamp indicates the receiver is playing the program source; AM broadcast, FM broadcast, record on the turntable, or another component connected to the AUX jacks.

DIAL POINTER

This pointer indicates the broadcasting stations.

STEREO INDICATOR

This indicator lights up when the receiver is tuned in to receive a stereo broadcast.

AM/FM TUNING METER

When tuning in to FM stations, position the meter pointer in the center of FM area for optimum reception. In the case of AM stations, tune for maximum meter deflection toward the right of the scale.

TUNING KNOB

Use this knob to tune in to broadcasting stations. Select the station and tune for optimum reception by observing the dial scale and the AM/FM tuning meter.

VOLUME CONTROL

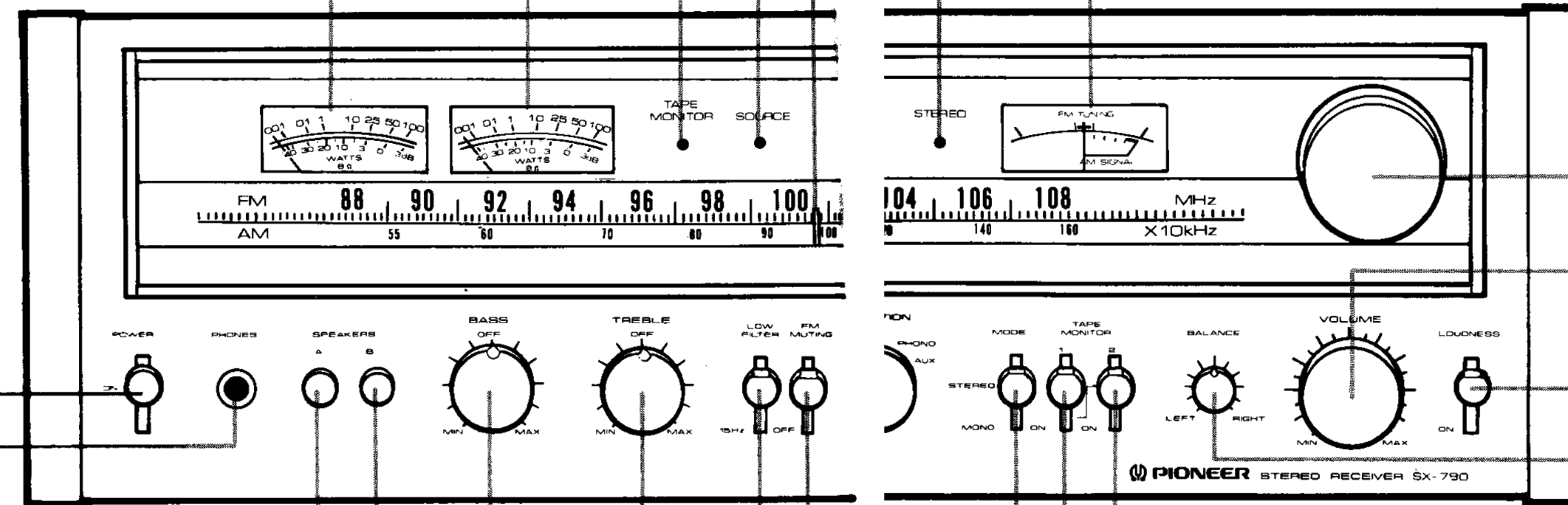
Use this control to adjust the output level to the speakers and headphones. Turn it clockwise to increase the output level. No sound will be heard if you set to MIN.

LOUDNESS SWITCH

Set this switch to ON when listening at a low volume. The frequency response of the human ear varies according to the listening volume, and setting this switch to the ON position compensates for hearing response by emphasizing the bass and treble.

BALANCE CONTROL

Use this control to balance the volume of the left and right channels. First, however, set the MODE switch to MONO. If the sound appears to be louder on the right, it means that the volume of the right channel is higher. Turn the BALANCE control to the left and adjust. Conversely, if the sound appears to be louder on the left, it means that the volume of the left channel is higher. Therefore, turn the BALANCE control to the right and adjust. After adjusting, return the MODE switch to STEREO.



LOW FILTER SWITCH

When this switch is set to 15Hz, a 6dB/oct attenuation can be provided for frequencies below 15Hz. This means that you can cancel out noise in the ultra-low frequencies which is generated by low-pitched rumble from a turntable and other forms of distortion. Although this noise cannot be heard, it can generate intermodulation distortion and damage the speakers.

FM MUTING SWITCH

When this switch is set to the upper position (On), the FM muting function acts to suppress unpleasant interstation noise while tuning between the FM broadcasting stations. When the switch is set to the OFF position, the FM muting function does not act, thus enabling suitable reception of weak radio stations.

FUNCTION SWITCH

Use this switch to select the program source. For a second after the switch is selected, no sound will be heard. This is due to the operation of the muting circuit, which can suppress the unpleasant switching noise generated when the FUNCTION switch is selected.

- AM: When listening to AM broadcasting.
- FM: When listening to FM broadcasting. The STEREO indicator lights up when the receiver is tuned in to an FM stereo broadcast.
- PHONO: When playing a record on the turntable connected to the PHONO jacks.
- AUX: When listening to an audio component connected to the AUX jacks.

