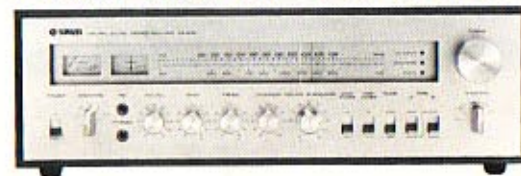


Yamaha Hi-Fi Stereo

FM/AM RECEIVER



model **CR-600**
Owner's Manual

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

CONTENTS

Congratulations upon your selection of the Yamaha CR-600. The CR-600 incorporates some of the world's most advanced electronic technology, employing a special Yamaha design to provide outstanding performance and convenience for any program source.

The FM tuner boasts excellent sensitivity for weak signal areas, yet assures outstanding clear signals in the city where many FM stations are close together on the dial scale.

Brilliant, distortion-free response is yours from the record and tape playback sections, and the possibility of microphone mixing makes the CR-600 an ideal choice for every music lover. For optimum performance and long years of listening pleasure, be sure to fully read this owner's manual and keep it handy for future reference.

Note: If you want to set up the system quickly, please see pages 12 & 13 showing the connection diagram.

PRECAUTIONS	4
OTHER EQUIPMENT:CONNECTION AND OPERATION	
Speaker System Connection and Operation	5
AM Antenna Connection	6
AM Broadcast Reception	6
FM Antenna Connection	6
FM Broadcast Reception	7
Record Player Connection and Operation	8
Tape Deck Connection and Operation	9
Auxiliary Input Connection and Operation	10
Microphone Connection and Operation	10
Headphone Connection and Operation	11
Accessories	11
CONNECTION DIAGRAM	12
FRONT PANEL PARTS AND FUNCTIONS	14
REAR PANEL PARTS AND FUNCTIONS	
TYPE A Model	16
TYPE B Model	17
TYPE C Model	18
TYPE D Model	19
TYPE E Model	20
EXPLANATIONS OF CONTROLS AND CONNECTIONS	
Volume, Balance Control	21
Tone Controls	21
Loudness Control	22
Filter Switches	22
Pre Out, Main In Connections	23
IF Out	23
DO NOT BE ALARMED IF	24
BLOCK DIAGRAM	25
SPECIFICATIONS	26

PRECAUTIONS

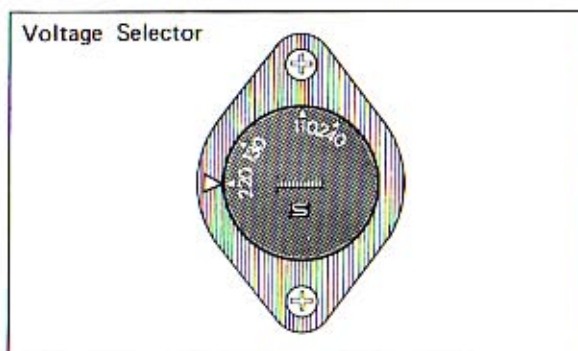
For optimum performance and durability from your CR-600, pay careful attention to the following points.

- Do not place the set in a location exposed to direct sunlight or heat.
- Be sure to use the function and speaker switches as explained on the following pages. Do not exert undue force on any of the controls.
- Be sure to turn off the power switch when making any connections or disconnections. This is especially important when disconnecting speaker leads.
- Input connections should be touched only when the volume is turned all the way down or the power switched off.
- The cabinet is made of fine-quality wood. Do not clean it with thinner or other volatile products. If any such products, such as insecticide, fall on the cabinet, wipe it clean immediately.

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).



OTHER EQUIPMENT: CONNECTION AND OPERATION

SPEAKER SYSTEM CONNECTION AND OPERATION

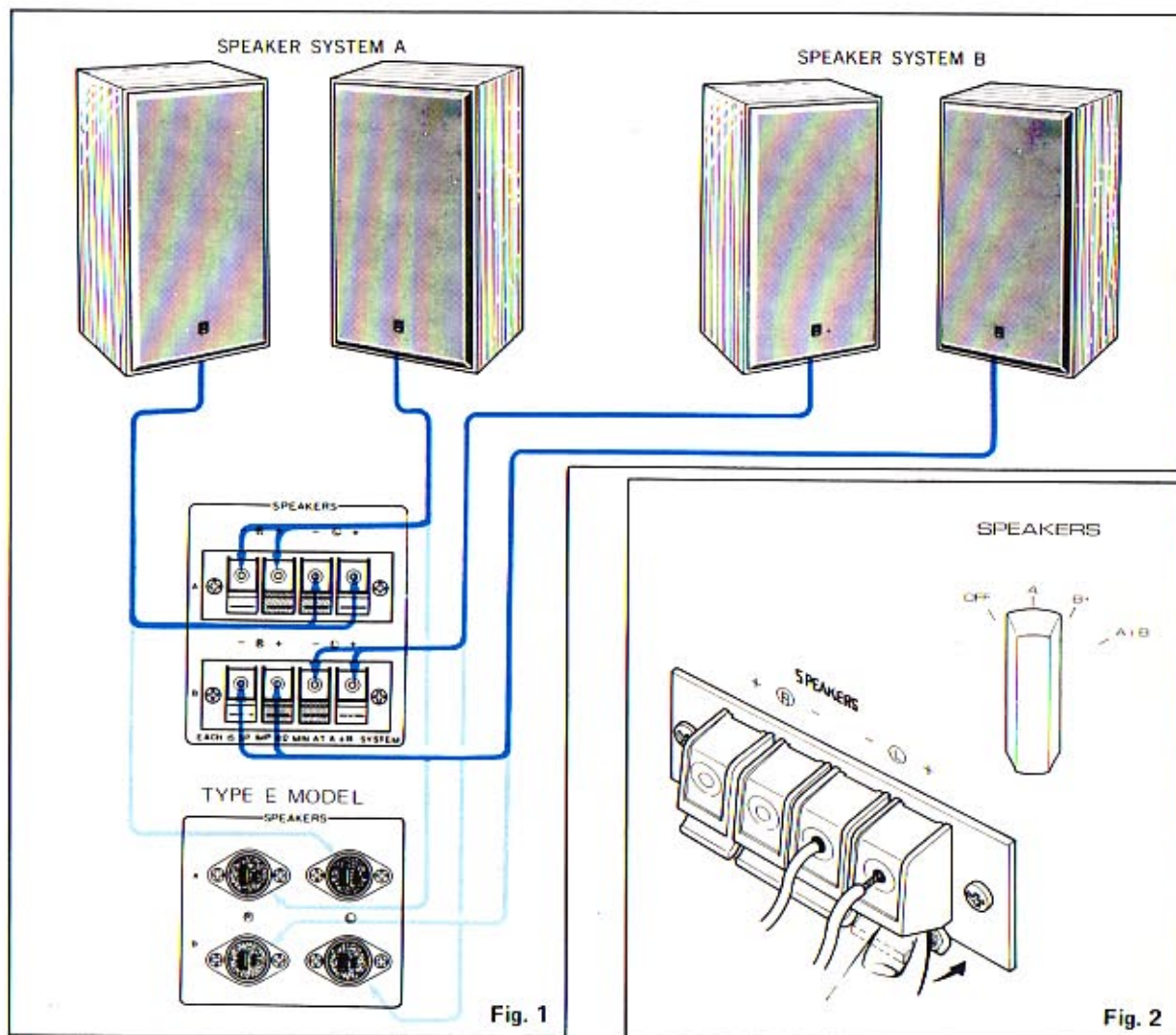
1. There are two sets of speaker Terminals (A, B) on the rear panel, permitting the connection of two separate sets of speakers.
2. These terminals are controlled by the Speaker selector on the front panel. Set for the A, B or both. The speaker(s) connected to any one of these jacks should have an impedance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

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. See Fig. 1.

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.

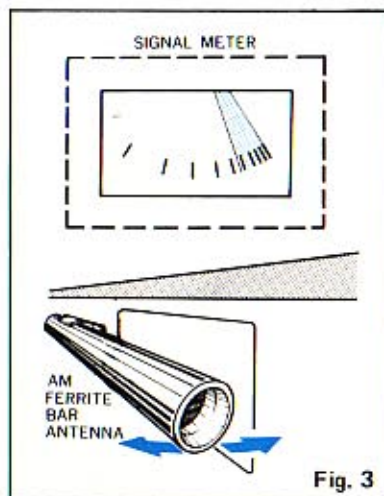
4. These terminals are push-spring types. As shown in Fig. 2, first push back on the bottom lever of the terminal, then insert the stripped end of the lead and hold it in place while you release the lever.

