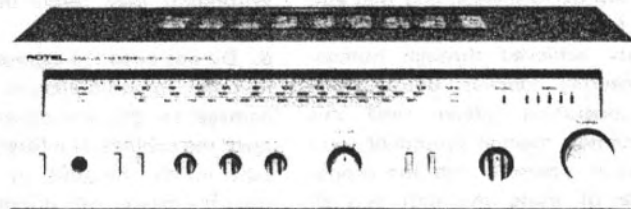


owner's manual



RX-400L

Quality. Uncompromised.

ROTEL[®]

AM/FM STEREO RECEIVER

RX-400

MW/LW/FM STEREO RECEIVER

RX-400L

ENGLISH 2

WARNING
TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO
RAIN OR MOISTURE

Write your SERIAL NUMBER here.

The number is located near the name plate on the rear panel.

ENGLISH

AM/FM STEREO RECEIVER RX-400

MW/LW/FM STEREO RECEIVER RX-400L

INTRODUCTION

We at Rotel want to thank you for purchasing our audio product.

Rotel audio products are designed to use the latest electronic technology, and they incorporate our long experience as a specialist manufacturer of audio equipment. We are confident that you will find satisfaction in the high quality sound and top performance, and that you will find pleasure in the functional beauty achieved through human-engineering concept. Before starting operation, please read this instruction manual thoroughly and acquaint yourself with the proper mode of using the unit and all its connections.

We hope you will enjoy top-notch performance for many years to come.

BEFORE ENJOYMENT/ POWER SUPPLY

Follow the instructions below for maximum safety:

1. Use a wall outlet for power supply

Be sure to connect the AC line cord directly to a household wall outlet, and not to an auxiliary outlet on another component. Be certain that the outlet voltage matches the electrical rating of the unit, found on the rear panel name plate.

2. Connecting and removing AC cord

Be sure to connect or disconnect the AC line cord only after turning off the power switch to prevent possible shock noise or damage to the speakers.

3. Furnished convenience AC outlet

(Not available for U.K., Scandinavia and some other countries)

a) Do not insert or remove plug from any convenience AC outlet supplied on the appliance while the appliance is connected to power.

Also do not insert foreign object, other than a proper plug, into the convenience AC outlet.

b) Do not connect other appliance(s) to convenience AC outlet if its/their total power consumption exceeds maximum rated watts labeled next to the outlet.

4. Installation

Be sure to place the unit on a level, flat surface in a place free from humidity, vibration, and high temperature and not exposed to direct sunlight. Make sure the location placed is well ventilated.

5. Ventilate the unit well

Never block any ventilation holes at the top and bottom of the unit. Be sure also to provide ample ventilation space around the unit. Poor ventilation may result in damage due to excessive heat.

6. Do not open the cabinet

In order to avoid electric shock or damage to the component, never open the cabinet. If a foreign object falls inside the unit by mistake, turn the power off, disconnect the wall plug, and consult a qualified electrician or your dealer.

7. Turn the volume control initially to minimum.

When lowering the tonearm of your turntable onto a record, an excess of current in the lower frequency range may cause damage to the speakers. To prevent this, always minimize the volume setting initially.

8. Moving the unit

When transporting, remove the AC cord from the wall outlet and all other connected cords on the rear

EXCLUSIVE NOTE FOR U.K.

If your unit comes with a 2-core cable without a plug, make certain live and neutral leads are connected to the proper terminals. Check that the terminals are screwed down firmly and no loose strands of wire are present.

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

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 BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

panel to prevent wire breakage and short circuits.

9. If the unit gets wet

If the unit should get wet, immediately disconnect the AC cord, and consult your dealer or a qualified electrician.

