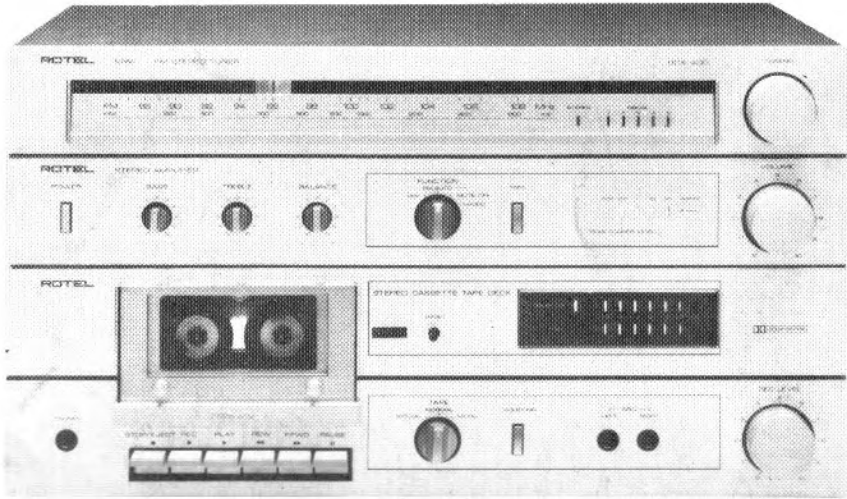


owner's manual



Quality. Uncompromised.

ROTEL

RCX-400

AM/FM STEREO CASSEIVER

RCX-400L

MW/LW/FM STEREO CASSEIVER

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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 CASSEIVER RCX-400
MW/LW/FM STEREO CASSEIVER RCX-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. 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.

4. 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.

5. Installation

Be sure to place the unit in a level and flat place where it is free from humidity, vibration, high temperature and not exposed to direct sunlight. Be careful not to place the unit in a highly enclosed place such as near a wall or on a bookshelf. A poor ventilation will cause undesirable effects to the unit.

6. Moving the unit

When transporting, remove the AC cord from the wall outlet and all other connected cords on the rear panel to prevent wire breakage and short circuits.

7. If the unit gets wet

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

8. Cleaning and maintenance

Do not use chemicals such as benzene or thin-

ners on the front panel. Always use a soft, dry cloth to clean the unit.

9. Owner's manual

Keep the owner's manual near the unit, and record the serial number (found on the rear panel) on the cover.

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 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.

REAR PANEL CONNECTIONS

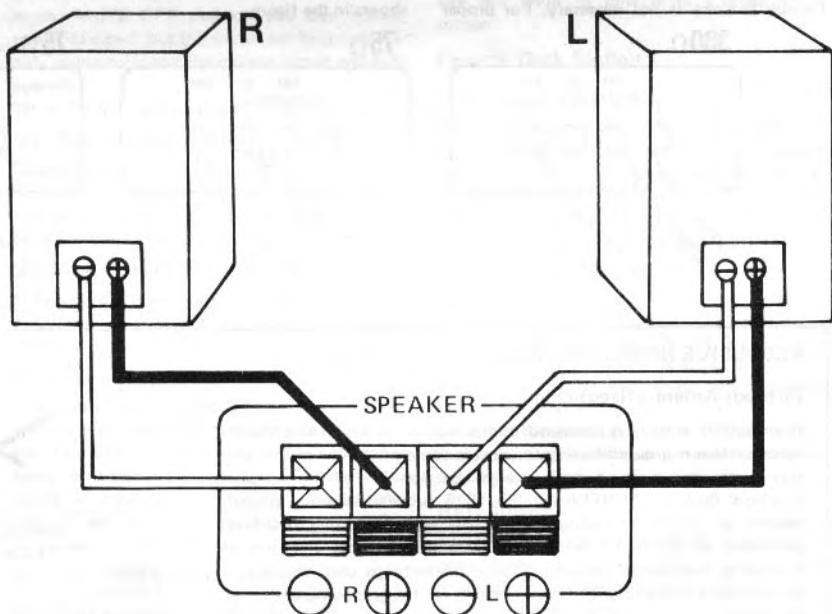
Speaker System

Use speaker system with impedance ratings of 4-16 ohms. Before hooking up your speaker system, be sure to check its impedance, which should be indicated on the back of the speaker. Connect left-hand speaker leads to SPEAKER terminals "L" on the rear panel, and right-hand speaker leads to terminals "R". Make sure that

the "+" speaker lead is connected to the "+" terminals on the rear panel, and the "-" lead to the "-" terminals.

