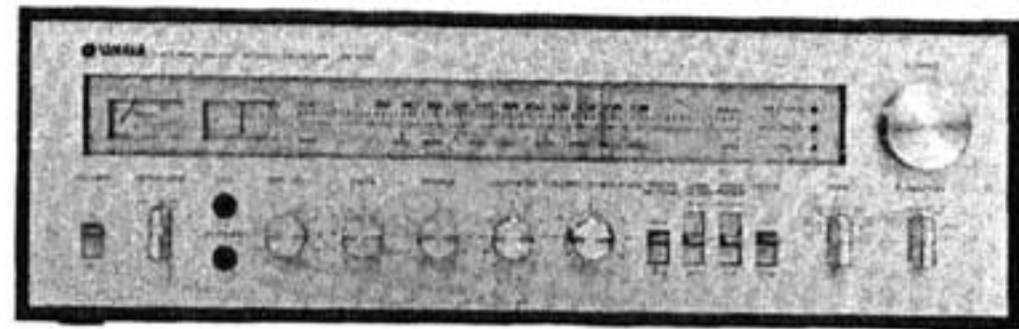
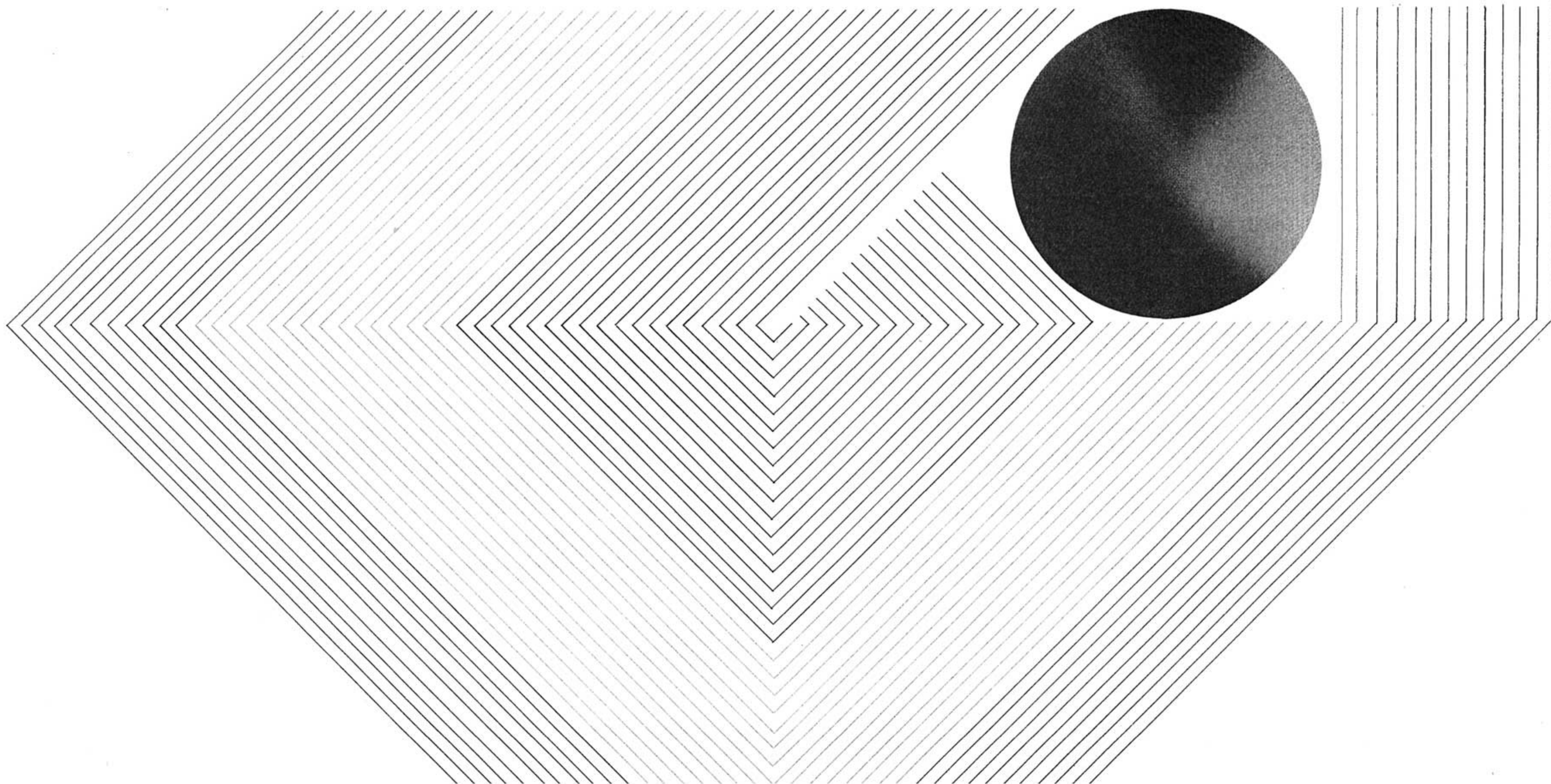


Yamaha Hi-Fi Stereo



CR-800

FM / AM • RECEIVER / OWNER'S MANUAL



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Warning; to prevent fire or shock hazard,
do not expose this appliance to
rain or moisture.

Varje högtalarimpedans är 8 ohm vid
A+B systemen.

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PRECAUTIONS

READ THIS FIRST

You may seriously damage any transistorized audio unit by being careless when you first operate it. Carelessness is the major cause of audio repairs. Avoid disappointment by following the precautions listed on this page. BEFORE attempting to plug in or operate your CR-800.

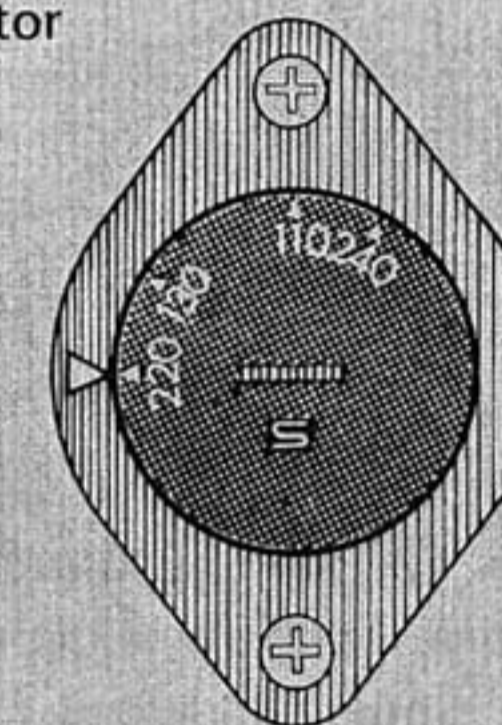
- Don't** locate your unit in direct sunlight or near a source of heat. Heat can damage transistors.
- Don't** force the knobs or switches.
- Don't** plug the CR-800 into a wall AC outlet unless you are sure the power switch is off.
- Don't** connect any other equipment (speakers, turntables, tape recorders, etc.) unless the power switch is off.
- Don't** turn on the power switch until you are sure that the speakers are properly connected and the volume is turned down to minimum.
- Don't** plug a microphone into the "PHONES" jack.
- Do** make sure that air can circulate freely above, under, and behind your unit.
- Do** protect the cabinet finish from insecticides, paint thinner and other volatile materials.
- Do** protect your CR-800 from dampness, dust and mechanical shocks.
- Do** use only 8 ohm speakers if you intend to play "A" and "B" speaker pairs simultaneously.

If your set has a voltage selector, before you plug in the power cord check that the selector is set to your local current.

If not properly set, turn the knob and reset it to the correct position.

Voltage settings: 110, 130, 220, 240V (the 150, 260V settings are not connected).

Voltage Selector



TO CHECK THE SOUND QUICKLY ON FM

First, connect a stereo pair of speakers to the upper (A) row of four output (SPEAKER) terminals on the rear panel of your CR-800. Connect the (L) outputs to your left speaker, and the (R) outputs to your right speaker.

To assure "in phase" operation of the two speakers, connect only black (-) output terminals to (-)

speaker terminals, and red (+) output terminals to (+) speaker terminals. See Fig. 1.

Next, connect the FM ribbon dipole antenna (included accessory) to the two "300Ω" terminals on the rear panel under "FM ANTENNA." See Fig. 2.

Next, make sure the CR-800 POWER switch is off. Plug the AC power cord into your AC wall outlet.

Now, set the POWER lever up to turn the AC power on. Tune across the dial for the strongest FM signal as indicated by maximum deflection (to the right) of the SIGNAL meter. Fine tune by centering the TUNING meter indicator. See Fig. 3. Then turn up the volume, and carefully experiment with the other front panel controls.

SET FRONT PANEL CONTROLS AS FOLLOWS

	SPEAKERS	MIC VOL.	TREBLE, BASS & BALANCE	LOUDNESS	VOLUME	AUDIO MUTING	HIGH & LOW FILTERS	MODE	TAPE	FUNCTION
POSITION	A	OFF	CENTERED	FLAT	0	NORMAL	OFF	STEREO	SOURCE	FM

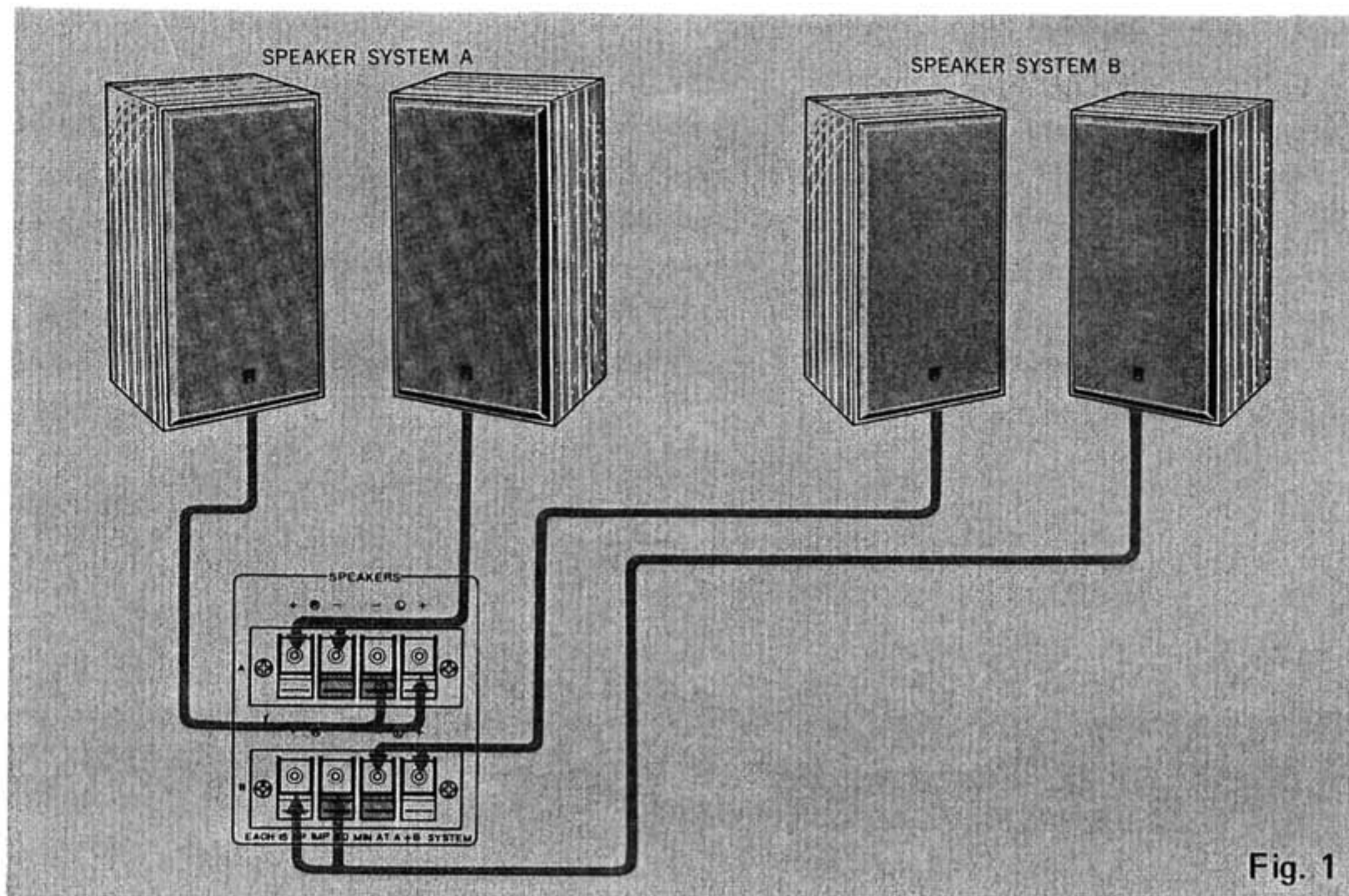


Fig. 1

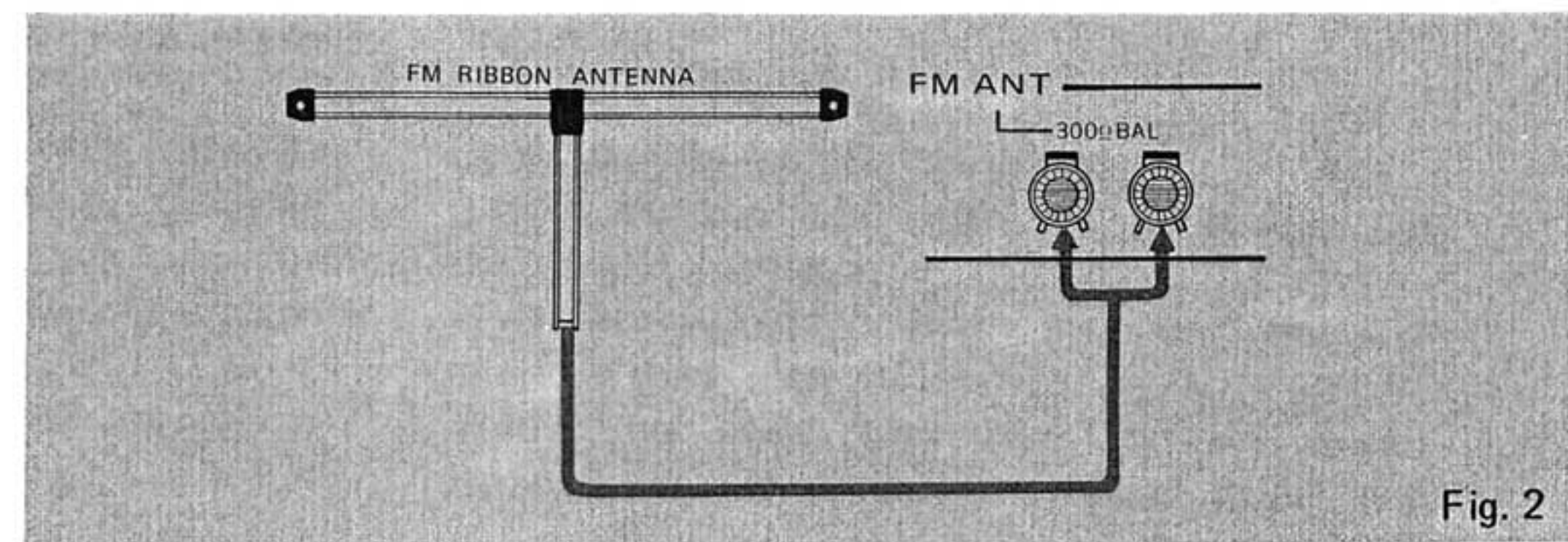


Fig. 2

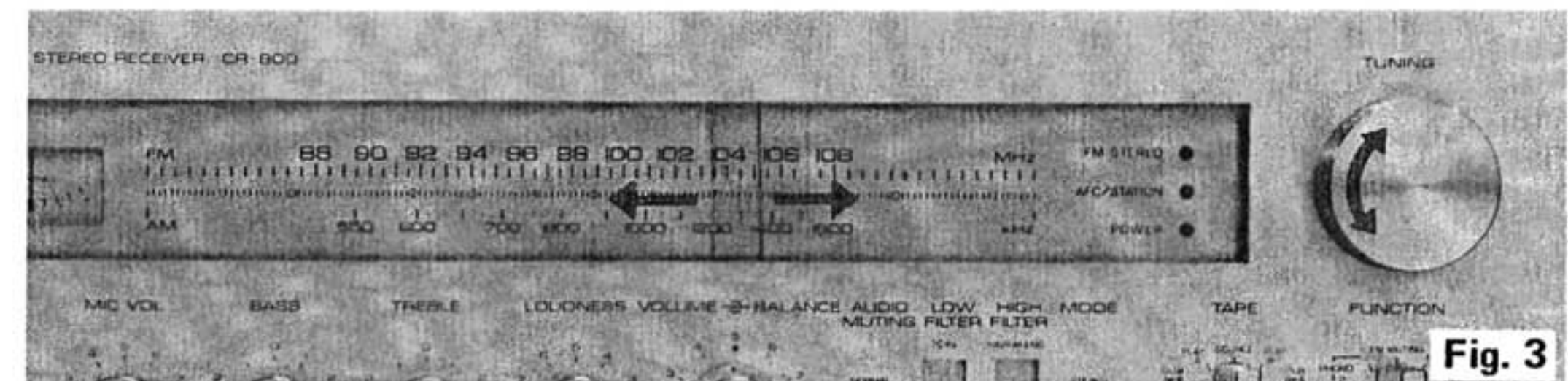


Fig. 3

OTHER EQUIPMENT: CONNECTION AND OPERATION

SPEAKER SYSTEM CONNECTION AND OPERATION

1. There are two sets of speaker Terminals (A, B) on the rear panel, permitting the connection of two separate sets of speakers (See Fig. 1).
2. These terminals are controlled by the Speaker selector on the front panel. Set for the A, B or both. (The speaker(s) connected to any one of these jacks should have an impedance of not less than 8Ω).

Note: If you are contemplating playing both sets of speakers at once (A + B setting), be sure that all your speakers are 8Ω impedance (or higher).

If the selector is set to OFF, no sound will be heard from any of the speakers; this is the position to use when listening through the headphones only.