10. Cleaning and maintenance

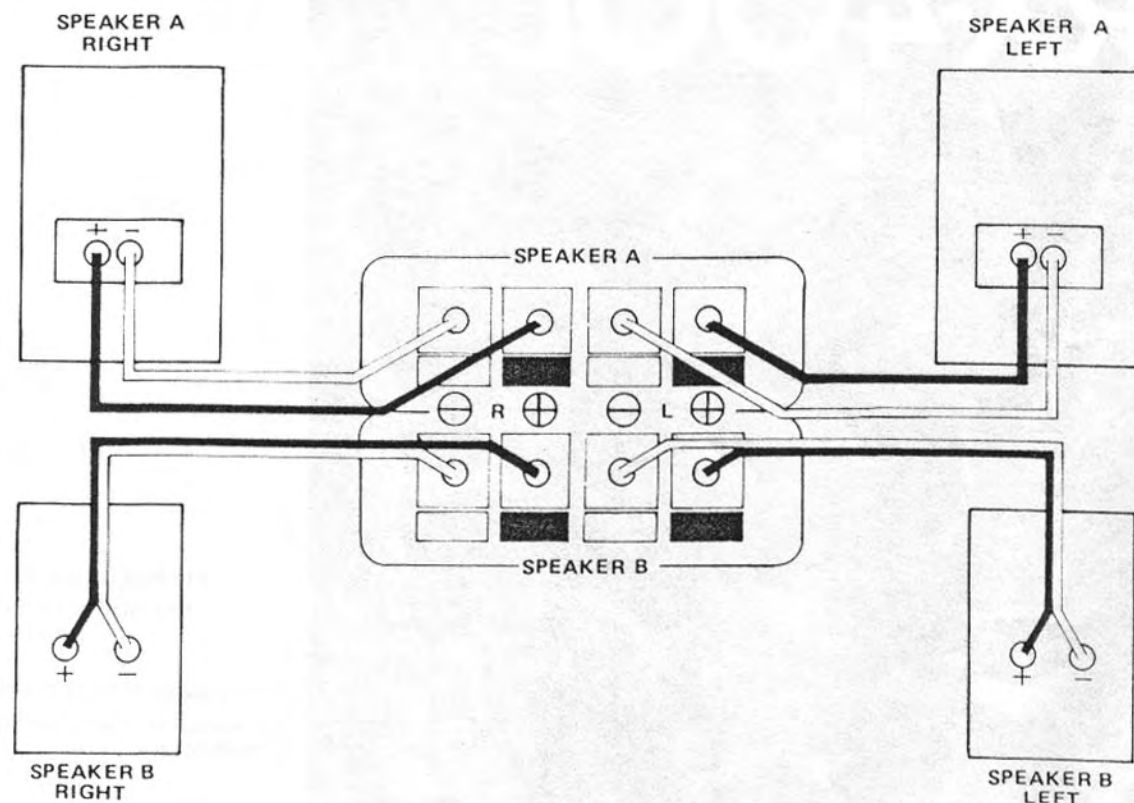
Do not use chemicals such as benzine or thinners on the front panel. Always use a soft, dry cloth to clean the unit.

11. Retain the owner's manual

Retain the owner's manual near the unit, and write down the serial number (found on the rear panel) on the cover.