Strip about 1.0cm (3/8") of the vinyl insulation off the end of each speaker lead, twist the exposed strands, and secure the end with a touch of solder.

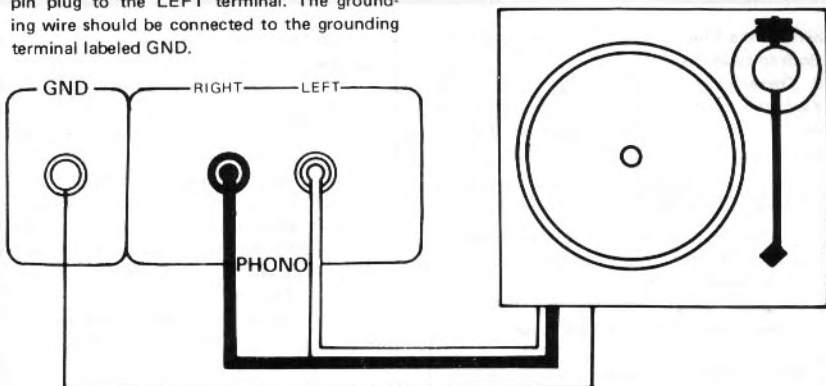
To connect the lead to the terminal, push the button on the terminal and insert the end of lead into the hole, and then release the button.



Turntable

The unit can be hooked up to turntable that takes MM type cartridge.

You will find a pair of RCA pin cords and a grounding wire extending out from your turntable. Connect the pin cords to the terminals labeled PHONO on the rear panel — the red pin plug to RIGHT terminal, and the white pin plug to the LEFT terminal. The grounding wire should be connected to the grounding terminal labeled GND.



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

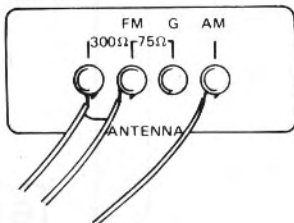
use of your outdoor FM antenna, follow the instructions below.

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.

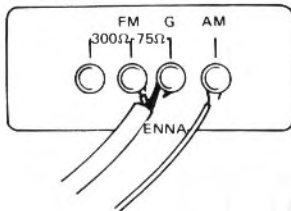
■ AM Antenna

If you install outdoor AM antenna, connect the antenna lead wire to the antenna terminal marked "AM."

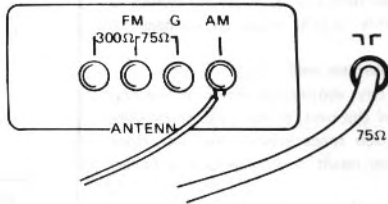
300Ω



75Ω



75Ω (RCX-400L, UK Model only)

