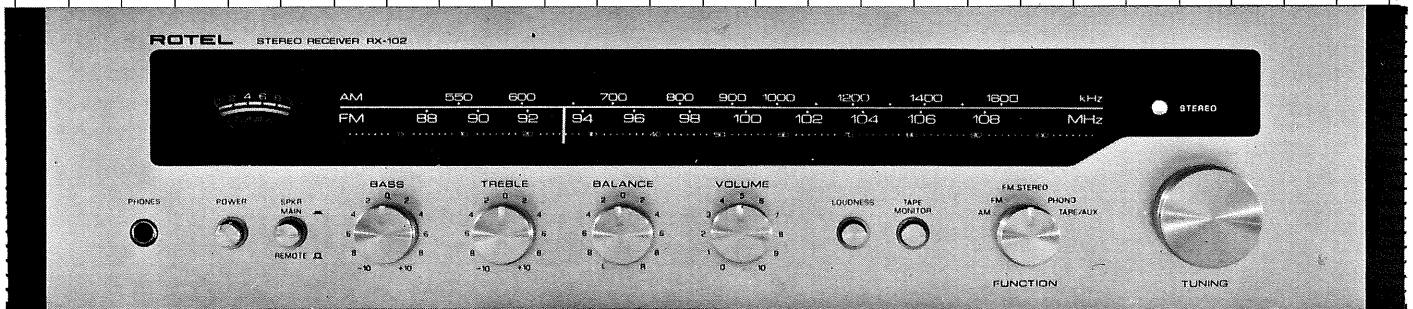


# ROTEL®

## RX-102

AM/ FM STEREO RECEIVER



# OWNER'S MANUAL

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**WARNING — to prevent fire or shock hazard, do not expose this appliance to rain or moisture.**

## INTRODUCTION

We would like to take this opportunity to thank you for purchasing our audio component. With the high quality design and workmanship that goes into making this equipment, you can be assured of its flawless performance for many years to come.

We have fitted every control and feature you could conceivably need. Built for both versatility and ease of operation, this piece of equipment will add professional studio flexibility to your Hi-Fi sound center. The performance is exceptional; it will allow you to experience true high fidelity as never before. Its full and natural

sound reproduction offers you musical entertainment approaching that of live performances. We sincerely hope you will treasure this professional-type component.

The operations are really simple if you read at least the first two sections of this manual. The third section covers additional components such as a record player and a tape recorder that can be connected to this equipment, and is recommended to be followed if you wish to realize the full potential of this advanced and superbly engineered equipment.

## INSTALLATION

**Caution:** Do not apply power to the equipment without first making sure that speakers are connected properly and that the unit's VOLUME is set to minimum.

### LOCATING THE UNIT

Although the unit normally does not develop high heat, it should be placed in such a way that its ventilation system will not be impeded. Place the unit on a hard surface — any conveniently located shelf or table where not affected by heat. Leave at least 2 inches (5 cm) clearance on each side and in the rear of the unit, and about 3 inches (8 cm) above the unit. Never directly place an object on the ventilation at the top of the unit, if there is such a ventilation.

### LOCATING SPEAKERS

**Caution:** Check that each speaker's rated impedance is 8 ohms or higher. (The value should be marked near its

connecting terminals or indicated in its instruction book or, if not, consult your dealer.) If any speaker is rated at 4 ohms, severe overload and distortion may be incurred.

**1. MAIN SPEAKERS —** Two speakers are required for stereo operation. Place both speakers against a wall or on a shelf so that they face your selected listening position and are equal distance from you. For optimum stereo effect, they should be 10 to 15 feet (3 meters) apart and, if possible, at about ear level height. You may determine best locations to suit your personal tastes and listening conditions.

**2. REMOTE SPEAKERS —** If you wish to enjoy stereo sound in another room in your home, you can connect a pair of speakers to the REMOTE terminals located on the unit's rear panel. Though you will need long cables between the unit and the speakers in another room, make sure they are not longer than 50 to 60 feet (15 to 20 meters) in length and that they are of heavy duty type in order to prevent loss of volume.

Follow the procedure described above in the item (1) for placing the remote speakers.

### SPEAKER CONNECTION

**Caution:** Do not apply power to the unit until the speakers are connected properly as described below.

When connecting the speakers to the screw terminals, make sure that the bare wires at the ends of each cable do not touch each other adjacent terminals. Connect one lead of each speaker cable to its corresponding terminal and another end to the adjacent terminal; the positive (+) lead of the speaker is connected to the (+) screw terminal and the ground (—) lead to the (—) screw terminal. (Note: if necessary, after stripping each end of speaker leads to obtain a bare wire, twist the bare strands together so it will be easy to wrap around each screw terminal and also prevent shorting among stray strands.)

