# owners manual

*Quality. Uncompromised.*

# ROTEL®

# RA-870

STEREO INTEGRATED AMPLIFIER


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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.

426-104633

# ENGLISH

## STEREO INTEGRATED AMPLIFIER RA-870

### 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 to a household wall outlet. 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 benzine or thinners 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.

**Caution:** On the rear panel of the RA-870 are two sets of AC outlet through which power is supplied to audio equipment (turntable, CD player, tuner, cassette deck, etc.) you use in conjunction with the RA-870. Each AC outlet is the switched type, turned on or off upon switching on or off the power in the RA-870, and has rating of 100 watts maximum. Do not attempt to connect equipment whose power consumption exceeds the rating of these AC outlets. Never connect a power amplifier to these AC outlets.

### SPEAKERS

Use speaker systems with impedance ratings of 8-16 ohms. Before hooking up your speaker system, be sure to check its impedance, which should be indicated either on the back of the speaker, or in the speaker instruction manual.

### HOOKING UP SPEAKERS

Connect the speaker leads of the right-hand speaker to terminals "R", and the speaker leads of the left-hand speaker to terminals "L". Make sure that the "+" speaker lead is connected to the "+" terminal, and the "–" lead to the "–" terminal.

Strip 1.0cm (3/8") of the polyvinyl chloride insulation from the end of each speaker lead. Twist the exposed strands tightly, and secure the end with a touch of solder.

To connect speaker lead to the speaker terminal of the amplifier, rotate the speaker terminal knob counterclockwise to loosen, insert the stripped end of the lead, and firmly tighten the knob onto the lead. Do not allow the stripped end of the lead to touch another lead, other terminal or other metal part.

### EXCLUSIVE NOTE FOR U.K.

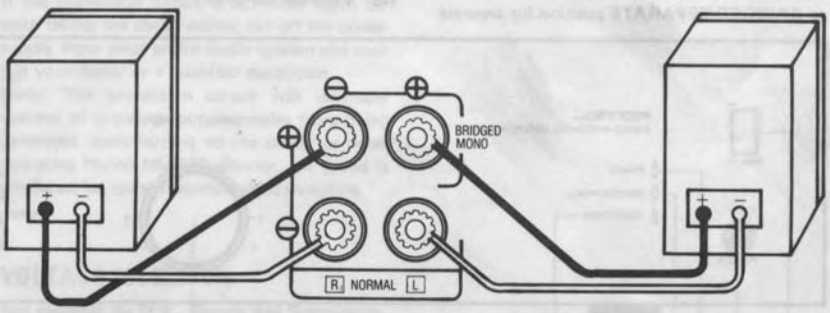
If your unit comes with a 2-core cable without a plug, make certain live and neutral leads are connected to the proper terminals. Check that the terminals are screwed down firmly and no loose strands of wire are present.

**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 colour-BROWN or RED.

**Note:** By combining the RA-870 with ROTEL stereo power amplifier RB-870, the main amplifier section of the RA-870 can be utilized as a monaural power amplifier in bridged connection (BTL). In that case, connect the "+" speaker lead to the "+" speaker terminal of "L", and the "–" speaker lead to the "+" speaker terminal of "R"; the speaker connected to the RA-870 is for left-channel sound.