3. Connect the left-hand speaker (viewed from the listening position) to the L terminals, the right-hand speakers to the R for both A and B sets. Be careful not to confuse the (+) and (-) terminals for each speaker, otherwise an out-of-phase signal will be produced, reducing stereo response.
4. These terminals are push-spring types. As shown in Fig. 4, first push back on the bottom lever of the terminal, then insert the stripped end of the lead and hold it in place while you release the lever.

The red terminal are (+), the black (-).

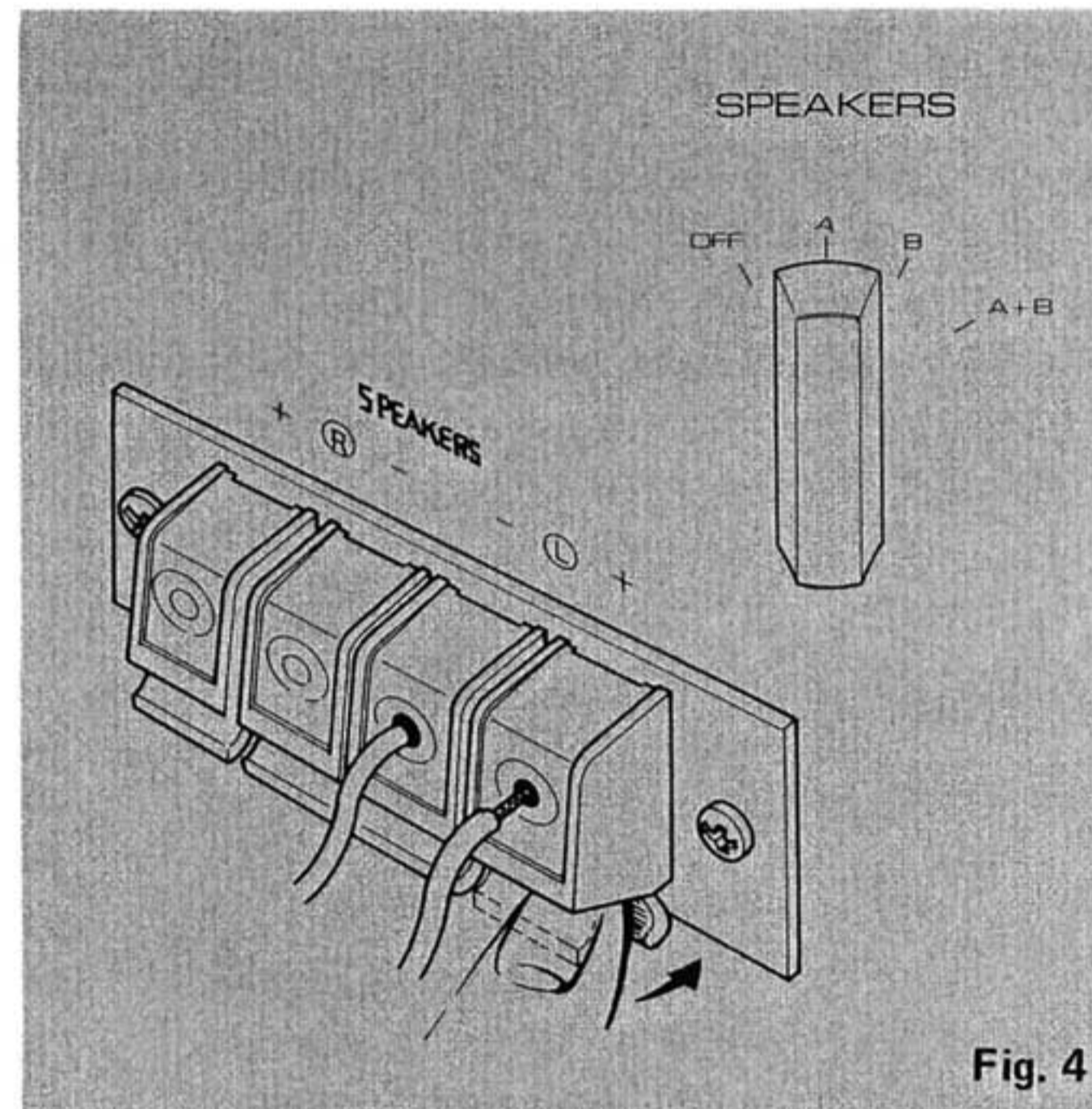


Fig. 4

HEADPHONE CONNECTION AND OPERATION

To use a set of headphones, plug it into its jack on the front panel. This does not turn off the speakers automatically; if you want to listen privately through the headphones, set the Speaker selector switch to Off. The side of the headphone with the cord attached is the left (Fig. 5).

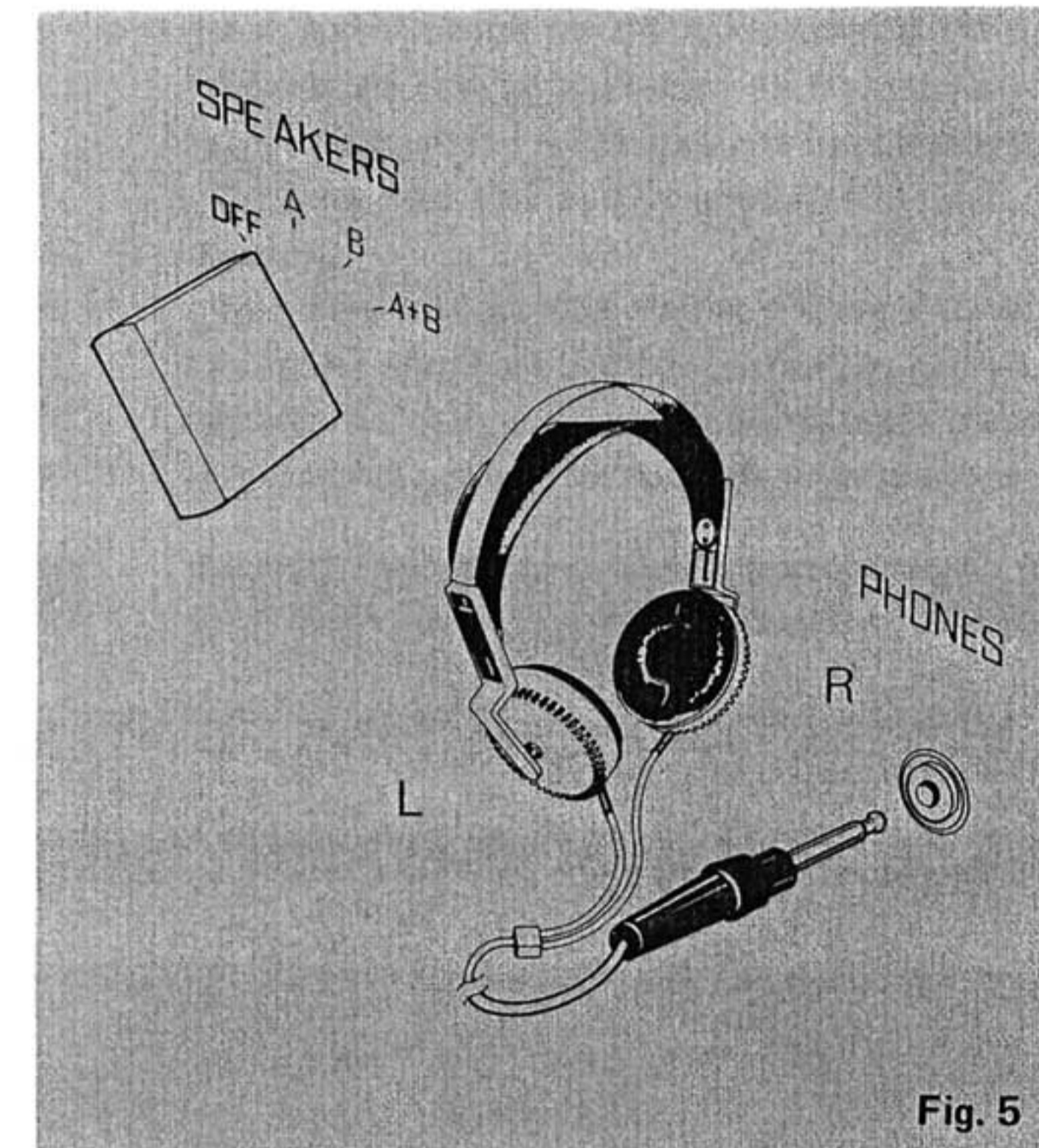
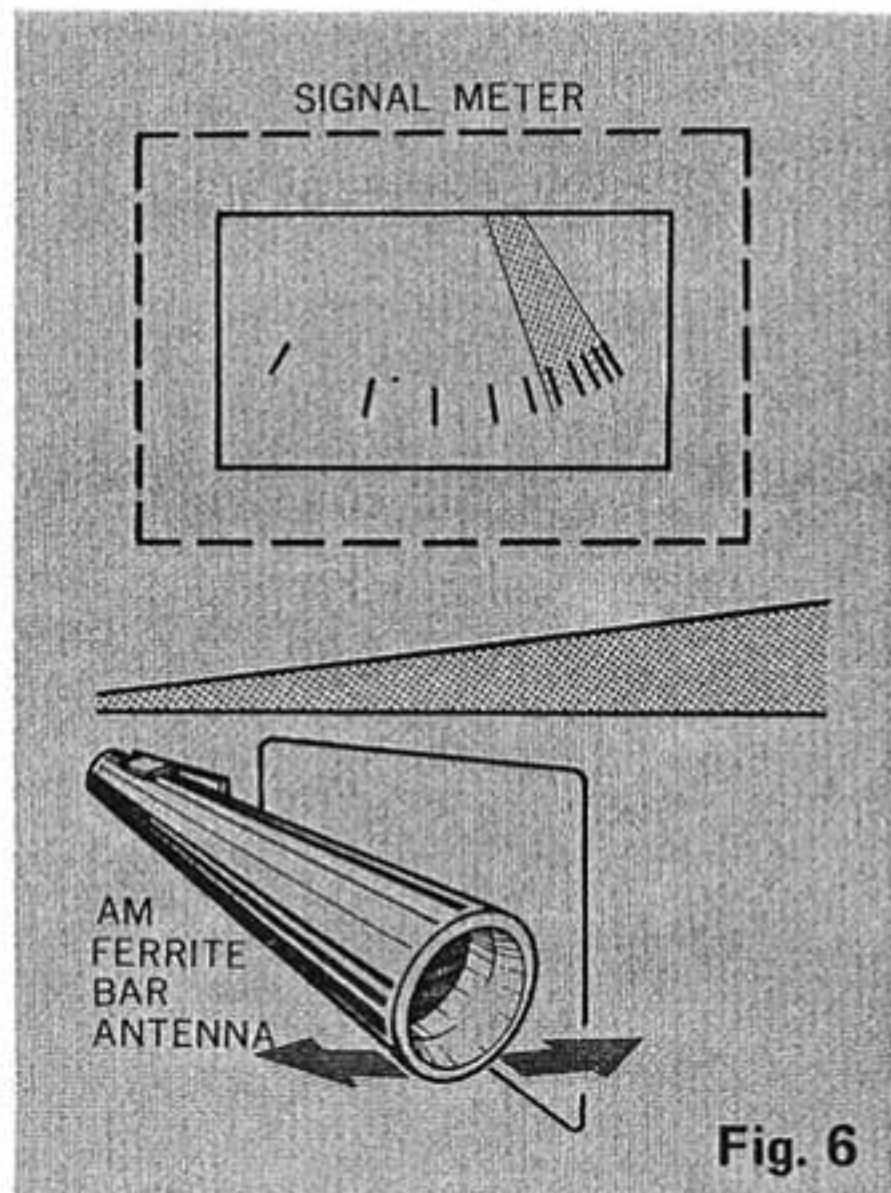


Fig. 5

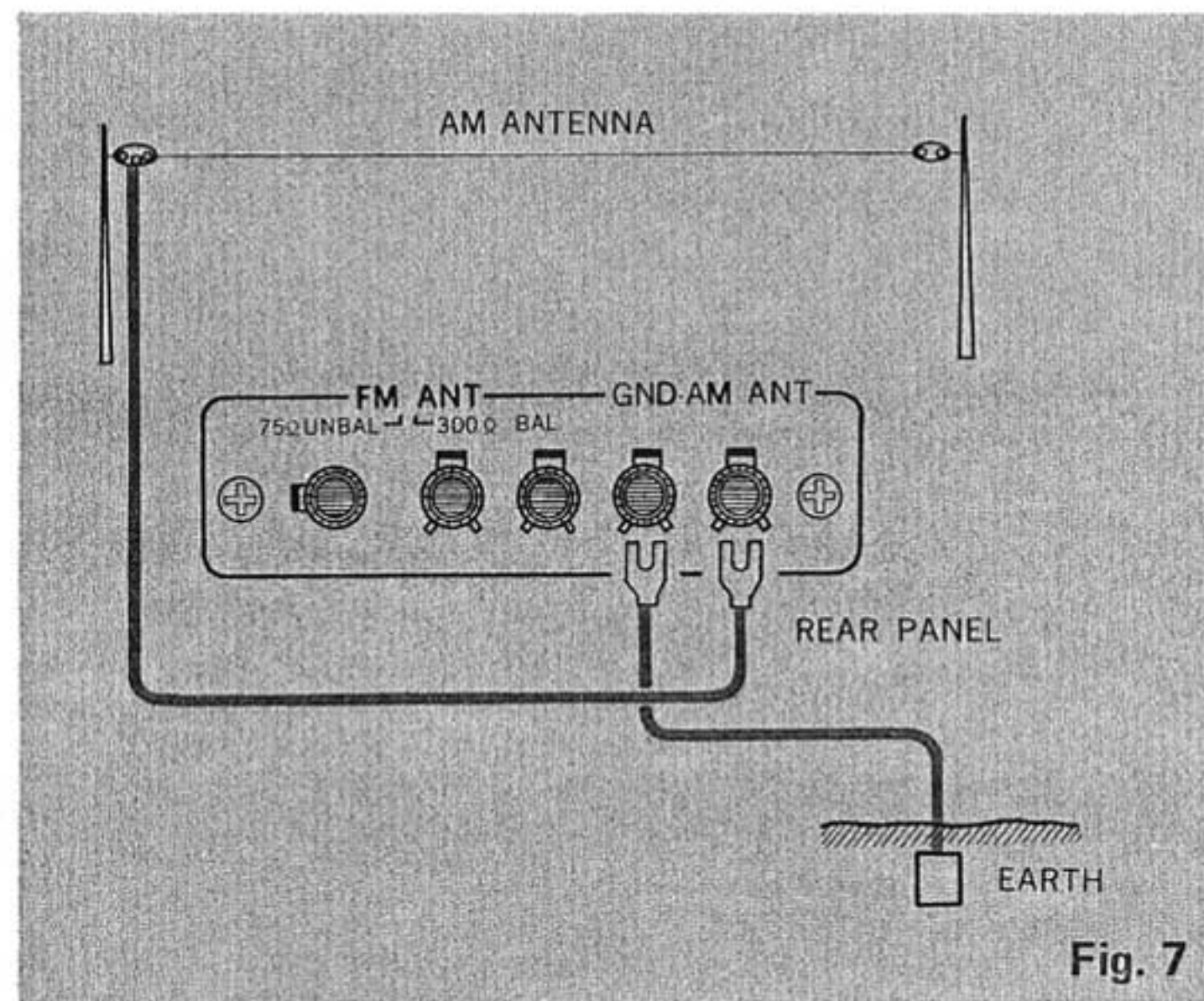
AM ANTENNA CONNECTION

A first-quality AM ferrite bar antenna is built into the rear panel. Beginning AM reception should be done using this antenna only: tune in a strong station and then swing out the bar while watching the tuning meter to find the best angle (see Fig. 6). Inside a ferroconcrete building or in a weak signal area where this antenna alone does not provide sufficient signal strength, an outdoor AM antenna must be installed. Connect it to the AM antenna terminal and set it up as shown in Fig. 7. Be sure to ground the set with the Gnd terminal at this time.



AM BROADCAST RECEPTION

Set the Function selector to AM and gently tune in an AM station with the Tuning knob; as you approach the desired station watch the Signal meter for maximum deflection to the right (the Tuning meter does not function for AM). Tuning to this point will provide the best reception.



FM ANTENNA CONNECTION

A T-shaped FM ribbon antenna is included among the accessories. Use it in strong signal areas (near the FM broadcast stations). For optimum FM (and especially FM Stereo) reception install a special outdoor FM antenna.

There are two sets of FM antennas on the CR-800: 300Ω and 75Ω. To use the ribbon antenna provided, connect to the 300Ω terminals as shown in Fig. 8. Tack the antenna up on a wall watching the Signal meter for maximum deflection as you try different locations (see Fig.10).

If you use an outdoor antenna, select a location as far as possible from sources of interference (motorcycle ignition noise, etc.). Between the antenna and the CR-800 use a coaxial cable, with a thickness up to C2V. Connect to the 75Ω terminal as shown in Fig. 9. The core lead should be connected to the terminal, with the shield wire exposed to the metal clamp. In some cases the antenna will require a matching transformer (300Ω : 75Ω), while some antennas do not; be sure to carefully read the antenna owner's manual. If you cannot use a coaxial cable for the antenna, but must use a regular feeder line (like that for television antennas), connect it directly to the 300Ω terminals.