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



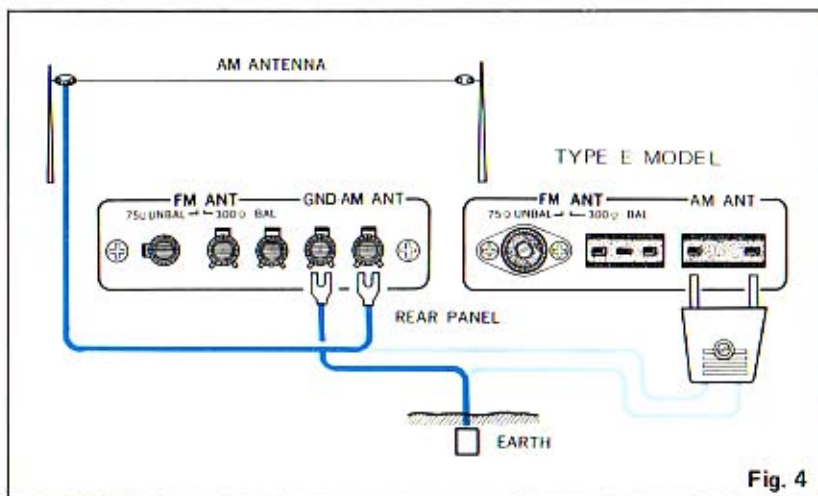
AM ANTENNA CONNECTION

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. 3). 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. 4. 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. Tuning to this point will provide the best reception.

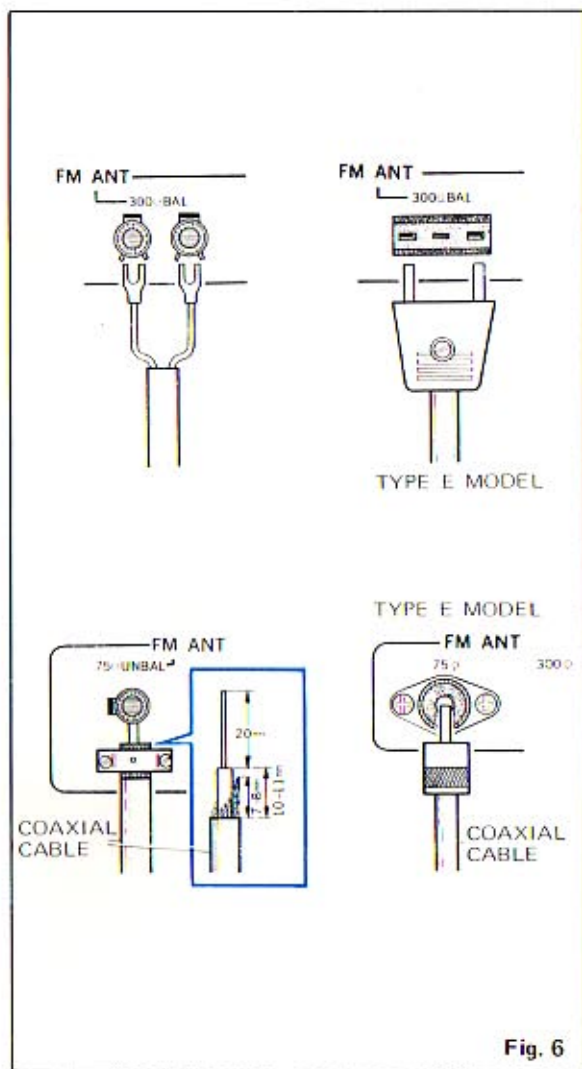


FM ANTENNA CONNECTION

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-600 : 300Ω and 75Ω. To use the ribbon antenna provided, connect to the 300Ω terminals as shown in Fig. 5. Tack the antenna up on a wall watching the Signal meter for maximum deflection as you try different locations (see Fig. 8).

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-600 use a coaxial cable, with a thickness up to C2V. Connect to the 75Ω terminal as shown in Fig. 6. 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.



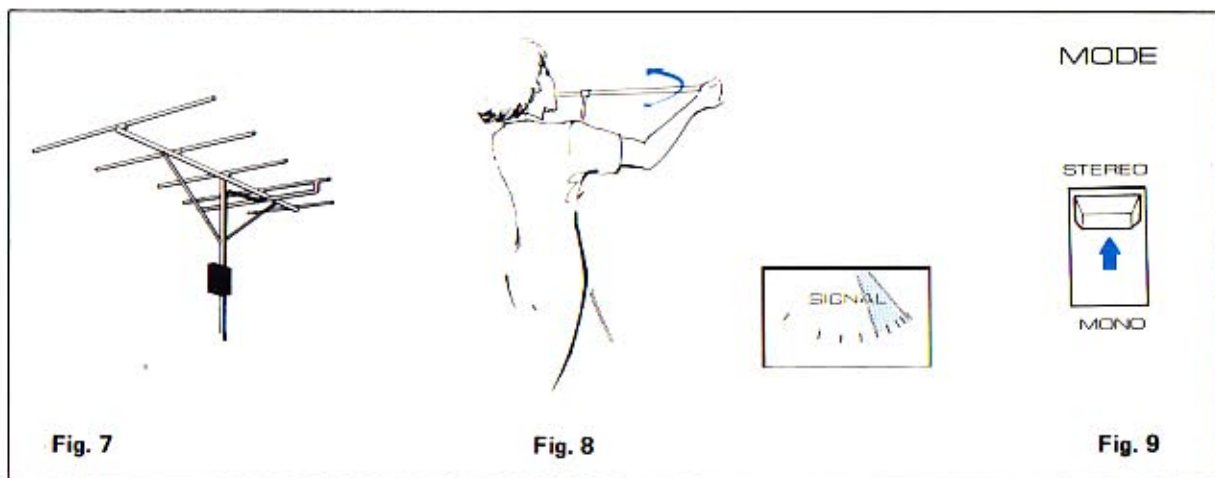
FM BROADCAST RECEPTION

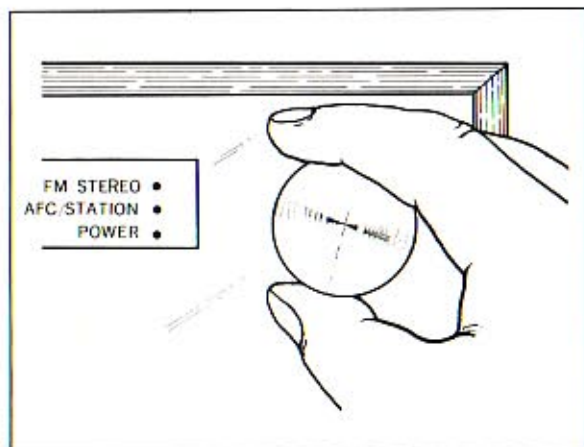
Set the Function selector to FM Muting or to FM, to switch on the FM tuner section. Then gently turn the Tuning knob until you find the desired station. Watch for maximum Signal meter needle deflection, and then finish the tuning by adjusting the Tuning knob so that the Tuning meter needle is at its central position. This position will provide best reception for that station. If the Function selector is set to FM Muting during tuning this will cut out all FM hiss and noise between FM stations, but it weakens the incoming signals. For this reason, do not use it when tuning in a weak station, or in a weak signal area. When it is used, however, be sure to reset to FM once the station is tuned in.

There is no setting for FM Stereo; if a stereo broadcast is received the CR-600 automatically switches to stereo mode, and the stereo lamp lights. The lamp does not light during reception of monophonic signals.

Even with the best of antennas, if you are distant from the station or in a weak signal area one or more FM stereo signals will be accompanied by a great deal of FM noise. In this case, flick the Mode selector switch down to Mono. You will lose the stereo effect, but the noise will be greatly reduced. In normal FM listening conditions the Mode switch should be left on Stereo. See Fig. 9.

If the Tuning meter needle should move from the center position during FM reception, retune so that it is centered in order to maintain optimum tone quality.





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. 10). 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 power source. These dual sets of jacks are very useful for connecting two turntables for testing, etc.