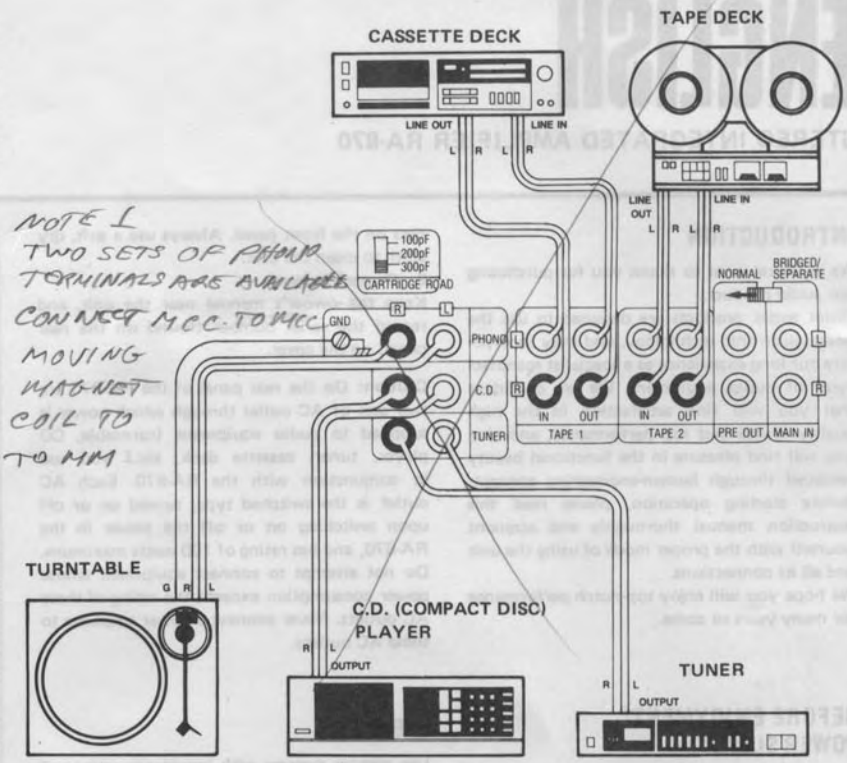
## CONNECTING COMPONENTS

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 amplifier.

**Note 1:** The rear panel of the unit is provided with the phono cartridge load selector, which allows selection of load capacitance in three steps, 100pF, 200pF, and 300pF. Use this selector to optimize the performance of your cartridge. See your cartridge specification sheet, and set the selector to the position closest to the specified value. If load capacitance is not specified on your cartridge, set the selector to 300pF position. Generally, as the capacitance is decreased from 300pF to 200pF, or from 200pF to 100pF, high notes are emphasized.

**Note 2:** In addition to the PHONO, C.D., TUNER, TAPE 1, and TAPE 2 input terminals, the rear panel of the RA-870 has PRE OUT and MAIN IN terminals. The PRE OUT terminals supply signal from the preamplifier section of the RA-870 to a separate power amplifier, allowing the unit to be used as a stereo preamplifier. The MAIN IN terminals are input terminals for the unit's main amplifier section, allowing the unit to be used as a stereo power amplifier when it is connected with a separate preamplifier.

When the RA-870 is combined with ROTEL RB-870 power amplifier in bridged connection (BTL), the main amplifier section of the RA-870 will operate as a monaural power amplifier to drive one channel only. Whereas the RB-870 works as a monaural amplifier to drive another channel. In the bridged operation, power-output capability of each unit will be greater than twice the single-unit rating. If you wish to use the PRE OUT and MAIN IN terminals for purposes mentioned above, set the NORMAL-BRIDGED/SEPARATE selector located above these terminals to BRIDGED/SEPARATE position. If you use the unit as a normal stereo integrated amplifier, set the selector to NORMAL position, so that the internal preamplifier section and the main amplifier section are combined.




## SWITCHES AND CONTROLS

### (1) Power Button

Depress this button to turn on the power in the unit. Press the button a second time to release it and to cut off the power.

### (2) Headphone Jack

For private listening, plug your headphones into this jack, which cuts off the sound from speakers. The volume of the headphone sound can be regulated with the volume control.

### (3) Power Indicator

Glows when power is turned on with the power button.

### (4) Bridged Mono Indicator

Glows when the NORMAL-BRIDGED/SEPARATE selector provided on the rear panel is set to BRIDGED/SEPARATE position for separate use of unit's preamplifier and main amplifier sections.

### (5) Protection Indicator

Glows when the built-in protection circuit is activated. The indicator normally lights for several seconds upon turning on the power, or upon switching the Phono MM/MC selector. When the indicator goes off, it means the unit is in the normal operating state.

The indicator also glows when abnormally high temperature is built up inside the unit due to low-impedance drive, etc. In such a case, the indicator will remain on until the temperature in the main amplifier section drops to a normal level. When the indicator goes off, it indicates the unit has returned to the normal operating state.