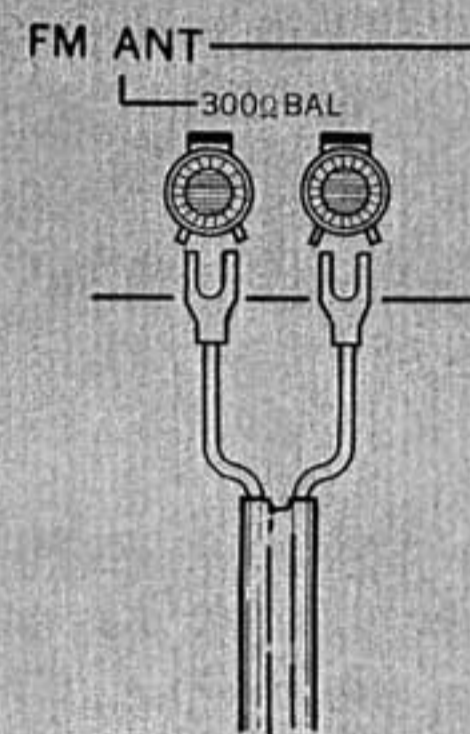


Fig. 8

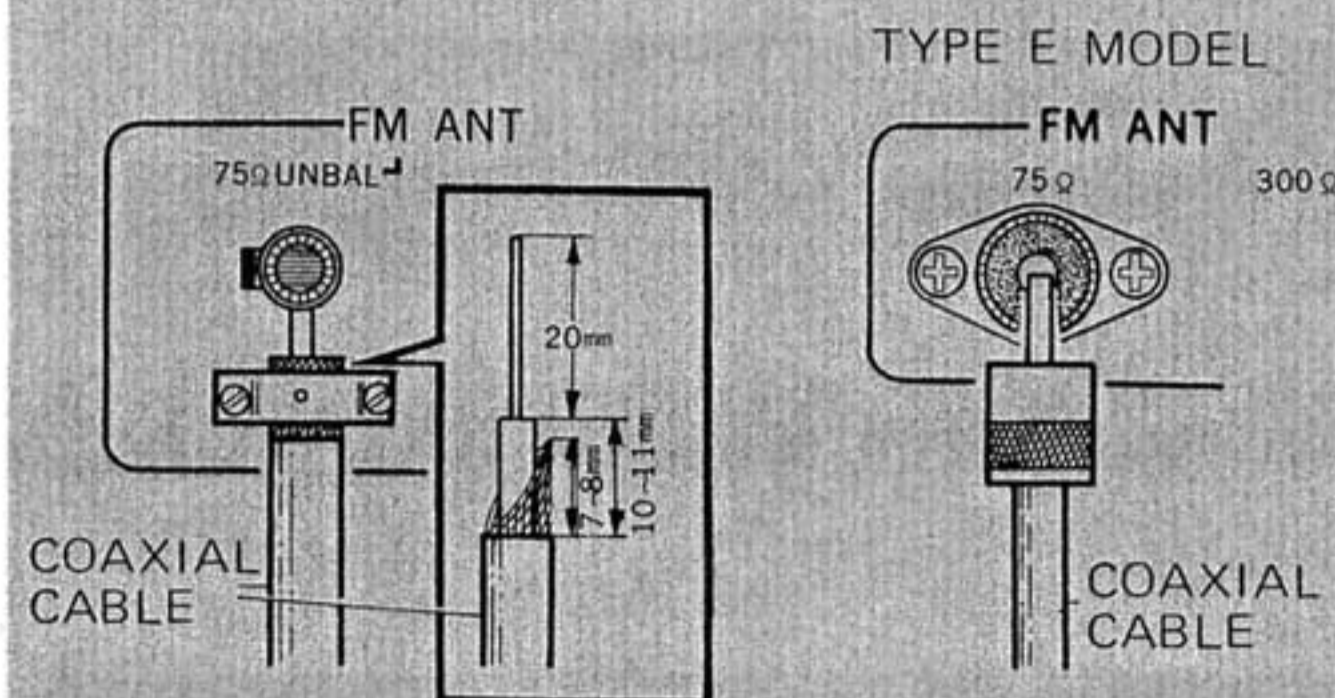


Fig. 9

FM BROADCAST RECEPTION

Set the function selector to FM and tune to the desired station. First tune for maximum deflection of the Signal meter. Then center the Tuning meter. The function selector FM Muting position will cut out unpleasant hiss between FM stations while tuning. Be sure to reset to FM after tuning. In a weak signal area, FM muting may also cut some stations; in this case it should not be used.

FM STEREO NOTES:

When a stereo broadcast is received, the stereo indicator lamp lights and the set automatically functions in stereo. If the lamp flickers or goes out altogether, it indicates that the signal is too weak for sufficient stereo channel separation.

Locate an outdoor antenna as far as possible from roads or machinery. Large buildings or metal-containing structures which obstruct the signal path will weaken the signal and cause distortion.

Locate the antenna as high as possible. Keep connector leads as short as possible and avoid long horizontal sections.

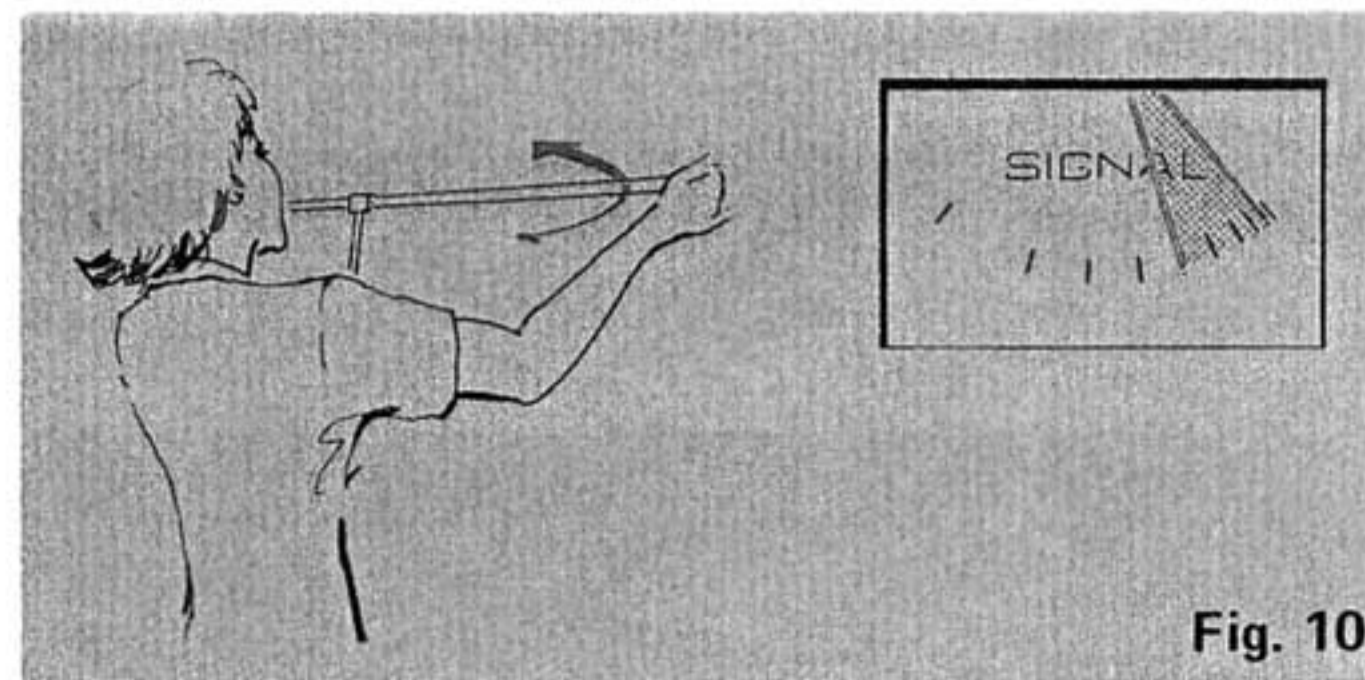
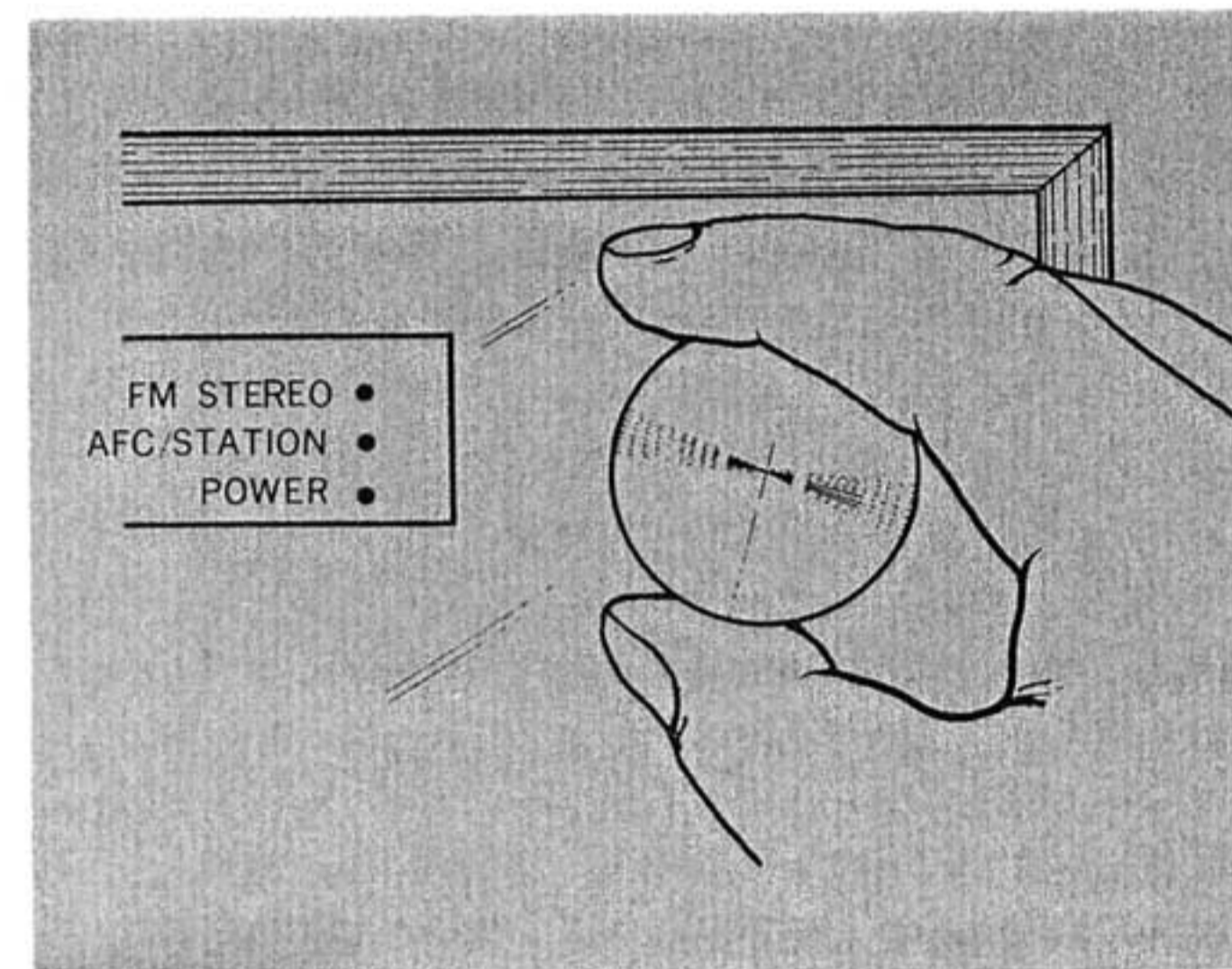


Fig. 10



When you touch the Tuning knob a special Yamaha circuit goes into operation shutting off the AFC (the AFC/Station lamp will also go off). Then, once the station is tuned in and you release the knob, the AFC automatically comes back on (and so does the lamp).

RECORD PLAYER CONNECTION AND OPERATION

Connect the pin plugs from the record player to the Phono 1 or Phono 2 jacks. Be careful not to confuse the left and right leads; the red lead is usually the right channel signal, the white (or grey) the left. Then connect the record player ground wire to the Gnd terminal to the left of these jacks (see Fig. 11). Now, when the Function selector is set to Phono 1 or Phono 2 the record player connected to the corresponding jacks can be used as a signal source. These dual sets of jacks are very useful for connecting two turntables for testing, etc.

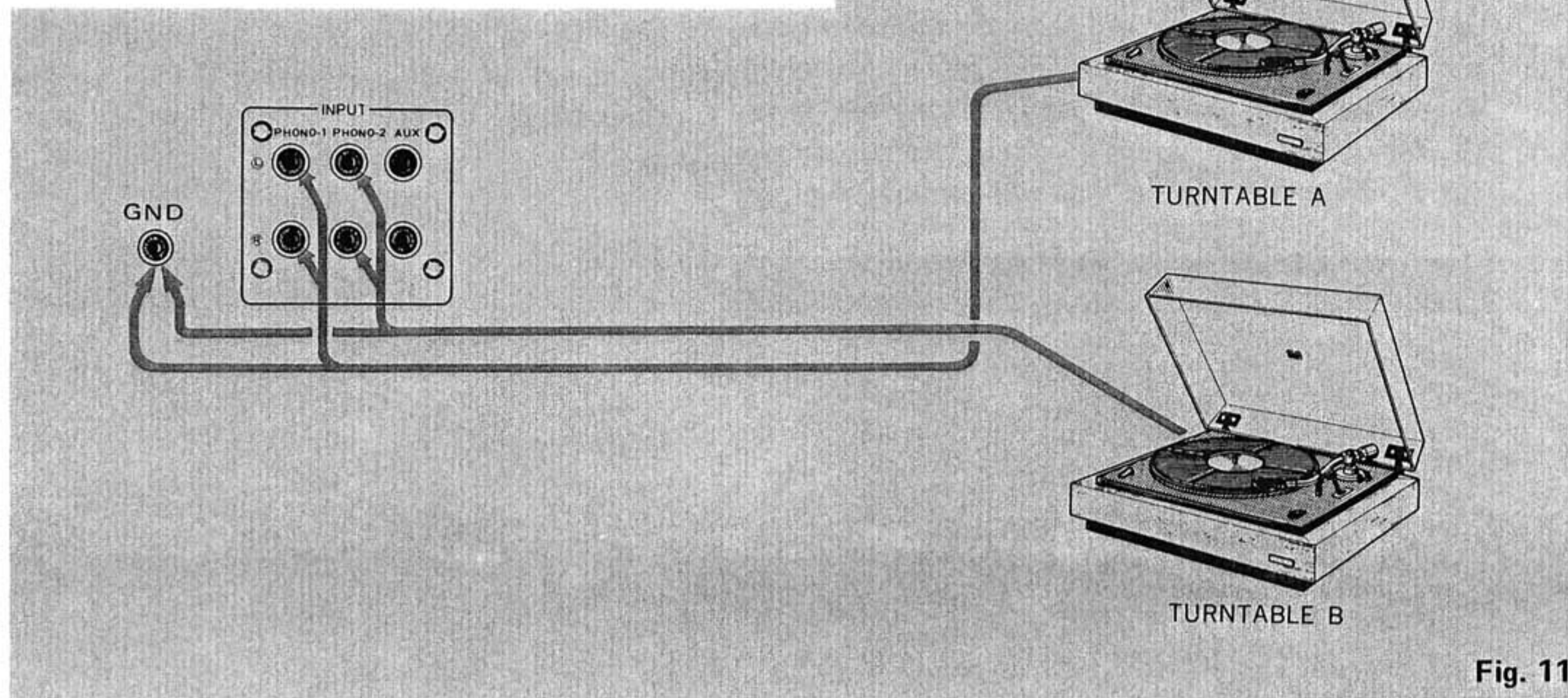


Fig. 11

AUXILIARY INPUT CONNECTION AND OPERATION

These terminals offer 150mV input sensitivity and 45kΩ impedance. To them, connect another tuner, stereo tape cartridge player, TV audio signal, etc.; or, use these terminals for connecting turntables with high output crystal or ceramic cartridges. See Fig. 12. When connecting a monophonic source, connect only to the L input jack. To play, then set the MODE switch at "MONO" and that mono source will be heard through both L and R speakers.

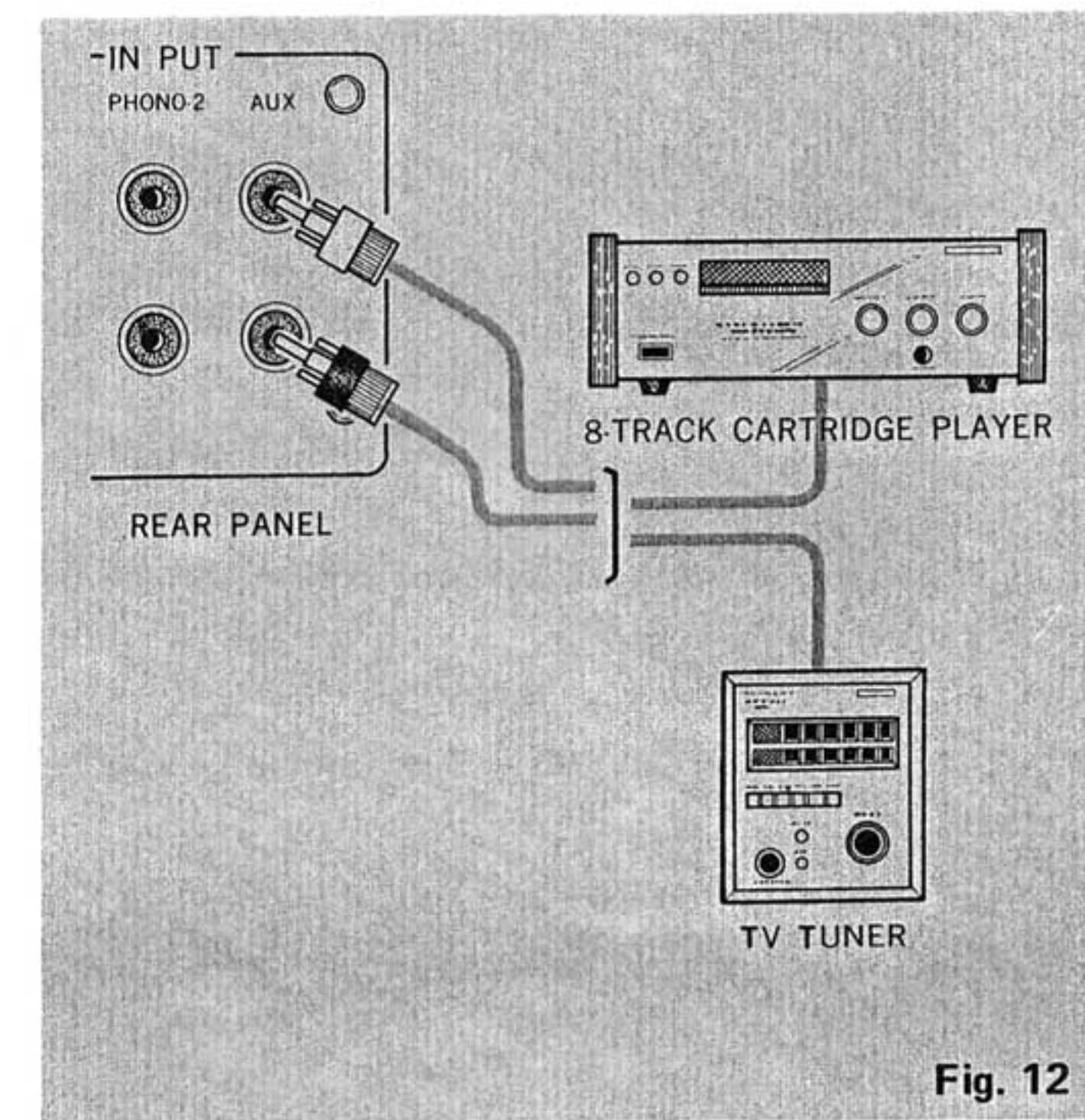


Fig. 12

TAPE DECK CONNECTION AND OPERATION

There are two sets of REC OUT and PB jacks, permitting you to connect and use two tape decks at once. This lets you record on both decks at once, as well as dubbing from one deck to the other. Connect the rear panel TAPE A REC OUT jacks and the tape deck's LINE IN jacks. Then connect the deck's LINE OUT jacks to the CR-800 rear panel TAPE A P/B jacks. In both cases be careful not to mix left and right jacks.

