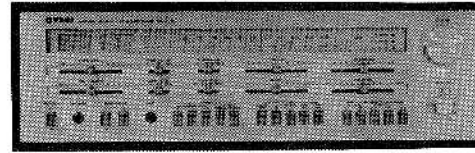


Yamaha Hi-Fi Stereo



FM STEREO RECEIVER
model **CR-1000**

Owner's Manual

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PRECAUTIONS

• READ THIS FIRST

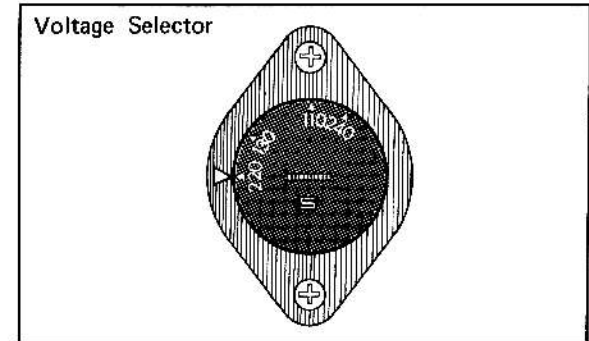
You may seriously damage any transistorized audio unit by being careless when you first operate it. Carelessness is the major cause of audio repairs. Avoid disappointment by following the precautions listed below BEFORE attempting to plug in or operate your CR-1000.

- 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-1000 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-1000 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).



TO CHECK THE SOUND QUICKLY ON FM

First, connect a stereo pair of speakers to the upper (A) row of four output (SPEAKERS) terminals on the rear panel of your CR-1000. 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 (-)

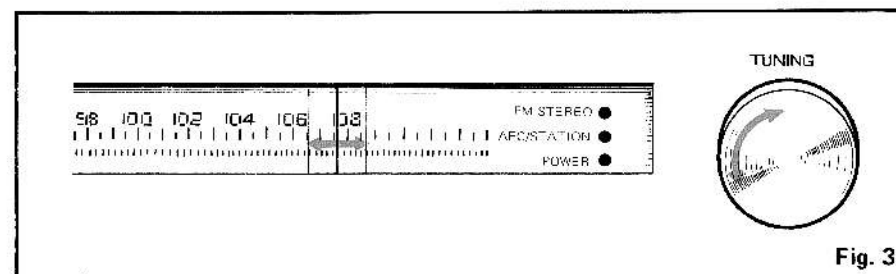
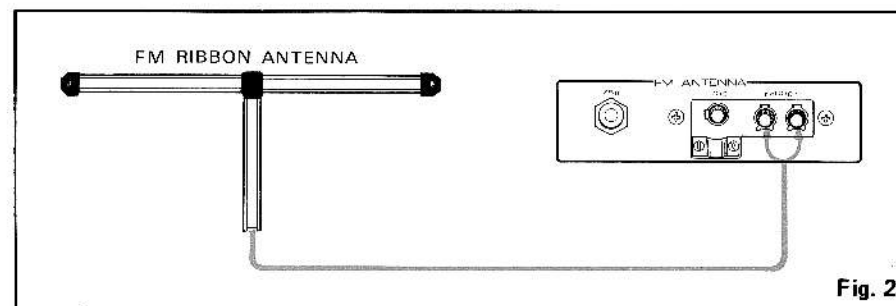
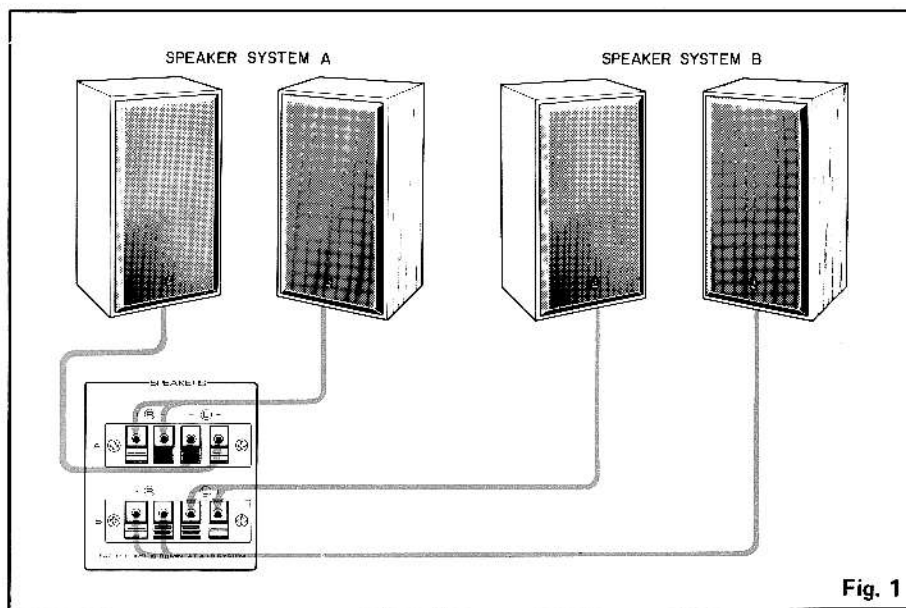
speaker terminals, and red (+) output terminals to (+) speaker terminals. See Fig. 1.

Next, connect the FM ribbon dipole antenna (included accessory) to the two "300" terminals on the rear panel under "FM ANTENNA". See Fig. 2. Next, make sure the CR-1000 POWER switch is off. Plug the AC power cord into your AC wall outlet.

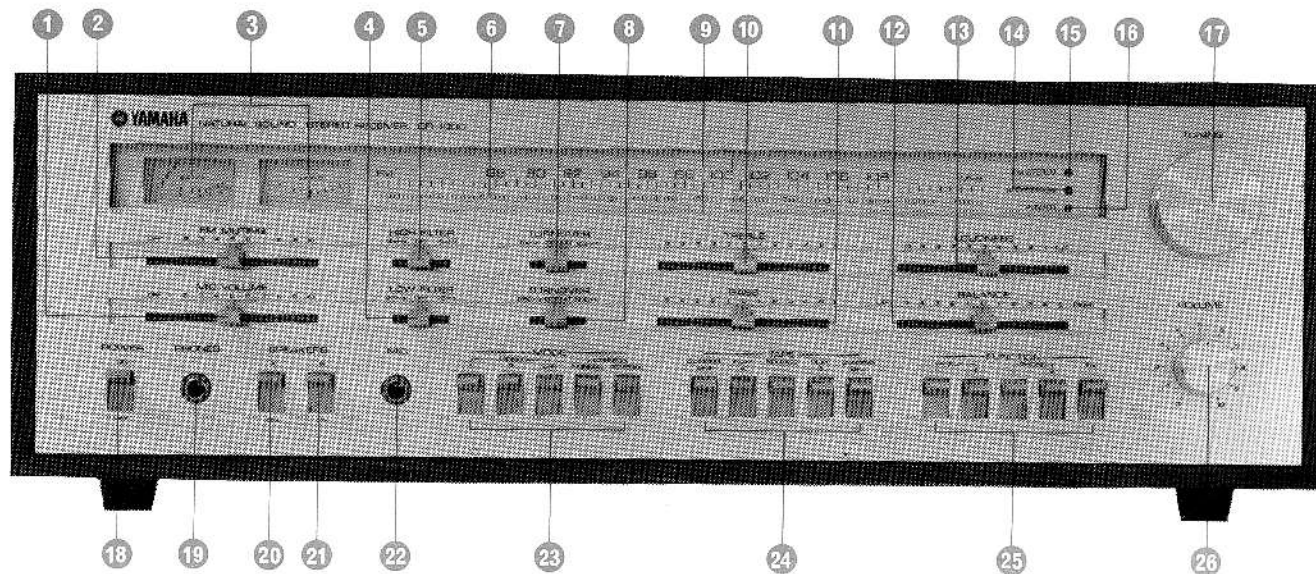
Now, set the POWER lever up to turn the AC power on. Tune across the dial for the strongest FM signal as indicated by maximum deflection (to the right) of the SIGNAL meter. Fine tune by centering the TUNING meter indicator. See Fig. 3. Then turn up the volume, and carefully experiment with the other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

SET FRONT PANEL CONTROLS AS FOLLOWS

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



FRONTPANEL PARTS AND FUNCTIONS



1 MIC VOLUME

Controls the input volume from a microphone connected to the Mic Jack. Turn off when not in use.

2 FM MUTING

Without muting, hissing noise will normally be heard when tuning between strong FM channels, and in the background with very weak channels. Muting circuitry blocks that noise (and also blocks weak FM channels) by cutting amplification of FM whenever incoming signal strength is below an established muting threshold. The Muting control adjusts that threshold.