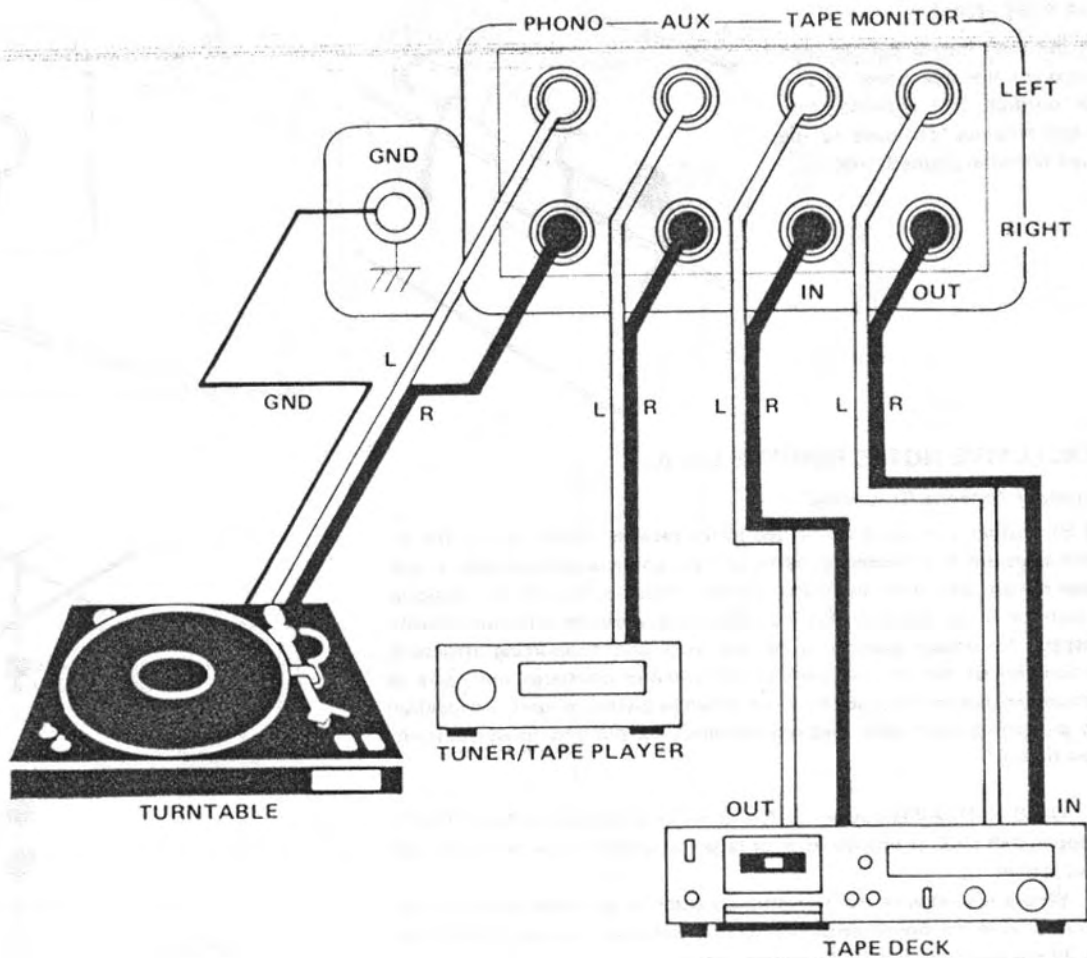
SPEAKERS

Be sure to use only speakers rated at 4 – 16 ohms. The unit will accept two pairs of speaker systems, but if the two systems are to be driven at a time, each speaker should be rated at 8 – 16 ohms. The speaker impedance may be found on its name plate or the instruction manual of the speaker.



CONNECTING COMPONENTS

Connect all necessary audio components to the rear panel of the unit, using RCA pin cords. See the illustration for properly completed connections. When connecting RCA pin cords, be sure that L (left) and R (right) markings on each component are matched correctly. Connect the grounding wire of the turntable to the terminal marked GND on the receiver.