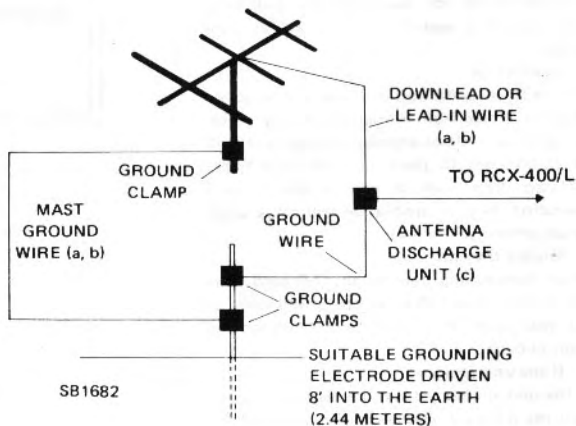


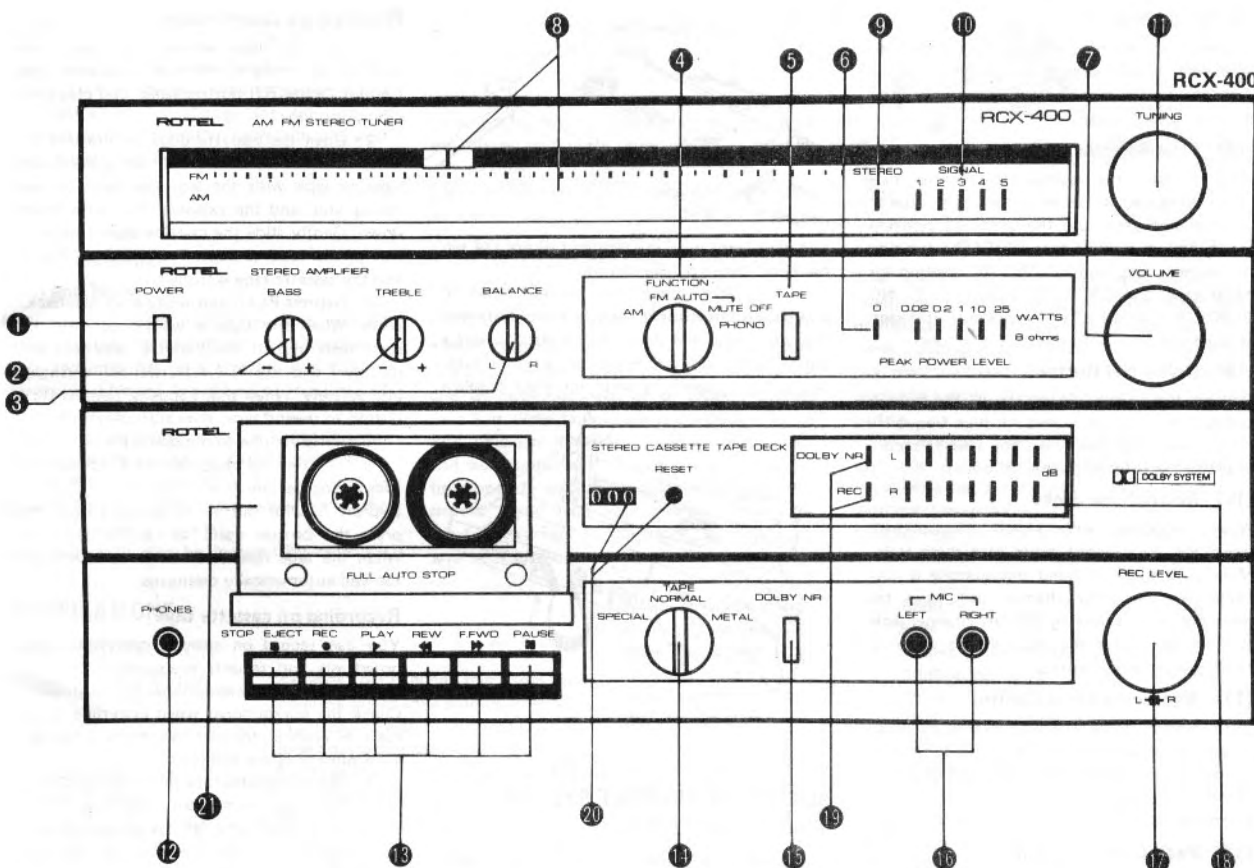
EXCLUSIVE NOTES FOR THE U.S.A.

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.

- a. 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.
- b. 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.
- c. Mount antenna discharge unit as closely as possible to where lead-in enters house.





SWITCHES AND CONTROLS

Amplifier/Tuner Section

(1) Power Button

Press the power button to turn on the unit. When the power is on, the dial pointer on the dial scale and the cassette compartment will be illuminated. Press the button a second time to turn off the power.

(2) Tone Controls

The knob labeled BASS regulates low-frequency response, and TREBLE regulates high-frequency response. Rotate each knob towards "+" to boost the response, and towards "-" to cut it. In mid-position (0), the unit gives normal response. Set these knobs as desired according to prevailing acoustics, etc., to achieve the sound you like best.