3 SIGNAL & TUNING METERS

Separate Signal strength and center-of-channel Tuning meters enable precise tuning for minimum FM distortion and maximum stereo channel separation.

4 LOW FILTER

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

5 HIGH FILTER

Sharply reduces hiss and high frequency response at 6dB per octave above selectable cutoff frequency of 6kHz or 12kHz.

6 DIAL SCALE

Indicates the broadcast frequency of the station tuned.

7 TURNOVER (TREBLE)

Selectable frequency range of Treble tone control can be above 2.5kHz, or above 5kHz. Select Defeat for flat treble response regardless of Treble and High Filter settings.

8 TURNOVER (BASS)

Selectable frequency range of BASS tone control can be below 500Hz or below 250Hz. Select Defeat for flat bass response regardless of Bass and Low Filter settings.

9 **DIAL INDICATOR**

10 **TREBLE TONE CONTROL**

Center (0) position is for "flat". Slide right for boost (+), or left for diminish (-).

11 **BASS TONE CONTROL**

Center (0) position is for "flat". Slide right for boost, or left for diminish.

12 **BALANCE CONTROL**

Center (0) position is for equal amplification through both channels. Slide right to emphasize the right channel (by reducing relative amplification of the left). Slide left to emphasize the left.

13 **LOUDNESS CONTROL**

Slide left to decrease audible loudness without the usual apparent loss of bass and treble.

14 **AFC/STATION INDICATOR LIGHT**

"On" indicates AFC is operating. "Off" indicates AFC is defeated. AFC is automatically defeated as you touch the tuning knob, to insure that you tune precisely to center-of-channel. AFC is automatically restored when you release the knob.

15 **FM STEREO INDICATOR LIGHT**

"On" indicates reception of a stereo transmission. "Off" indicates mono.

16 **POWER INDICATOR LIGHT**

17 **TUNING KNOB**

18 **POWER SWITCH**

19 **HEADPHONE JACK**

For standard 8 ohm (or higher impedance) dynamic stereo headphones with binaural phone plug.

20 21 **SPEAKER SWITCHES**

Play either or both ("A" and/or "B") speaker pairs. Turn both off for phones-only.

22 **MICROPHONE JACK**

For one high impedance dynamic microphone with standard mono phone plug.

23 **MODE SWITCHES**

Mono L: Assigns L channel input only to both L and R outputs.

R: Assigns R channel input only to both L and R outputs.

L+R: Combines L and R inputs, and assigns the result to L and R outputs.

Stereo Normal: Assigns L input to L output, and R input to R output.

Stereo Reverse: Assigns L input to R output, and R input to L output.

Do not press more than two of the following switches at the same time: Function, Mode, Tape

24 **TAPE SWITCHES**

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

25 **FUNCTION SWITCHES**

Aux 1 & 2: To play a tape deck, tuner, or other stereo program source connected to the rear panel Aux (1 or 2) jacks.

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

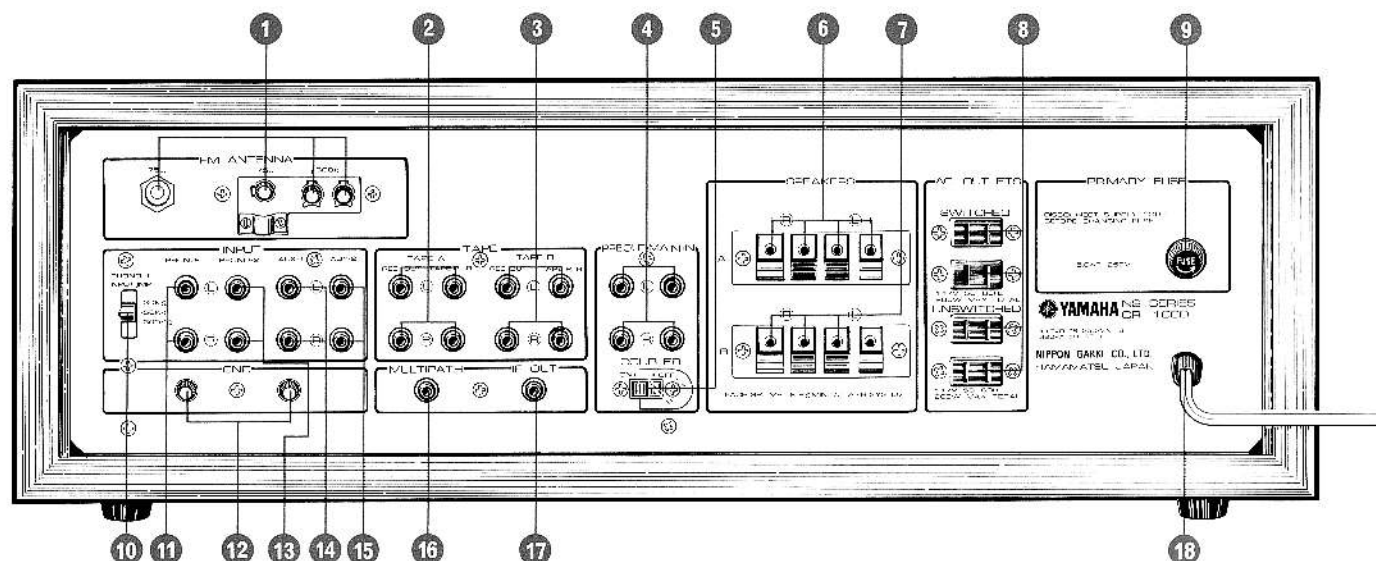
FM: To play FM.

26 **VOLUME CONTROL**

REAR PANEL PARTS AND FUNCTIONS

Be sure to turn off the CR-1000 before connecting or disconnecting any leads. Make all connections firm and tight.

●TYPE A MODEL



① FM ANTENNA TERMINALS

② TAPE A
Rec Out Jacks
Tape PB Jacks

③ TAPE B
Rec Out Jacks
Tape PB Jacks

④ PRE OUT/MAIN IN JACKS
Pre Out Jacks
Main In Jacks

⑤ PRE/MAIN COUPLER SWITCH

⑥ SPEAKER A TERMINALS

⑦ SPEAKER B TERMINALS

⑧ AC OUTLETS-SWITCHED

You can plug your tape recorder or turntable AC power cord into these outlets. With your CR-1000 power switch On these outlets are "live." With your CR-1000 power switch Off, these outlets are "dead." Your CR-1000 power switch can thus function as a system On-Off power switch.

AC OUTLETS-UNSWITCHED

Always powered when the CR-1000 power cord is plugged in, regardless of power switch position.