### (6) Volume Control

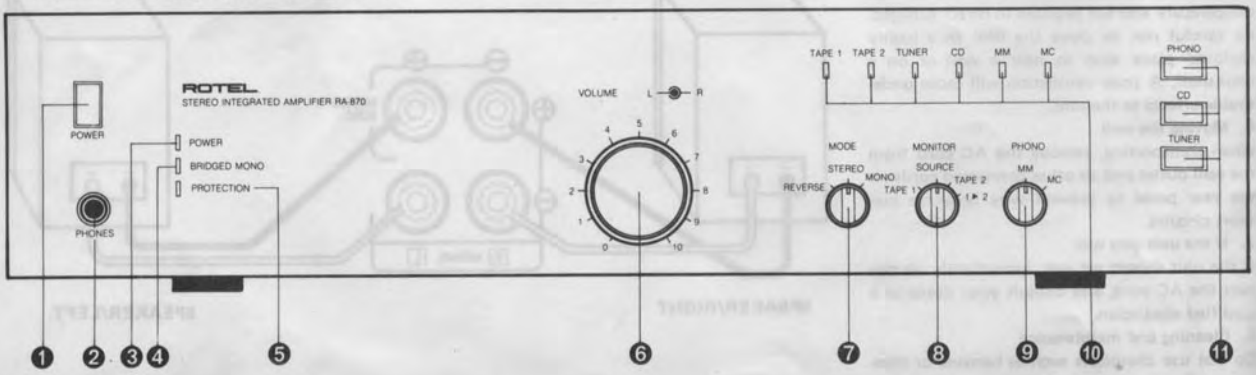
Used to regulate the volume level. Turn clockwise to increase the volume, and counterclockwise to reduce it. This is a dual concentric knob which permits either separate or combined adjustment of both channels.

### (7) Mode Selector

Used to select the reproducing mode of the stereo signal fed into the preamplifier section of the unit. STEREO position is for normal stereo reproduction, MONO position for monophonic reproduction, and REVERSE position for reproduction with left and right channel sounds reversed.

### (8) Tape Monitor Selector

Used to listen to signal supplied from tape deck. Set the selector to TAPE 1 position for the signal from a tape deck connected to TAPE 1 terminals on the rear panel, and set to TAPE



2 for the deck connected to TAPE 2 terminals. When set to "1 → 2" position, you can perform tape-to-tape copying from TAPE 1 to TAPE 2 deck.

Be sure to set this selector to SOURCE when listening to source selected by the function selector.

### (9) Phono MM/MC Selector

The unit has a built-in MC head amplifier. This selector is used to receive MM (moving magnet) or MC (moving coil) phono cartridge signal with an appropriate gain. In MC position, the built-in MC head amplifier is activated. When your turntable uses an MC cartridge, set the selector to MC position. When MM cartridge is used, set the selector to MM position.

### (10) Function Indicator

Those lamps indicate selected function among TAPE 1, TAPE2, TUNER, C.D., MM (PHONO), and MC (PHONO).

### (11) Function Selector

The Function selector is effective when the Tape Monitor selector is set to SOURCE. These selector buttons are used to select the desired input source. Depress PHONO button to listen to signal from turntable, C.D. button for signal from compact disc player, and TUNER button for signal from tuner.

## OPERATION

• Before commencing operation, check to see if all connections are properly made.

• Always be sure to set the volume control to the minimum position before turning on power.

### Listening from turntable

1. Set Tape Monitor selector to SOURCE.
2. Depress PHONO button on the Function selector, and set Phono MM/MC selector to the appropriate position, MM or MC, according to the cartridge type used.
3. Start playing turntable, and raise the volume to the desired level.

### Listening from compact disc player or tuner

1. Set Tape Monitor selector to SOURCE.
2. To listen to a compact disc, depress C.D. button on the function selector; depress TUNER button to receive radio broadcast.
3. Play the compact disc or tune in to the desired station, according to instructions given for the equipment.
4. Raise the volume to the desired level.

### Playing back tape deck

1. Set Tape Monitor selector to TAPE 1 or TAPE 2 position according to the tape deck you are going to play back.
2. Start playback.
3. Raise the volume to the desired level.

### Recording program source

Play the desired program source according to the procedures mentioned above. The signal from the source will be sent through TAPE MONITOR OUT terminals on unit's rear panel. Put the tape deck in the record mode to record the signal. During recording, operation of Volume control, and Mode selector will have no effect on the signal being sent through TAPE MONITOR OUT terminals.