TAPE MONITOR SWITCHES (1, 2)

Set switch 1 to ON with a tape deck which is connected to the TAPE 1 jacks (REC and PLAY) when you want to monitor the playback or recording of a tape. The tape on a deck which is connected to the TAPE 2 jacks (REC and PLAY) can be similarly monitored by setting switch 2 to ON. For details, refer to "TAPE DECK OPERATIONS" on page 13.

NOTE:

Set the switches to the upper (OFF) position when listening to records or broadcasts.

MODE SWITCH

- Use this switch for selecting mono or stereo performances.
- STEREO: Set to this position for normal stereo operation.
- MONO: When set to this position, the left and right channel signals will be mixed and reproduced monophonically from both speaker systems.

BEFORE OPERATION

Before switching the power on, set the various controls as follows:

Depress the **SPEAKERS** button that corresponds to the speaker system which is connected to the **SPEAKERS** terminals on the rear panel.

Set the **VOLUME** control to the **MIN** position. Set the **BALANCE** control to the center position.

Set the **TAPE MONITOR** switch 1 and 2 to the upper position (off).

Set the **LOW FILTER** switch to the upper position (off).

Set the **FM MUTING** switch to the upper position (on).

Set the **MODE** switch to the **STEREO** position. Set the **BASS** and **TREBLE** controls to the **OFF** position.

Set the **LOUDNESS** switch to the upper position (off).

FM RECEPTION

1. Set the **FUNCTION** switch to the **FM** position. Slightly turn the **VOLUME** control clockwise to obtain the sound.

2. Select the broadcasting station with the tuning knob. Adjust so that the tuning meter pointer is centered, as indicated in Fig. 9.

Set the **FM MUTING** switch to **OFF** if the signals from the station are weak.

If the program is being broadcast in stereo, the **STEREO** indicator will come on.

3. Adjust the volume with the **VOLUME** control. 4. Set the **BASS** and **TREBLE** controls for the preferred bass and treble levels.