If you have another pair of speakers, connect to the REMOTE terminals in the same manner as the above.

See Fig. 1.

### AM ANTENNA CONNECTION

A ferrite-core AM loopstick antenna is affixed inside the unit for optimum reception.

If you live in a difficult reception area and the AM loopstick does not give sufficient reception, an external antenna may be required. There is a terminal on the rear panel for such antenna connection, so refer to the ANTENNAS section of this manual for installing external antenna.

### FM ANTENNA CONNECTION

Due to the high sensitivity of the FM tuner section of the unit, a "T"-shape dipole antenna (or sometimes even a 48-inch long single wire) is sufficient for most locations. Connect this to both FM antenna terminals marked 300 ohms and fasten the short arms of the antenna horizontally to a non-metallic surface, for instance by tacking to the shelf on which the unit is mounted or to the wall where reception is optimum.

In extremely difficult reception areas, an outdoor antenna may prove necessary. Refer to the ANTENNAS section of this manual for installing outdoor antennas.

## COMPONENTS CONNECTIONS

This unit is designed to handle a record player either with magnetic or ceramic cartridge, a stereo tape recorder and an additional auxiliary component such as stereo cassette or 8-track cartridge deck.

We recommend that you familiarize yourself with basic operations before connecting any such units. Refer to the ADDITIONAL COMPONENTS section provided in this manual for connections and operations of these components.

### AC OUTLET

The outlet marked SWITCHED on the rear panel provides power and switching control to whatever component you may wish to connect to the unit. For example, if you connect the power cord of your record player to the outlet, the record player will be activated and deactivated by the power switch on the unit.

**Caution:** Do not connect components whose total power consumption exceeds 20W.

### POWER SUPPLY CONNECTION

For power the unit requires the normal house AC electrical current.

Before connecting up ensure that a suitable plug is fitted. If you need to fit a plug, ensure live, neutral and (where appropriate) earth leads are connected to the proper terminals. Ensure the terminals are screwed down firmly, and no loose strands of wire are present.

### UNITED KINGDOM ONLY:

**Warning:** THIS APPARATUS MUST BE EARTHED.

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

GREEN/YELLOW: EARTH  
BLUE: NEUTRAL  
BROWN: LIVE

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

The wire which is coloured GREEN/YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  $\perp$  or coloured GREEN or GREEN/YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLUE or BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured BROWN or RED. The apparatus must be protected by a 3 Amp fuse if a 13 Amp (BS 1363) plug is used. If another type of plug is used a 5 Amp fuse or lower must be used, either in the plug or adaptor or at the distribution board.

If in any doubt about connecting to the power source, consult a qualified electrician.