⑨ AC LINE FUSE

⑩ PHONO 1 INPUT IMPEDANCE SELECTOR

⑪ PHONO 1 JACKS

⑫ GROUND TERMINALS

⑬ PHONE 2 JACKS

⑭ AUX 1 INPUT JACKS

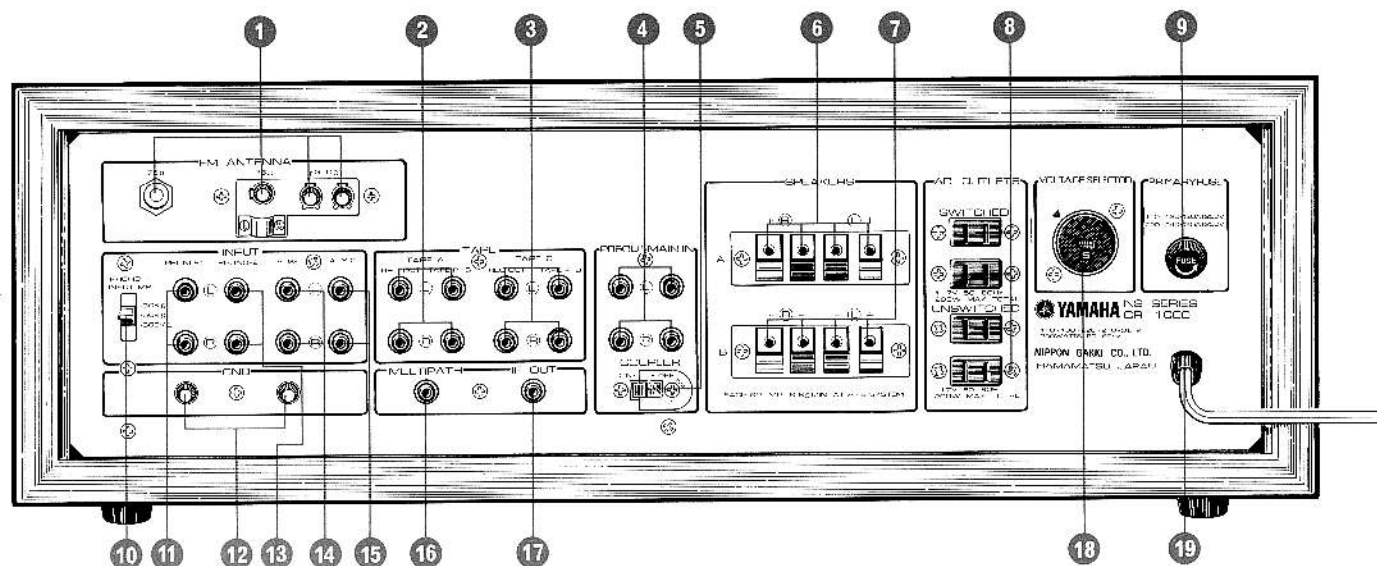
⑮ AUX 2 INPUT JACKS

⑯ MULTIPATH JACK

⑰ IF OUT JACK

⑱ POWER CORD

●TYPE B MODEL



① FM ANTENNA TERMINALS

② TAPE A
Rec Out Jacks
Tape PB Jacks

③ TAPE B
Rec Out Jacks
Tape PB Jacks

④ PRE OUT/MAIN IN JACKS
Pre Out Jacks
Main In Jacks

⑤ PRE/MAIN COUPLER SWITCH

⑥ SPEAKER A TERMINALS
⑦ SPEAKER B TERMINALS

⑧ AC OUTLETS-SWITCHED

You can plug your tape recorder or turntable AC power cord into these outlets. With your CR-1000 power switch On these outlets are "live." With your CR-1000 power switch Off, these outlets are "dead." Your CR-1000 power switch can thus function as a system On-Off power switch.

AC OUTLETS-UNSWITCHED

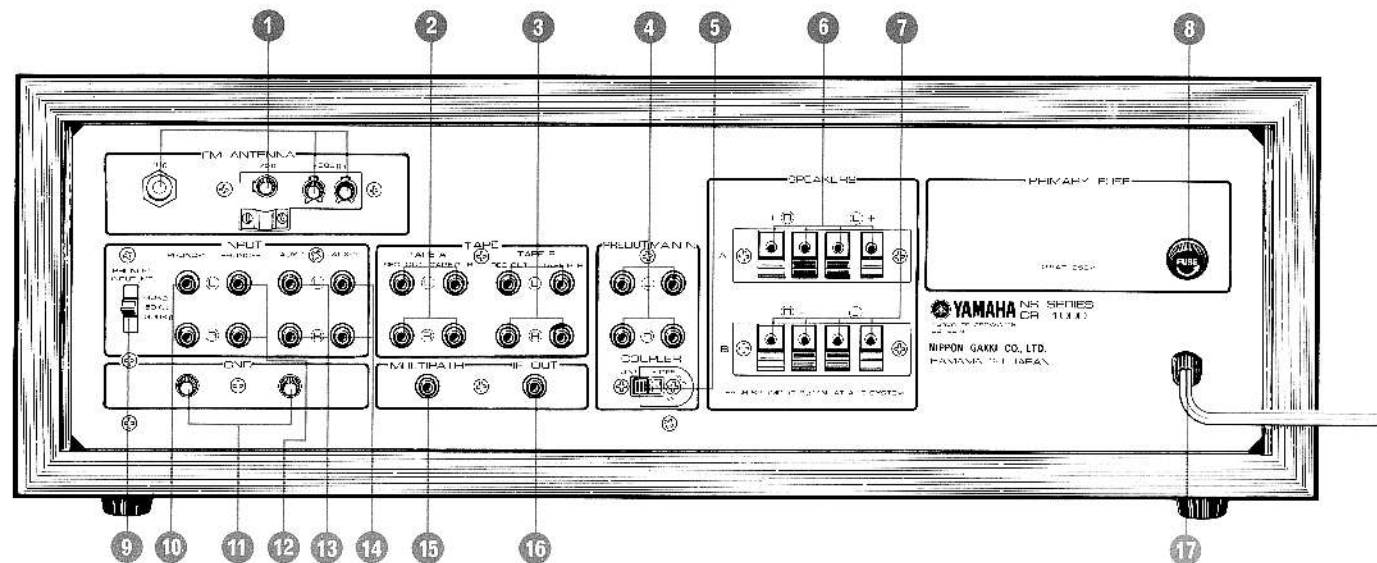
Always powered when the CR-1000 power cord is plugged in, regardless of power switch position.

⑨ AC LINE FUSE

⑩ PHONO 1 INPUT IMPEDANCE SELECTOR

⑪ PHONO 1 JACKS
⑫ GROUND TERMINALS
⑬ PHONO 2 JACKS
⑭ AUX 1 INPUT JACKS
⑮ AUX 2 INPUT JACKS
⑯ MULTIPATH JACK
⑰ IF OUT JACK
⑱ VOLTAGE SELECTOR
⑲ POWER CORD

● TYPE C MODEL

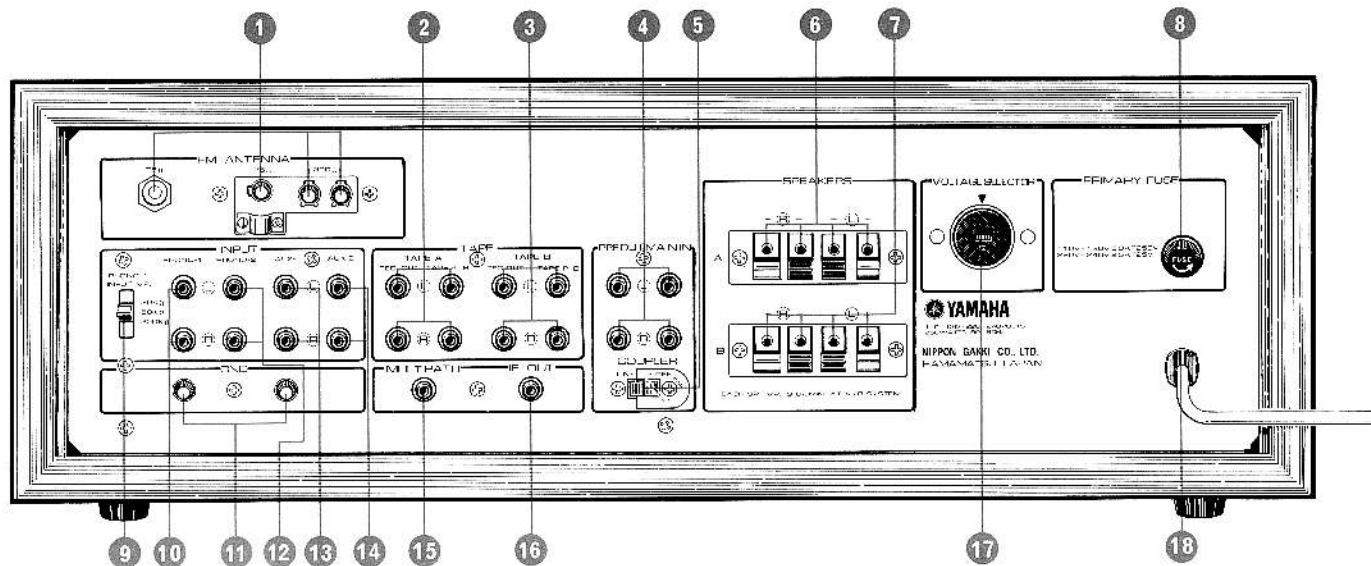


- ① FM ANTENNA TERMINALS
- ② TAPE A
Rec Out Jacks
Tape PB Jacks
- ③ TAPE B
Rec Out Jacks
Tape PB Jacks
- ④ PRE OUT/MAIN IN JACKS
Pre Out Jacks
Main In Jacks

- ⑤ PRE/MAIN COUPLER SWITCH
- ⑥ SPEAKER A TERMINALS
- ⑦ SPEAKER B TERMINALS
- ⑧ AC LINE FUSE
- ⑨ PHONO 1 INPUT IMPEDANCE SELECTOR
- ⑩ PHONO 1 JACKS
- ⑪ GROUND TERMINALS
- ⑫ PHONO 2 JACKS
- ⑬ AUX 1 INPUT JACKS
- ⑭ AUX 2 INPUT JACKS