If a second deck is used, connect to the TAPE B jacks in the same way. See Fig. 13.

PLAYBACK

To listen to deck "A," set the tape selector to PLAY A. To listen to deck "B," set the selector to PLAY B.

RECORDING

To record from FUNCTION, set the tape selector to SOURCE. You can now record on deck "A," on deck "B," or on both simultaneously. If deck "A" is a 3-head type (with separate record/playback electronics), you can monitor deck "A" while recording by switching to PLAY A. Similarly, you can monitor such a 3-head deck "B" by switching to PLAY B.

TAPE DUBBING

When two decks are connected it is possible to record from one to the other via the CR-800. To record from the deck connected to the B jacks to the deck connected to the A jacks, set the first for play, the second for recording. Then set the tape switch to DUB B ▶ A and the signal will pass from the B deck to the A deck. To record in the opposite direction reverse the deck settings and set the tape switch to DUB A ▶ B. See Fig. 14.

Note: The function switch setting has no effect here. It does not operate unless the tape switch is set to SOURCE.

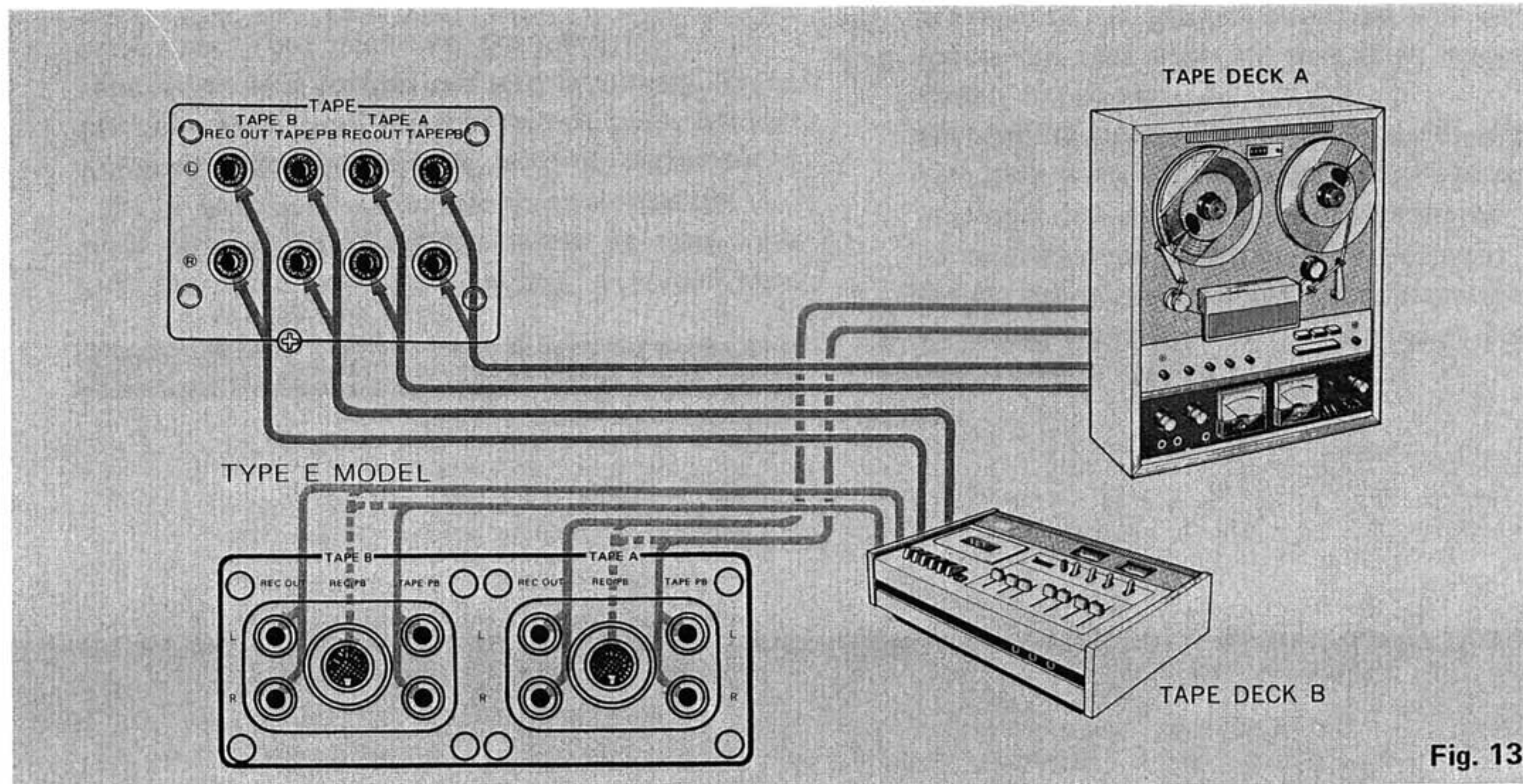


Fig. 13

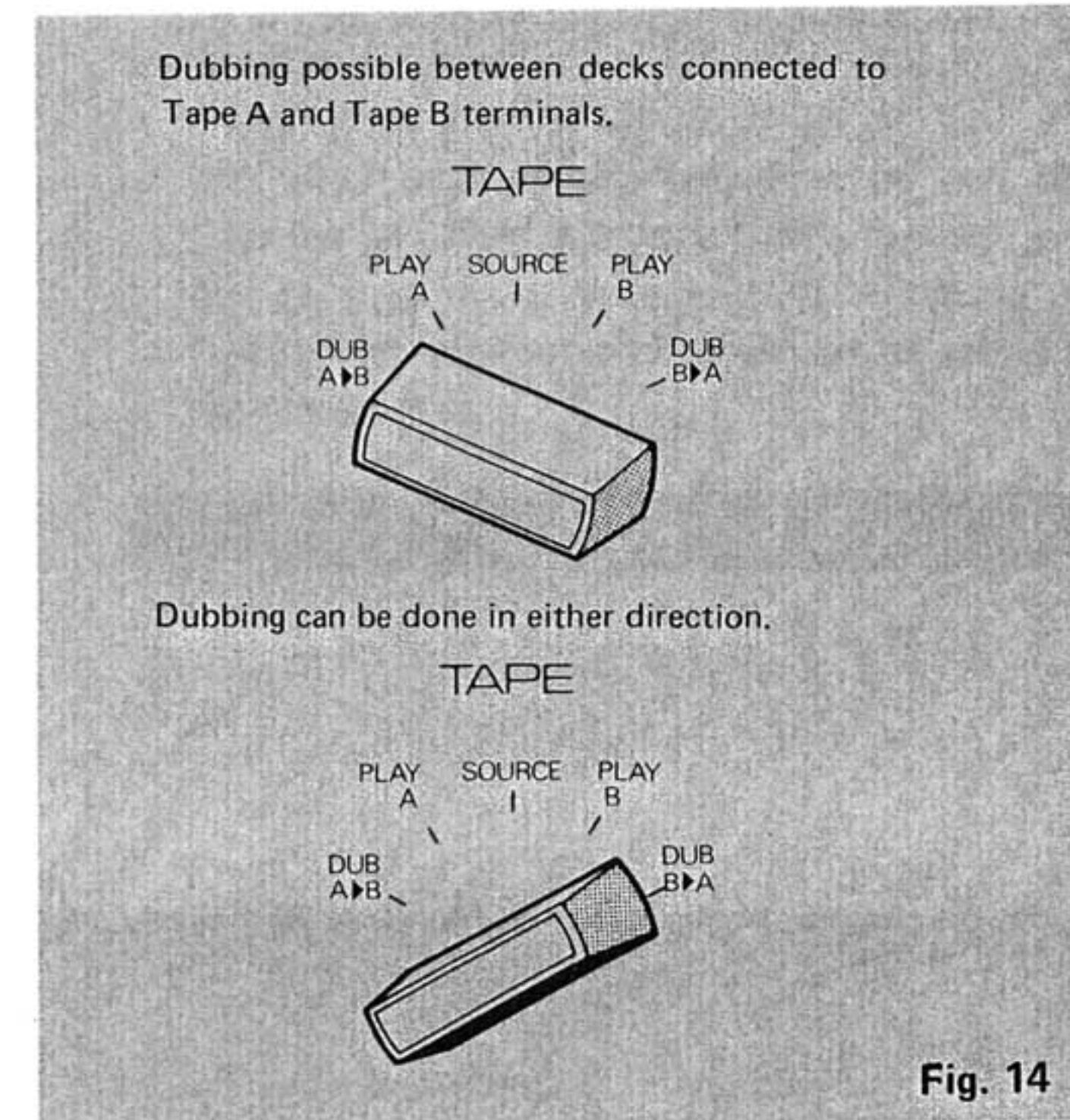


Fig. 14

MICROPHONE CONNECTION AND OPERATION

Plug the microphone into the MIC jack (any type from 200Ω to $50k\Omega$ impedance can be used). See Fig. 15. And then control its volume with the Mic Volume control. If "howling" feedback occurs, move the mike away from the speakers, or lower the Mic volume. Be sure to turn the MIC VOLUME to Off when a mic is not being used. See Fig. 16.

Note: After the MIC VOLUME control, the mic signal bypasses all circuits until the PRE OUT jacks. You may adjust all other panel controls without affecting the mic signal, and the mic signal will not arrive at the tape playback outputs.

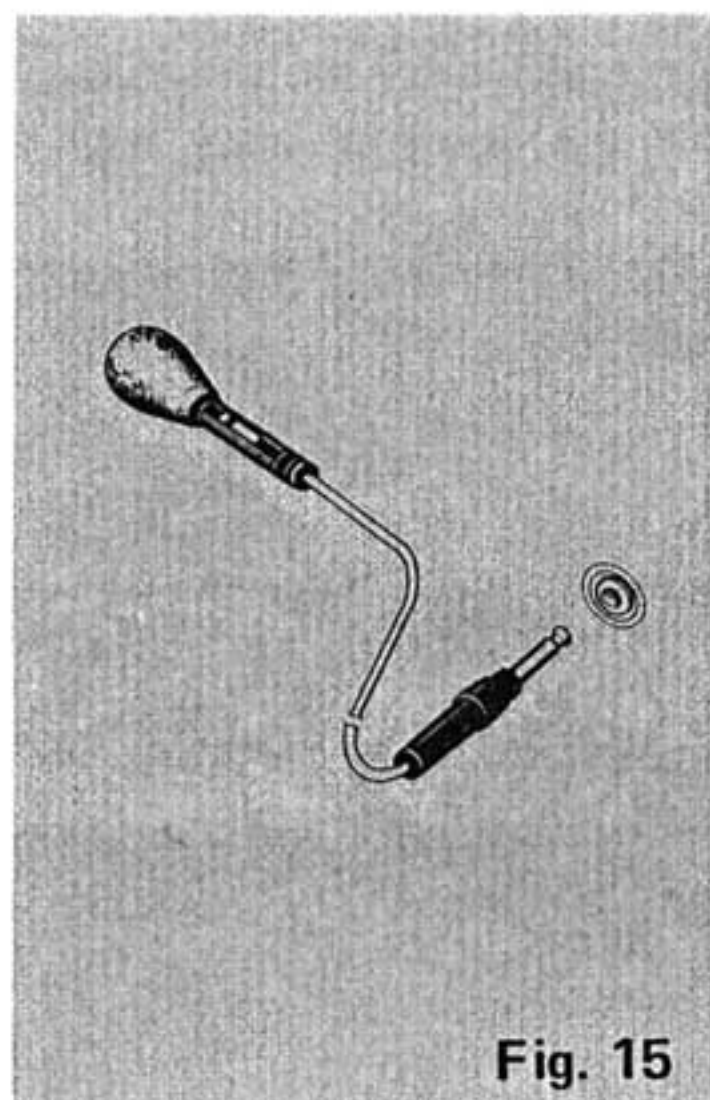


Fig. 15



Fig. 16

MIXED-SIGNAL RECORDING

1. To record a mixed (microphone sound + program source) signal, the tape deck input terminals must be connected to the CR-800 Pre Out jacks. Then recording can be done in the regular way. If the tape deck is connected to the Rec Out jacks, only the program source signal (without the microphone sound) will be recorded. See Fig. 17.
2. Remember that when a mixed signal is recorded, the level of the signal entering the tape recorder is a combination of both the Mic Volume and main Volume controls on the CR-800, so test a few times first to be sure you have them properly balanced. The best setting is one which causes the VU meter needle to swing as far as the 0 when the loudest sound comes from the amplifier.

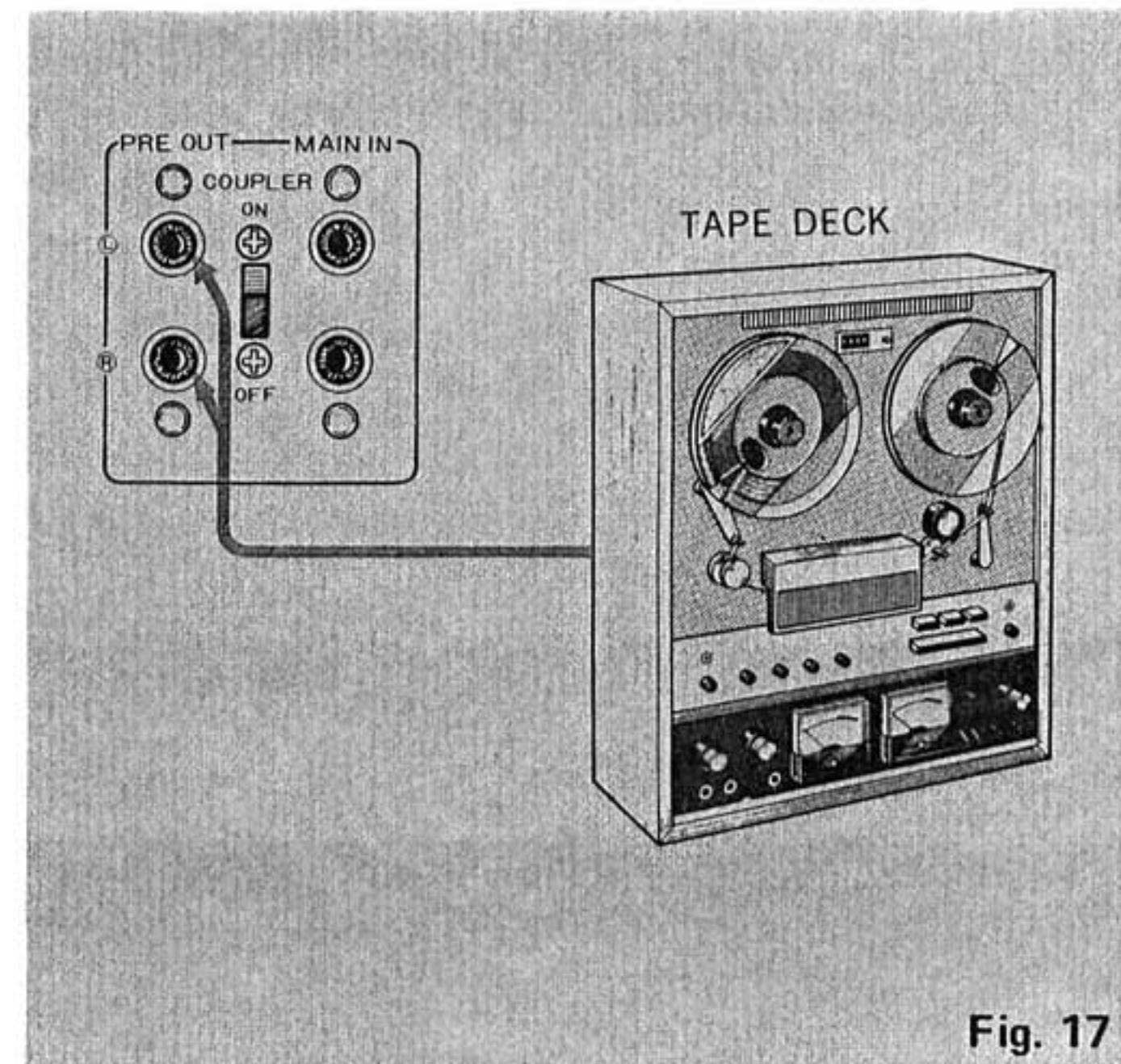


Fig. 17

COUPLER SWITCH

ACCESSORIES

- Service Pads
Use the service pads to protect the upper panel of the CR-800 when another unit is placed on it. Peel off the tape and stick a pad to each foot of the other unit before placing it on top of the CR-800. See Fig. 18.
- Hexagonal Wrench
Use this wrench to loosen the Function and Speaker selectors if their settings do not match the indicated markings on the panel.