## REAR PANEL CONNECTIONS

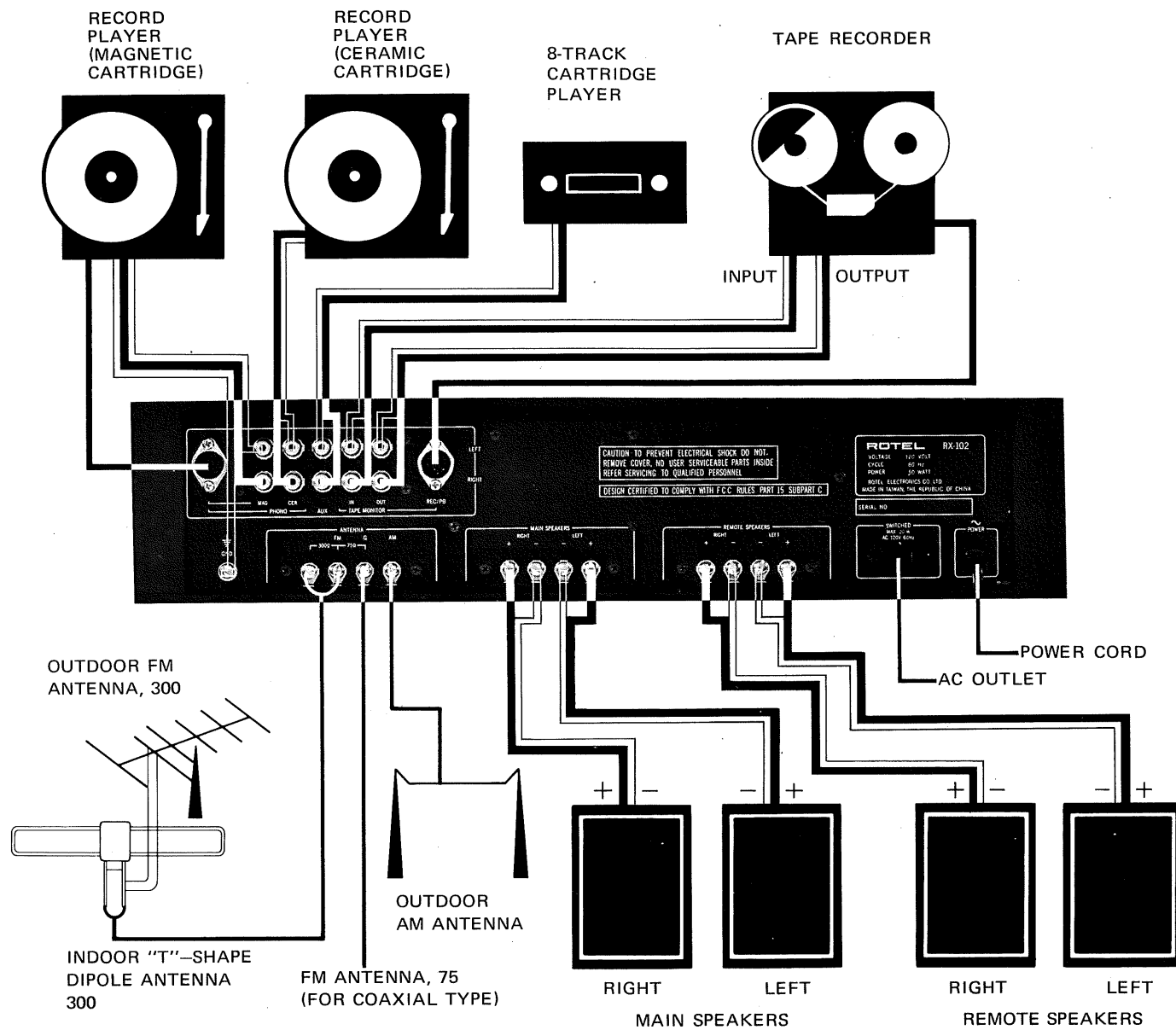


Fig. 1 Rear panel connections

## OPERATION

Refer to Fig. 4 for the locations of the switches and the controls of the unit, and follow the instruction below carefully in order to master complete operation of the unit.

### CONTROLS AND SWITCHES

#### A. PUSH BUTTON SWITCHES

The push button switches used are all of the PUSH/PUSH type; that is push in to activate the circuit and push again to release or deactivate the circuit. In describing these switches we will consider the "in" position to be "ON" and the "out" position to be "OFF".

- ① **POWER SWITCH** — performs the function as its name denotes. It supplies power to the unit and to any switched AC outlets. When the switch is ON the dial scale board will be illuminated.
- ② **SPEAKERS SWITCH** — in MAIN position activates the speakers connected to MAIN terminal on the rear panel, and in REMOTE activates the speakers connected to REMOTE terminal.
- ③ **LOUDNESS SWITCH** — in ON position activates a circuit which boosts low and high frequency sounds at low volume control settings. This compensates for the ears loss of sensitivity to bass and treble notes at

low listening levels. However, leave the switch OFF at normal and high volume settings to prevent booming noise or overload on some speakers.

- ④ **TAPE MONITOR SWITCH** — is used in conjunction with a tape recorder connected to the TAPE MONITOR terminals on the rear panel, and serves a dual function. For playback push ON (in this case, position of settings on the function selector control becomes irrelevant as it is overridden); for recording, if your tape recorder has a separate playback head, setting the switch ON will allow you to listen to the program as being recorded (monitoring). Refer to the ADDITIONAL COMPONENTS section for details. Always leave the switch OFF when not operating the tape recorder or during recording when the tape recorder does not have the separate playback head.

#### B. ROTARY CONTROLS

- ⑤ **BASS CONTROL** — regulates low frequency sounds as desired, to suit personal tastes, speaker characteristics, room acoustics, etc. The center setting gives normal (flat) frequency response. Rotate clockwise to increase the bass tone, and counterclockwise to decrease.
- ⑥ **TREBLE CONTROL** — regulates high frequency sounds, and operates in the same manner as the BASS CONTROL.
- ⑦ **BALANCE CONTROL** — regulates the relative sound outputs from each channel. Normally the control is adjusted to provide the effect of a mono signal coming from a midway point between the speakers.