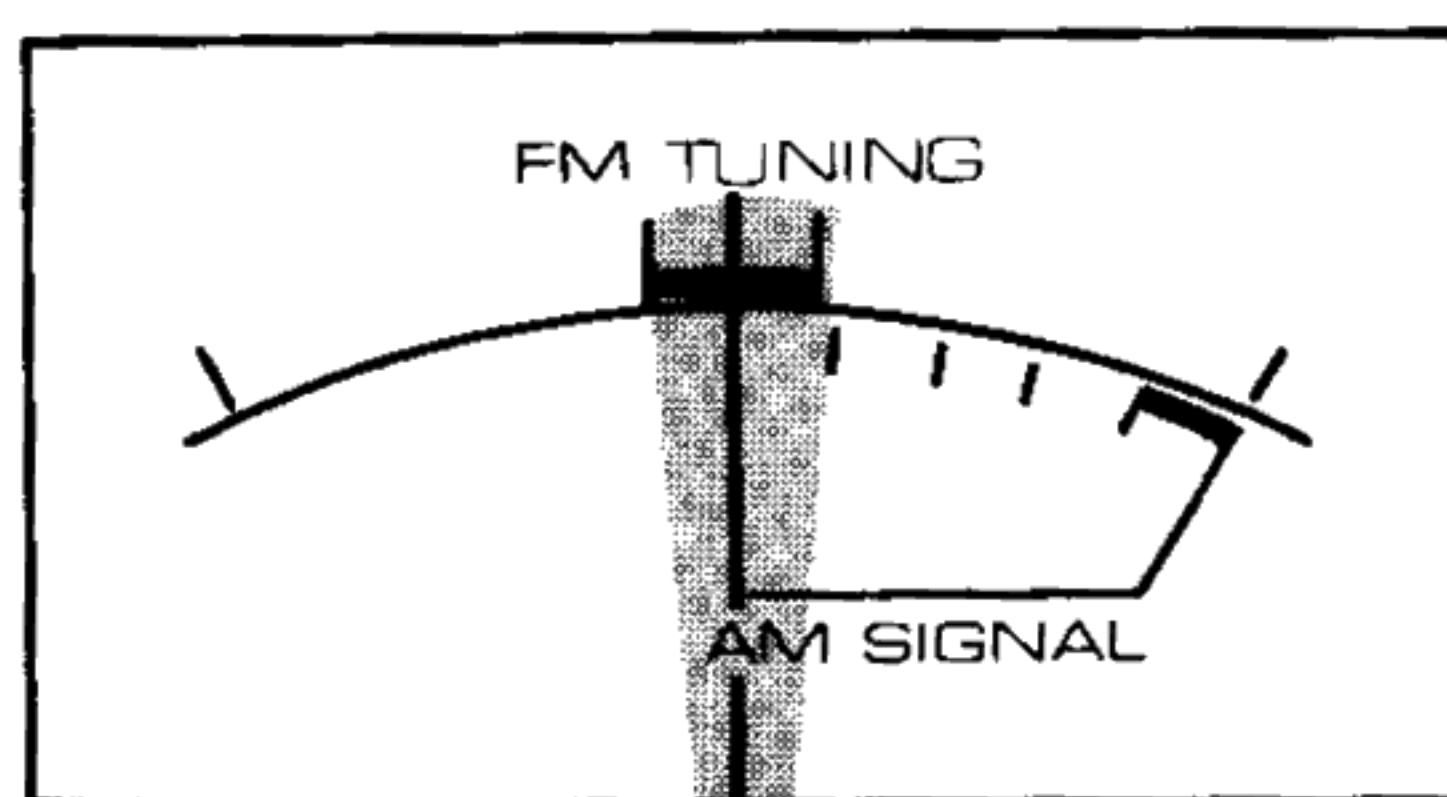


Fig. 9

AM RECEPTION

1. Set the **FUNCTION** switch to the **AM** position.
2. Slightly turn the **VOLUME** control clockwise to obtain the sound.
3. Turn the tuning knob to select a station. The best reception is obtained when the tuning meter pointer deflects to the extreme right, as indicated in Fig. 10.
4. Adjust the volume with the **VOLUME** control.
5. Set the **BASS** and **TREBLE** controls for the preferred bass and treble levels.

NOTE:

If, when listening to either an **FM** or **AM** broadcast, your listening pleasure is seriously affected by poor sensitivity or strong interference, refer to the section "ANTENNA AND GROUND CONNECTIONS" on page 8, and make any necessary changes.

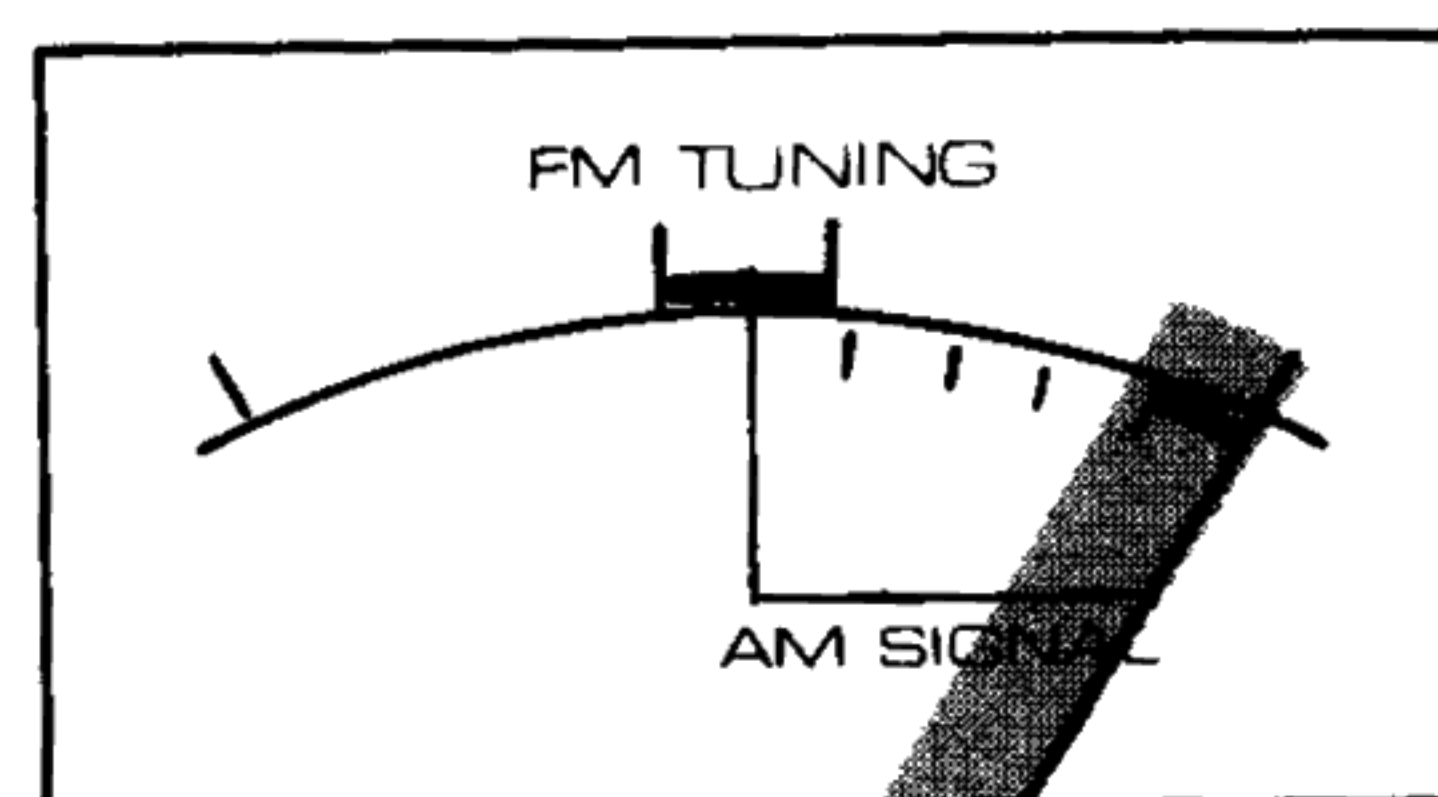


Fig. 10

PLAYING RECORDS

1. Set the **FUNCTION** switch to the **PHONO** position.
2. Operate the turntable to play the record.
3. Adjust the volume with the **VOLUME** control.
4. Set the **BASS** and **TREBLE** controls for the preferred bass and treble levels.