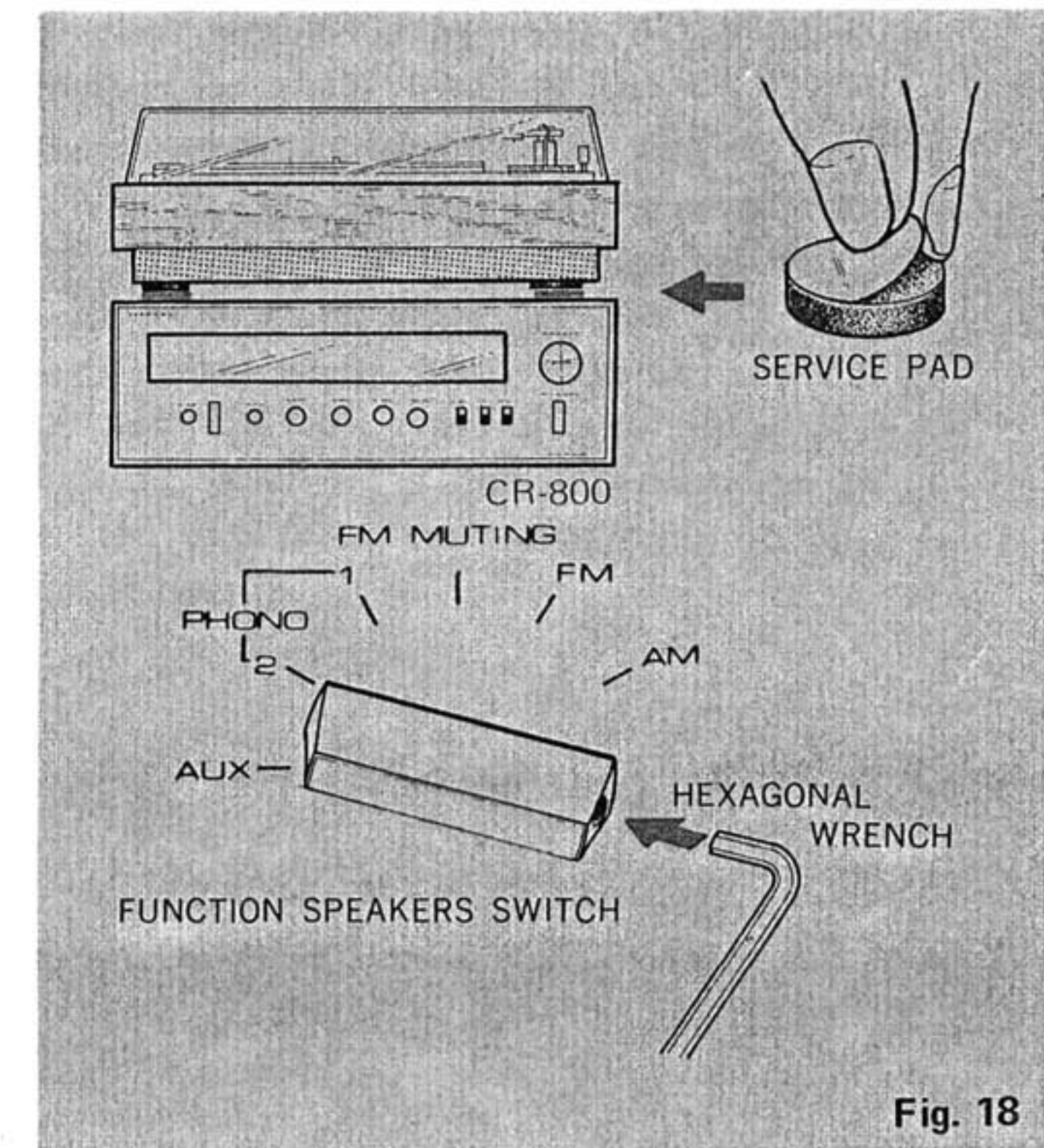


Fig. 18

EXPLANATIONS OF CONTROLS AND CONNECTIONS

VOLUME, BALANCE CONTROL

This is a two-part control. The inner portion is used to adjust the volume; turn to the right to increase the volume level.

The outer portion is used to adjust the left and right channel balance. When set to its middle position, both channels are equally strong. Turn to the right and the left speaker is diminished, turn to the left and the sound from the right is diminished. To check the balance first play a monophonic signal, then adjust so that when you are in the listening position the sound seems to be coming from a point midway between the speakers. See Fig. 19.

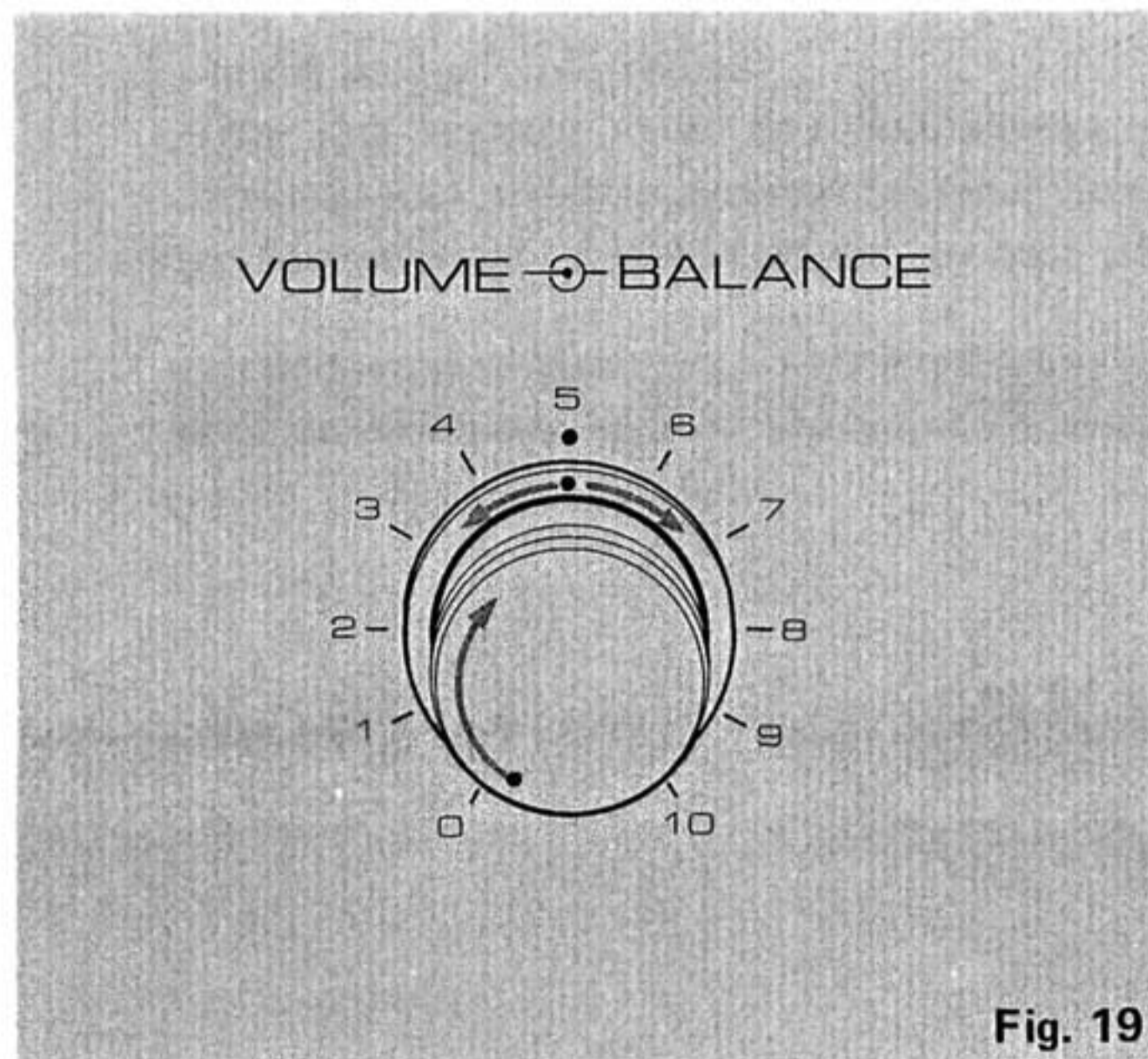


Fig. 19

TONE CONTROLS

Use tone controls to tailor the sound to your listening room, or to your mood (see Fig. 20).

Each tone control has eleven click-stop positions. Moving one position changes the response by 3dB. The "O" position provides flat response.

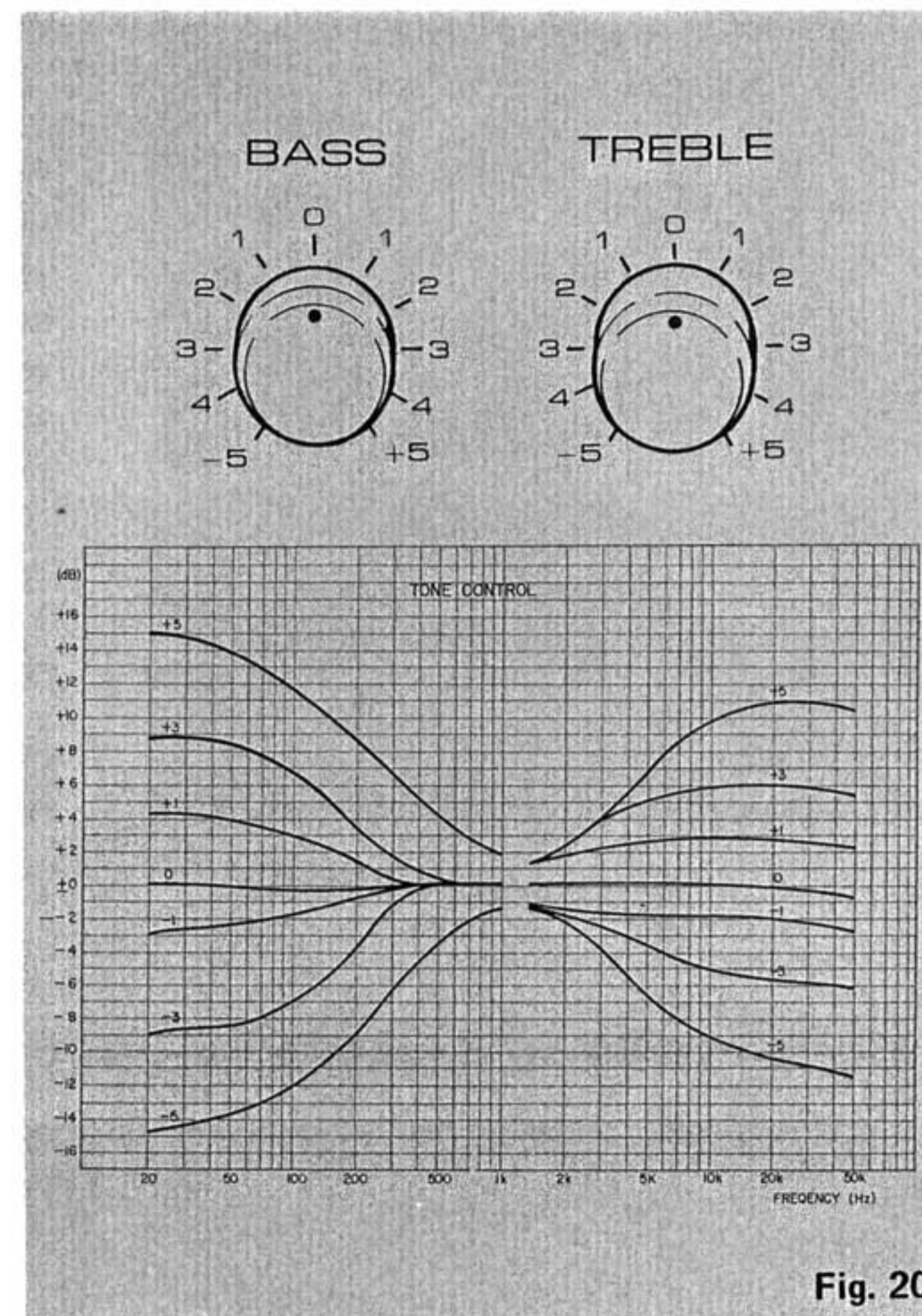


Fig. 20

MUTING SWITCH

This switch permits instant reductions in volume level without touching and then later readjusting the volume control. When flicked to its -20dB position the pre-amp gain is reduced 20dB (1/10) of the original level. This is ideal for temporary volume reductions, such as a telephone call in the middle of a record, etc.

If you listen at the -20dB level and then raise the volume, returning the switch to NORMAL may result in an excessive surge of power which can damage your speakers. For this reason, once the muting switch is used, be sure to return it to the NORMAL position for regular-volume listening.

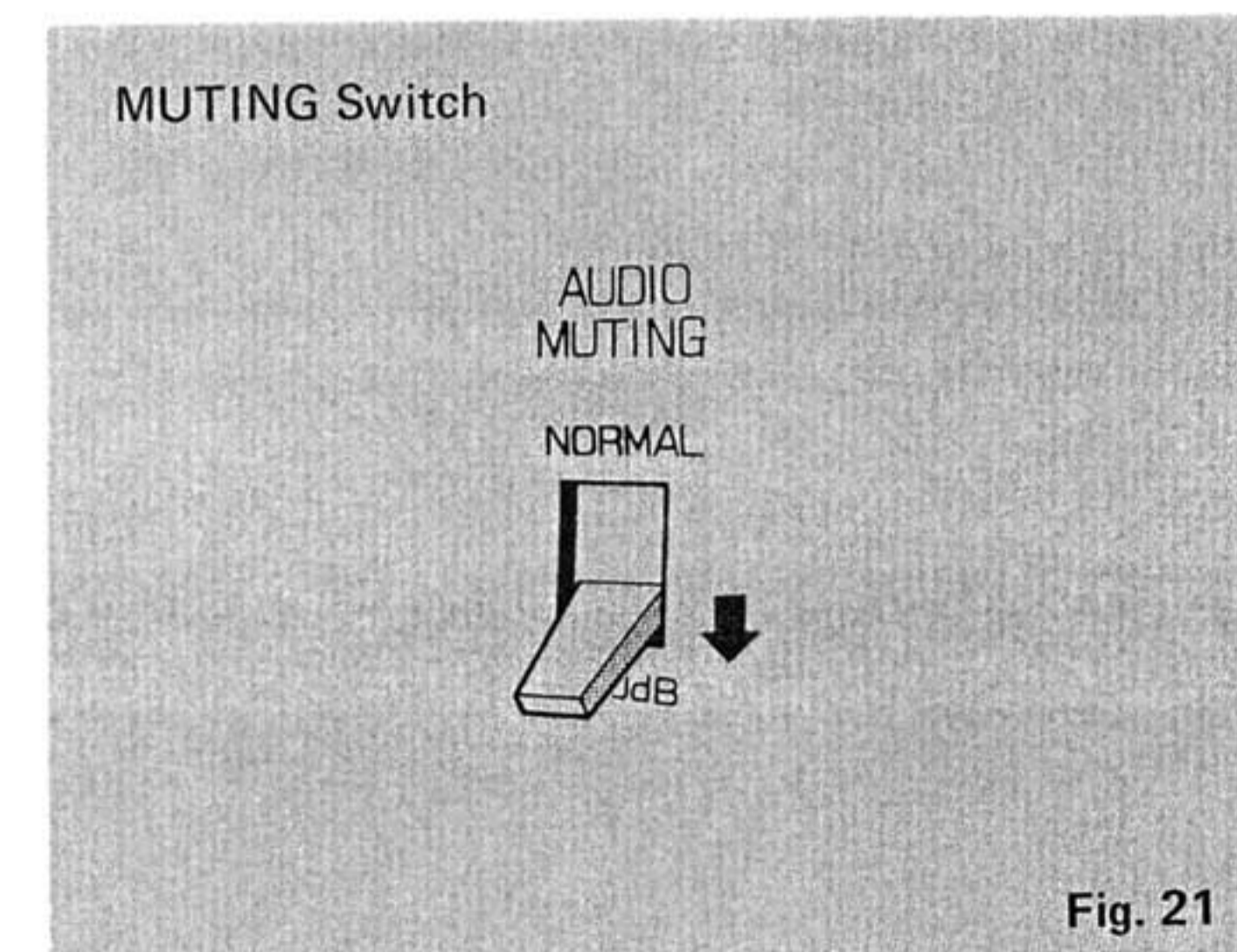


Fig. 21

LOUDNESS CONTROL

At low volume listening levels, human hearing is relatively insensitive to extreme bass and treble tones. With this control, you can compensate for that normal hearing "deficiency."