FUNCTION

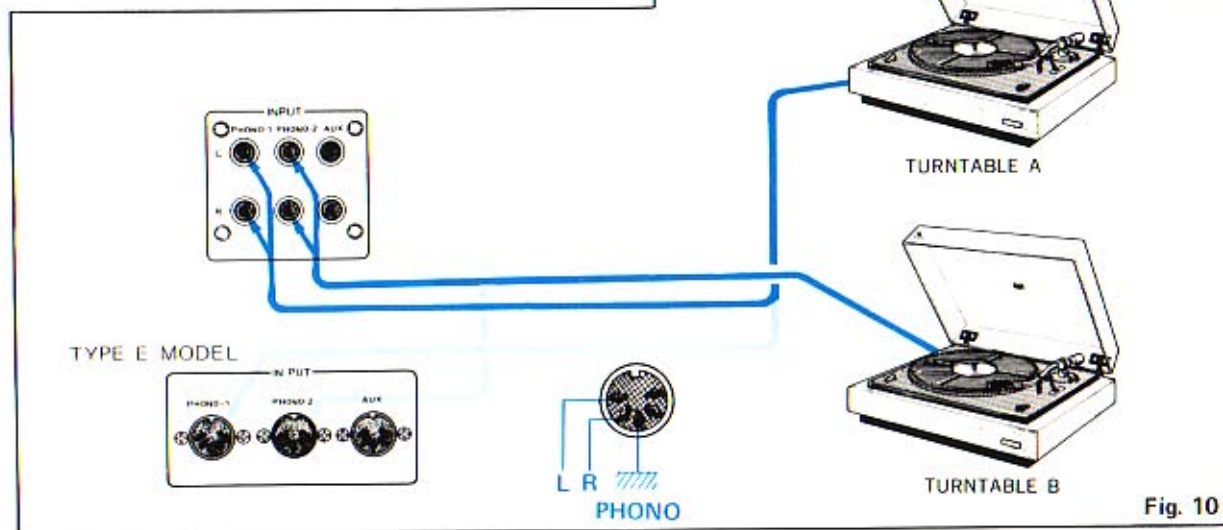
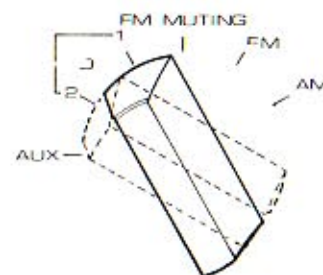


Fig. 10

TAPE DECK CONNECTION AND OPERATION

There are two sets of Rec Out and PB jacks, permitting the use of two tape decks. This lets you record on both decks at once, and in addition you can dub from deck A to deck B.

Connect the Tape A Rec Out jacks on the rear panel to the tape deck Line In jacks; then connect the Tape A PB jacks to the Line Out jacks on the same deck. Be careful not to confuse the left and right leads. Connect the second deck (if one is used) in the same way to the Tape B jacks. See Fig. 11.

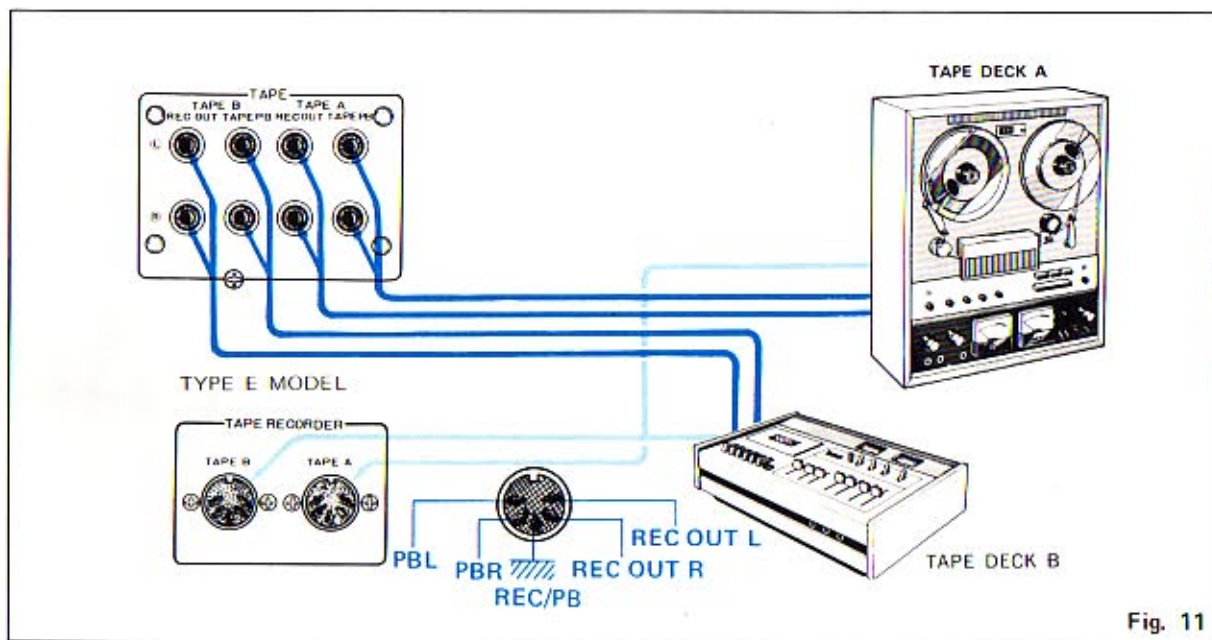


Fig. 11

TAPE PLAYBACK

Set the tape switch A to Monitor (when using the deck connected to the A jacks) and set the controls on the deck for playback. At this time be sure to set the Tape B switch to Source. See Fig. 12. If you want to listen to the deck connected to the Tape B jacks, set the Tape B switch to Monitor. In this case the Tape A switch can be set to either Monitor or Source without affecting the performance.

Note: When listening to a program source selected by the Function selector, be sure both Tape switches are set to Source. If either one is set to Monitor no sound will be heard.

RECORDING

Set either the Tape A or Tape B switch to Source, then you can record onto the tape deck connected to the proper Rec Out jacks. You can record any program selected by the Function selector.

DUBBING

When two tape decks are connected, you can record directly from deck A to deck B (this is impossible in the opposite direction, i. e., from deck B to deck A). For this direct dubbing, set Tape switch A to Monitor, Tape switch B to Source. Of course, the deck connected to the B jacks must be set for recording. In this way you will also be able to monitor what is being recorded.

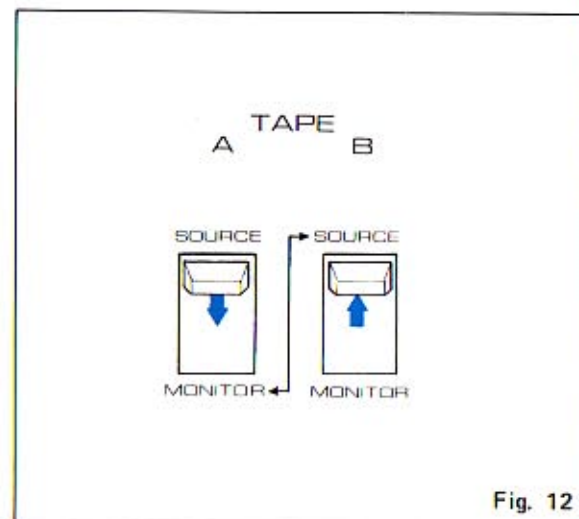


Fig. 12

AUXILIARY INPUT CONNECTION AND OPERATION

The Aux jacks on the rear panel are for connecting other sound source equipment such as an 8-track cartridge player, television or other tuner. If the connected unit is monophonic, connect to the left (L) jack only, and set the Mode switch to Mono. Use these jacks instead of the Phono jacks for connecting a turntable with a crystal or ceramic cartridge. Be sure to set the Function switch to Aux when listening to any unit connected to these jacks. See Fig. 13.

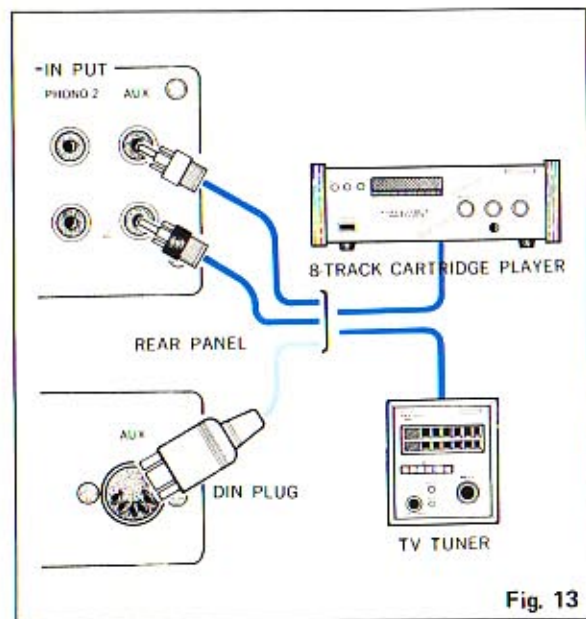


Fig. 13

MICROPHONE CONNECTION AND OPERATION

The CR-600 incorporates a mike mixing circuit which not only lets you add your voice to any other program source, but also allows recording of the mixed signal.

MIXING

1. Plug the microphone into its jack on the front panel (any type from 200Ω to $50k\Omega$ impedance can be used). See Fig. 14.
2. Turn the Mic Volume knob to the right to switch on the microphone circuit; turning further to the right increases the microphone volume. If howling occurs, it shows that either the microphone volume is too high, the microphone is too near the speakers or it is pointing at one speaker. See Fig. 15.