- ⑮ MULTIPATH JACK
- ⑯ IF OUT JACK
- ⑰ POWER CORD

●TYPE D E MODEL

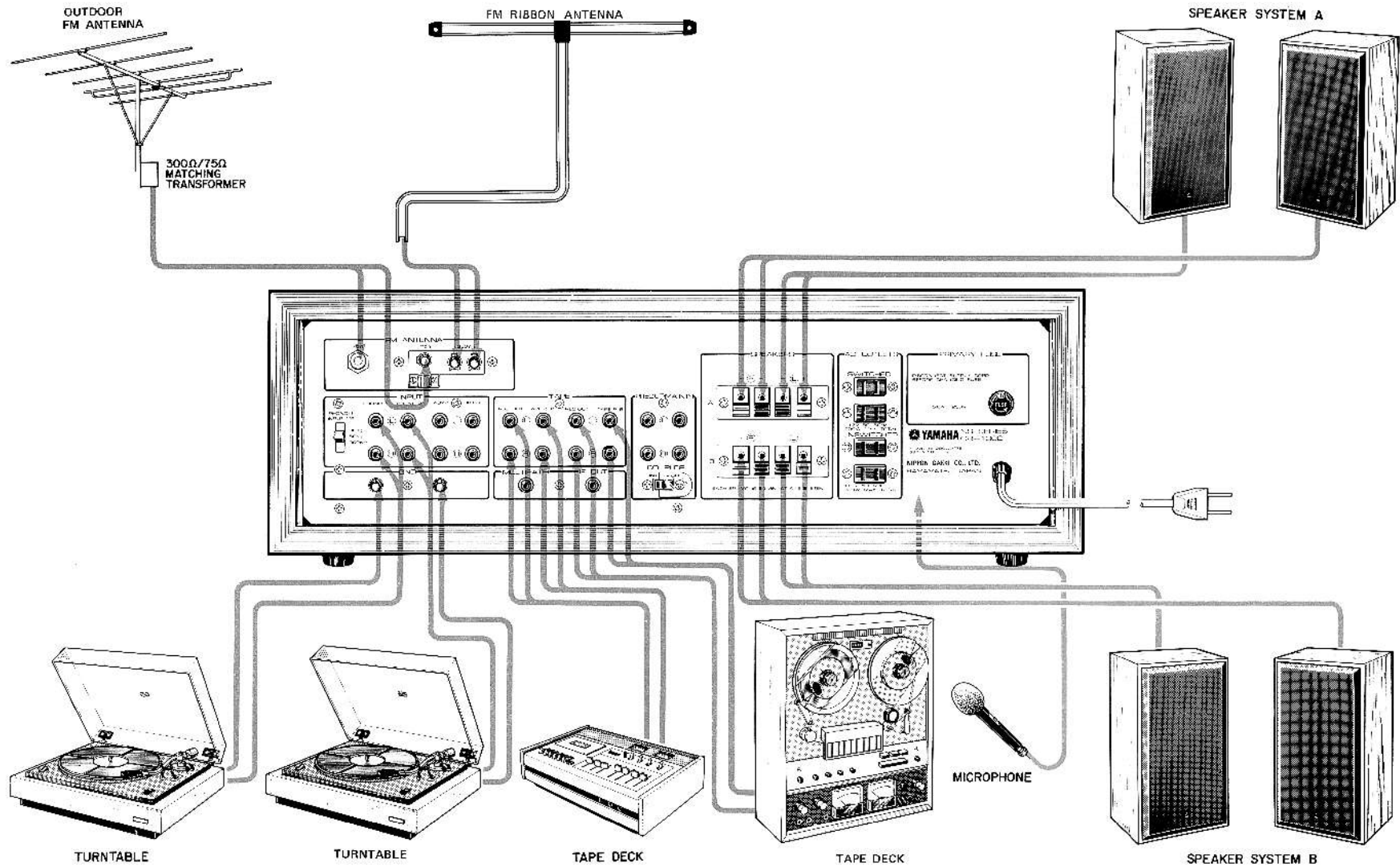


- ① FM ANTENNA TERMINALS
- ② TAPE A
Rec Out Jacks
Tape PB Jacks
- ③ TAPE B
Rec Out Jacks
Tape PB Jacks
- ④ PRE OUT/MAIN IN JACKS
Pre Out Jacks
Main In Jacks
- ⑤ PRE/MAIN COUPLER SWITCH
- ⑥ SPEAKER A TERMINALS

- ⑦ SPEAKER B TERMINALS
- ⑧ AC LINE FUSE
- ⑨ PHONO 1 INPUT IMPEDANCE SELECTOR
- ⑩ PHONO 1 JACKS
- ⑪ GROUND TERMINALS
- ⑫ PHONO 2 JACKS
- ⑬ AUX 1 INPUT JACKS
- ⑭ AUX 2 INPUT JACKS
- ⑮ MULTIPATH JACK
- ⑯ IF OUT JACK
- ⑰ VOLTAGE SELECTOR

- ⑱ POWER CORD

CONNECTION DIAGRAM



OTHER EQUIPMENT: CONNECTION AND OPERATION

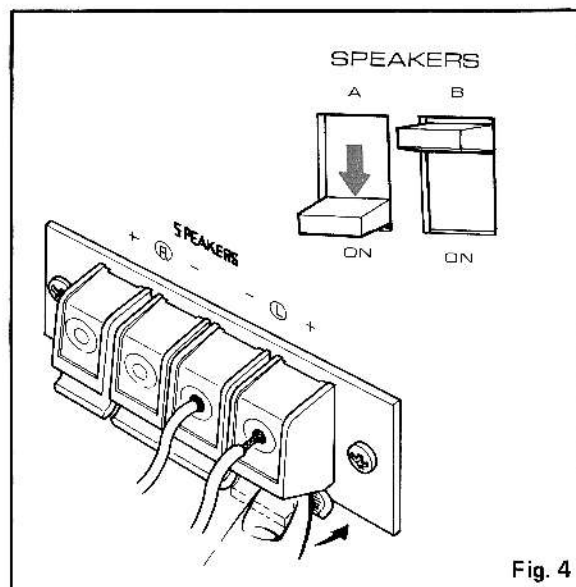
SPEAKER SYSTEM CONNECTION

The Speaker terminals on the rear panel permit connection of two sets of stereo speakers.

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

Connection Procedure

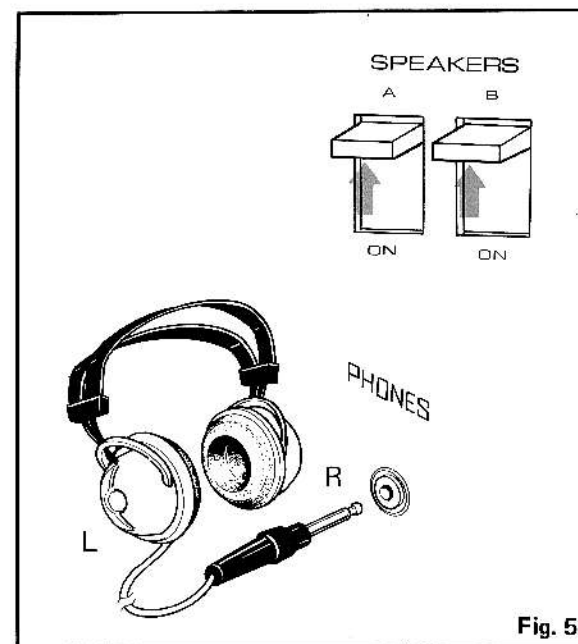
1. Connect the amplifier outputs to the speaker inputs, observing (+) and (-) polarity as previously described. If a speaker is connected with amplifier output (+) to speaker (-), and output (-) to speaker (+), then that speaker is said to be connected with reverse polarity. With one speaker (of a stereo pair) connected "normal" and the other "reversed", those two speakers will play "out of phase", with apparent loss of bass response.
2. These speaker terminals are spring types. As shown in Fig. 4, push the lever in, insert the twisted bare wire end of the speaker lead into the hole, then release the lever. The spring force will hold the wire.
3. If two pairs of speakers are to be used, connect the second pair to the B terminals. Make sure all speaker connections are firm and neat.



HEADPHONE CONNECTION

See Fig. 5. With speaker switches A and B off, you can listen to phones only. The cable side of the headphone is the left channel side.

If you mistakenly plug the microphone into the Phones jack the microphone may be damaged.