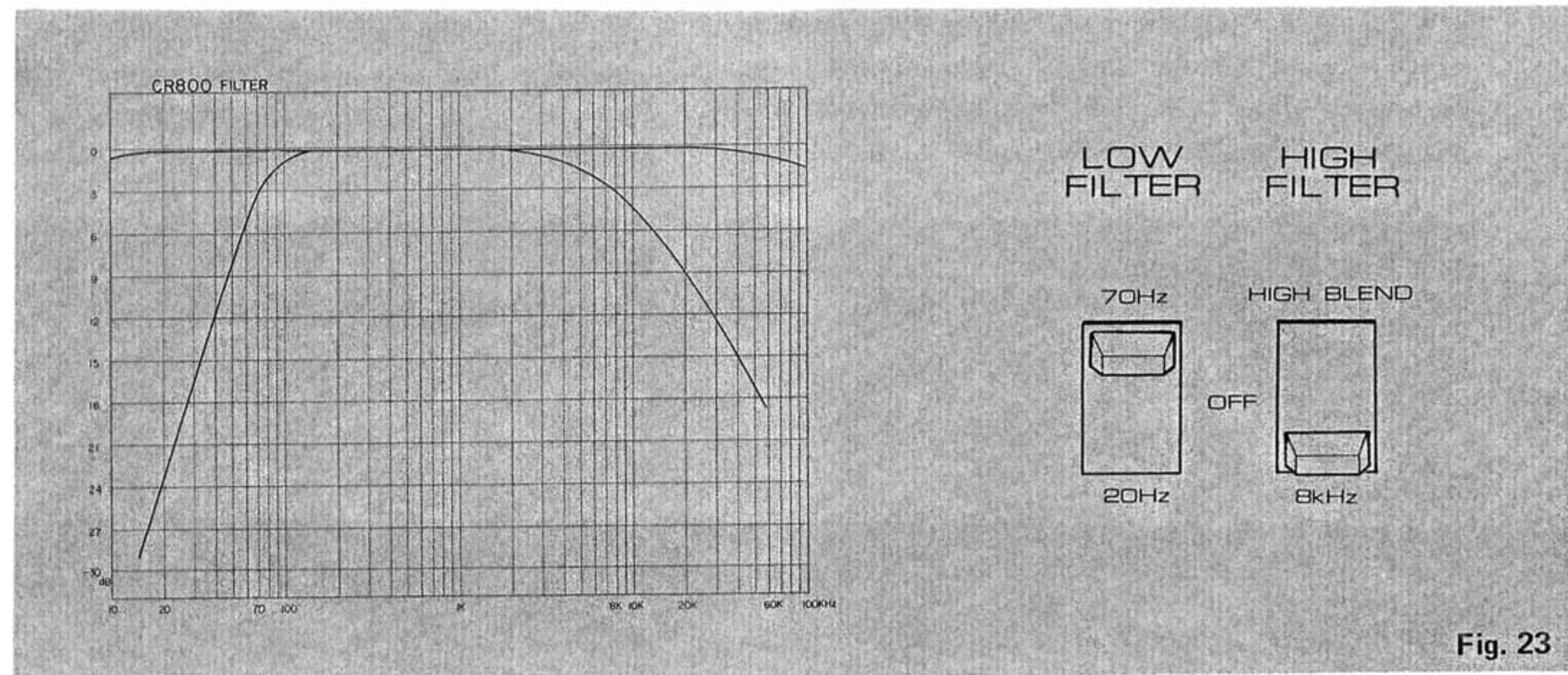
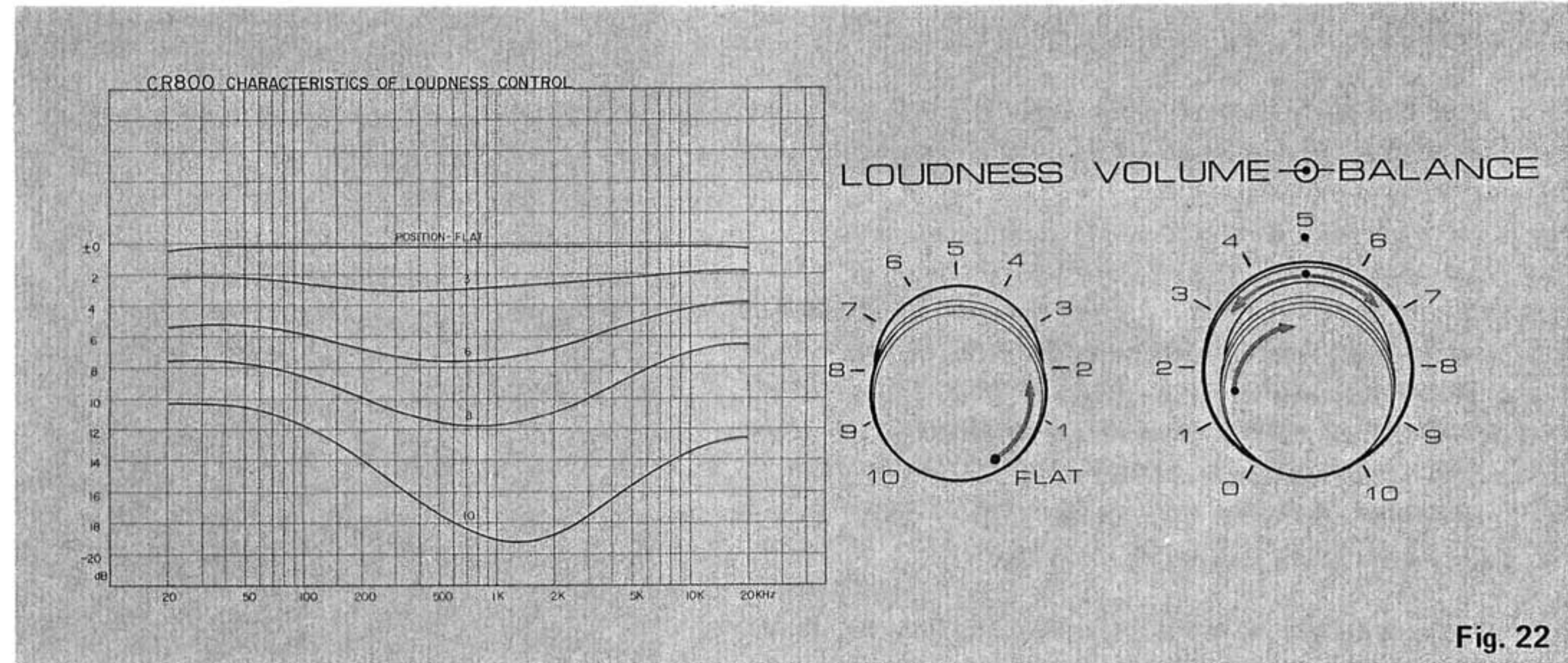
First, set the Loudness control to Flat for normal response. Then play a program and set the Volume control at the loudest setting you normally expect to use. Now, if you turn the Loudness control to the left, you will reduce the volume while at the same time increasing the Loudness compensation. From now on you can control the volume with the Loudness control. See Fig. 21

FILTER SWITCHES

To cut out low and high frequency distortion and noise the CR-800 incorporates a low and a high filter. The low filter is useful for cancelling record player motor rumble; it reduces all frequency below 20Hz and 70Hz by 12dB/oct.

The high filter works to reduce record scratch noise and radio hiss by cutting all frequency above 8kHz by 6dB/oct.

Use the High Blend position to cut stereo noise without affecting frequency response. For maximum frequency response, set these switches OFF. See Fig. 23.



PRE OUT, MAIN IN CONNECTIONS

The Pre Out and Main In jacks, plus the Coupler switch, allow you to use the CR-800 pre-amp and main amp separately.

With the Coupler switch set to Off (see Fig. 24) the set can be used as a multi-channel system or, with the addition of a 4-channel quadralizer, as a four-channel playback system.

You can also use this feature to compare other pre-amps and main amps.

For normal listening the Coupler switch should be left On.

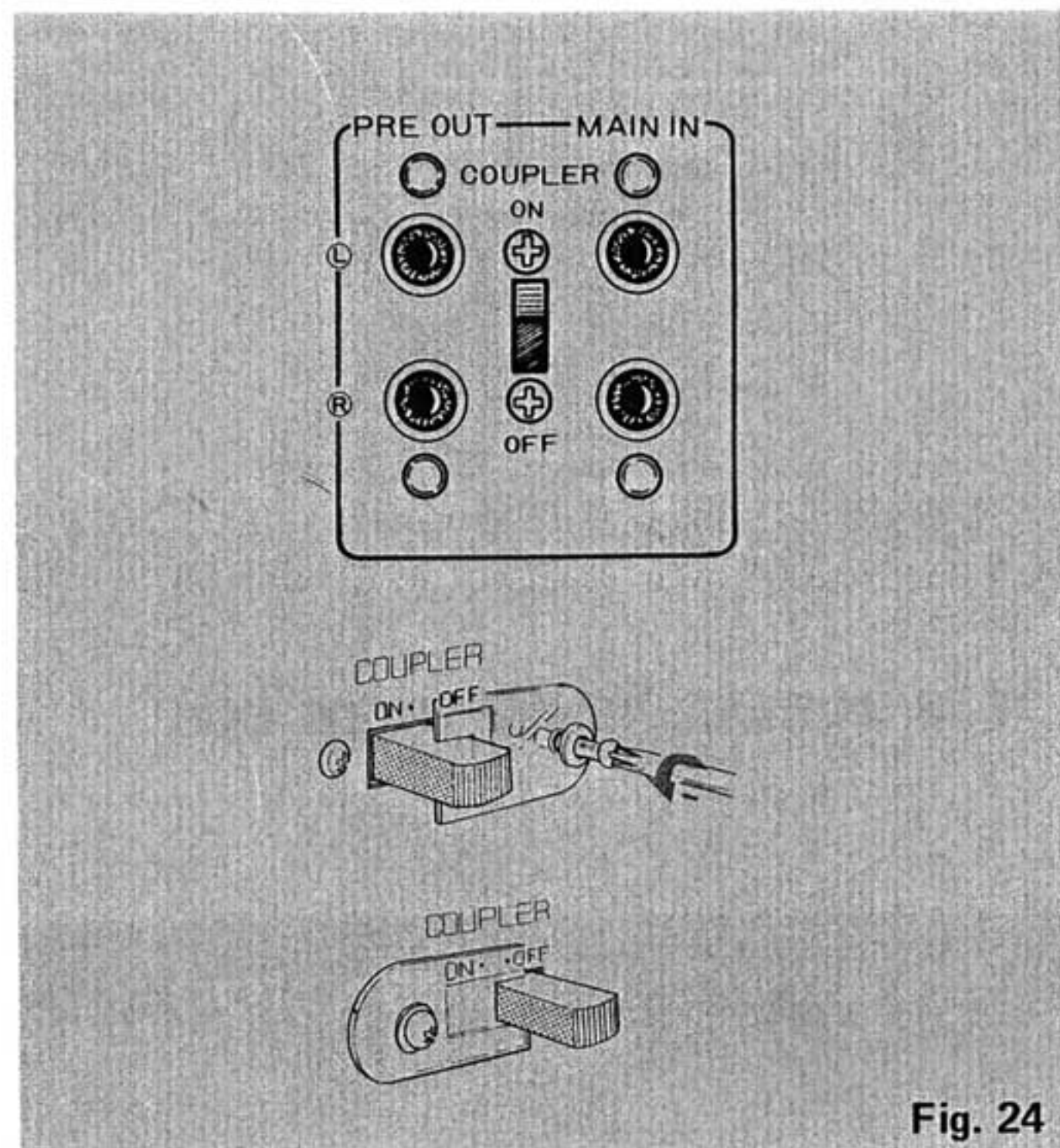


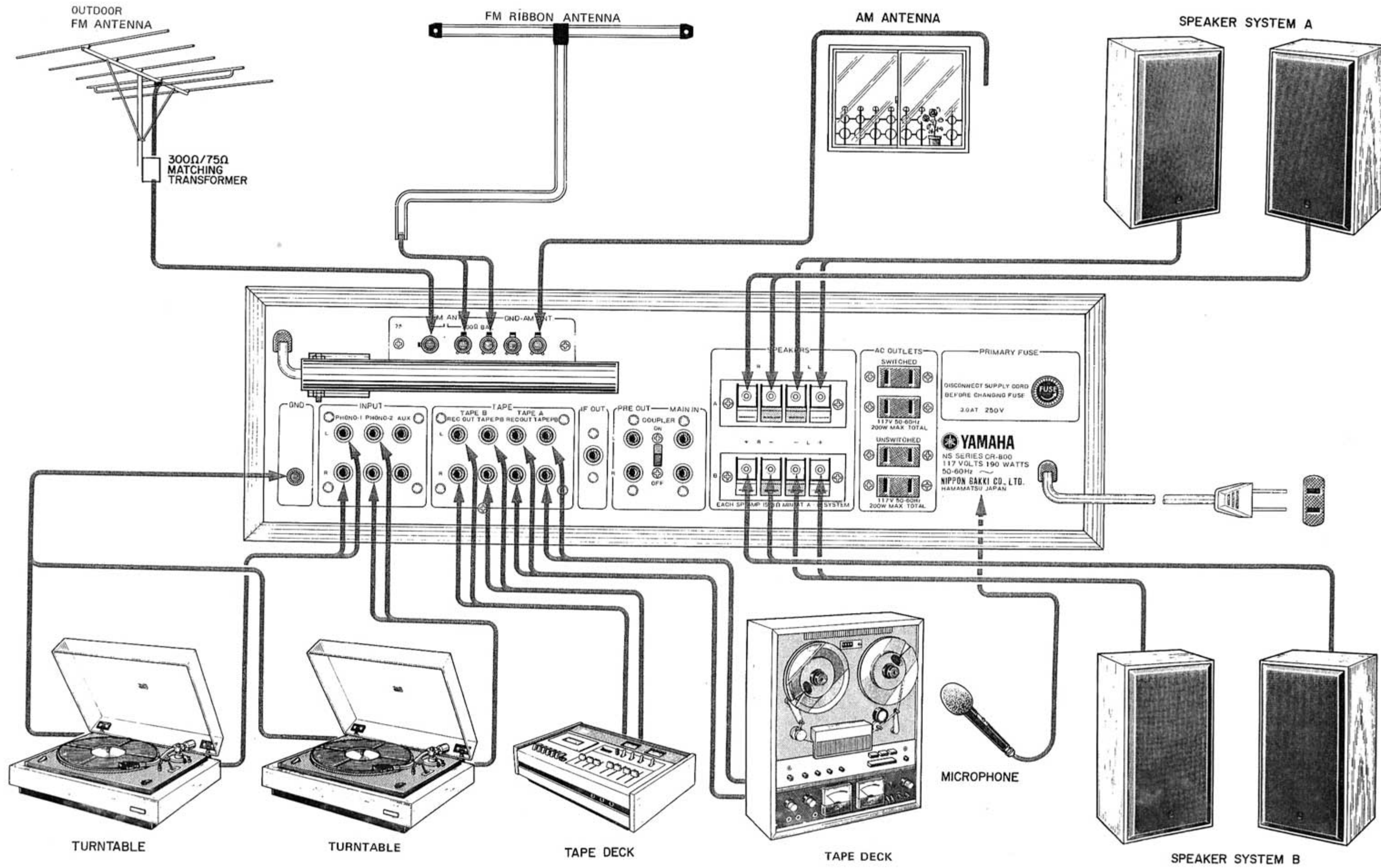
Fig. 24

IF OUT

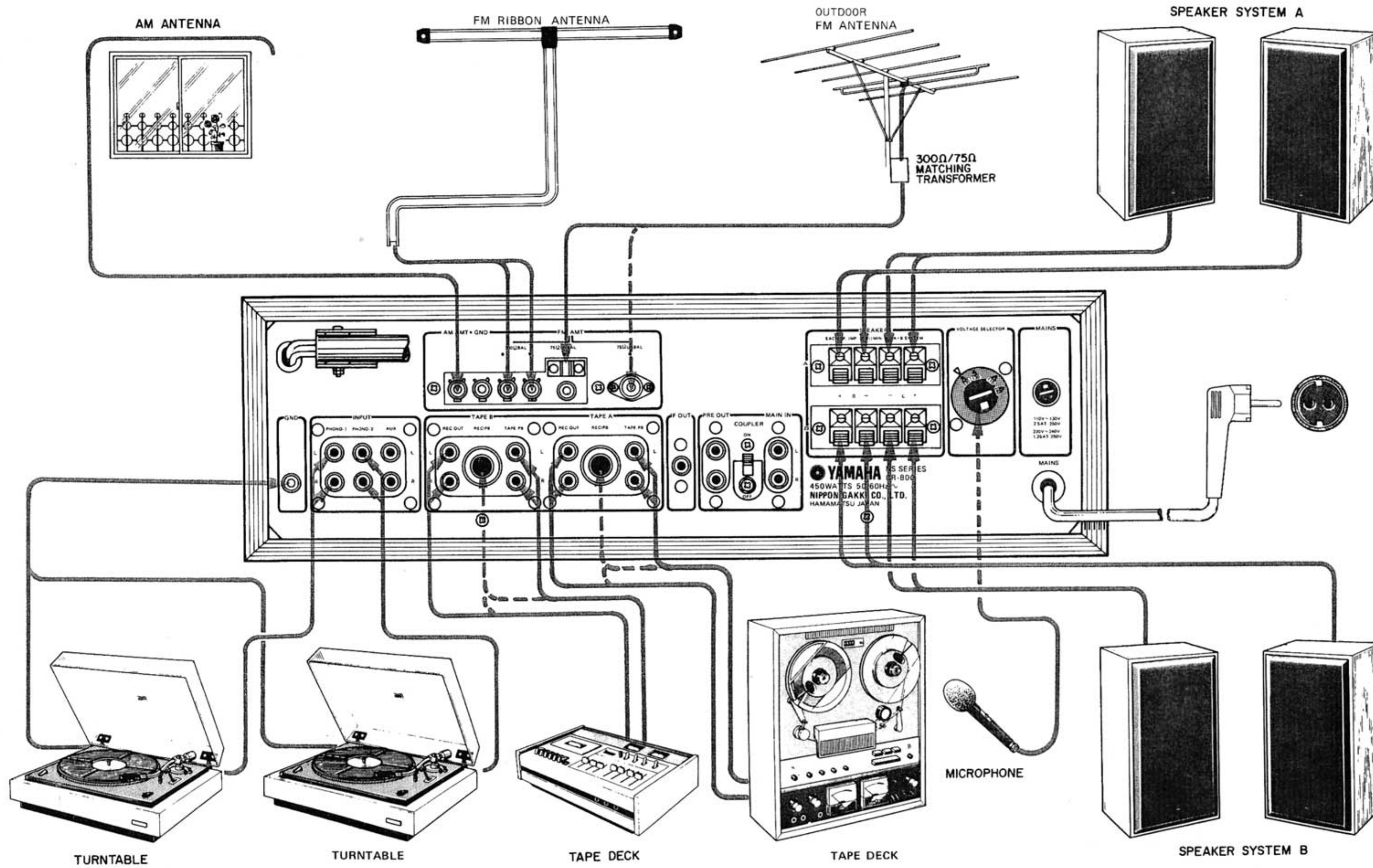
Connect an FM 4-channel adaptor using an SCA signal to the rear panel IF Out jack for 4-channel FM listening pleasure.