Precautions when playing records

- Lower the stylus gently onto the surface of the record. It is a good idea to turn the volume down when lowering the stylus onto the record.
- Do not cause the turntable to vibrate while a record is being played, since this will cause the stylus to jump and scratch the record. Do not turn off the power if the stylus is still tracing grooves on the record.

USING THE AUX JACKS

1. Set the **FUNCTION** switch to the **AUX** position.
2. Operate the audio component which you have connected to the **AUX** jacks.
3. Adjust the volume with the **VOLUME** control.
4. Set the **BASS** and **TREBLE** controls for the preferred bass and treble levels.

TAPE DECK OPERATIONS

PLAYBACK

Proceed as follows when playing back pre-recorded music tapes available on the market, and tapes on which you have recorded programs:

1. As shown in Fig. 11, set the TAPE MONITOR switch 1 to ON if the tape deck is connected to the TAPE 1 jacks. Set the TAPE MONITOR switch 2 to ON if it is connected to the TAPE 2 jacks.
2. Operate the tape-deck controls for playback.
3. Adjust the volume with the VOLUME control.
4. Set the BASS and TREBLE controls for the preferred base and treble levels.

NOTES:

1. Always return both of the TAPE MONITOR switches to the upper position (OFF) when you are not playing back a tape
2. As long as the TAPE MONITOR switch 1 or 2 is at ON, you will be able to play back a tape regardless of the setting of the FUNCTION switch.