Fig. 14



Fig. 15

3. The microphone sound is not affected by the other controls: Volume, Bass, Treble, etc. These controls are only for program sources set by the Function selector.

MIXED-SIGNAL RECORDING

1. To record a mixed (microphone sound + program source) signal, the tape deck input terminals must be connected to the CR-600 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. 16.

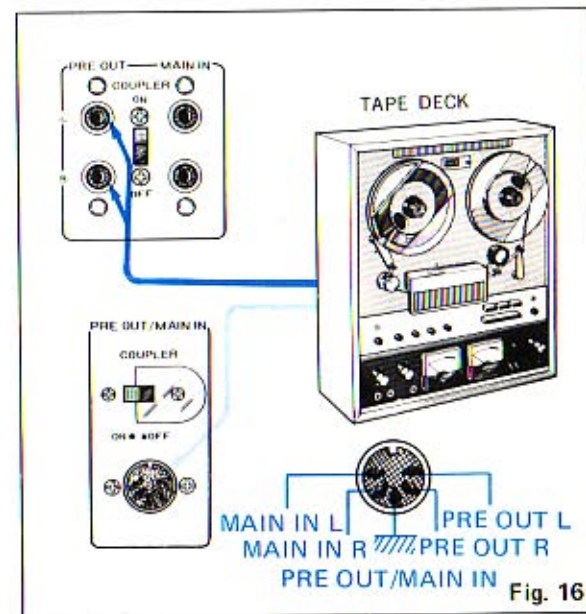


Fig. 16

- 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-600, 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.

USING THE MICROPHONE ONLY

When using the microphone only, turn the main Volume control all the way down; then you can broadcast or record through the microphone only.

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. 17).

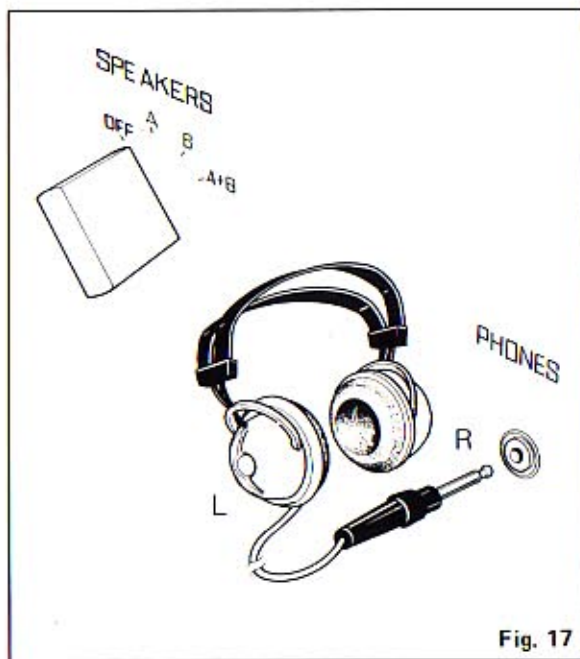


Fig. 17

ACCESSORIES

- Service Pads**
Use the service pads to protect the upper panel of the CR-600 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-600. 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.

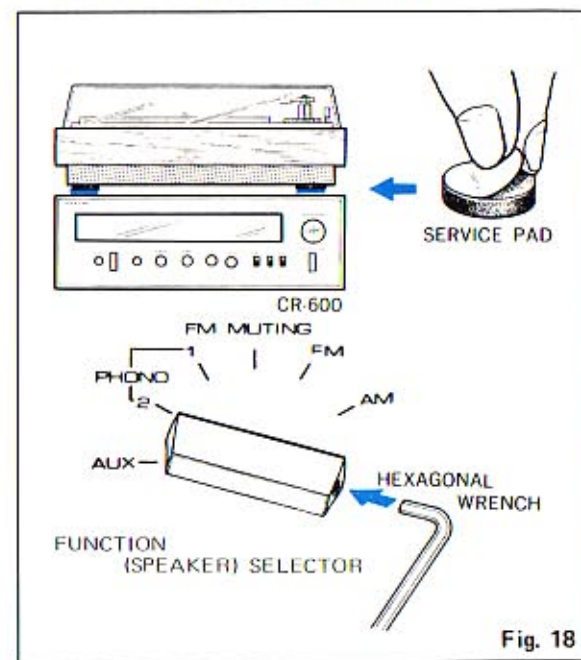
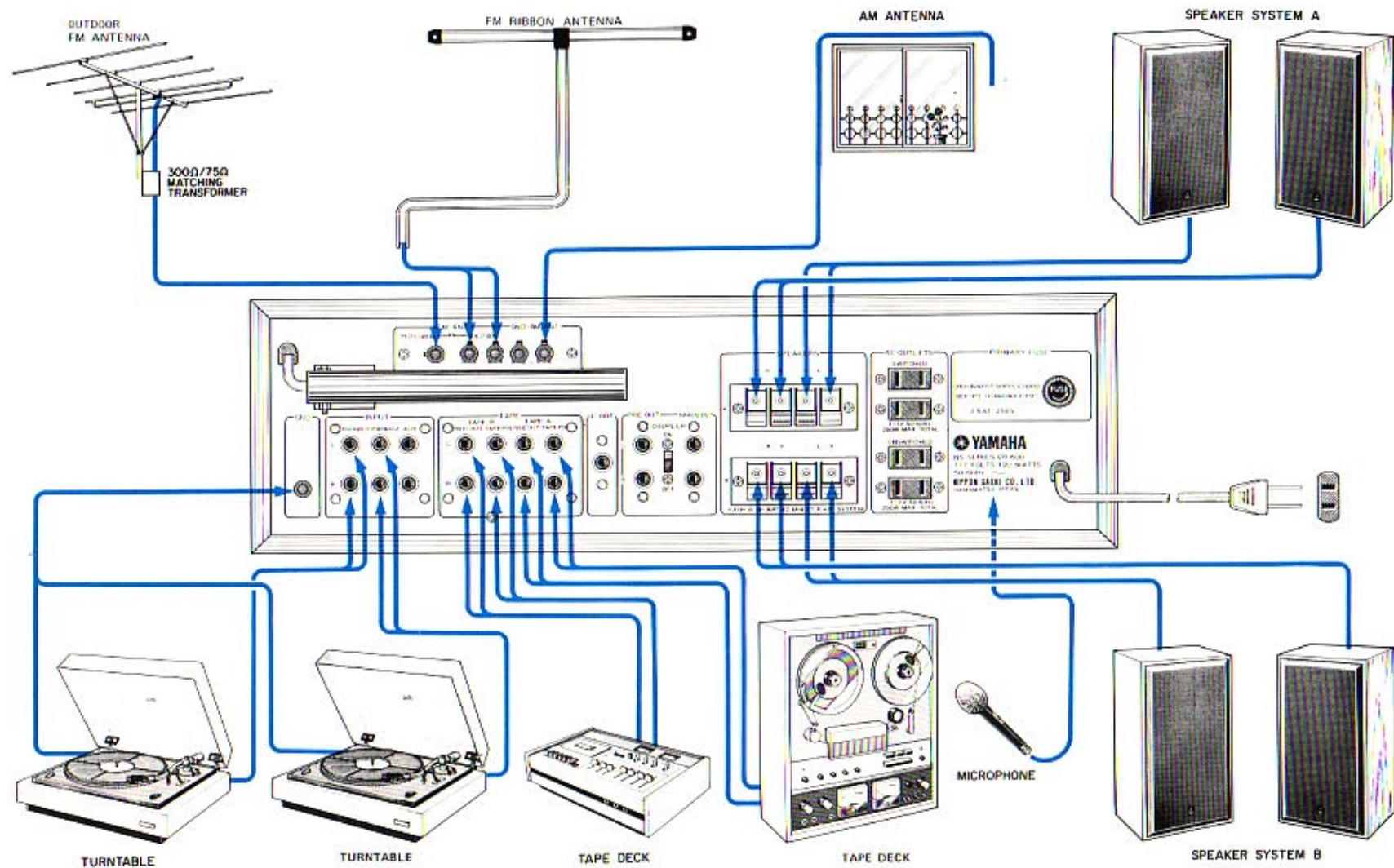
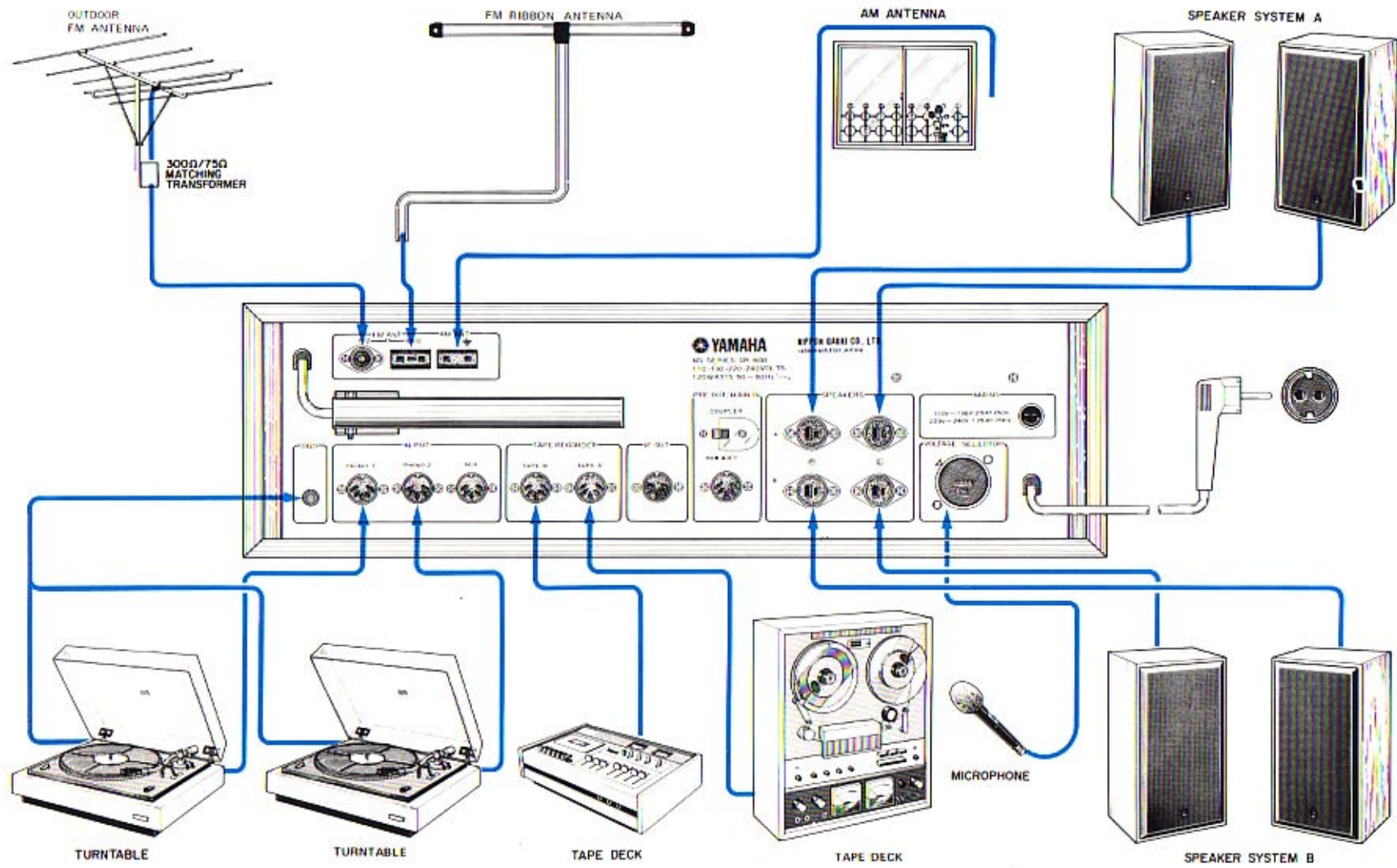