ANTENNA INSTALLATION AND CONNECTION

FM ANTENNA

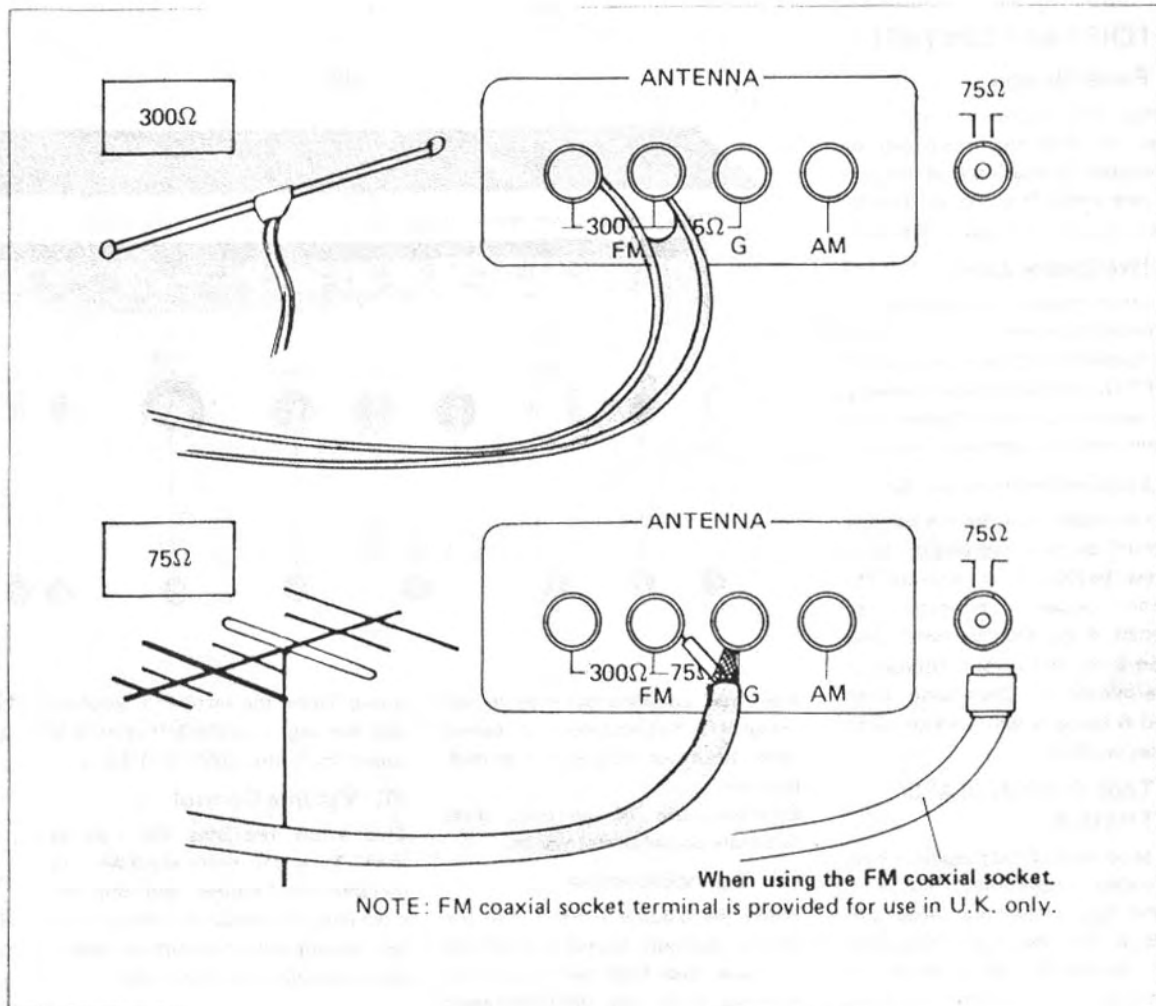
Proper installation of antenna is the key to smooth signal reception. To install the attached T-shape indoor antenna, stretch it taut and secure horizontally along a wall or the like in a location where signal reception is optimal. Securely connect the antenna to FM antenna terminals marked "300Ω" on the rear panel. If outdoor type FM antenna is installed, the T-shape antenna is not necessary. For proper use of your outdoor FM antenna, follow the instructions below to minimize effect from multipath with optimal antenna position.