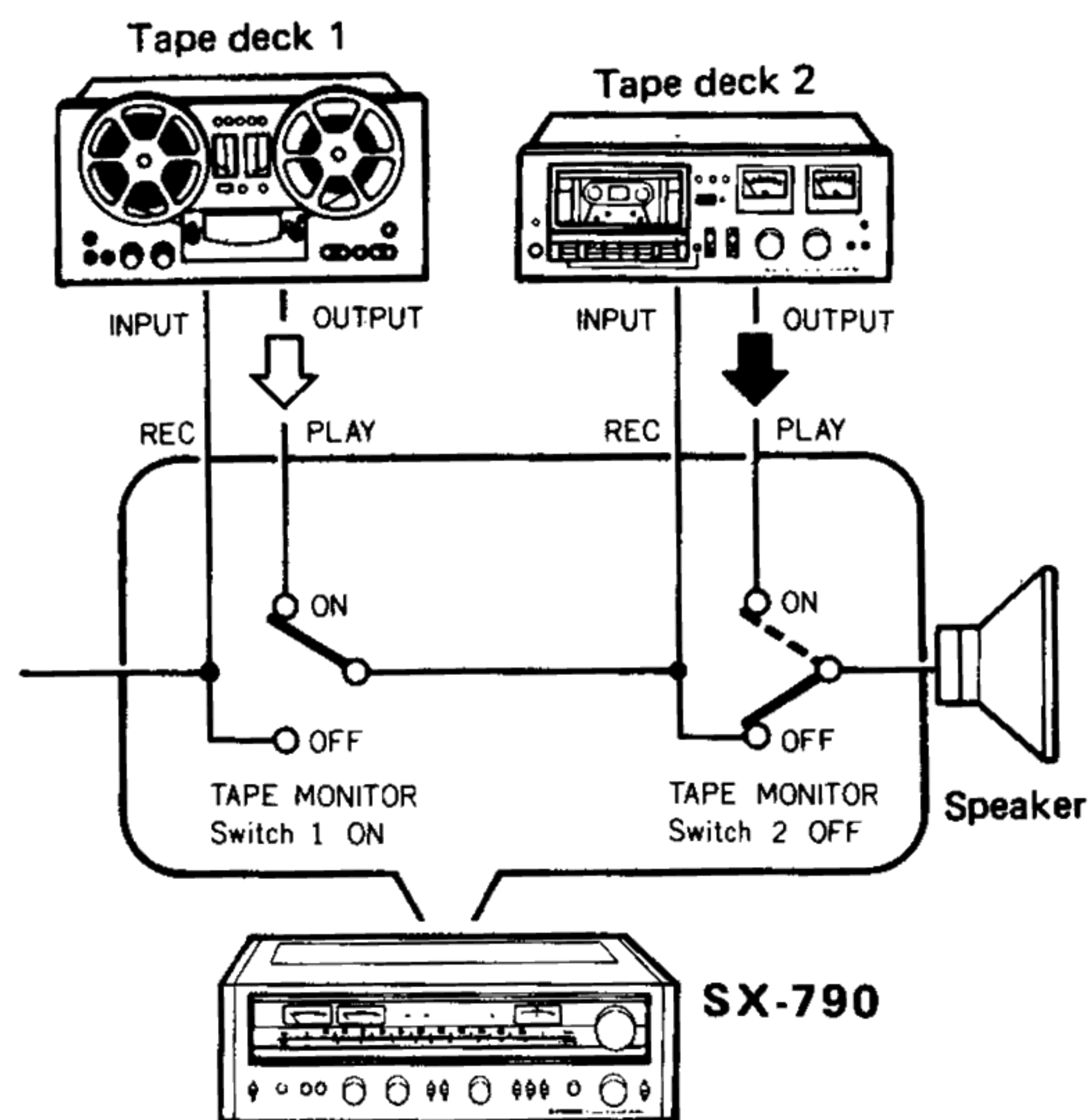


Fig. 11

RECORDING

1. Set the FUNCTION switch to the program source to be recorded.
2. Play the selected program source.
3. Set recording level by means of the controls on the tape deck. During recording, the VOLUME, BASS, and TREBLE controls of the receiver have no effect on the recording level.
4. Operate the tape deck controls and start recording.

NOTE:

When recording, keep the MODE switch at STEREO.

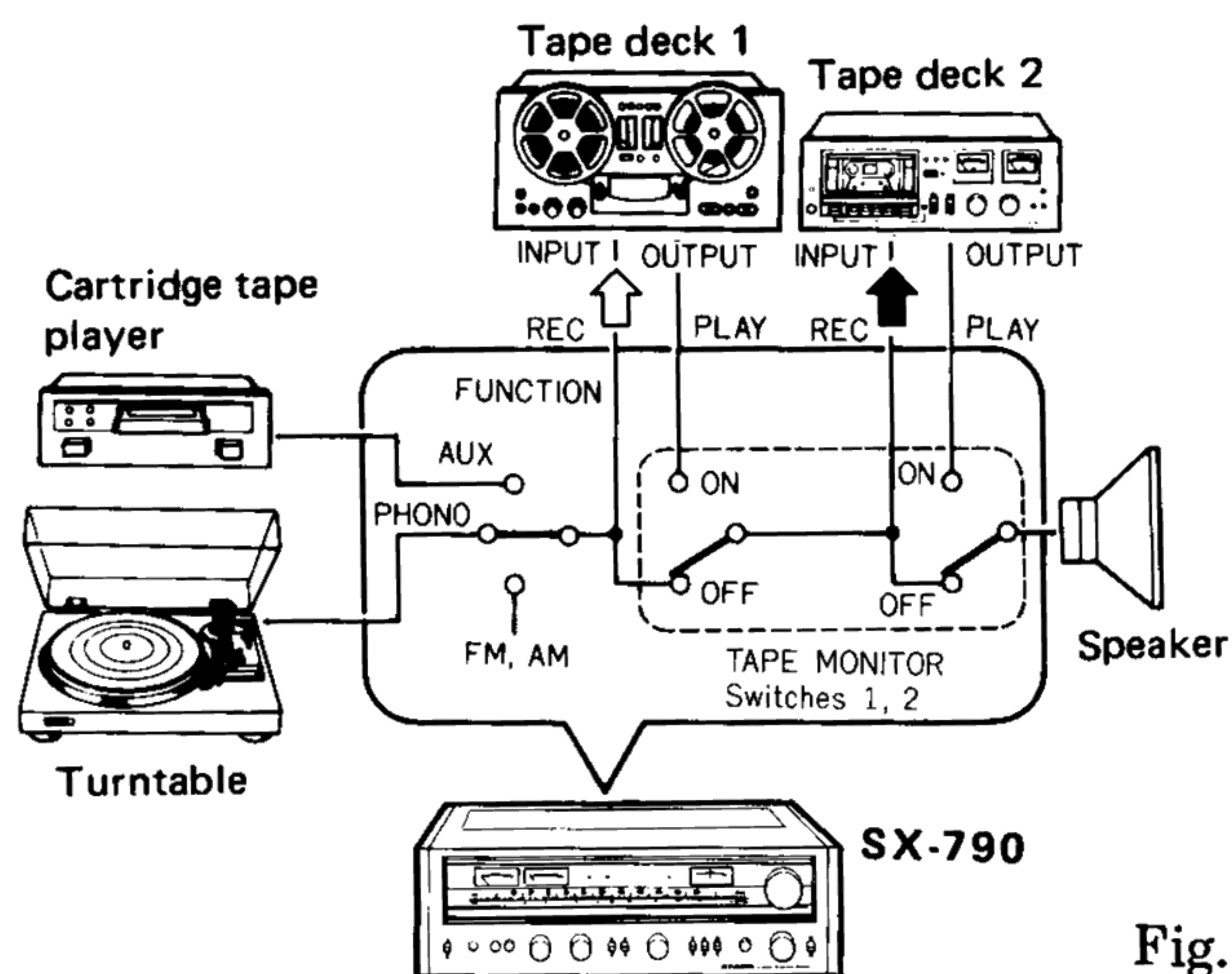


Fig. 12

TAPE MONITORING

If a recording is being made on a 3-head tape deck, the recorded sound can be monitored through the speaker systems if the TAPE MONITOR switch 1 or 2 is set to ON. In this case, both recording and playback connections must be made.