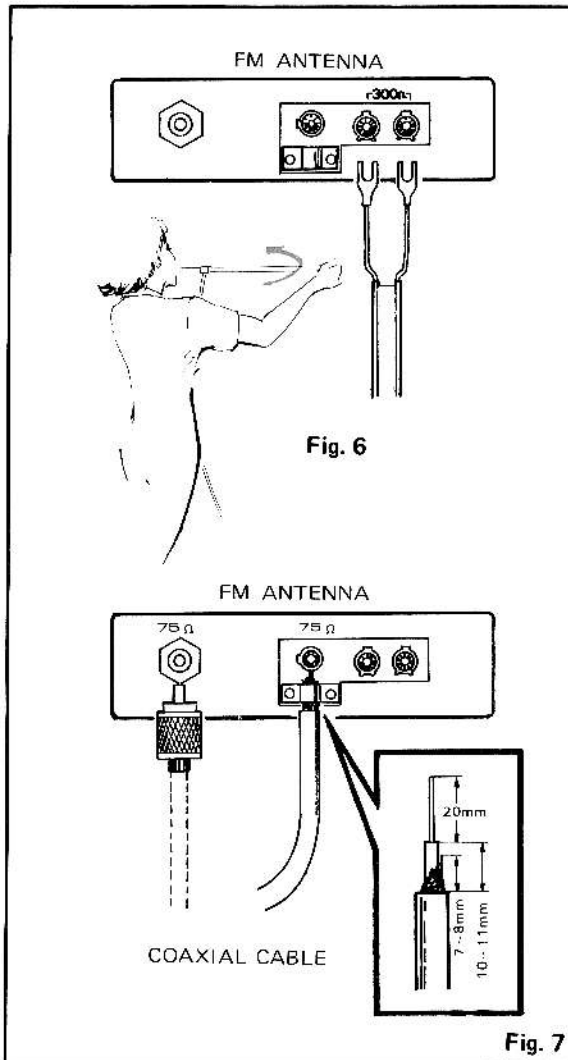
FM ANTENNA CONNECTION

FM300Ω: In a strong signal area, use the indoor T-shaped ribbon antenna. The top of the "T" should be horizontal (see Fig. 6). To determine the best antenna location, tune in a strong FM station and vary the direction in which the antenna points, while you watch the tuning meter. Maximum deflection (to the right) of the meter will indicate optimum orientation of the antenna for that FM station. If you cannot achieve adequate deflection with the ribbon antenna, ask your dealer about an outdoor FM antenna.

FM 75Ω: If you use an outdoor antenna, connect it by coaxial cable to these terminals. Strip enough insulation from the coaxial cable so you can fasten the inner conductor to the binding post, and so the metallic outer cable shield makes contact under the clamp (see Fig. 7).

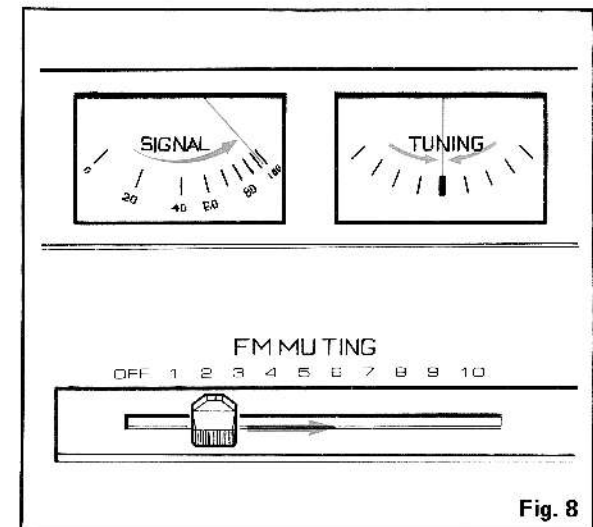
Note: If you must use regular TV ribbon lead from the outdoor antenna, connect to the "300" terminals.

Be sure to connect only a 300Ω antenna (i.e., the ribbon antenna included among the accessories or a 300Ω feeder antenna, etc.) to the 300Ω antenna terminals. If a 75Ω antenna cable is connected to the 300Ω antenna terminals Signal and Tuning meter indications will not be correct.



FM BROADCAST RECEPTION

Press the FM switch and tune to the desired station. First tune for maximum deflection of the Signal meter. Then center the Tuning meter. FM Muting will cut out unpleasant hiss between FM stations while tuning. On the CR-1000 this is not a simple switch, but a continuous control. In a strong signal area you can slide the lever farther to the right for more efficient noise reduction while tuning. (see Fig. 8). In a weak signal area, strong muting may also cut some stations; in this case the muting lever should not be set so far to the right.



FM STEREO NOTES

When a stereo broadcast is received, the stereo indicator lamp lights up and the set automatically functions in stereo. See Fig. 9. 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.

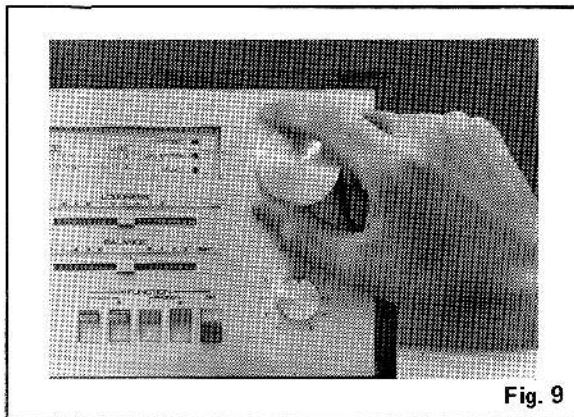


Fig. 9

TURNTABLE CONNECTION AND OPERATION

Two separate sets of Phono inputs permit the connection of two magnetic cartridge type turntables. With the rear panel switch, the Phono 1 input impedance can be matched to a 30kΩ, 50kΩ or 100kΩ moving magnet (MM), induced magnet (IM) or moving iron (MI) cartridge. Plug the phono lead pin plugs into the Phono 1 or Phono 2 jacks, and be sure to connect the turntable ground lead to the CR-1000 Gnd terminal (see Fig. 10).

Note: When using the Phono 1 jacks, be sure to read your turntable instruction manual carefully and to set the CR-1000 rear panel impedance switch accordingly. The switch is factory-set to 50kΩ.

To use the Phono 2 jacks, first remove the factory-installed shorting plugs from these jacks.

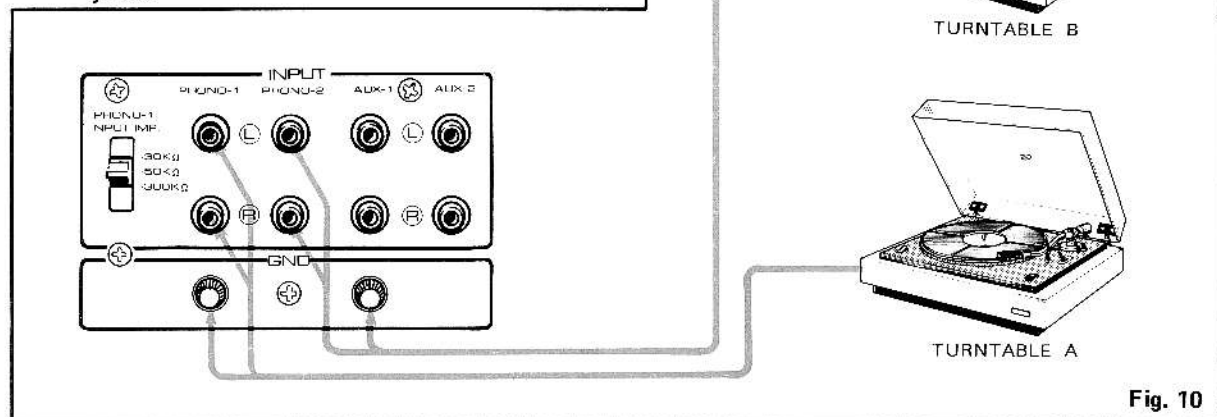


Fig. 10

AUX 1, 2 CONNECTION AND USE

These terminals offer 150mV input sensitivity and 40k Ω 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. 11. When connecting a monophonic source device, connect only to the L input jack. To play, then depress the Mono L Mode switch, and that mono source will be heard through both L and R speakers.

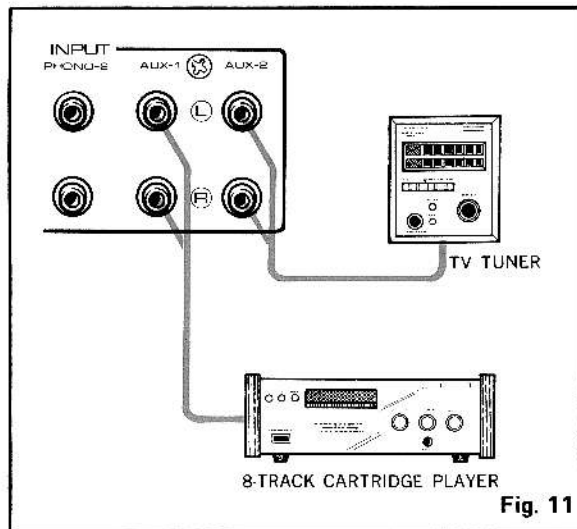


Fig. 11

TAPE DECK CONNECTION AND OPERATION

The CR-1000 features two independent Rec Out and Tape PB circuits, so that two stereo tape decks can be used. This permits recording from Function (Aux, Phono, FM) on both decks simultaneously, or dubbing from either deck to the other.