1. Be sure to select the most appropriate type of antenna for the signal reception conditions in your area.

2. A 75-ohm coaxial cable is recommended in connecting the antenna to the unit.

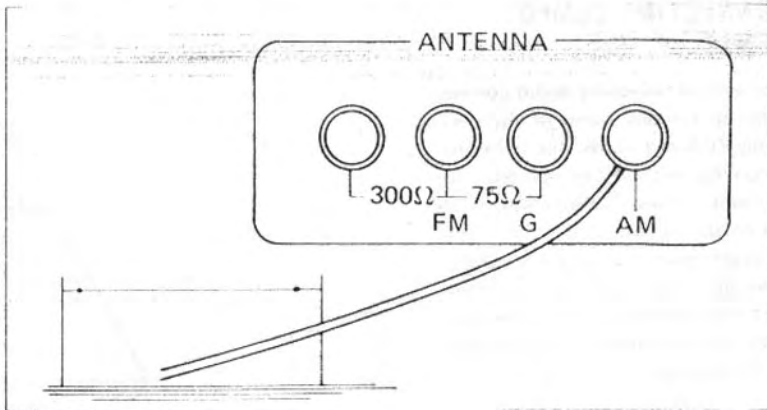
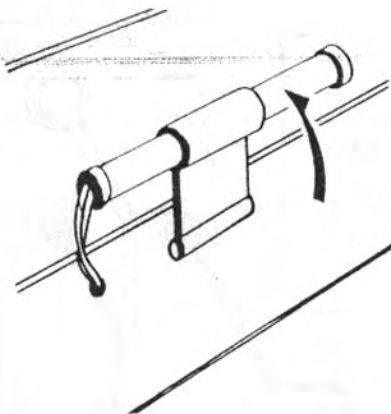
3. Set the antenna in a position as high as possible if buildings, mountains or other obstructions nearby affect reception.

4. Connect the 75-ohm coaxial cable to the antenna terminals located on the rear panel, as shown in the figure.



AM ANTENNA

Erect the AM ferrite bar antenna provided on the rear panel. If you install outdoor AM antenna, connect the antenna lead wire to the antenna terminal marked "AM."

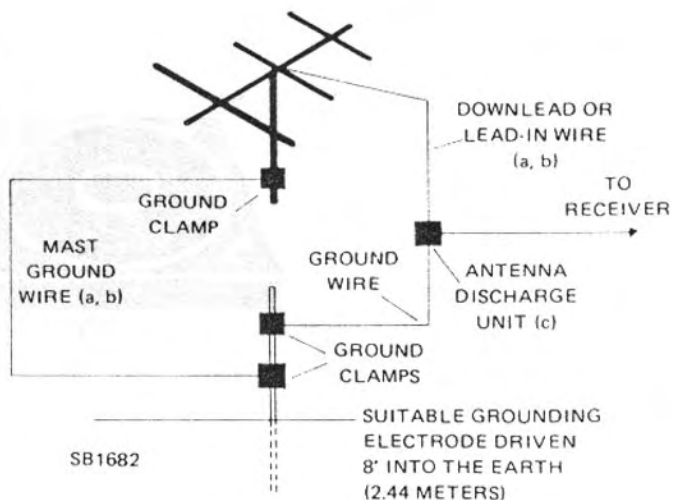


EXCLUSIVE NOTES FOR THE U.S.A.

Outdoor Antenna Grounding

If an outside antenna is connected to the receiver/tuner, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1978, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See figure.

- Use No. 10 AWG copper or No. 8 AWG aluminum or No. 17 AWG copper-clad steel or bronze wire, or larger as ground wires for both mast and lead-in.
- Secure lead-in wire from antenna to antenna discharge unit and mast ground wire to house with stand-off insulators, spaced from 4 feet (1.22 meters) to 6 feet (1.83 meters) apart.
- Mount antenna discharge unit as closely as possible to where lead-in enters house.



SWITCHES AND CONTROLS

(1) Power Button

Depress this button to turn the power on. The dial scale will be illuminated, indicating that the unit is in operation. Pressing the button a second time will cut the power.

(2) Headphone Jack

Plug your headset into this jack for headphone listening.

Both speaker buttons should be set to OFF during headphone listening. The volume control regulates the volume level of headphone sound.

(3) Speaker Buttons (A, B)

You can select your desired speaker system(s) by means of two buttons. Depress button A to activate the speaker system connected to terminals A on the rear panel, and button B for the system connected to terminals B. Depressing both A and B buttons will activate both speaker systems.

(4) Tone Controls (BASS/TREBLE)

Two separate controls regulate bass and treble, respectively: BASS is for the low frequency range and TREBLE for the high frequency range. Rotate the knob clockwise to increase the response in each

case, and counterclockwise to decrease it. A flat response is obtained when both controls are set at mid-position. Effective use of controls gives optimum sound performance.