NOTE:

If you have a 2-head open-reel deck or cassette deck, you will not be able to monitor the recorded sound even if you set the TAPE MONITOR switch to ON. However, you will be able to hear the sound at the playback end (program source).

DUPLICATING AND EDITING RECORDED TAPES

1. As shown in Fig. 13, connect the tape deck for the receiver's TAPE 1 and TAPE 2 jacks.
2. Playback the recorded tape on tape deck 1 and set the TAPE MONITOR switch 1 to ON.
3. Operate the controls on tape deck 2 and start recording.
4. Set the TAPE MONITOR switch 2 to ON when you want to monitor the recorded sound.

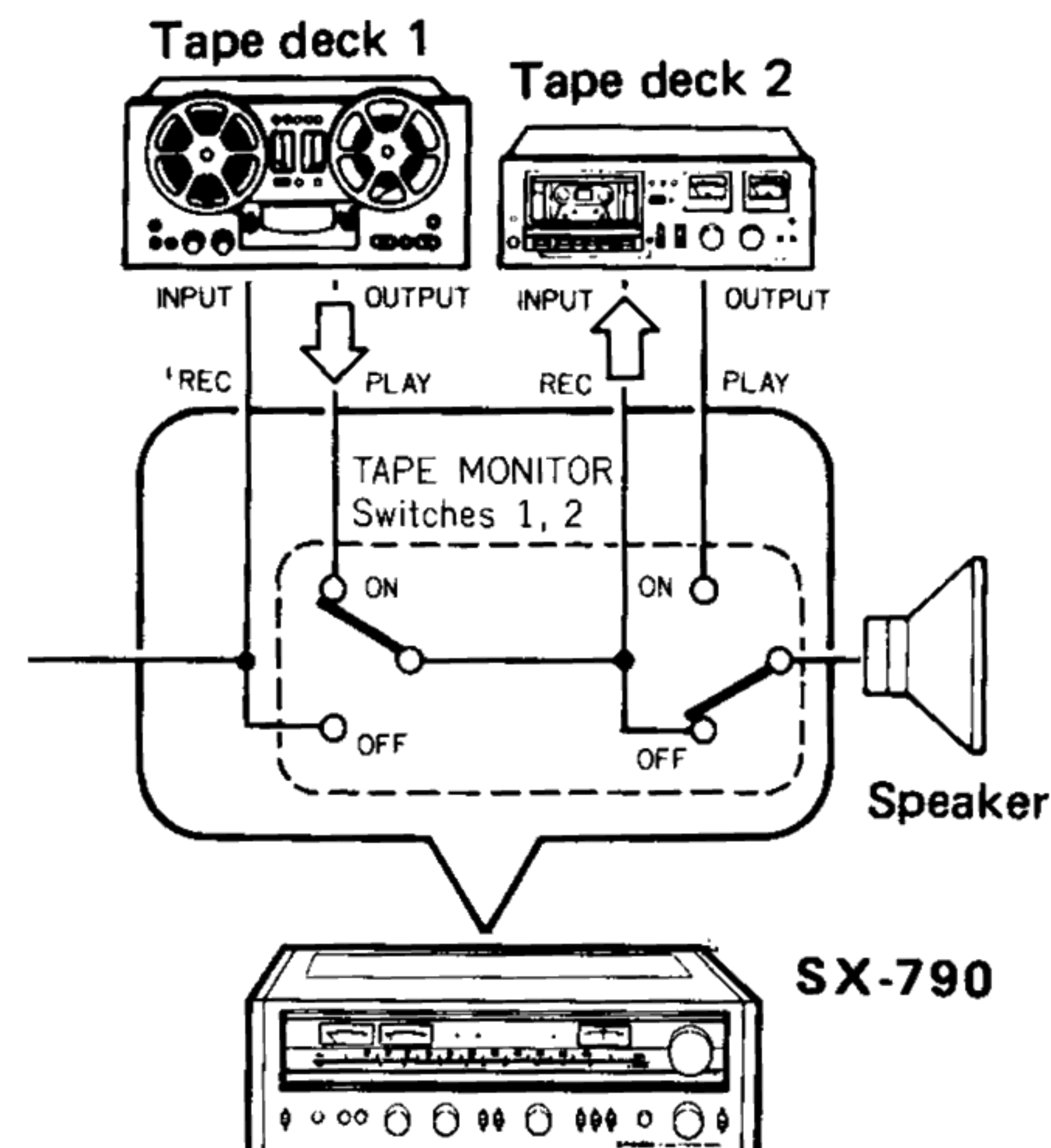


Fig. 13

FOR USE IN UNITED KINGDOM OR AUSTRALIA

CAUTION 240V: MAINS SUPPLY VOLTAGE IS FACTORY ADJUSTED AT 240 VOLTS.

WARNING: THIS APPARATUS MUST BE EARTH-ED.

IMPORTANT

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

Green-and-yellow:	Earth
Blue:	Neutral
Brown:	Live

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

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

The power cord should be connected last, make sure that the power switch is off. First insert the female appliance connector of the mains cord into the AC INLET, then plug the cord to the wall socket. Be sure that the appliance connector is fully inserted into the AC INLET. Unplug the set from the wall socket when it is not be used for an extended period of time.