### Dubbing (tape-to-tape copying)

By hooking up two tape decks, dubbing of prerecorded tape can be performed. The unit allows dubbing from TAPE 1 to TAPE 2 only.

1. Set Tape Monitor selector to "1 → 2" position.
2. Play back TAPE 1 deck, and put TAPE 2 deck in record mode, then dubbing starts. During dubbing, you can listen to the signal with volume or mode selector set as desired; they have no effect on dubbing.

## 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.

## PROTECTION CIRCUIT

The RA-870 incorporates all possible safety measures by combining multiple protection circuits to prevent accident or damage.

If for some reason the protection circuit is activated, there will be a sudden cut-off of sound from the speakers, and the protection indicator will light up.

If no sound is produced, the reason may be due to the functioning of the protection circuit. First, turn off the power and disconnect the plug from the electrical outlet, and check to be sure that the speaker cables are not short-circuited. Also check to make sure the impedance of each speaker is 8 ohms or over (if it is below 8 ohms, the unit will be overloaded due to low impedance).

After checking the above points, turn the power on, and the protection circuit will be automatically deactivated and the unit will start functioning again.

If the protection circuit is activated again despite taking the above action, cut off the power supply from your entire audio system and consult your dealer or a qualified electrician.

**Note:** The protection circuit will normally operate to prevent a popping noise from being generated upon turning on the power or upon operating Phono MM/MC selector. No sound is produced for several seconds upon switching.

## 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, consult your dealer.

## SPECIFICATIONS

| | |
|---|---|
| Continuous Power Output | 60 watts* per channel, min. RMS both channels driven into 8 ohms from 20 to 20,000 Hz with no more than 0.03% total harmonic distortion. |
| DIN Output | 118 watts per channel (1 kHz, 4 ohms, 1% THD) |
| Power Output (BTL) (When used with RB-870 power amp.) | 120 watts (mono) min. RMS driven into 8 ohms from 20 to 20,000 Hz with no more than 0.03% total harmonic distortion. |
| Total Harmonic Distortion (20 to 20,000 Hz, from TUNER) | No more than 0.03% (continuous rated power output)<br>No more than 0.03% (continuous 1/2 rated power output)<br>No more than 0.05% (1 watt per channel power output, 8 ohms) |
| Intermodulation Distortion (60 Hz : 7 kHz = 4 : 1) | No more than 0.05% (continuous rated power output)<br>No more than 0.05% (continuous 1/2 rated power output)<br>No more than 0.05% (1 watt per channel power output, 8 ohms) |
| Output: Speaker | 8-16 ohms |
| Headphone | 4-16 ohms |
| Damping Factor | 280 (20 to 20,000 Hz, 8 ohms) |
| Input Sensitivity/Impedance: | |
| PHONO (MC) | 0.2 mV/200 ohms |
| PHONO (MM) | 2.5 mV/47 kohms |
| CD | 750 mV/39 kohms |
| TUNER | 150 mV/47 kohms |
| TAPE MONITOR 1, 2 | 150 mV/47 kohms |
| Overload Level (T.H.D. 0.01%, 1k Hz): | |
| PHONO (MC) | 27mV |
| PHONO (MM) | 300mV |
| CD, TUNER, TAPE | 5V |
| Frequency Response: | |
| PHONO | 20 to 20,000 Hz, ±0.2 dB (RIAA STD) |
| CD, TUNER, TAPE | 20 to 30,000 Hz, +0 dB, −1.0 dB |
| Signal-to-Noise Ratio (IHF, A network): | |
| PHONO (MC) | 70 dB |
| PHONO (MM) | 80 dB |
| CD, TUNER, TAPE | 102 dB |

**MISCELLANEOUS**

| | |
|---|---|
| Power Requirement | 120V/60 Hz, 220V/50 Hz, 240V/50 Hz, or 120, 220, 240V/50-60 Hz (switchable) (depending on destinations) |
| Power Consumption | 500 watts |
| Dimensions (overall) | 430 (W) x 91 (H) x 317 (D) mm<br>16-15/16" x 3-9/16" x 12-15/32" |
| Weight (net) | 9.8 kg/21.56 lbs. |

- Specifications and design subject to possible modification without notice.

*Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only).