When balanced in this way, the optimum stereo effect will be achieved. Rotate clockwise for increase in sound level from the right channel, and counterclockwise for the left channel.

- ⑧ **VOLUME CONTROL** — regulates the volume level of all channels simultaneously. Rotate the knob clockwise to increase the volume and counterclockwise to decrease.
- ⑨ **FUNCTION SELECTOR CONTROL** — enables you to select the program you desire from AM, FM, FM STEREO, PHONO and TAPE/AUX.
- ⑩ **TUNING KNOB** — allows you to tune in, in conjunction with the dial pointer, AM or FM stations with smooth flywheel action and precision.

#### C. INDICATORS AND RECEPTACLE

- ⑪ **TUNING METER** — provides visual indication of signal strength of reception for AM and FM broadcasts. For optimum reception, turn the TUNING KNOB so that the deflection of the meter pointer to the right becomes maximum.
- ⑫ **STEREO INDICATOR** — automatically lights up on the right side of dial scale board to visually indicate whenever an FM stereo broadcast is tuned. The function selector control must be set at FM STEREO position for stereo reception.  
**Note:** In some cases, very weak stereo signals may not activate the stereo indicator. In this case the program will be reproduced monaurally.

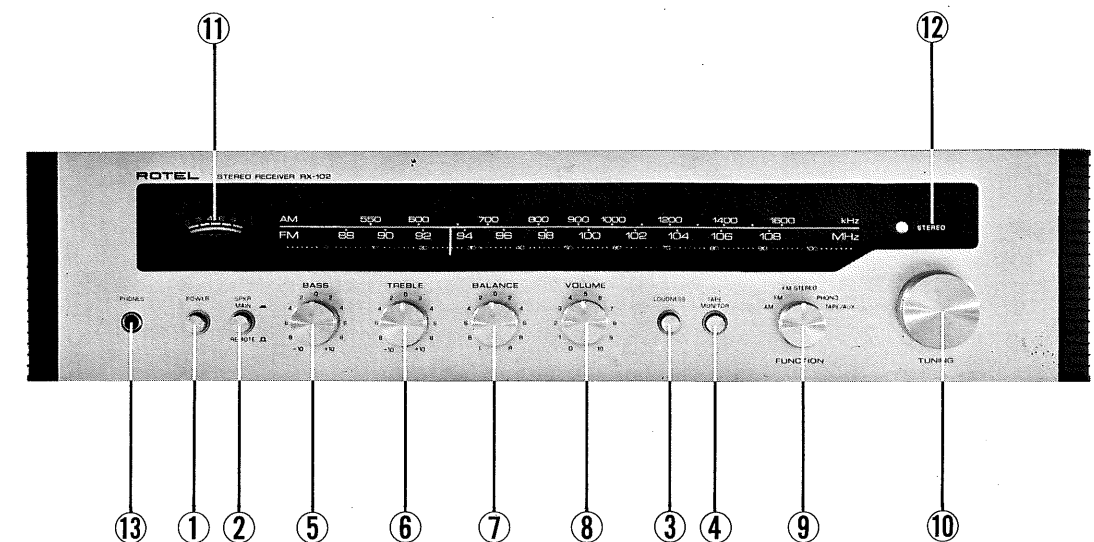


Fig. 2 Locations of the switches and controls

- ⑬ **HEADPHONES RECEPTACLE** — simply plug in your stereo headphones lead to the receptacle for private listening. Speakers will be deactivated when the headphones are plugged.

## RECEIVING FM AND AM BROADCASTS

### 1. FM STEREO

Under normal use for all FM broadcasts the function selector control should be set at FM STEREO position. If a station you wish to listen to is transmitting stereo signal, your unit will automatically switch on the multiplex circuit and you will hear the broadcast in stereo. Should the station conclude broadcasting in stereo, the unit will automatically switch back to monaural reception. Use the stereo indicator light as a guide to locate stereo stations.

### 2. FM

Should you wish to receive monaural signal, or weak stereo signal whose quality is degraded by noise or poor reception conditions and you wish to listen more clearly, place the function selector control to FM position.

### 3. AM

Should you wish to listen to AM broadcasts, turn the function selector control to AM position. Though AM gives only monaural signal, the unit will enable you to listen to it from two speakers as if in stereo.