(5) Balance Control

When the balance control is in the central position, sound is produced in equal level from both speakers. Turning it to the right decreases

sound from the left-hand speaker, and turning it to the left decreases sound from the right-hand speaker.

(6) Volume Control

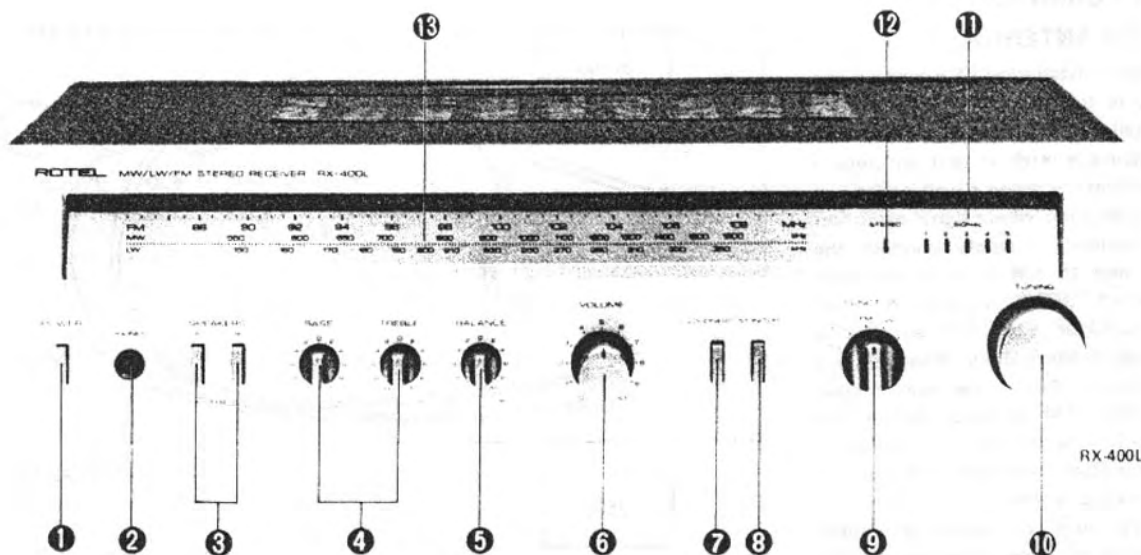
This knob regulates the volume level. Turn the knob clockwise to increase the volume, and counterclockwise to reduce it. Always have the volume set at minimum whenever you switch on the power.

(7) Loudness Button

When listening at low volume levels, the human ear tends to become less sensitive to bass and treble notes. Depressing this button will boost those frequencies and a more natural sound will be heard.

(8) Tape Monitor Button

Depress this button to listen to the signal from tape deck. When it is in released position, the source



selected by the Function Selector (broadcast or record) will be heard.

(9) Function Selector

The function selector is used to listen to a source other than tape deck. Make sure the Tape Monitor button is set in released position when operating the function selector.

On model RX-400, set the knob to AM to listen to AM broadcast, FM for FM broadcast, PHONO to use turntable, and AUX for equipment connected to AUX terminal on the rear panel.

On model RX-400L, AM broadcast can be received in either MW or LW mode.

Set to MW for MW reception, and to LW for LW reception.

(10) Tuning Knob

Tune in to a desired station using this knob. Rotate it to the left to bring the dial pointer to the left, and vice-versa.

(11) Signal Strength Indicator (for AM/FM)

The 5 LEDs show incoming signal strength; the greater the number of glowing LEDs, the better the receiving condition.

(12) Stereo Indicator

Glowes when FM stereo broadcast is tuned in.

(13) Dial Scale

Indicates the receiving frequency for respective bands.