(3) Balance Control

This knob regulates the balance of sound output from the speakers. Rotate the knob to the left to shift the center of total sound to the left, and to the right to shift the center to the right. In mid-position, the sound is equally balanced between the two speakers.

(4) Function Selector

This knob selects function, except in case of cassette tape playback.

Set the knob to AM for AM broadcasts. (The RCX-400L has MW and LW positions for AM reception.) Set to FM AUTO for normal FM reception. In this position, the unit will reproduce stereo FM broadcast stereophonically. Because the muting circuit is activated in the FM AUTO position, noise generated when tuning in an FM station is reduced to a minimum.

Set to MUTE OFF when you cannot get satisfactory FM reception in FM AUTO position; in the MUTE OFF position you can receive weak FM signal, but the sound will be produced only monaurally and the muting circuit will not operate.

Set to PHONO when using turntable.

(5) Tape Monitor Button

Depress this button when playing back a tape. Be sure this button is released to (OFF) position when reproducing other sources (AM-FM broadcasts and record).

(6) Peak Power Level Indicator

Shows output levels from the unit. Each LED is calibrated in wattage applicable to 8-ohm speakers.

(7) Volume Control

This knob regulates the volume level. Rotate the knob clockwise to raise the volume level, and counterclockwise to reduce it. When the knob is turned fully counterclockwise, no sound is produced. Always have the volume control set to minimum before you turn on power.

(8) Dial Scale and Dial Pointer

(9) Stereo Indicator (for FM only)

Glowes when stereo broadcasting signal is tuned in. Note that when stereo signal is very weak, the unit may give only monaural reproduction. In that case, the indicator will not light up even though the unit is tuned to a stereo program.

(10) Signal Strength Indicator

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

(11) Tuning Knob

Use this knob to tune in to a broadcasting station.

Cassette Deck Section

(12) Headphone Jack

Plug your headphones into this jack; you can enjoy headphone listening to any program source, including radio broadcasts and records. When headphones are plugged in, the speakers produce no sound. The volume control regulates volume level of the headphone sound.

(13) Cassette Controls

STOP/EJECT Button

Depress this button to stop the tape in any mode: record, playback, rewind, or fast-forward. This button will release any transport button currently engaged.

When this button is pressed all the way down, the cassette door will open so that the cassette tape can be removed or inserted.

REC Button

To record, depress this and PLAY button. The deck is now in the recording mode, and the tape should be winding. The REC indicator glows during recording.

PLAY Button

Depress this button to start the cassette for playback of recorded tape.

REW Button

For rapid tape rewind, depress this button.

F.FWD Button

Depress this button to advance the tape rapidly forward.

PAUSE Button

Depress this button to stop the tape temporarily during recording or playback. Pressing the button a second time will restart the tape in the interrupted mode.

(14) Tape Selector

Used to select the appropriate recording bias and playback equalization, according to type of cassette tape used. Use the SPECIAL position for chromium dioxide tape, NORMAL position for normal tape, and the METAL position for metal tape. See TAPE SELECTOR SETTING GUIDE for details of various brands of cassette tapes and their proper setting positions.

(15) Dolby NR Button

Depress this button to switch in the built-in Dolby NR circuit provided for high-frequency range noise reduction when you wish to record or play back through Dolby NR circuit.

(16) Microphone Jacks

When recording with stereo microphones, insert the microphone plugs into these jacks. Make sure the right-hand microphone is connected to the right channel jack, and the left-hand microphone to the left channel jack. Be sure to unplug the microphones when recording from other sources.

(17) Recording Level Control

Used to control the recording level of incoming signals, such as from the unit's tuner section, turntable, or microphones. This is a dual concentric knob which permits either separate or combined adjustment of both channels.

(18) Peak Level Indicator

Gives instantaneous display of recording or playback level for both left and right channels. Each bank of seven LEDs directly shows levels from -13 dB to +8 dB.

(19) Dolby NR Indicator and REC Indicator

The Dolby NR indicator glows when the Dolby NR switch is set to ON. The REC indicator glows when the unit is in the recording mode.