CONNECTION DIAGRAM

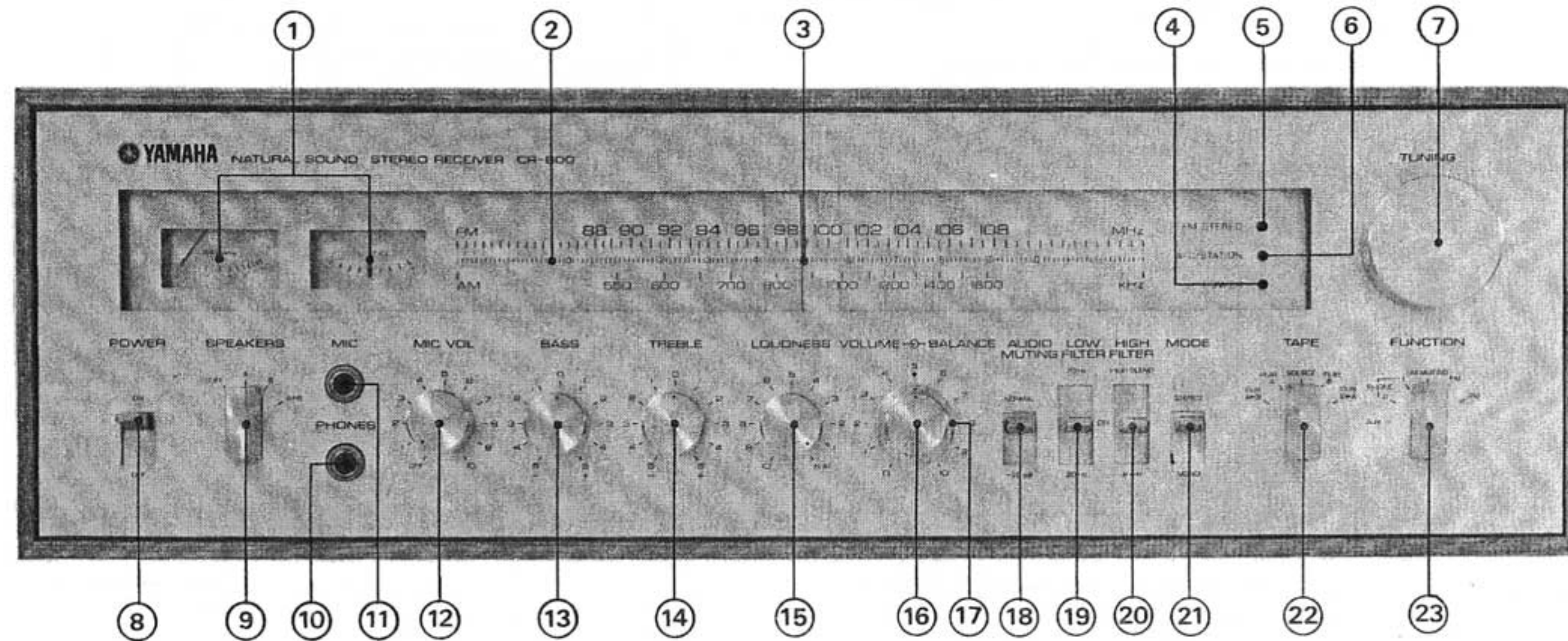
FOR REAR PANEL TYPE A, B, C, D MODELS



FOR REAR PANEL TYPE E MODEL



FRONT PANEL PARTS AND FUNCTIONS



① SIGNAL AND TUNING METERS

These meters can be used to indicate when you have achieved perfect tuning for a particular radio station. Both meters are used for FM broadcasts, while the Signal meter alone is used for AM. If the signal meter needle does not swing past 20 this shows that the incoming signal for that station is not strong enough. See the antenna connection explanations, p 6~7.

② DIAL SCALE

Shows the frequency of the incoming radio signal. The upper portion is for FM, the lower for AM.

③ DIAL INDICATOR

Moves when the Tuning knob is tuned. The middle red line indicates the frequency of the FM or AM station received.

④ POWER INDICATOR

Lights up when the unit is receiving power through the power switch.

⑤ FM STEREO INDICATOR

When an FM stereo program is received the set will automatically switch to stereo performance and this lamp will light. When a monophonic station is tuned, the set will play in mono and this lamp will go out.

⑥ AFC/STATION INDICATOR

During normal reception this lamp is lit. When a station is being tuned and your hand is on the tuning knob, the AFC goes off automatically, and so does this lamp (this permits more precise tuning). Then, when you remove your hand the AFC goes on and the lamp lights (AFC locks onto the station for drift-free reception). If the signal is very weak, however, the lamp may fail to light.

⑦ TUNING KNOB

Use this knob to tune in an FM or AM station while watching the Tuning and Signal meters. Turn the knob slowly.

⑧ **POWER SWITCH**

Use it to switch on the set.

⑨ **SPEAKER SELECTOR SWITCH**

Use this switch to select either or both of the speaker systems (A, B), connected to the rear panel terminal (see p. 5 for details).

⑩ **HEADPHONE JACK**

Plug in a headphone set here for private listening (see p. 5).

⑪ **MIC JACK**

When using a microphone, plug it into this jack (see p. 10).

⑫ **MIC VOLUME CONTROL**

This knob controls the volume of the input from a microphone plugged into the proper jack. Turn to the right to increase the volume. When a microphone is not in use, be sure to turn this knob all the way to the left (Off position). See p. 10.

⑬ **BASS CONTROL**

Adjusts the bass tones. From the O position turn to the right to strengthen bass tones, turn to the left to diminish them. For normal listening, leave the knob set at O (see p. 11).

⑭ **TREBLE CONTROL**

Adjusts the treble tones. From the O position turn to the right to strengthen treble tones, turn to the left to diminish them. For normal listening, leave the knob set at O (see p. 11).

⑮ **LOUDNESS CONTROL**

During low-volume listening the ear's sensitivity to high and low tones is greatly reduced. This control incorporates a unique Yamaha circuit permitting you to readjust the balance for full listening pleasure, even late at night when the sound must be kept low (see p. 12).

⑯ **VOLUME CONTROL**

This knob controls the overall volume coming from the speakers. Turn to the right to increase the volume. Turn the volume down (all the way to the left) when turning on the power or changing the Function selector or Speaker selector setting (see p. 21).

⑰ **BALANCE CONTROL**

This knob controls the relative strengths of the left and right channels. The strength of both channel signals are even when the knob is set at 5. Turn to the right to diminish the left channel volume, to the left to diminish the right.

⑱ **AUDIO MUTING**

Cuts the sound by 20dB for temporary volume reduction (i.e., during a telephone call) with one-touch resetting (see p. 11 for detail).

⑲ **LOW FILTER**

Sharply reduces rumble and low frequency response at 12dB per octave below selectable cutoff frequency of 70Hz or 20Hz (see p. 12).

⑳ **HIGH FILTER**

Sharply reduces hiss and high frequency response at 6dB per octave above the cutoff frequency of 8kHz. Use the High Blend position to cut stereo noise without affecting frequency response (see p. 12).

㉑ **MODE SWITCH**

Mono; Combines L and R inputs, and assigns the result to L and R outputs.

Stereo; Assigns L input to L output, and R input to R output.

㉒ **TAPE SELECTOR**

With two professional-type 3-head tape decks connected, you can record on either or both, or from one to the other, with monitoring (see p. 9).

㉓ **FUNCTION SELECTOR**

Aux: To play a tape deck, tuner, or other stereo program source connected to the rear panel Aux jacks.

Phono 1

& 2: To play a turntable with magnetic stereo cartridge connected to the rear panel Phono (1 or 2) jacks.

FM

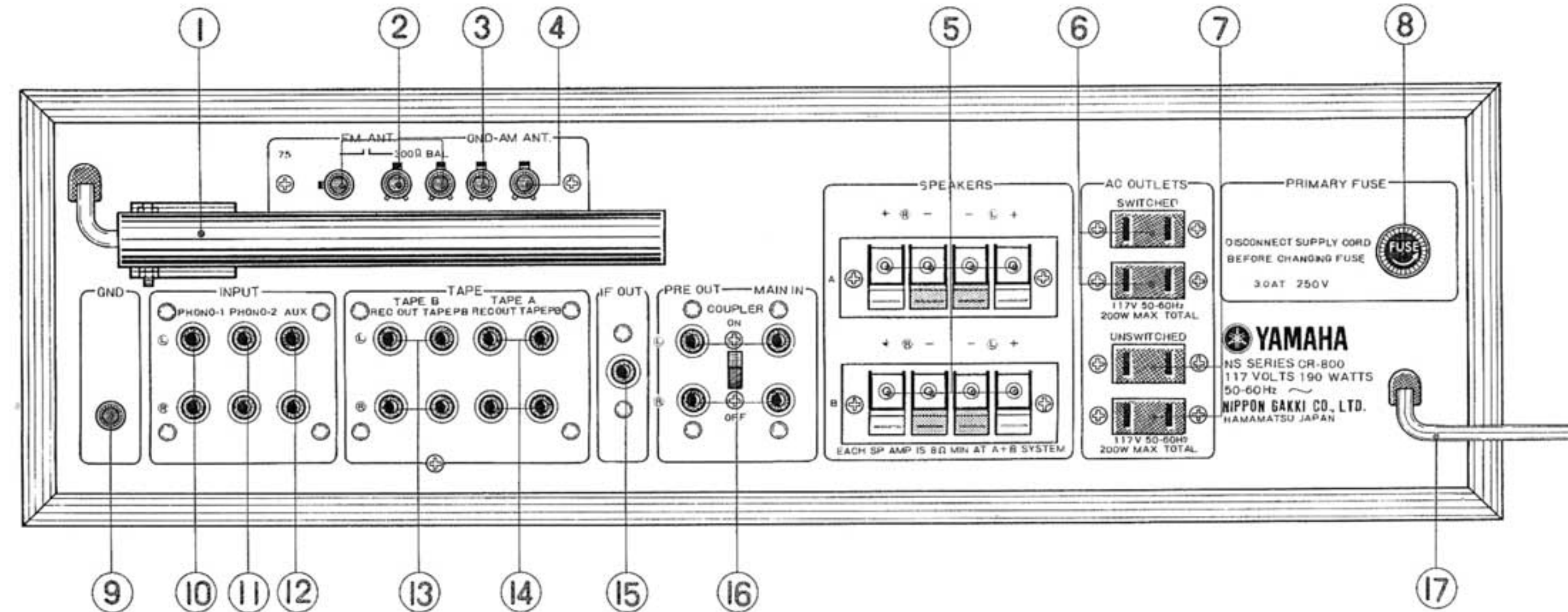
Muting: To cut noise between FM stations while tuning.

FM: To play FM.

AM: To play AM.

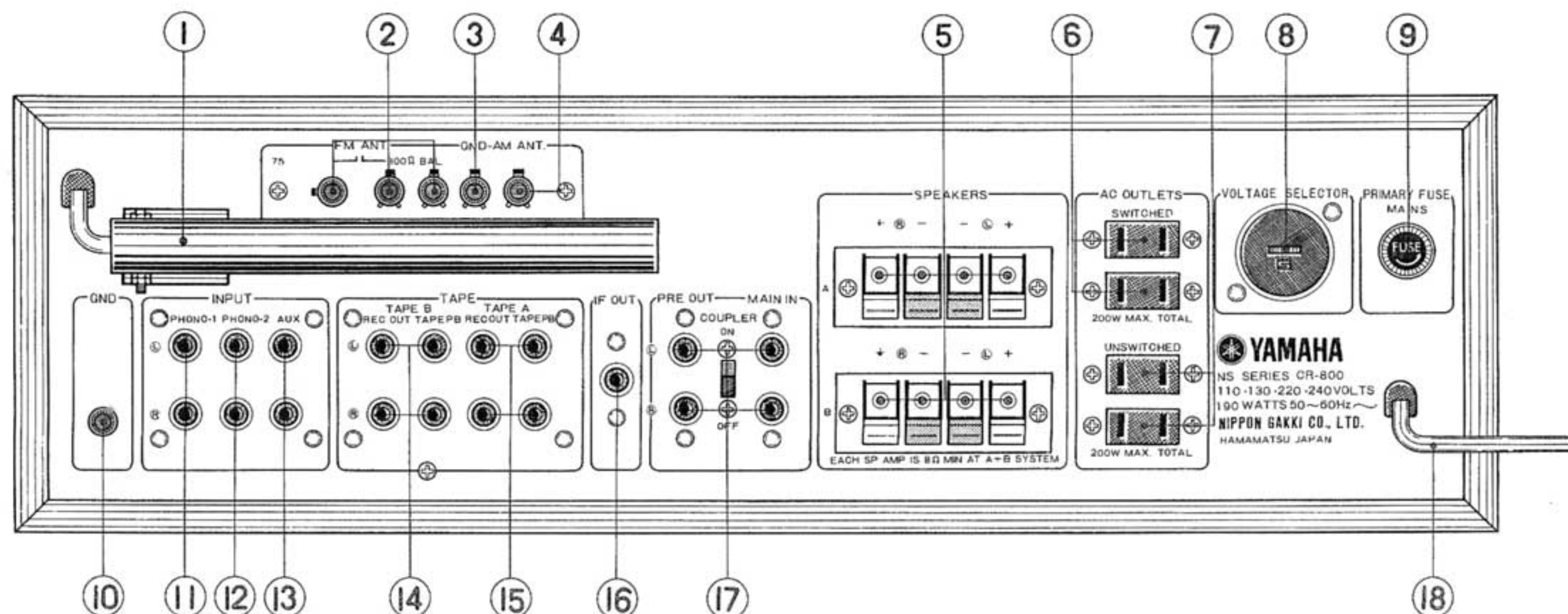
REAR PANEL PARTS AND FUNCTIONS

■ TYPE A MODEL



- ① **AM FERRITE BAR ANTENNA**
- ② **FM ANTENNA TERMINALS** (see p. 7)
- ③ **GROUND TERMINAL** (see p. 6)
- ④ **AM ANTENNA TERMINAL** (see p. 6)
- ⑤ **SPEAKER TERMINALS** (see p. 5)
- ⑥ **AC OUTLETS - SWITCHED**
You may plug your tape recorder or turntable AC power cord into these outlets. With your CR-800 power switch ON these outlets are "live." With your CR-800 power switch can thus function as a system ON-OFF power switch.
- ⑦ **AC OUTLETS - UNSWITCHED**
Always powered when the CR-800 power cord is plugged in, regardless of power switch position.
- ⑧ **PRIMARY FUSE**
This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.
- ⑨ **GROUND TERMINAL** (see p. 8)
- ⑩ **PHONE 1 JACKS** (see p. 8)
- ⑪ **PHONO 2 JACKS** (see p. 8)
- ⑫ **AUX JACKS** (see p. 8)
- ⑬ **TAPE B REC OUT/PB JACKS** (see p. 9)
- ⑭ **TAPE A REC OUT/PB JACKS** (see p. 9)
- ⑮ **IF OUT JACK** (see p. 13)
This jack is for connecting an FM 4-channel adaptor.
- ⑯ **PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)**
These jacks and the switch let you use the pre-amp and main amp separately when necessary.
- ⑰ **AC CORD**

■ TYPE B MODEL



① AM FERRITE BAR ANTENNA

② FM ANTENNA TERMINALS (see p. 7)

③ GROUND TERMINAL (see p. 6)

④ AM ANTENNA TERMINAL (see p. 6)

⑤ SPEAKER TERMINALS (see p. 5)

⑥ AC OUTLETS—SWITCHED

You may plug your tape recorder or turntable AC power cord into these outlets. With your CR-800 power switch ON these outlets are "live." With your CR-800 power switch can thus function as a system ON-OFF power switch.

⑦ AC OUTLETS—UNSWITCHED

Always powered when the CR-800 power cord is plugged in, regardless of power switch position.

⑧ VOLTAGE SELECTOR

Set it to match the voltage in your area.

⑨ PRIMARY FUSE

This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.

⑩ GROUND TERMINAL (see p. 8)

⑪ PHONO 1 JACKS (see p. 8)

⑫ PHONO 2 JACKS (see p. 8)

⑬ AUX JACKS (see p. 8)

⑭ TAPE B REC OUT/PB JACKS (see p. 9)

⑮ TAPE A REC OUT/PB JACKS (see p. 9)

⑯ IF OUT JACK (see p. 13)

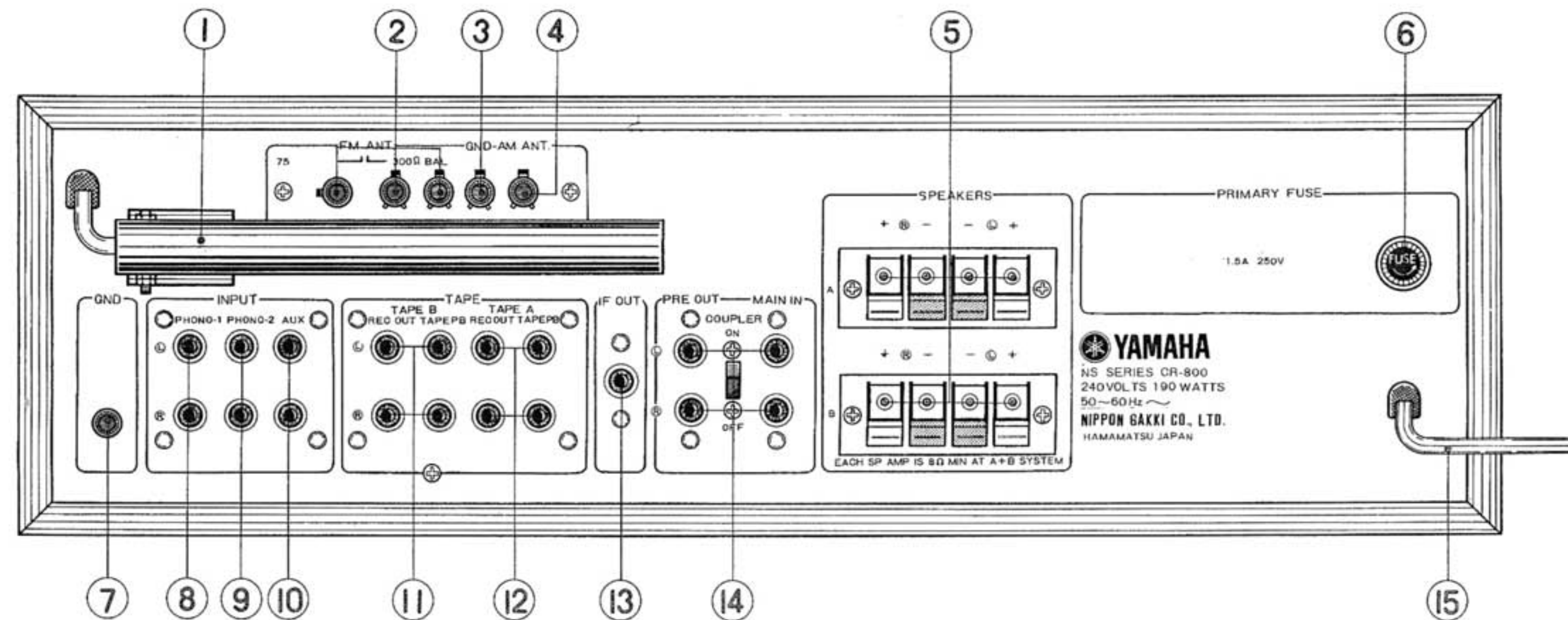
This jack is for connecting an FM 4-channel adaptor.