Fig. 18

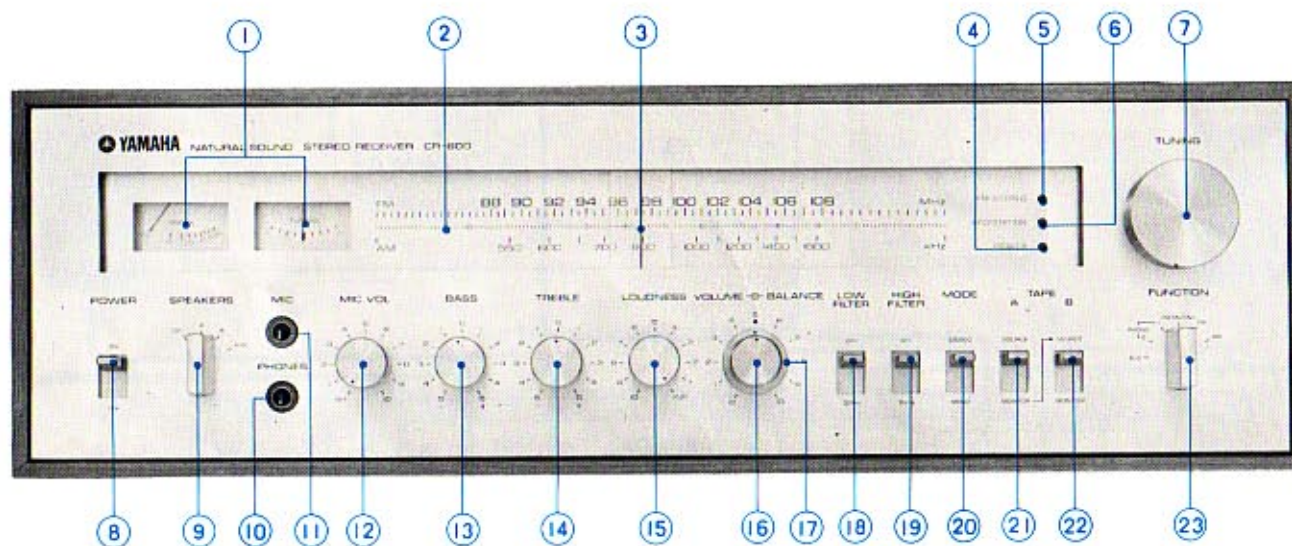
CONNECTION DIAGRAM



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

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 turned. The middle red line indicates the frequency of the FM or AM station received.

4 POWER LAMP

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. 11).

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. 21).

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. 21).

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. 22).

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 LOW FILTER SWITCH

Cuts all frequencies below 50Hz (see p. 22).

19 HIGH FILTER SWITCH

Cuts all frequencies above 8kHz (see p. 22).

20 MODE SWITCH

Lets you select between stereo and monophonic performance according to the program source. If a signal is being heard through only one channel, set this switch to Mono and it will be heard through both sides.

21 TAPE A MONITOR SWITCH

This is for monitoring the sound from a tape deck connected to the Tape A recording and playback jacks on the rear panel. For tape play set this switch to Monitor. In addition, if the tape deck is a three-head type, you can monitor even while you are recording.

22 TAPE B SWITCH

This switch is for recording or playing a tape on the deck connected to the Tape B jacks.

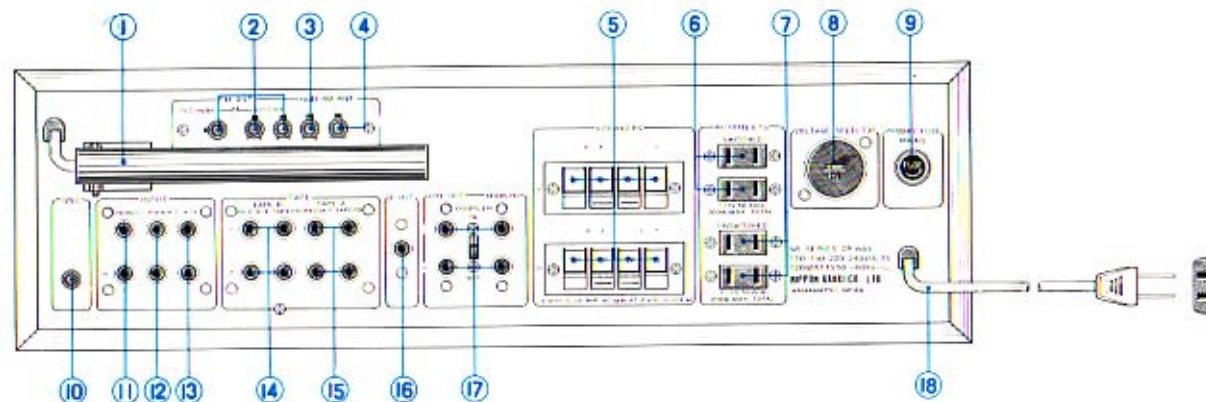
23 FUNCTION SWITCH

Use this switch to select the program source.

AUX	See p. 10.
PHONO (1, 2)	See p. 8.
FM MUTING	See p. 7.
FM	See p. 7.
AM	See p. 6.