• CONNECTION

Connect the "A" deck Line In Jacks and the CR-1000 Tape A Rec Out Jacks; connect the deck's Line Out jacks to the Tape A Tape PB jacks. Be sure to connect Ls to Ls and Rs to Rs. Similarly connect the "B" deck to the Tape B jacks. See Fig. 12.

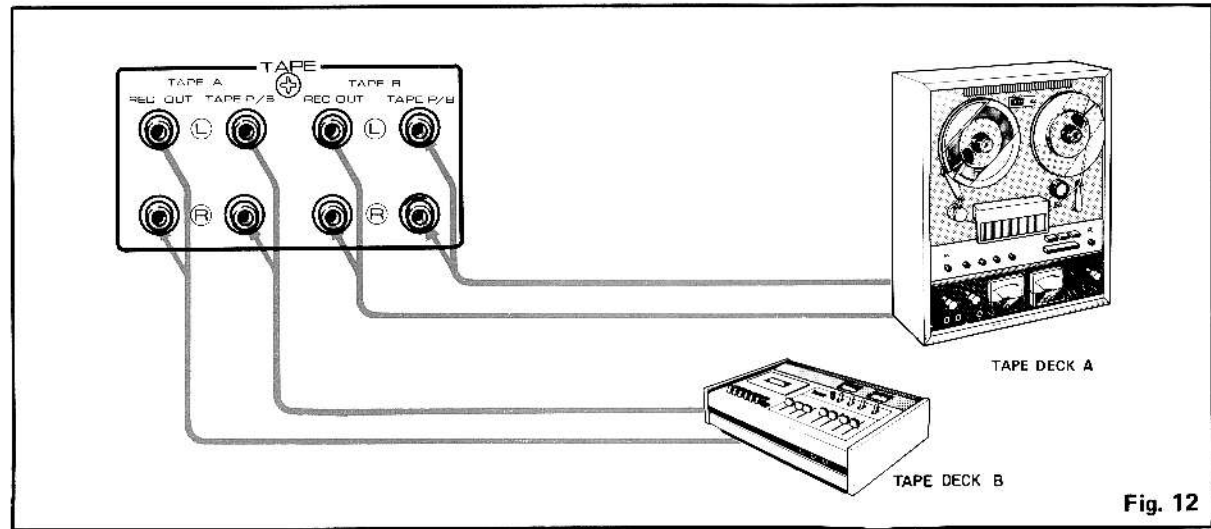


Fig. 12

• PLAYBACK

To listen to deck "A", press A Play.
To listen to deck "B", press B Play.

• RECORDING

To record from Function, press 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 pressing A Play. Similarly, you can monitor such a 3-head deck "B" by pressing B Play.

• **DUBBING**

To dub from deck A to deck B, set deck A for playback, and B for recording. Then press the A ▶ B Dubbing switch (Fig. 13).

To dub from B to A, set deck A for recording, B for playback, and press the B ▶ A Dubbing switch (Fig. 14).

Note: During dubbing, the signal cannot be sent directly through the amplifier. If the recording deck is a 3-head type with monitoring, then the signal can be monitored from the recording deck.

Never have both dubbing switches down at the same time.

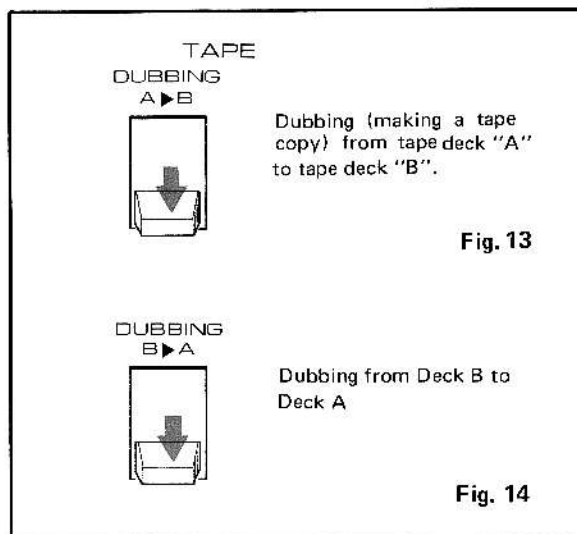


Fig. 13

Fig. 14

MICROPHONE CONNECTION AND OPERATION

Plug the microphone into the Mic jack (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 slide Mic Volume to Off when a mic is not being used.

Note: After the Mic Volume control, the mic signal bypasses all circuits until the Pre Out jacks. You can adjust all other panel controls without affecting the mic signal, and the mic signal will not arrive at the tape playback outputs. To record mic-plus-program, connect the CR-1000 rear panel Pre Out to your tape deck's input. You can then mix the mic and program signals as desired while recording.

Do not mistakenly plug the headphone plug into the Mic jack.

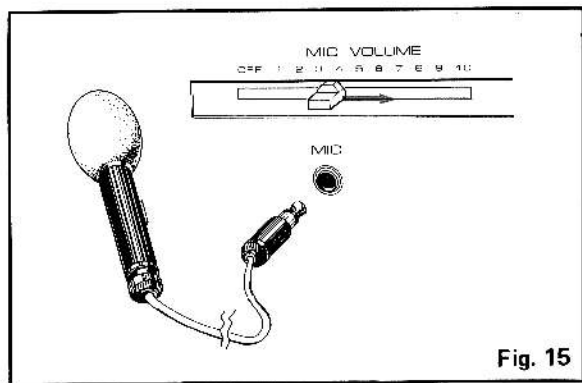


Fig. 15

ACCESSORIES

• **SERVICE PADS**

These protective pads will adhere to the feet of your CR-1000, if you first peel off the cover papers.

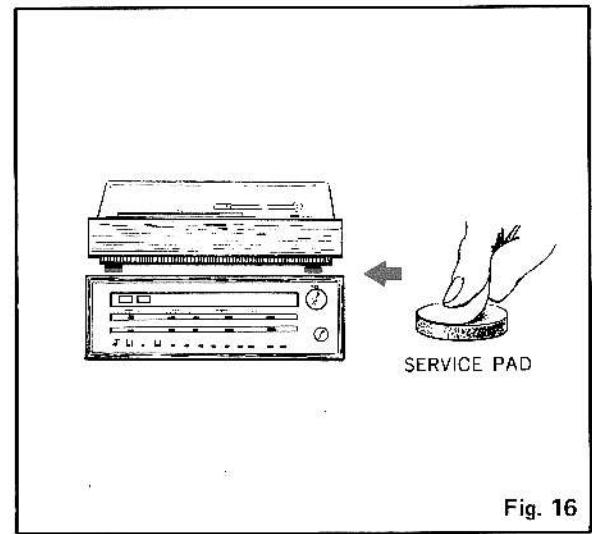


Fig. 16

CONTROLS

TONE CONTROLS

Use tone controls to tailor the sound to your listening room, or to your mood. (See Fig. 17).

Each tone control has eleven click-stop positions. Moving one position changes the response by 3dB (bass) or 2dB (treble). The "0" position provides "flat" response.

Setting the turnover switches to Defeat will also provide "flat" response.

The Turnover switches also control the frequency ranges on which the tone controls operate. With Bass Turnover switch set to 500Hz, the Bass tone controls operate on frequencies below 500Hz. With Bass Turnover set to 250Hz, the Bass tone control operates only on frequencies below 250Hz. Similarly, the Treble Turnover switch selects the frequency (5kHz, 2.5kHz) above which the Treble tone control operate.

FILTERS

The High Filter sharply cuts all tones above the selected frequency. The Low Filter similarly cuts low tones. See Fig. 18. Use the low Filter to attenuate turntable rumble, etc., and/or the high filter to reduce record "scratch", tape "hiss", or radio "static". For maximum frequency response, set these switches off.

BALANCE CONTROL

If your speakers are not ideally positioned in your room, experiment with the Balance lever to balance the apparent sound level from both speakers to your listening area. See Fig. 19.