In all cases, tune in the desired station with the tuning knob, using the tuning meter to assure the strongest possible reception. Utilize other controls to enhance your listening conditions and pleasure.

## ADDITIONAL COMPONENTS

**Note:** Refer to Fig. 2 and Fig. 3 for visual guide to proper connections.

## RECORD PLAYER

### 1. CONNECTION

Connect the RIGHT output cable of your record player to the RIGHT jack and the LEFT output cable to the corresponding LEFT jack. If there is another cable emerging from the record player besides the output cables, connect it to the ground terminal marked GND on the rear panel near the PHONO jacks.

If your record player comes equipped with a magnetic cartridge, use the pair of PHONO jacks marked MAG, or if it comes with a ceramic cartridge, use the pair of PHONO jacks marked CER.

If your turntable has DIN-type plug:

Connect the output DIN-type 5-prong plug of your record player to the DIN-type socket marked PHONO. Make sure the cartridge on your record player is magnetic type.

**Note:** To avoid loss of the high frequency response due to excessively long cables, shielded cables not exceeding 10 feet (3 meters) in length should be used to connect your record player. Usually, cables supplied with your record player are sufficient.

### 2. OPERATION

When you wish to play the record player, place the function selector control to PHONO position. In case you have two record players connected (as in RCA-type connections where there are two pairs of PHONO jacks, one for use with magnetic cartridge and the other with ceramic cartridge), whichever record player you are playing will be amplified by the unit.

Activate either or both speaker switches depending on your listening situation, and adjust the volume, bass, treble and balance controls to suit your personal tastes and acoustic conditions.

## TAPE RECORDER

### 1. CONNECTION

There is a connection facility for tape recorder on the rear panel. It is called TAPE MONITOR and is used in conjunction with the tape monitor switch on the front panel. It is also used when your tape recorder has a separate playback head (i.e., tape recorder normally equipped with three heads). Your tape recorder can be reel-to-reel deck, cassette recorder deck or 8-track cartridge player or recorder deck.

### TAPE MONITOR CONNECTION

- a) If your recorder has RCA-type plugs:

Input jacks marked IN are for playing back pre-recorded tapes, and output jacks marked OUT are for recording program materials such as broadcasts, records and live sounds.

Connect the pair of output cables of your tape recorder to corresponding LEFT and RIGHT input jacks and the pair of input cables to the corresponding output jacks.

- b) If your recorder has DIN-type plug:

Connect the DIN-type 5-prong plug of your tape recorder to the socket marked REC/PB.

### AUX CONNECTION

This facility is used for connection of tape deck without a recording capability such as 8-track cartridge player.

Connect to AUX jacks in the same manner as to the input jacks of the TAPE MONITOR CONNECTION.

## 2. OPERATION

### TAPE PLAYBACK

- a) When using TAPE MONITOR inputs.

To listen to a playback of pre-recorded tape, push ON the TAPE MONITOR switch. The setting of the function selector control is irrelevant in this case and may be left at any position.

- b) When using AUX inputs.

Turn the function selector control to TAPE/AUX position.

Play your tape deck and adjust volume, bass, treble and balance controls to suit your personal tastes and listening conditions.

### TAPE RECORDING

You may record with your tape recorder any program materials that can be played through this unit. Turn the function selector control to AM, FM, FM STEREO, PHONO or TAPE/AUX depending on which program you

wish to record, and operate the tape recorder while listening to the program.

Always leave the TAPE MONITOR switch OFF if your tape recorder has no separate playback head (look up in its instruction manual to see if the tape recorder is equipped with separate playback and recording heads). If your tape recorder has the separate playback head, pushing ON the switch will let you monitor the recording program (listening to the program as it is actually being recorded). Hence, you may compare the program as played by this unit to the same program as being recorded by pushing ON and OFF the TAPE MONITOR switch.

**Note:** You will not obtain any sound if the TAPE MONITOR switch is ON unless the tape recorder has a separate playback head. Also, volume, bass, treble and balance controls of this until will have no effect upon the recording, so you should use the controls on the tape recorder.

## ANTENNA

### FM ANTENNA

If a single wire antenna or a "T"-shape dipole antenna is inadequate for FM reception in your area, it may be necessary to replace it with better indoor antenna or, in some extreme case, outdoor antenna.