(20) Tape Counter and Reset Button

The three-digit tape counter indicates the amount of tape travel. Push the reset button to set the counter to "000". This counter is convenient in finding the beginning of a specific section of the tape or checking the amount of the remaining tape on the cassette.

(21) Cassette Holder

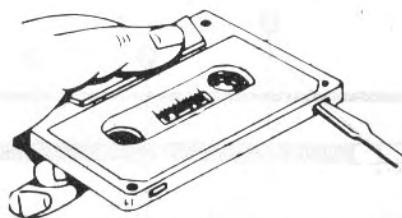
Press the STOP/EJECT button all the way down to open the cassette door for removal and insertion of cassette tape. To close the door, gently push it back.

CASSETTE TAPES

- To prevent possible trouble with the transport mechanism, use of large size cassette tapes, such as C-120, is not recommended.

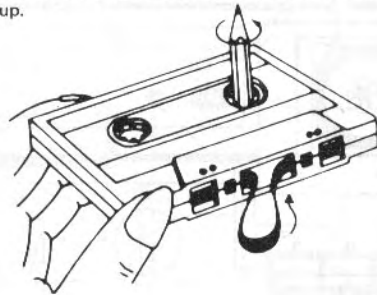
- Handle cassette tapes with care. Keep them away from heat, circulating dust, or a magnetic field (e.g. on the TV set).

- Each cassette tape has safety tabs on its back edge to prevent accidental re-recording. The tabs are provided for both sides of cassette tape. You cannot record on the side whose tab has been removed. The tab can be removed with a screwdriver, etc. If you wish to record on the side with no tab, place a piece of adhe-



sive tape, etc. over the opening where the tab has been, then you can record.

- A loosened tape may cause trouble in playback or recording. Check the tape before loading it into the deck. If it is slack, insert a pencil or the like into either of cassette's hubs, and rotate it carefully until the slack is taken up.



AUTOMATIC SHUTOFF SYSTEM (Cassette Deck Section)

To protect the RCX-400/L motor and transport mechanism against unnecessary wear, an automatic shutoff device has been built into the unit. When either end of tape is reached in play, record, fast-forward, or rewind mode, the motor and mechanism will automatically shut off, disengaging the present mode.

OPERATION

- Check that all speaker cable connections and turntable connections are correct and complete.

- Always make sure the volume control is set to minimum before turning on power.

- Set the tone controls and balance control as desired.

- For headphone listening, plug your headset into the headphone jack on the unit; no sound is produced from the speakers.

Listening to radio broadcasts

1. Release the tape monitor button to OFF position.

2. Set the function selector to AM for AM reception (to either MW or LW on model RCX-400L), or to FM AUTO for FM reception.

3. Tune in to desired station with tuning knob, while checking the signal strength indicator. The stereo indicator will light up when stereo FM station is received. If FM reception is difficult in the FM AUTO position, switch the function selector to MUTE OFF position.

4. Enjoy listening at the most pleasing volume level.

Listening to records

1. Set the tape monitor button to OFF.
2. Set the function selector to PHONO.
3. Start playing turntable.
4. Raise volume to the desired level.

Playing back cassette tape

1. Set the tape selector to appropriate position according to the type of cassette tape. Depress Dolby NR button when you play back Dolbyized tape.

2. Open the cassette door by pressing the STOP/EJECT button. Hold the prerecorded cassette tape with the side you wish to hear facing you, and the exposed tape edge facing down. Gently slide the cassette down the inner side of the cassette door. Push the door closed, and the cassette tape is loaded.

3. Depress PLAY button to start playback. **Note:** When the tape is wound up onto the right-hand hub in the cassette, playback will not start and the PLAY button will disengage immediately. When that happens, depress REW button to rewind tape, then start playback.

4. Raise volume to the desired level.

5. To stop the play, depress STOP button. This disengages the PLAY button.

Depress PAUSE button to suspend play, and press the button again to resume the play. When the tape reaches its end, the PLAY button will automatically disengage.