⑰ PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)

These jacks and the switch let you use the pre-amp and main amp separately when necessary.

⑱ AC CORD

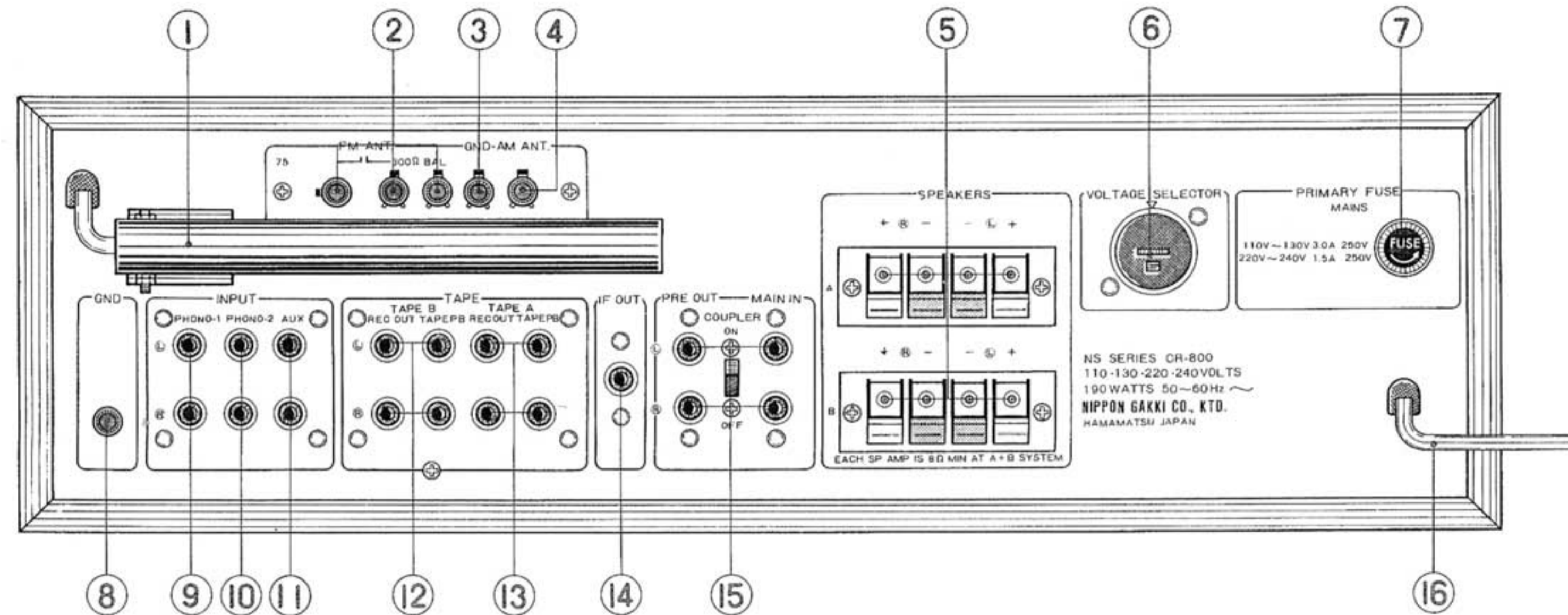
■ TYPE C MODEL



- ① AM FERRITE BAR ANTENNA
- ② FM ANTENNA TERMINALS (see p. 7)
- ③ GROUND TERMINAL (see p. 6)
- ④ AM ANTENNA TERMINAL (see p. 6)
- ⑤ SPEAKER TERMINALS (see p. 5)
- ⑥ PRIMARY FUSE
This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.
- ⑦ GROUND TERMINAL (see p. 8)
- ⑧ PHONO 1 JACKS (see p. 8)
- ⑨ PHONO 2 JACKS (see p. 8)
- ⑩ AUX JACKS (see p. 8)

- ⑪ TAPE B REC OUT/PB JACKS (see p. 9)
- ⑫ TAPE A REC OUT/PB JACKS (see p. 9)
- ⑬ IF OUT JACK (see p. 13)
This jack is for connecting an FM 4-channel adaptor.
- ⑭ PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)
These jacks and the switch let you use the pre-amp and main amp separately when necessary.
- ⑮ AC CORD

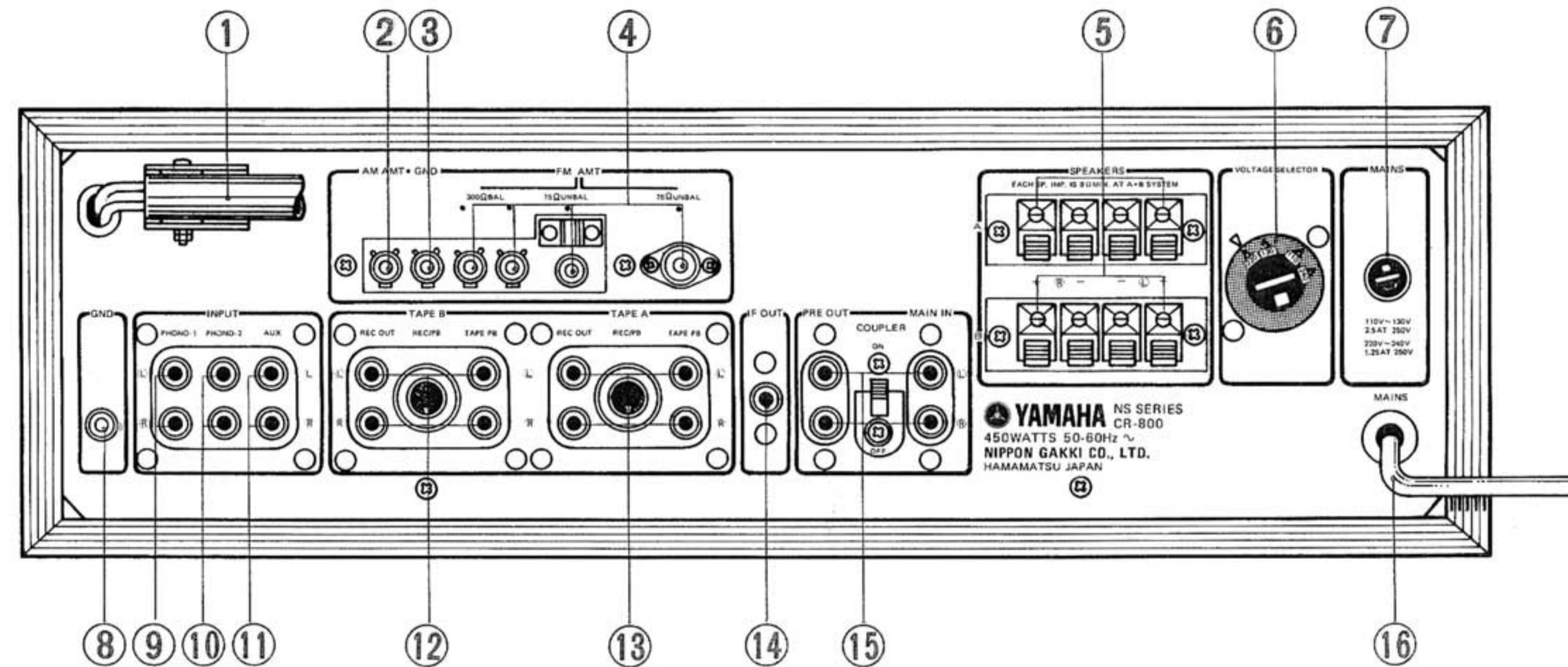
■ TYPE D MODEL



- ① AM FERRITE BAR ANTENNA
- ② FM ANTENNA TERMINALS (see p. 7)
- ③ GROUND TERMINAL (see p. 6)
- ④ AM ANTENNA TERMINAL (see p. 6)
- ⑤ SPEAKER TERMINALS (see p. 5)
- ⑥ VOLTAGE SELECTOR
Set it to match the voltage in your area.
- ⑦ PRIMARY FUSE
This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.
- ⑧ GROUND TERMINAL (see p. 8)
- ⑨ PHONO 1 JACKS (see p. 8)

- ⑩ PHONO 2 JACKS (see p. 8)
- ⑪ AUX JACKS (see p. 8)
- ⑫ TAPE B REC OUT/PB JACKS (see p. 9)
- ⑬ TAPE A REC OUT/PB JACKS (see p. 9)
- ⑭ IF OUT JACK (see p. 13)
- ⑮ PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)
This jack is for connecting an FM 4-channel adaptor.
- ⑯ PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)
These jacks and the switch let you use the pre-amp and main amp separately when necessary.
- ⑰ AC CORD

■ TYPE E MODEL



- ① AM FERRITE BAR ANTENNA
- ② AM ANTENNA TERMINAL (see p. 6)
- ③ GROUND TERMINAL (see p. 6)
- ④ FM ANTENNA TERMINALS (see p. 7)
- ⑤ SPEAKER TERMINALS (see p. 5)
- ⑥ VOLTAGE SELECTOR
Set it to match the voltage in your area.
- ⑦ PRIMARY FUSE
This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.
- ⑧ GROUND TERMINAL (see p. 8)
- ⑨ PHONO 1 JACKS (see p. 8)

- ⑩ PHONO 2 JACKS (see p. 8)
- ⑪ AUX JACKS (see p. 8)
- ⑫ TAPE B REC OUT/PB JACKS (see p. 9)
- ⑬ TAPE A REC OUT/PB JACKS (see p. 9)
- ⑭ IF OUT JACK (see p. 13)
This jack is for connecting an FM 4-channel adaptor.
- ⑮ PRE OUT, MAIN IN JACKS (WITH COUPLER SWITCH)
These jacks and the switch let you use the pre-amp and main amp separately when necessary.
- ⑯ AC CORD

TROUBLE SHOOTING

If the unit does not seem to be functioning properly, consult the following chart and make the proper checks. If it still does not work right, contact your Yamaha serviceman.

PROBLEM	CAUSE	CORRECTION
No power when the switch turned on.	Cord not plugged in. Plug not firmly inserted. Primary fuse blown.	Plug in. Push in firmly. Replace with fuse or contact serviceman.
Power is on, but no sound.	Improper speaker connection. Speaker selector switch set to Off. Tape monitor switch set to Monitor. Improper function selector switch setting. Volume turned too low.	Recheck connections. Turn to A, B or A+B. Set to Source. Set to proper program source. Turn up.
No sound from one channel.	Improper speaker connection. Defective input jack connection. Improper left-right balance setting. Playback from mono tape recorder.	Recheck connections. Recheck connections. Line up red marks on volume knobs. Set mode switch to Mono.
FM Stereo indicator flashes during FM stereo reception.	Improper tuning. Improper antenna or weak signal.	Retune. Check antenna connections. Replace ribbon antenna with more powerful outdoor type.
Noise during FM stereo reception.	A clear FM stereo signal can be received only to within a distance about half that for an FM mono signal.	Install more powerful antenna. Listen in mono mode.
Strange hissing or beeping during FM reception.	Interference from auto or motorcycle ignition.	Make sure to connect antenna with a coaxial cable. Move the antenna farther from the street.
Hum during record play.	Player ground wire disconnected. Improper positioning of player and/or amp. Improper phono connections.	Reconnect firmly. Reposition the units on solid bases. Reconnect firmly.
Sound distortion during record play.	Worn stylus. Improper stylus. Dirty stylus.	Replace. Replace with one that matches the cartridge. Clean.
Howling during record play when volume turned high.	Speakers too close to player.	Separate player and speakers as far as possible. Put a soft, vibration-damping material under the player. Do not place the speaker(s) and player on the same shelf, table-top, etc.

SPECIFICATIONS

■ AUDIO SECTION

POWER OUTPUT

Dynamic Power (IHF)	150 watts (4Ω) 130 watts (8Ω)
Continuous RMS Power (each channel driven)	70/70 watts (4Ω) at 1,000Hz 55/55 watts (8Ω) at 1,000Hz
Continuous RMS Power (both channels driven)	60+60 watts (4Ω) at 1,000Hz 50+50 watts (8Ω) at 1,000Hz
Continuous RMS Power (both channels driven)	50+50 watts (4Ω) at 20 to 20,000Hz 45+45 watts (8Ω) at 20 to 20,000Hz

TOTAL HARMONIC DISTORTION

Power Amplifier Only	less than 0.1% at rated power less than 0.04% at 1 watt
Preamplifier Only (Phono to Pre Out)	less than 0.1% at rated power (Aux to Pre Out) less than 0.02% at rated power
Overall (Aux to Power Output)	less than 0.1% at rated power

INTERMODULATION DISTORTION

(70Hz:7,000Hz=4:1 SMPTE method)

Power Amplifier Only	less than 0.1% (8Ω) at rated power less than 0.05% (8Ω) at 1 watt
Overall (Aux to Power Output)	less than 0.1% (8Ω) at rated output

POWER BANDWIDTH (IHF, distortion 0.5% const.)

5 to 70,000Hz

FREQUENCY RESPONSE (at 1 watt)

Overall (Aux, Tape PB to Power Output)	10 to 50,000Hz +0.5dB, -1dB
Overall (Mic to Power Output)	100 to 10,000Hz +0.5dB, -6dB

Power Amplifier Only

10 to 100,000Hz +0dB, -1dB

Deviation from RIAA (30 to 15,000Hz)

+0.5dB, -0.5dB

LOAD IMPEDANCE	4 to 16Ω
DAMPING FACTOR (8Ω)	70 at 1,000Hz
CHANNEL SEPARATION (at rated power, 1,000Hz)	
Power Amplifier Only	60dB
Overall from PHONO 1, 2	50dB
Overall from AUX, TAPE	
PB	50dB
Overall from MIC	50dB
HUM AND NOISE (IHF, Closed Circuit A Network)	
Overall from PHONO 1, 2	better than 75dB
Overall from MIC	better than 70dB
Overall from AUX, TAPE	
PB	better than 90dB
Power Amplifier Only	better than 100dB
Volume at Minimum	better than 90dB
INPUT SENSITIVITY AND IMPEDANCE	
	(at rated power, 1,000Hz)
PHONO 1	3mV (50kΩ)
PHONO 2	3mV (50kΩ)
PHONO 1, 2 Max. Input	
Capability	240mV (T.H.D. 0.1%)
MIC	3mV (50kΩ)
MIC Max. Input Capability	450mV (T.H.D. 0.3%)
AUX	150mV (45kΩ)
TAPE PB A, B	150mV (45kΩ)
Power Amplifier Input	775mV (50kΩ)
OUTPUT LEVEL AND IMPEDANCE	
	(at rated power, 1,000Hz)
TAPE REC OUT A, B	150mV (2kΩ)
PRE OUT	775mV (2kΩ)
	3,000mV (Max. Output T.H.D. 0.1%)
TONE CONTROLS	
BASS	+15dB, -15dB at 50Hz
TREBLE	+10dB, -10dB at 10,000Hz
FILTERS	
LOW	-3dB at 20Hz, 70Hz (12dB/oct.)
HIGH	-3dB at 8,000Hz (6dB/oct.) High Blend
LOUDNESS CONTROL	
	(Continuous Loudness Volume at Minimum)
	+10dB at 100Hz, +5dB at 10,000Hz

■ TUNER SECTION

FM:

Tuning Range	88 to 108MHz
Usable Sensitivity (IHF)	1.7 μ V
Quieting Slope	55dB at 5 μ V 60dB at 10 μ V
Image Frequency Rejection	100 dB
IF Rejection	100dB
Spurious Response Rejection	100dB
AM Rejection	55dB
Capture Ratio	1.0dB
Alternate Channel Selectivity (IHF)	80dB
Signal-to-Noise Ratio	75dB
Total Harmonic Distortion	
MONO	0.15% at 400Hz 0.3% at 50 to 10,000Hz
STEREO	0.3% at 400Hz 1.0% at 50 to 10,000Hz
Stereo Separation	45dB at 400Hz 35dB at 50 to 10,000Hz
Frequency Response	
	+0.5dB, -0.5dB at 50 to 10,000Hz +1.5dB, -1.5dB at 20 to 15,000Hz
Sub-Carrier Suppression	60dB
Muting Override Signal Level	10 μ V
Antenna Impedance	300 Ω balanced 75 Ω unbalanced
IF Out Level and Impedance	400mV/1k Ω

AM:

Tuning Range	525 to 1,605kHz
Usable Sensitivity (IHF Antenna Terminal)	25 μ V
	(IHF Bar Antenna) 52dB/m
Signal-to-Noise Ratio	45dB at 80dB/m
Image Frequency Rejection	80dB at 1,000kHz
Selectivity	30dB at 1,000kHz
IF Rejection	60dB at 1,000kHz
Spurious Response Rejection	70dB at 1,000kHz
Total Harmonic Distortion	0.8% at 80dB/m

■ GENERAL

Semiconductors	2 ICs; 3 MOS FETs; 98 Transistors; 3 LED's; 60 Diodes; 6 Zener Diodes
Power Source	AC 117V, 50/60Hz
Power Consumption	
Max.	300 watts
Rated	190 watts
AC Outlets	
Switched	2 (total 200 watts)
Unswitched	2 (total 200 watts)
Dimensions	474mm(17 $\frac{3}{4}$ ")Wx158mm(6 $\frac{1}{4}$ ")H x300mm(11 $\frac{3}{4}$ ")D
Weight	14kg (31 lbs)

Specifications subject to change without notice.