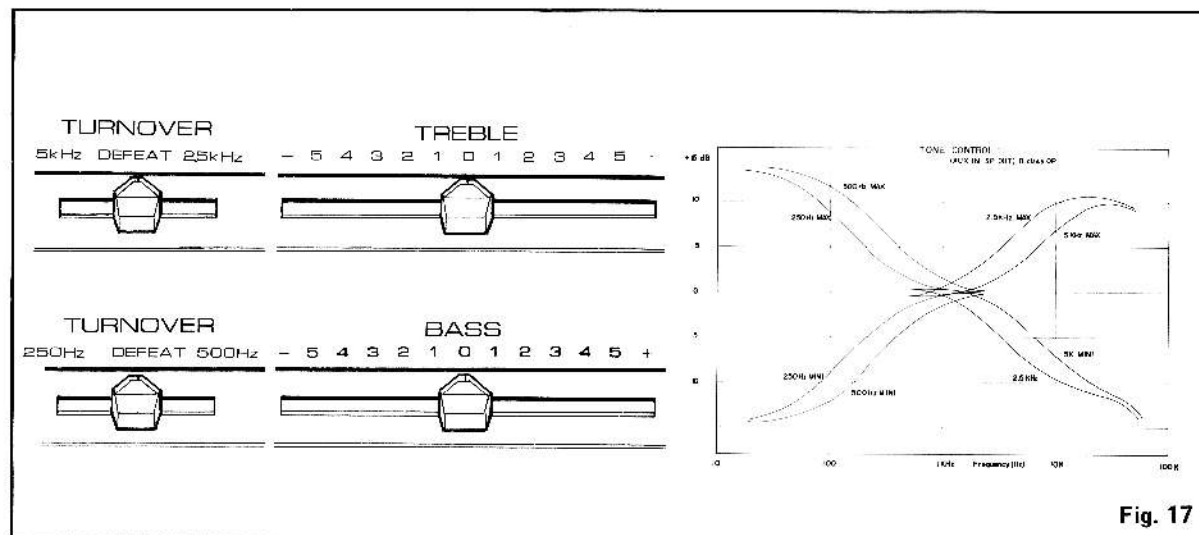


Fig. 17

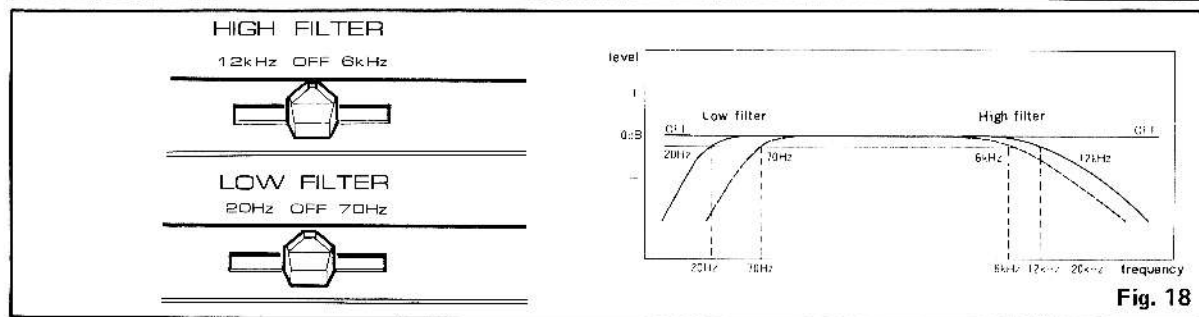


Fig. 18

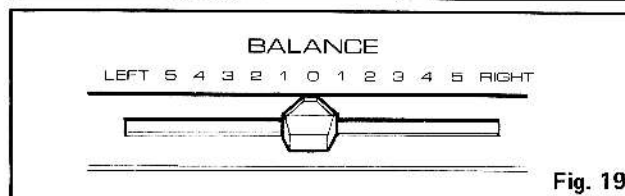


Fig. 19

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 lever to Flat for flat response. Then play a program and set the Volume control at the loudest setting you normally expect to use. Now, if you slide the Loudness lever 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 lever. See Fig. 20.

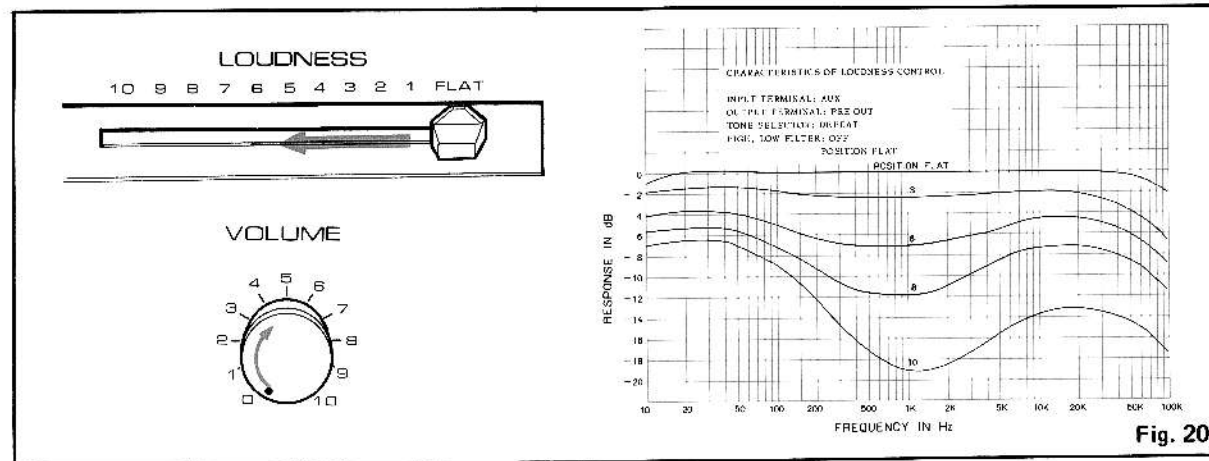


Fig. 20

PRE OUT/MAIN IN JACKS

With the rear panel Coupler switch On, the CR-1000 stereo preamp and power amplifier sections are internally coupled for normal operation. With the Coupler switch Off, these two sections can be used as though they were separate audio components. See Fig. 21.

MULTIPATH, IF OUT

Connect the oscilloscope as shown in Fig. 22 in order to find the best installation position. The antenna should be adjusted so that the oscilloscope waveform is a straight line as shown in the figure. For receiving 4-channel FM broadcasts you can connect a stereo adaptor to the IF Out terminals.