FOR YOUR SAFETY

1. Insert this plug only into effectively earthed three-pin plug-socket outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cords, if used, must be three-core correctly wired.

SPECIFICATIONS

Semiconductors

FETs	5
ICs	11
Transistors	26
Diodes	22

Amplifier Section

Continuous Power Output of 45 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.05% total harmonic distortion, or 45 watts per channel at 4 ohms from 20 Hertz to 20,000 Hertz with no more than 0.08% total harmonic distortion.

Continuous Power Output at 1kHz (both channels driven)

T.H.D. 0.05%, 8 ohms 45 watts per channel

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from AUX)

continuous rated power output No more than 0.05%

23 watts per channel power output,

8 ohms No more than 0.03%

1 watt per channel power output,

8 ohms No more than 0.03%

Intermodulation Distortion (50 Hertz:7,000 Hertz=4:1, from AUX)

continuous rated power output No more than 0.05%

23 watts per channel power output,

8 ohms No more than 0.03%

1 watt per channel power output,

8 ohms No more than 0.03%

Input (Sensitivity/Impedance)

PHONO 2.5mV/50 kilohms

AUX 150mV/50 kilohms

TAPE PLAY 1 150mV/50 kilohms

TAPE PLAY 2 150mV/50 kilohms

TAPE PLAY 2 (DIN connector) 150mV/50 kilohms

Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms) . . . 30

PHONO Overload Level (1kHz, T.H.D.: 0.05%) . . . 200mV

Output (Level/Impedance)

TAPE REC 1 150mV

TAPE REC 2 150mV

TAPE REC 2 (DIN connector) 30mV/80 kilohms

SPEAKERS A, B, A+B

HEADPHONES Low impedance

Frequency Response

PHONO (RIAA equalization) . 20Hz to 20,000Hz ± 0.2 dB

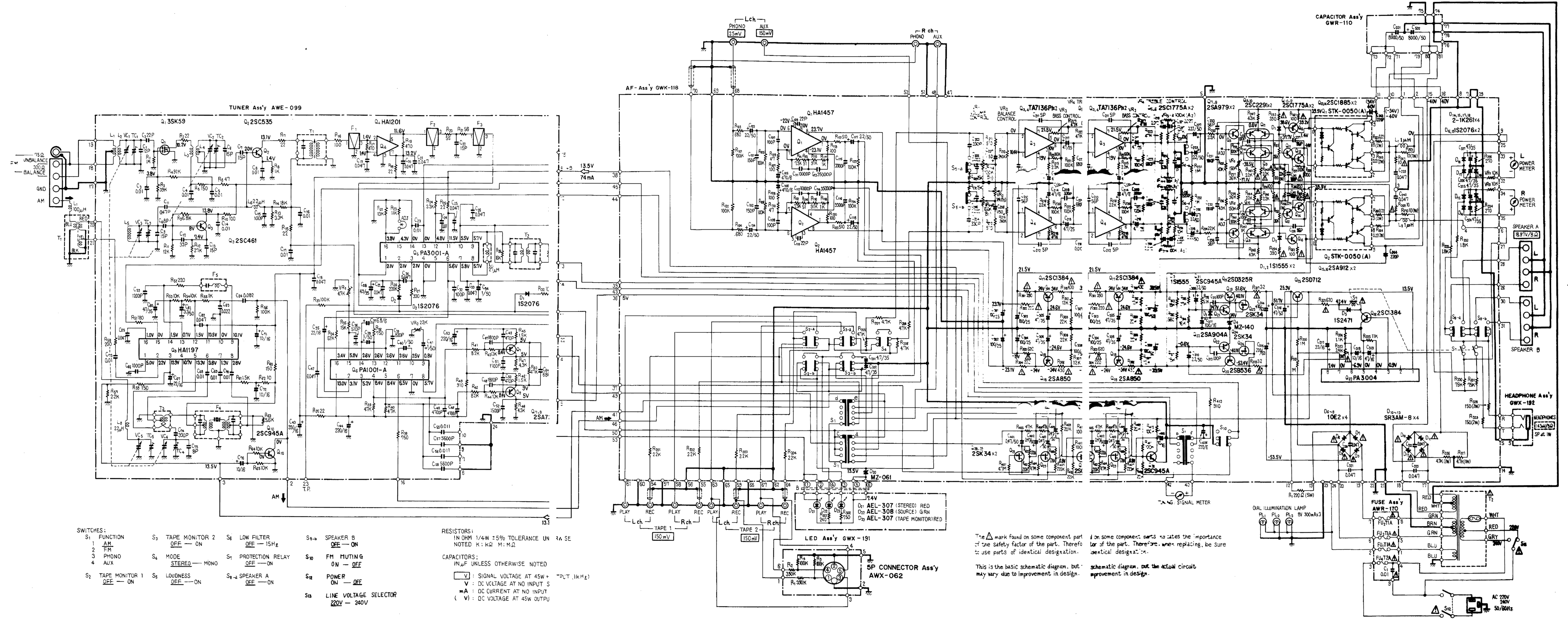
AUX, TAPE PLAY 5Hz to 80,000Hz $^{+0}_{-1}$ dB

Tone Control

BASS +8dB, -7dB (100Hz)

TREBLE +7dB, -6dB (10kHz)

Filter Low 15Hz (6dB/oct.)