OPERATION

- Before commencing operation, check to see that all connections are properly made.
- Always set the volume control to the minimum position before turning on power.
- Select SPEAKER button A or B for the speaker system you are going to use.
- When using headphones, set both SPEAKER buttons to released (OFF) position.
- Set the Tone controls, Balance control, and Loudness button as desired.

Listening from Turntable

1. Set the Tape Monitor button to released (OFF) position.
2. Set the Function Selector to PHONO.
3. Start the play, raising the volume level as desired.

FM and AM Signal Reception

1. Set the Tape Monitor button to OFF.
2. Set the Function Selector to FM or AM. (RX-400)

Set the Function Selector to FM, MW or LW. (RX-400L).

3. Tune in to the desired station by means of the tuning knob.
4. Raise the volume to the desired level.

Pausing Back Tape Deck

1. Depress Tape Monitor button.
2. Put the tape deck in the play-back mode.
3. Raise the volume to the desired level.

Listening to Signal from Equipment Connected to AUX Terminal

1. Set the Tape Monitor button to released (OFF) position.
2. Set the function selector to AUX.
3. Put the equipment connected to AUX terminal into playing mode.
4. Raise the volume level as desired.

Tape Recording from Program Source

Play record or tune in desired station according to the instructions given above. The signal from the source will appear at TAPE MONITOR OUT terminals on the rear panel of the receiver. Put the tape deck in the record mode to record the signal. If your deck is the 3-head type, depress the Tape Monitor button to monitor the re-recorded signal.

Controls for volume, tone and so on, have no effect during recording on the recording signal from the TAPE MONITOR OUT terminals.

PROTECTION CIRCUIT

To prevent accidental damage to the unit or speakers, a protection circuit is installed in the unit. If the unit suddenly stops operating, a blown fuse may be the cause. Accordingly, carry out the following check.

1. Turn off the unit.
2. Open the fuse box on the rear panel and check the two fuses: one is for the left channel and the other for the right channel circuit.
3. The blown fuse may be due to a short-circuited speaker cable or an overload resulting from the use of a low impedance speaker. Check the speaker cable, its connection and speaker impedance. Correct the cause of the trouble if any.
4. Replace the blown fuse with a new one and close the fuse box. If the fuse blows again despite taking the above action, cut off the power supply from your entire audio system and consult your dealer or a qualified electrician.

HUM AND NOISE

In any high fidelity installation, hum may be caused by the inter-connection of a turntable, tuner and amplifier, and speakers as the result of wiring, different grounding or locations of components.

If hum is experienced with your unit, disconnect everything but the speakers from the unit.

Plug in the turntable and if hum or howling appears, move the turntable away from the speakers as much as possible.

Note hum may also be induced by defective cable connections or by running the cables too close to a strong AC field.

When your unit picks up noise 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 noise.

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 the cause, consult your dealer or a qualified electrician.

VOLTAGE SELECTION

Not available for U.K., Canada and Scandinavia

The unit is a variable voltage equipment that can run on 120V, 220V or 240V power supply. Your unit should already be preset at the proper voltage for use in your area. However, if you move to an area where the power supply voltage is different, the voltage setting can be manually changed. BE SURE THAT YOUR UNIT IS NOT CONNECTED TO THE POWER SOURCE BEFORE ATTEMPTING TO MAKE THIS CHANGE. To check the voltage setting, remove the name plate on the rear panel and locate the VOLTAGE SELECTOR. Use a screwdriver to turn the voltage selector to the required voltage.