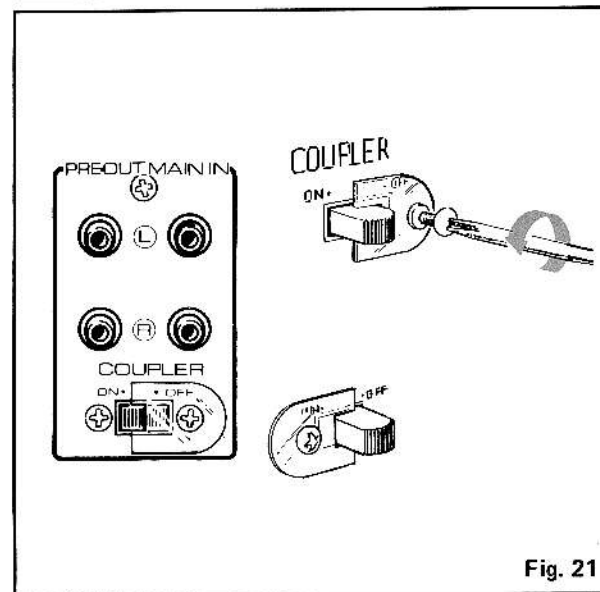


Fig. 21

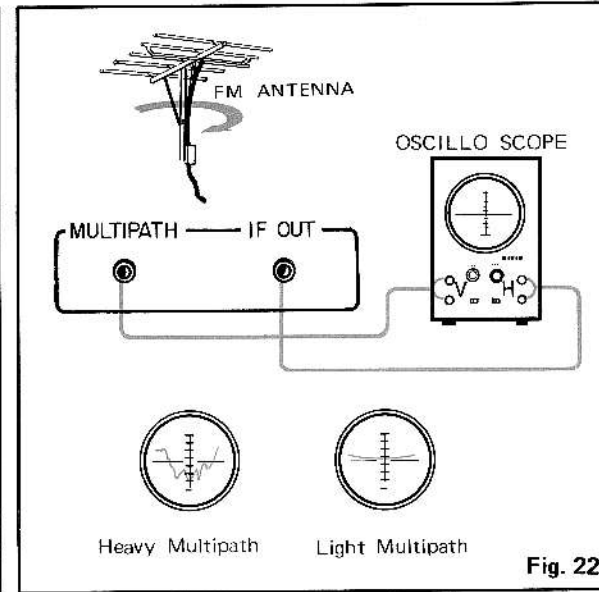


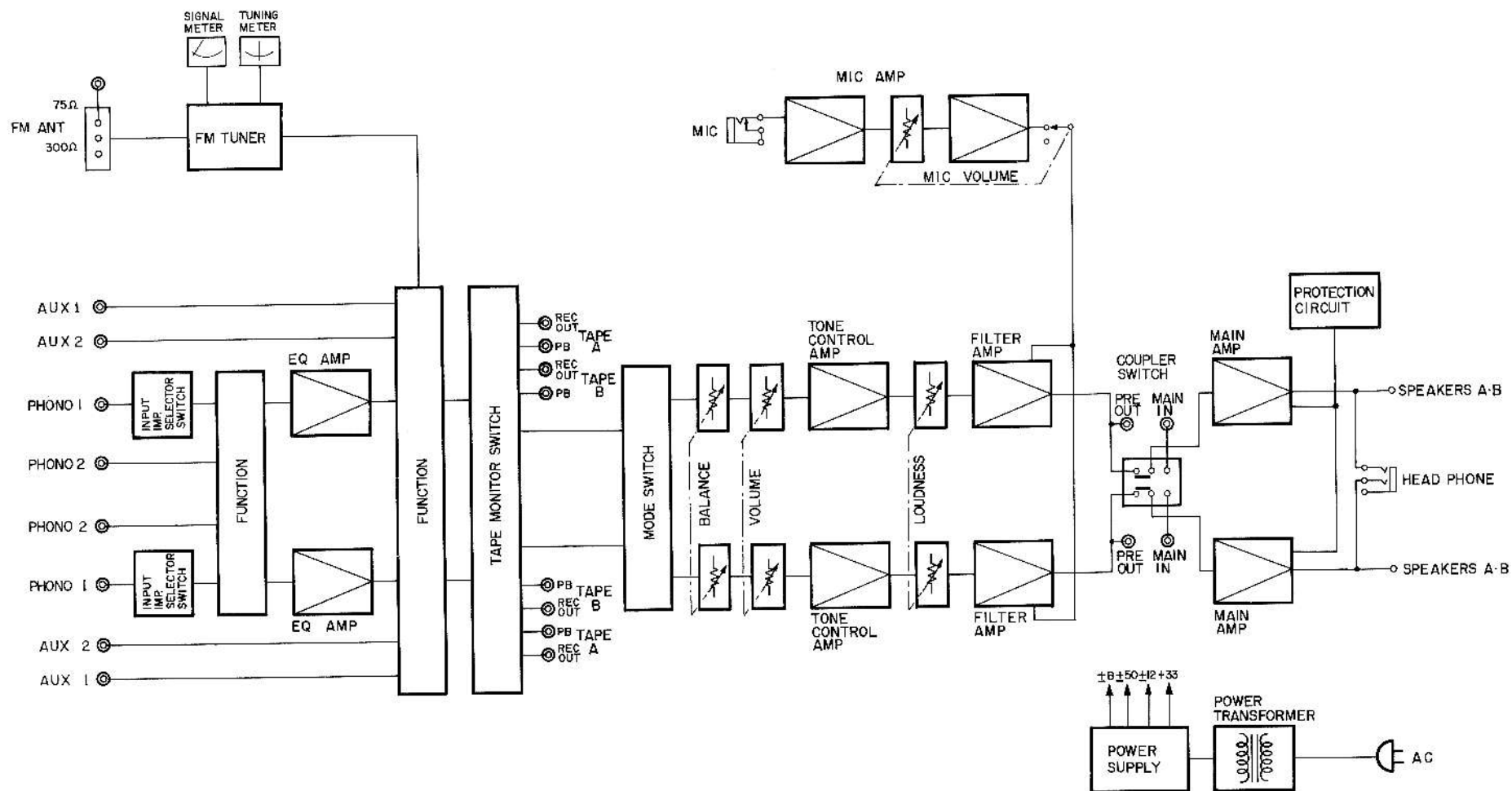
Fig. 22

TROUBLESHOOTING

If the CR-1000 does not seem to function properly, check the following chart for suggestions. If you cannot solve the problem, contact your dealer.

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 switch set to off. Tape switch is not set to source. Improper function 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. Set balance control to "O". Set mode switch to L + R.
FM Stereo indicator flashes during FM stereo reception.	Improper tuning. Improper antenna or weak signal.	Retune. Check antenna connections. Replace ribbon antenna with more special 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)	200 watts (4 Ω) 200 watts (8 Ω)
Continuous RMS power (each channel driven)	100/100 watts (4 Ω) at 1,000Hz 80/80 watts (8 Ω) at 1,000Hz
Continuous RMS Power (both channels driven)	100/100 watts (4 Ω) at 1,000Hz 75/75 watts (8 Ω) at 1,000Hz
Continuous RMS Power (both channels driven)	85/85 watts (4 Ω) at 20 to 20,000Hz 70/70 watts (8 Ω) 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) (AUX to PRE OUT)	less than 0.1% at rated power 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% (8 Ω) at rated power less than 0.05% (8 Ω) at 1 watt
Overall (AUX to Power Output)	less than 0.1% (8 Ω) at rated output

POWER BANDWIDTH

(IHF, distortion 0.5% const.) 5 to 50,000Hz

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) +0.2dB, -0.2dB

LOAD IMPEDANCE 4 to 16 Ω

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 80dB
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 (30k Ω , 50k Ω , 100k Ω)
PHONO 2	3mV (50k Ω)

PHONO 1, 2 Max. Input

Capability	280mV (T.H.D. 0.1%)
MIC	3mV (50k Ω)
MIC Max. Input Capability	450mV (T.H.D. 0.3%)
AUX 1, 2	150mV (40k Ω)
TAPE PB A, B	150mV (40k Ω)
Power Amplifier Input	775mV (40k Ω)

OUTPUT LEVEL AND IMPEDANCE (at rated power, 1,000Hz)

TAPE REC OUT A, B	150mV (2k Ω)
PRE OUT	775mV (2k Ω)
	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 6,000Hz, 12,000Hz (6dB/oct.)

LOUDNESS CONTROL (Continuous Loudness Volume at Minimum)

+10dB at 100Hz, +5dB at 10,000Hz

• TUNER SECTION

FM:	
Tuning Range	88 to 108MHz
Sensitivity (mono)	
IHF/DIN (40 KHz Deviation S/N 26 dB)	1.7/1.1 μ V
Sensitivity (stereo)	
DIN (40 KHz Deviation S/N 46 dB DIN 45500)	40 μ V
Quieting Slope	55 dB at 5 μ V 60 dB at 10 μ V
Limiting Level (-3 dB)	1.1 μ V
Image Frequency Rejection	110 dB
IF Rejection	110 dB
Spurious Response Rejection	110 dB
AM Rejection	55 dB
Capture Ratio	1.0 dB
Selectivity IHF/DIN (300 KHz 40 KH Deviation)	80/65 dB
Signal-to-Noise Ratio	
mono: 75 KHz Deviation/DIN (40 KHz Deviation)	75/69 dB
stereo: 75 KHz Deviation/DIN (40 KHz Deviation)	72/66 dB
Total Harmonic Distortion	
antenna Level 1 mV	
mono: 400 Hz (75 KHz Dev.)/DIN (1 KHz 40 KHz Dev.)	0.15/0.15 %
50 to 10,000 Hz /DIN (40 KHz Dev.)	0.30/0.30 %
stereo: 400 Hz (75 KHz Dev.)/DIN (1 KHz 40 KHz Dev.)	0.30/0.30 %
50 to 10,000 Hz /DIN (40 KHz Dev.)	1.0/1.0 %
Stereo Separation	
400 Hz (75 KHz Deviation)/1 KHz 40 KHz Deviation)	45/45 dB
50 Hz to 10 KHz (75 KHz Dev.)/(40 KHz Dev.)	35/35 dB
Frequency Response	
50 Hz to 10 KHz	+0.5 dB -0.5 dB
20 Hz to 15 KHz	+1.5 dB -1.5 dB
Sub-Carrier Suppression	60 dB
Muting override Signal Level	10 ~ 50 μ V
Stereo level	10 ~ 50 μ V
Antenna Impedance	300 Ω balanced 75 Ω unbalanced
IF Out Level and Impedance	400 mV/ 1 K Ω

• GENERAL

Semiconductors	2 IC's; 2 MOS FET's; 98 Transistors; 10 FET's; 3LD's; 56 Diodes; 5 Zener Diodes
Power Source	AC 110, 117, 130, 220, 240V 50/60Hz
Power Consumption Max.	430 watts
Rated	250 watts
AC Outlets	
Switched	2 (total 200 watts)
Unswitched	2 (total 200 watts)
DIMENSIONS	510mm (20") W x 174mm (6 $\frac{3}{4}$ ") H x 335mm (13 $\frac{1}{4}$ ") D
WEIGHT	19 kg (41.8 lbs)

Specifications subject to change without notice.

SINCE 1887



YAMAHA

NIPPON GAKKI CO.,LTD. HAMAMATSU, JAPAN