REAR PANEL PARTS AND FUNCTIONS

• TYPE A MODEL

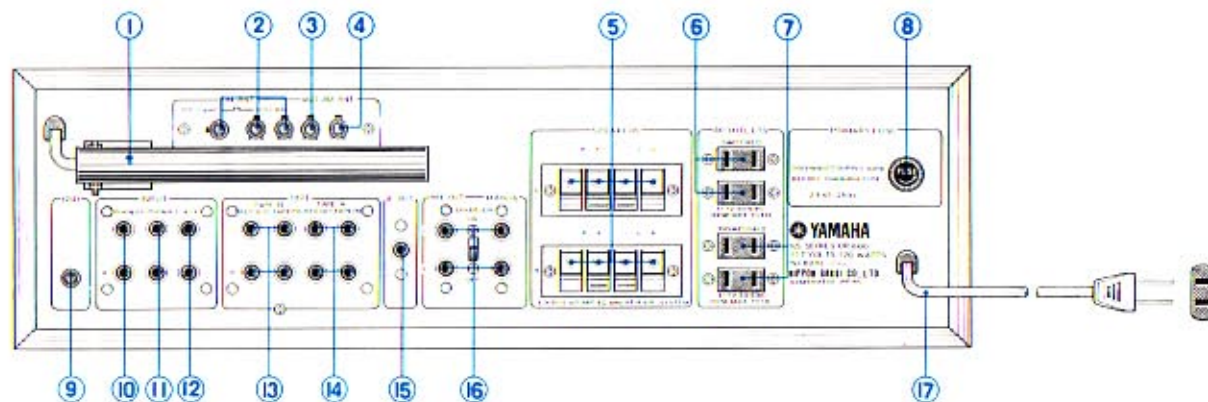


- ① **AM FERRITE BAR ANTENNA**
- ② **FM ANTENNA TERMINALS** (see p. 6~7)
- ③ **GROUND TERMINAL** (see p. 6)
- ④ **AM ANTENNA TERMINAL** (see p. 6)
- ⑤ **SPEAKER TERMINALS** (see p. 5)
- ⑥ **AC OUTLETS – SWITCHED**
Provide AC power only when the CR-600 power switch is on.
- ⑦ **AC OUTLETS – UNSWITCHED**
Provide AC power when the CR-600 power cord is plugged in, regardless of whether the power switch is on or off.

- 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. 10)
- ⑭ **TAPE B RECORDING/PLAYBACK JACKS** (see p. 9)

- ⑮ **TAPE A RECORDING/PLAYBACK JACKS** (see p. 9)
- ⑯ **IF OUT JACK** (see p. 23)
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 B MODEL

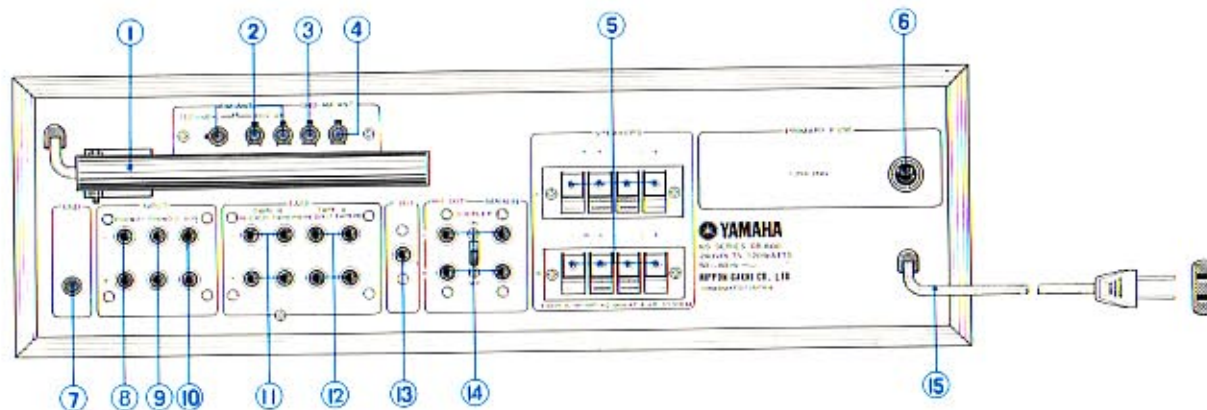


- ① **AM FERRITE BAR ANTENNA**
- ② **FM ANTENNA TERMINALS** (see p. 6~7)
- ③ **GROUND TERMINAL** (see p. 6)
- ④ **AM ANTENNA TERMINAL** (see p. 6)
- ⑤ **SPEAKER TERMINALS** (see p. 5)
- ⑥ **AC OUTLETS – SWITCHED**
Provide AC power only when the CR-600 power switch is on.
- ⑦ **AC OUTLETS – UNSWITCHED**
Provide AC power when the CR-600 power cord is plugged in, regardless of whether the power switch is on or off.

- 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 **PHONO 1 JACKS** (see p. 8)
- ⑪ **PHONO 2 JACKS** (see p. 8)
- ⑫ **AUX JACKS** (see p. 10)
- ⑬ **TAPE B RECORDING/PLAYBACK JACKS** (see p. 9)
- ⑭ **TAPE A RECORDING/PLAYBACK JACKS** (see p. 9)

- ⑮ **IF OUT JACK** (see p. 23)
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 C MODEL

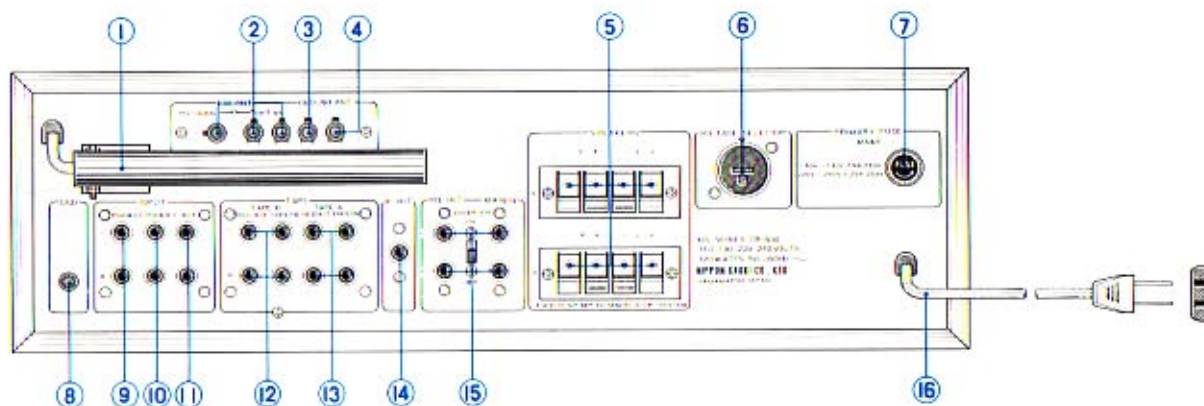


- ① AM FERRITE BAR ANTENNA
- ② FM ANTENNA TERMINALS (see p. 6~7)
- ③ GROUND TERMINAL (see p. 6)
- ④ AM ANTENNA TERMINAL (see p. 6)
- ⑤ SPEAKER TERMINALS (see p. 5)
- ⑥ PRIMARY FUSE
This fuse protects the amplifier. Be sure to use a fuse of the same specifications for replacement.
- ⑦ GROUND TERMINAL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

- ⑩ AUX JACKS (see p. 10)
- ⑪ TAPE B RECORDING/PLAYBACK JACKS (see p. 9)
- ⑫ TAPE A RECORDING/PLAYBACK JACKS (see p. 9)
- ⑬ IF OUT JACK (see p. 23)
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. 6~7)

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. 10)

12 TAPE B RECORDING/PLAYBACK JACKS
(see p. 9)

13 TAPE A RECORDING/PLAYBACK JACKS
(see p. 9)

14 IF OUT JACK (see p. 23)

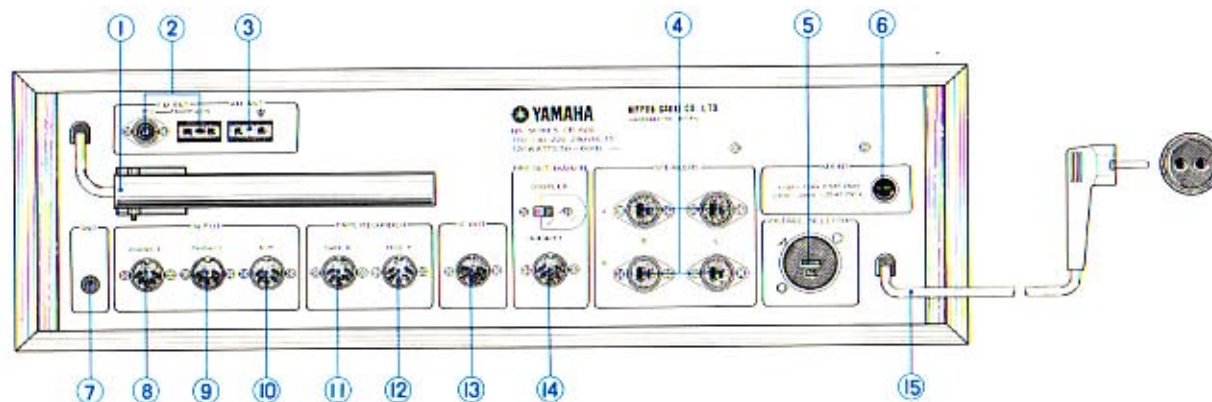
This jack is for connecting an FM 4-channel adaptor.