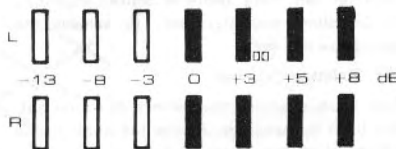
Recording on cassette tape

You can record on cassette tape both radio broadcasts and records produced in the unit, and recording by microphones is also possible. Check the microphones when recording broadcasts or records, for such recording is not possible when they are connected.

1. Have a cassette tape ready for recording.
2. Set the tape selector according to type of tape. Set the Dolby NR switch to ON when you wish to use Dolby NR circuit for noise reduction while recording.

3. Press STOP/EJECT button to open the cassette door. Hold the cassette tape with the recording side facing you and the exposed tape edge down. Slide the cassette down the inner side of the cassette door, and push the door closed.

4. Adjust the recording level: First start recording source — FM-AM broadcast or record — or put sound through microphones when recording through microphones. Depress PAUSE button, and then simultaneously depress REC and PLAY buttons; the peak level indicator will start operating. Checking the level indications, adjust the recording level control for left and right channels so that the peak level indicator does not exceed 0 dB position very frequently.



5. After adjusting recording level, start recording by pressing the PAUSE button a second time. When recording phonograph record, restart the play.

6. To temporarily suspend recording, depress the PAUSE button. Press STOP button to stop recording. When the tape reaches its end during recording, the recording mode will disengage automatically.

Note: When recording on prerecorded cassette tape, first check to see if there is an accidental-erasure-prevention tab on the cassette. If not, the REC button cannot be activated.

SWITCH FOR CANCELLING BEAT

When recording AM broadcasts, whistle may be heard under certain circumstances. If this interference occurs, change the position of the beat-cancelling switch found on the rear panel, which may be effective in cancelling the whistle.

MAINTENANCE

Hum and Noise

In any high fidelity installation, hum may be caused by the interconnection 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.

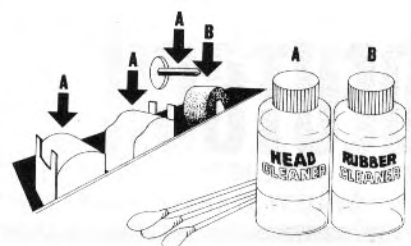
Either relocating the unit away from the noise sources or using an improved outdoor antenna may readily solve the problem.

In the event you cannot find the cause, consult your dealer or a qualified electrician.

Cassette Deck Section Maintenance

• Head cleaning

The most frequent cause of failure to record in one or both channels, or of weak, distorted sound, is dirty tape heads and capstan. So, be sure to clean the heads, capstan, pinch roller and tape guides as often as possible using a "Q" tip dipped in ordinary rubbing alcohol or commercial liquid tape head cleaner. Thoroughly wipe the surface of the heads, capstan, roller and tape guide.



• Head demagnetizing

The tape heads, capstan and tape guides gradually become magnetized with use, which will eventually affect the sound quality of your tapes. Demagnetizing should follow cleaning, but need not take place as often as cleaning, once after every 20 to 30 hours of use should suffice.

A demagnetizer may be purchased at a moderate cost from any dealer carrying tape recording accessories. Follow the instruction supplied with the demagnetizer.

Caution: Be sure to turn off the unit before you attempt demagnetizing.

SPECIFICATIONS

AMPLIFIER SECTION

Continuous Power Output20 watts* per channel, min. RMS both channels driven into 8 ohms from 40 to 20,000Hz with no more than 0.09% total harmonic distortion.

Total Harmonic DistortionNo more than 0.09% (continuous rated power output)

No more than 0.07% (continuous 1/2 rated power output)

No more than 0.07% (1 watt per channel power output, 8 ohms)

Intermodulation DistortionNo more than 0.09% (continuous rated power output)

(60Hz : 7kHz = 4 : 1)

No more than 0.07% (continuous 1/2 rated power output)

No more than 0.07% (1 watt per channel power output, 8 ohms)

Output: Speaker4-16 ohms

Headphone4-16 ohms

Damping Factor40 (40 to 20,000Hz, 8 ohms)

Input Sensitivity/Impedance:

PHONO2.5mV/47 kohms

Overload Level (T.H.D. 0.5%, 1kHz):

PHONO130mV

Frequency Response:

PHONO35 to 15,000Hz, ±0.3dB (RIAA STD)

Tone Control:

BASS±10dB, 50Hz

TREBLE±10dB, 15kHz

Signal-to-Noise Ratio (1HF, A network):

PHONO82dB

FM TUNER SECTION

Usable Sensitivity (mono)11.2dBf/2.0μV

50dB Quieting Sensitivity:

Mono17.8dBf/4.3μV

Stereo41dBf/63μV

Signal-to-Noise Ratio (at 65dBf):

Mono72dB

Stereo65dB

Harmonic Distortion (at 65dBf):

100Hz0.3% (mono), 0.5% (stereo)

1kHz0.3% (mono), 0.5% (stereo)

6kHz0.4% (mono), 0.7% (stereo)

Frequency Response40 to 13,000Hz, +0.3dB, -3.0dB

Capture Ratio2.0dB

Alternate Channel Selectivity

(±400kHz)48dB

Spurious Response Ratio70dB

Image Response Ratio47dB

IF Response Ratio75dB

AM Suppression Ratio55dB
Muting Threshold5μV
Stereo Separation	100Hz/1kHz/10kHz, 30dB/40dB/30dB
Subcarrier Product Ratio35dB
SCA Rejection Ratio60dB
Antenna Input	300 ohms balanced, 75 ohms unbalanced

AM TUNER SECTION

Sensitivity500μV/m

Selectivity30dB

Signal-to-Noise Ratio42dB

Image Response Ratio40dB

IF Response Ratio38dB

AntennaBuilt-in ferrite loopstick antenna

CASSETTE DECK SECTION

Heads: Rec/PlayHigh B permalloy 6 laminated type

EraseFerrite

Track4-track/2-channel

Tape Speed4.8cm/sec.

MotorElectronically controlled DC motor

Wow and Flutter0.10% (DIN)

0.07% (WRMS)

Distortion (REC/PB, 400Hz)0.6% (METAL)

Frequency Response (-20dB)Normal, LH 30 to 14,000Hz±3dB

Chromium 30 to 16,000Hz±3dB

Metal 30 to 17,000Hz±3dB

Signal-to-Noise Ratio (WTD.

0dB=580mV, Chromium)Dolby NR in: 63dB

Dolby NR out: 54dB

Input Sensitivity/ImpedanceMIC 0.3mV/10 kohms

Fast Wind Time (C-60)80 seconds

Tape SelectorBIAS EQUALIZER

Normal, LH100% 120μs

Chromium120% 70μs

Metal150% 70μs

MISCELLANEOUS

Power Requirement120V/60Hz, 220V/50Hz, 240V/50Hz, or 120, 220, 240V/50-60Hz (switchable, depending on destinations)

Power Consumption160 watts

Dimensions (Overall)420(W) x 233(H) x 297(D)mm/16-17/32" x 9-3/16" x 11-11/16"

Weight (net)8.2kg/18.04 lbs.

- Specifications and design subject to possible modification without notice.
- Dolby, Dolbyized and the double-D symbol are trade marks of Dolby Laboratories. Noise reduction system manufactured under license from Dolby Laboratories.
- *Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only).

TAPE SELECTOR SETTING GUIDE

TDK	OD, AD	NORMAL
FUJI FILM	ER, DR	NORMAL
SONY	AHF, BHF	NORMAL
MAXELL	UD, XL-I	NORMAL
SCOTCH	MASTER I	NORMAL
BASF	Super LH-I, LH	NORMAL
TDK	SA, SA-X	SPECIAL
FUJI FILM	UR	SPECIAL
SONY	JHF	SPECIAL
MAXELL	XL-II, X II-S	SPECIAL
SCOTCH	MASTER II	SPECIAL
BASF	SCR	SPECIAL
TDK	MA	METAL
FUJI FILM	SUPER RANGE	METAL
SONY	METALLIC	METAL
MAXELL	NEW-MX	METAL
SCOTCH	METAFINE	METAL