SPECIFICATIONS

AMPLIFIER SECTION

Continuous Power Output . . . . .	.20 watts* per channel, min. RMS both channels driven into 8 ohms from 20 to 20,000Hz with no more than 0.08% total harmonic distortion.
Total Harmonic Distortion (20 to 20,000Hz, from AUX)	No more than 0.08% (continuous rated power output) No more than 0.05% (10 watts per channel power output 8 ohms) No more than 0.08% (1 watt per channel power output 8 ohms)
Intermodulation Distortion (60Hz : 7kHz = 4 : 1)	No more than 0.08% (continuous rated output power) No more than 0.05% (10 watts per channel power output 8 ohms) No more than 0.08% (1 watt per channel power output 8 ohms)
Output: Speaker	A, B (4-16 ohms); A + B (8-16 ohms)
Headphone . . . . .	.4-16 ohms
Damping Factor . . . . .	.38 (20 to 20,000Hz, 8 ohms)
Input Sensitivity/Impedance:	
PHONO (MAG) . . . . .	.25mV/47 kohms
AUX . . . . .	.150mV/33 kohms
TAPE IN . . . . .	.150mV/33 kohms
Overload Level (T.H.D. 0.5% 1kHz):	
PHONO (MAG) . . . . .	.140mV
AUX . . . . .	.5V
Output Level/Impedance:	
TAPE OUT . . . . .	.280mV/1 kohm
Frequency Response:	
PHONO . . . . .	.30 to 15,000Hz, +0.3dB, -0.3dB (RIAA STD)
AUX, TAPE IN . . . . .	.10 to 60,000Hz, +0.3dB, -2.0dB
Tone Control:	
BASS	±10dB (50Hz)
TREBLE	±8dB (15kHz)
Loudness Contour	+7dB (100Hz), +4dB (10kHz) (volume control set at -40dB position)
Signal-to-Noise Ratio (IHF, A network):	
PHONO . . . . .	.82dB
AUX, TAPE IN . . . . .	.90dB

FM TUNER SECTION

Usable Sensitivity (Mono)	10.8dBf (1.9μV/300 ohms)
50dB Quieting Sensitivity:	
Mono	17.8dBf (4.3μV/300 ohms)
Stereo	41dBf (63μV/300 ohms)
Signal-to-Noise Ratio (at 65dBf):	
Mono . . . . .	.72dB
Stereo . . . . .	.65dB
Distortion (at 65dBf):	
100Hz . . . . .	.015% (mono), 0.3% (stereo)
1kHz . . . . .	.015% (mono), 0.2% (stereo)
6kHz . . . . .	.025% (mono), 0.4% (stereo)
Frequency Response . . . . .	.30 to 14,000Hz +0.3dB, -3dB
Capture Ratio	1.5dB
Alternate Channel Selectivity . . . . .	.52dB
Spurious Response Ratio . . . . .	.75dB
Image Response Ratio . . . . .	.50dB
IF Response Ratio . . . . .	.75dB
AM Suppression Ratio . . . . .	.56dB
Stereo Separation . . . . .	.40dB (1kHz), 30dB (30 to 15,000Hz)
Subcarrier Product Ratio . . . . .	.35dB
SCA Rejection Ratio . . . . .	.60dB
Antenna Input . . . . .	.300 ohms balanced, 75 ohms unbalanced

AM TUNER SECTION (RX-400)

Sensitivity . . . . .	.250μV/m (IHF, ferrite antenna)
Selectivity . . . . .	.30dB
Signal-to-Noise Ratio . . . . .	.45dB
Image Response Ratio . . . . .	.40dB
IF Response Ratio . . . . .	.38dB
Antenna	Built-in ferrite loopstick antenna

MW/LW TUNER SECTION (RX-400L)

Sensitivity: MW . . . . .	.250μV/m (IHF, ferrite antenna)
LW . . . . .	.500μV/m (IHF, ferrite antenna)
Signal-to-Noise Ratio . . . . .	.50dB (MW), 40dB (LW)
Image Response Ratio . . . . .	.40dB (MW), 50dB (LW)
IF Response Ratio . . . . .	.38dB (MW), 45dB (LW)

MISCELLANEOUS

Power Requirement . . . . .	.120V/60Hz, 220V/50Hz, 240V/50Hz 100, 220, 240V/50-60Hz (switchable)
Power Consumption . . . . .	.85 watts (UL)
Dimensions (overall) . . . . .	.430 (W) x .115 (H) x .336 (D) mm 16-15/16" x 4-17/32" x 13-7/32"
Weight (net) . . . . .	.5.4kg/11.9 lbs

- Specifications and design subject to possible modification without prior notice.
- * Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only)