1. **INDOOR ANTENNA** — you may use an indoor antenna such as "rabbit-ears" or telescopic antenna which can be rotated for best reception of the desired signal. Connection of such antenna is exactly the same as the dipole antenna. Make sure the leads connected to the antenna terminals, if the terminals are screw-type, do not touch each other as it will impede reception performance.
2. **OUTDOOR ANTENNA** — in weak-signal "fringe" areas, an outdoor antenna may be necessary if indoor antenna does not give satisfactory results. If you already have an outdoor VHF television antenna, this antenna may prove suitable for FM reception as well. To test it, connect TV antenna leads to the FM antenna terminals marked 300 ohms on the rear panel. If the results are satisfactory, obtain a TV/FM splitter/coupler so that

you can operate both the TV set and this unit from the antenna simultaneously. If the TV antenna does not serve the purpose, you may have to use an outdoor antenna designed specially for FM. Follow its instruction manual for information and usage.

3. The unit is also equipped with the antenna terminals for 75 ohms for FM coaxial cable antenna. If you wish to use such an antenna, follow its instruction manual for information and usage.

### AM ANTENNA

If AM reception is poor because you live in a steel-frame building, or if you wish to supplement the built-in AM antenna for improved reception of weak stations, connect an insulated, flexible, single-conductor wire to the AM antenna terminal on the rear panel of this unit. The wire should be as long as possible, and should be run in a straight line along a nonmetallic surface or under a rug. In some cases, reception may be further improved by draping the wire out a window or by connecting it to an outdoor whip or rod antenna.

## HUM AND NOISE

In any high fidelity installation, hum may be caused by the interconnection of a record player, tuner and amplifier, and speakers as a result of the cables, different grounds or locations of components. If hum is experienced with your unit, disconnect everything but the speakers from the unit. If the hum persists, reverse the power cord at the power source. Plug in the record player and if hum or howling appears, reverse the record player power plug or relocate the record player away from the speakers as much as possible. Note hum may also be induced by

defective connecting cables or by running these cables too close to a strong AC field.

When your unit picks up noises during the reception of broadcasts, causes are mostly due to external objects such as fluorescent lamps and house appliances using motor or thermostat, or others that may induce the noises. Either relocating the unit away from the noise sources or using an improved outdoor antenna may readily solve the problem. In the event you cannot find causes, consult your dealer or a qualified electrician.

# SPECIFICATIONS

## AMPLIFIER SECTION

Continuous Power Output .....	<b>5.5 watts per channel min. RMS, both channels driven into 8 ohms from 60 to 20,000 Hz with no more than 1% total harmonic distortion</b>
IM Distortion .....	Less than 1% at rated output
Frequency Response .....	30 to 40,000 Hz $\pm 3$ db
Damping Factor .....	30 (8 ohms, 1kHz)
Input Sensitivity/Impedance .....	TAPE MONITOR 140 mV/40k ohms TAPE/AUX 150 mV/42k ohms PHONO MAG 2.4mV/50k ohms PHONO CER 110 mV/270k ohms
Phono Overload .....	100 mV (1kHz)
Phono Equalization .....	RIAA S.T.D. $\pm 1.5$ db
Bass Control .....	$\pm 10$ db at 100Hz
Treble Control .....	$+10$ db— $14$ dB at 10KHz
Loudness Contour .....	$+7$ db/100Hz, $+4$ db/10kHz
Crosstalk .....	50db/10kHz
Hum and Noise (S/N) .....	PHONO 64db (continuous power output) TAPE 74db Residual 1 mV
Speaker Impedance .....	8 to 16 ohms

## FM TUNER SECTION

Frequency Range .....	88 to 108 MHz
Sensitivity (IHF) .....	7 microvolts
Signal-to-Noise Ratio .....	65 db
Harmonic Distortion .....	0.4 %
Selectivity .....	50 db $\pm$ 40kHz
Capture Ratio .....	8 db
Stereo Separation .....	33 db at 1kHz
IF Rejection .....	80 db
Image Rejection .....	40 db
Spurious Response Rejection .....	65 db
SCA Suppression .....	50 db
AM Suppression .....	48 db

## AM TUNER SECTION

Frequency Range .....	525 to 1650 kHz
Sensitivity .....	400 microvolts/m
Selectivity .....	20 db $\pm$ 10kHz
IF Rejection .....	43 db
Image Rejection .....	48 db

## GENERAL

Power Consumption .....	50W
Power Supply .....	AC 120V 60Hz or AC 220V 50/60Hz AC 240V
Dimensions (overall) .....	474(W) x 114(H) x 267(D) mm
Weight (net) .....	5 kg/11 lbs.

Note: features and specifications subject to changes for improvement without prior notice.

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