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

• TYPE E MODEL



- ① **AM FERRITE BAR ANTENNA**
- ② **FM ANTENNA CONNECTOR** (see p. 6~7)
- ③ **AM ANTENNA CONNECTOR** (see p. 6)
- ④ **SPEAKER CONNECTORS** (see p. 5)
- ⑤ **VOLTAGE SELECTOR**
Set it to match the voltage in your area.
- 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 CONNECTOR** (see p. 8)
- ⑨ **PHONO 2 CONNECTOR** (see p. 8)
- ⑩ **AUX CONNECTOR** (see p. 10)
- ⑪ **TAPE B RECORDING/PLAYBACK CONNECTOR** (see p. 9)
- ⑫ **TAPE A RECORDING/PLAYBACK CONNECTOR** (see p. 9)

- ⑬ **IF OUT CONNECTOR** (see p. 23)
This jack is for connecting an FM 4-channel adaptor.
- ⑭ **PRE OUT, MAIN IN CONNECTOR** (with Coupler Switch)
This Connector and the switch let you use the pre-amp and main amp separately when necessary.
- ⑮ **AC CORD**

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 left 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.

VOLUME — BALANCE

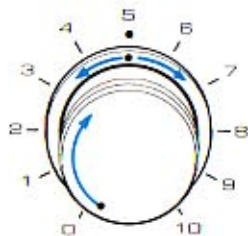


Fig. 19

TONE CONTROLS

In addition to adjusting the sound quality to match your listening tastes for any particular song, the tone controls can also be used in the following ways. If a program source is filled with high-pitch distortion or noise, turn the Treble control down (to the left) past the 0 mark to reduce this distortion. By the same token, if you are troubled at any time by low-

pitch noise or distortion, turn the Bass control down from 0 to reduce the problem.

However, if the noise or distortion is so bad that you are forced to turn the control too far to the left, it will result in reduced musical response and listening pleasure. For this reason, be moderate in your use of these controls to cancel noise and distortion.

The tone controls are also useful for adjusting the bass and treble tone to match the characteristics (live or dead) of your listening room. See Fig. 20.

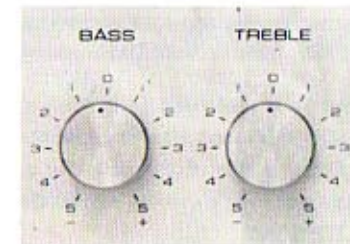
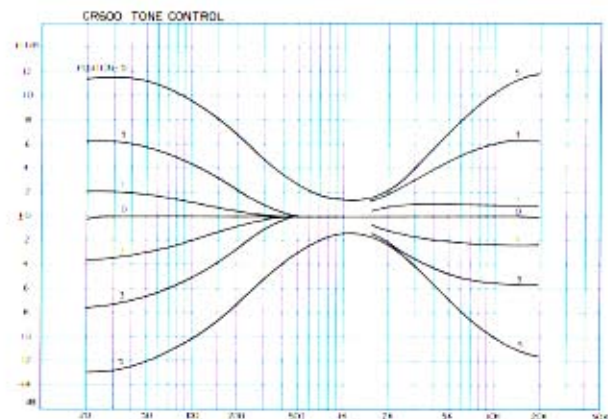


Fig. 20

LOUDNESS CONTROL

At very low volume listening levels the ear's sensitivity to bass and treble tones becomes very poor. The Loudness control helps to compensate for this phenomenon.

With the special continuous Loudness control on the CR-600 you can adjust the effect to match your personal listening preferences.

First set the Loudness control to Flat. In this position the effect does not work at all.

Next set the Volume control to the loudest level you expect to use. Now you can turn the volume down by turning the Loudness control to the left, and at the same time increase the Loudness effect (see Fig. 21). In this way you have in fact tailored the Loudness control to the volume range that best suits your ear.

FILTER SWITCHES

To cut out low and high frequency distortion and noise the CR-600 incorporates a low and a high filter. The low filter is useful for cancelling record player motor rumble; it reduces all frequencies below 50Hz by 12dB/oct.

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

With either of these switches set to Off the filter is not operating (see Fig. 22).

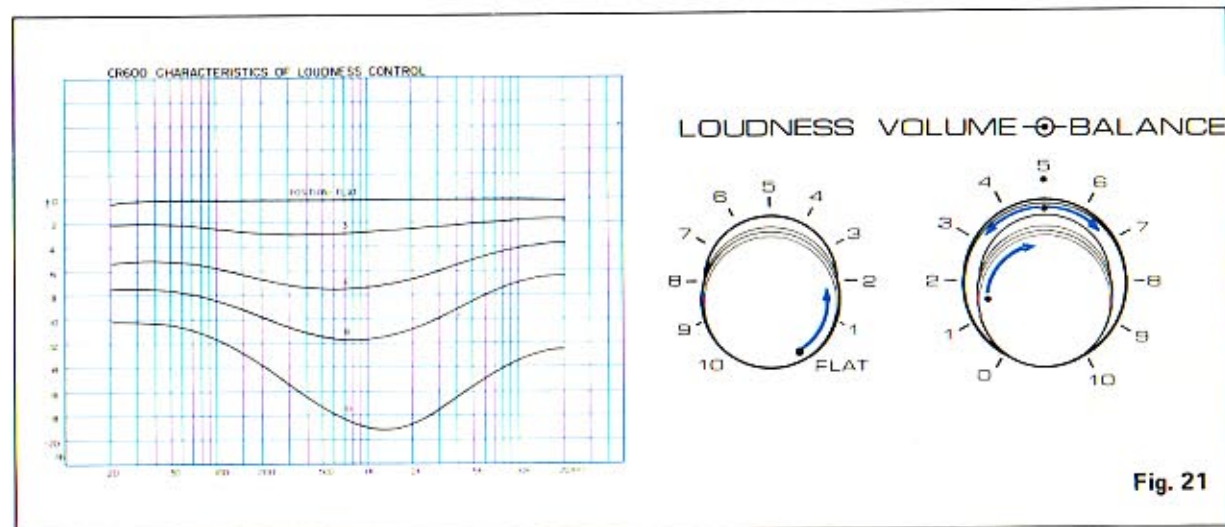


Fig. 21

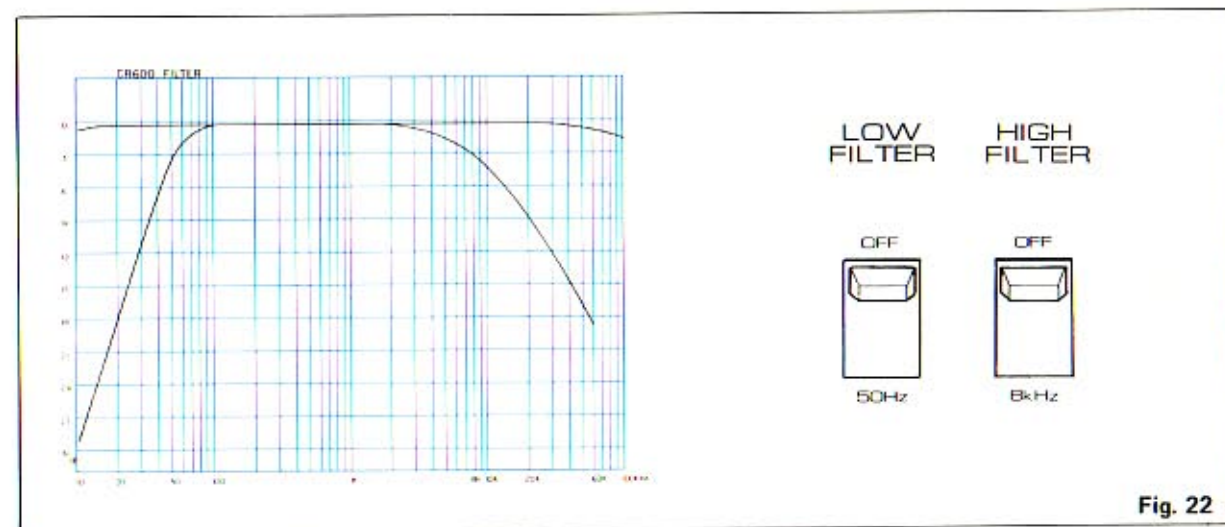


Fig. 22

PRE OUT, MAIN IN CONNECTIONS

The Pre Out and Main In jacks, plus the Coupler switch, allow you to use the CR-600 pre-amp and main amp separately.