- SWITCHES:**
- | | | | |
|---|-------------------------------|---------------------------------|--|
| S1 FUNCTION
1 AM
2 FM
3 PHONO
4 AUX | S3 TAPE MONITOR 2
OFF — ON | S6 LOW FILTER
OFF — 15Hz | S8-a SPEAKER B
OFF — ON |
| S2 TAPE MONITOR 1
OFF — ON | S4 MODE
STEREO — MONO | S7 PROTECTION RELAY
ON — OFF | S10 FM MUTING
ON — OFF |
| | S5 LOUDNESS
OFF — ON | S8-b SPEAKER A
OFF — ON | S12 POWER
ON — OFF |
| | | | S13 LINE VOLTAGE SELECTOR
220V — 240V |

- RESISTORS:**
IN OHM 1/4W ±5% TOLERANCE UN
NOTED K: K2 M: M2
- CAPACITORS:**
IN μF UNLESS OTHERWISE NOTED
- ⊕: SIGNAL VOLTAGE AT 45W +
⊖: DC VOLTAGE AT NO INPUT S
⊕A: DC CURRENT AT NO INPUT
(⊖): DC VOLTAGE AT 45W OUTPU

The Δ mark found on some component part of the safety factor of the part. Therefore to use parts of identical designation.

This is the basic schematic diagram, but may vary due to improvement in design.

In some component parts Δ notes the importance of the part. Therefore, when replacing, be sure of identical designation.

Δ on some component parts notes the importance of the part. Therefore, when replacing, be sure of identical designation.

AC 220V
240V
50/60Hz

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

If your stereo appears to malfunction, first check such things as the controls (POWER switch, FUNCTION switch, TAPE MONITOR switch, etc.) and connecting cords (components connected correctly).

Noise: There are a variety of noises relating to the operation of a hi-fi unit. There are generally divided into two types: (1) the unit is faulty (a transistor or part has deteriorated), and (2) an external source is interfering with the unit.

When a hi-fi unit produces an unpleasant noise, it is often assumed that the unit is faulty; however, statistical records indicate that the majority of noise produced in hi-fi acoustic units results from external sources of noise: Due to the inherent high-sensitivity and the high-fidelity reproduction, the unit amplifies and reproduces extraneous noises, however small, into audible output noise. If your receiver produces a noise, check according to the following table and trace the source of noise for the appropriate corrective action.

	Symptom	Suspected source of noise	Diagnosis and remedy
When listening to broadcasts	Continuous or intermittent buzzing noise.	<ul style="list-style-type: none"> • Static (lighting) • A fluorescent lamp, motor, or thermostat may be in use in the house or in the vicinity. 	In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in hum is mixed in the program.	<ul style="list-style-type: none"> • A poor fluorescent lamp, motor, or electric heater may be in use in the house or nearby. 	Reversing the power plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing noise in AM (medium wave) reception.	<ul style="list-style-type: none"> • The frequency of an adjacent station is interfering with that of the station being tuned in to (10kHz beat interference). • TV set is on in the same house with the receiver. 	Impossible to remove such interference. If the cause of such noise is the TV set, increase the distance between the TV set and receiver.
	Static noise (in particular, when automobiles run close to the house).	<ul style="list-style-type: none"> • White noise generated from automobile engines. • High-frequency sewing machine or welding machine being used near your house. 	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an FM outdoor antenna having many director elements.
	Reception of FM stereo program contains more noise than FM mono program.	<ul style="list-style-type: none"> • Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast. 	Increasing the FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-type antenna.
When playing records	Hum or buzz. When switched to radio reception, the noise disappears.	<ul style="list-style-type: none"> • Poor connection of shielded wire. (a) • Jack connection is loose. (b) • Power lead of fluorescent lamp passes near the shielded wire. (c) • Poor grounding. (d) • Ham transmitting station or TV transmitting station is near your house. (e) 	Correct the conditions stated in (a), (b), (c), or (d). In case of (e), report it to an official authority.
	Output tone quality is poor and mixed with noise. Treble is not clear.	<ul style="list-style-type: none"> • Stylus is worn. (a) • Record is worn. (b) • Dust adhering to stylus. (c) • Stylus is improperly mounted. (d) • Stylus pressure (tracking force) is not correct. (e) • The TREBLE level is too high. 	Check (a) through (e) and correct the condition.
	In playing a record, increasing the volume causes howling.	<ul style="list-style-type: none"> • Distance between the turntable and the speakers is too short. • The turntable or speakers supports are unstable. 	Increase the distance or rearrange the installation of the unit and speakers. (Installing the turntable on a firm, solid stand may alleviate this problem.) Do not enhance the BASS sound level excessively.

Protection Circuit

After the POWER switch is set to ON, there is delay of about 5 seconds before sound is obtained. This is due to the muting function of the protection circuit which eliminates unpleasant noise when the power supply is activated.

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