With the Coupler switch set to Off (see Fig. 23) 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.

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.

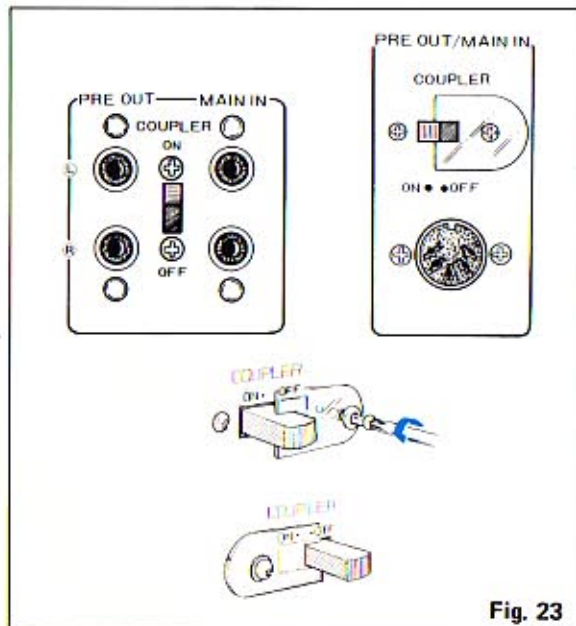


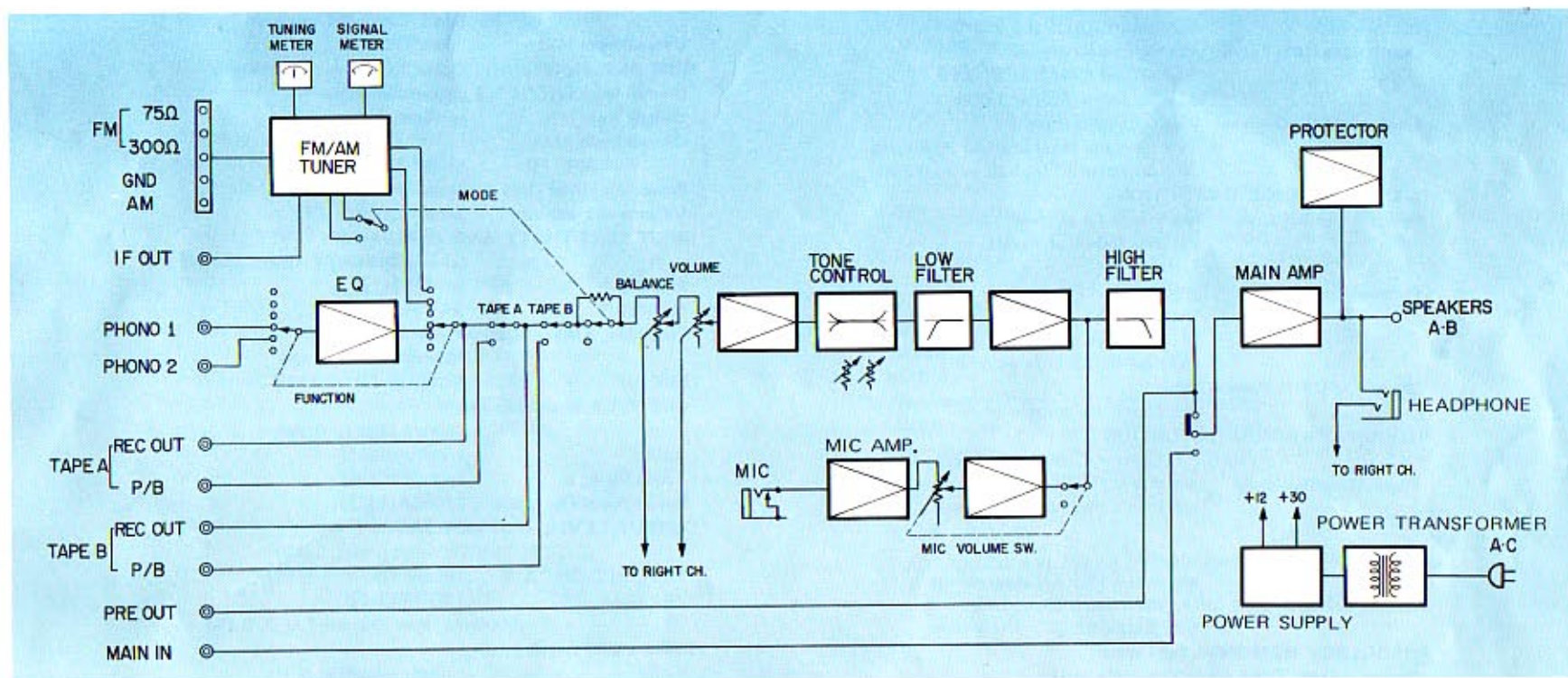
Fig. 23

DO NOT BE ALARMED IF

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 3.0A (Type E Model: 3.15A) 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.

BLOCK DIAGRAM



SPECIFICATIONS

AUDIO SECTION

POWER OUTPUT

Dynamic Power	(IHF) 130 watts (4Ω) 90 watts (8Ω)
Continuous RMS Power	(each channel driven) 45/45 watts (4Ω) at 1,000Hz 35/35 watts (8Ω) at 1,000Hz
Continuous RMS Power	(both channels driven) 40 + 40 watts (4Ω) at 1,000Hz 32 + 32 watts (8Ω) at 1,000Hz
Continuous RMS Power	(both channels driven) 35 + 35 watts (4Ω) at 20 to 20,000Hz 30 + 30 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
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POWER BANDWIDTH (IHF, distortion 0.5% const.)	5 to 70,000Hz
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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
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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	250dB
Overall from AUX, TAPE	

PB 50dB

Overall from MIC	50dB
HUM AND NOISE (IHF, Closed Circuit A Network)	
Overall from PHONO1, 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 ($50k\Omega$)
PHONO 2	3mV ($50k\Omega$)
PHONO1, 2 Max. Input Capability	135mV (T.H.D. 0.1%)
MIC	3mV ($50k\Omega$)
MIC Max. Input Capability	450mV (T.H.D. 0.3%)

AUX	150mV ($45k\Omega$)
TAPE PB A, B	150mV ($45k\Omega$)
Power Amplifier Input	775mV ($45k\Omega$)

OUTPUT LEVEL AND IMPEDANCE

	(at rated power, 1,000Hz)
TAPE REC OUT A, B	150mV ($2k\Omega$)
PRE OUT	775mV ($2k\Omega$)
	3,000mV (Max. Output T.H.D. 0.1%)

TONE CONTROLS

BASS	+10dB, -10dB at 50Hz
TREBLE	+10dB, -10dB at 10,000Hz

FILTERS

LOW	-3dB at 50Hz (12dB/oct.)
HIGH	-3dB at 8,000Hz (6dB/oct.)

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)	2.0 μ V
Quieting Slope	55dB at 5 μ V 60dB at 10 μ V
Image Frequency Rejection	90dB
IF Rejection	95dB
Spurious Response Rejection	95dB
AM Rejection	55dB
Capture Ratio	1.5dB
Alternate Channel Selectivity (IHF)	75dB
Signal-to-Noise Ratio	70dB
Total Harmonic Distortion	MONO 0.3% at 400Hz STEREO 0.5% at 400Hz
Stereo Separation	40dB at 400Hz 28dB at 50 to 10,000Hz
Frequency Response	+1.0dB, -1.0dB at 50 to 10,000Hz +1.5dB, -3.0dB at 20 to 15,000Hz
Sub-Carrier Suppression	40dB
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	41 ICs; 2 MOS FETs; 59 Transistors; 3 LEDs; 33 Diodes; 3 Zener Diodes
Power Source	AC 110, 117, 130, 220, 240V, 50/60Hz
Power Consumption	
Max.	200 watts
Rated	120 watts
AC Outlets	
Switched	2 (total 200 watts)
Unswitched	2 (total 200 watts)
Dimensions	474mm (18 $\frac{1}{2}$ ") W x 158mm (6 $\frac{1}{4}$ ") H x 300mm (11 $\frac{3}{4}$ ") D
Weight	13 kg (28.7 lbs.)

Specifications subject to change without notice.

SINCE 1887



YAMAHA

NIPPON GAKKI CO.,LTD. HAMAMATSU, JAPAN

