

ROTEL *hiFi*

RA 945

Stereo Integrated Amplifier with Remote Control

Owners Manual

Please write the serial number and purchase date of this RA 945 for your records in the space provided.

Serial Number _____

Purchase date _____

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Explanation of Graphical Symbols

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.



SAFETY INSTRUCTIONS

- 1. Read Instructions** - All the safety and operating instructions should be read before the appliance is operated.
- 2. Retain Instructions** - The safety and operating instructions should be retained for future reference.
- 3. Heed Warnings** - All warnings on the appliance and in the operating instructions should be adhered to.
- 4. Follow Instructions** - All operating and use instructions should be followed.
- 5. Water and Moisture** - The appliance should not be used near water - for example, near a bathtub, kitchen sink, laundry tub, in a wet basement or near a swimming pool, etc.
- 6. Carts and Stands** - The appliance should be used only with a cart or stand that is recommended by the manufacturer.
- 6A.** An appliance and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the appliance and cart combination to overturn.
- 7. Wall or Ceiling Mounting** - The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
- 8. Ventilation** - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a bookcase or cabinet that may that may impede the flow of air through the ventilation openings.
- 9. Heat** - The appliance should be situated away from heat sources such as radiators, heat registers, stoves



or other appliances (including amplifiers) that produce heat.

- 10. Power Sources** - The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
- 11. Grounding or Polarization** - The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
- 12. Power-Cord Protection** - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance.
- 13. Cleaning** - The appliance should be cleaned only as recommended by the manufacturer.
- 14. Nonuse Periods** - The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
- 15. Object and Liquid Entry** - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through the openings.
- 16. Damage Requiring Service** - The appliance should be serviced by qualified factory-authorized service personnel when:
 - The power-supply cord or the plug has been damaged; or
 - Objects have fallen, or liquid has been spilled into the appliance; or
 - The appliance has been exposed to rain; or
 - The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - The appliance has been dropped, or the enclosure damaged.
- 17. Servicing** - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified factory-authorized service personnel.

APPLICABLE FOR U.S.A., CANADA OR WHERE APPROVED TO THE USAGE.

CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

EXCLUSIVE NOTE FOR U.K.

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

GREEN-AND-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-and-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-and-YELLOW.

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.

WARNING: THIS APPARATUS MUST BE EARTHED

A WORD FROM ALL OF US AT ROTEL

Thank you for purchasing our RA 945 Stereo Integrated Amplifier. Rotel has been designing and manufacturing high quality, high performance audio electronics for more than 30 years. This remote control integrated amp was designed to offer lifelike sound. This a natural extension of our love for music. Our passion for good sound and our love of music is well known. We believe that music played through the RA 945 will be a source of enjoyment to you for many years to come.

Rotel is committed to making quality products to enhance your life. We have designed this amp to be durable, easy to use and to have *high fidelity to the original sound*. **Please read this owners manual** to ensure that the amp is properly installed and able to offer optimum performance. We appreciate being a part of your life.

FEATURES OF THE RA 945 STEREO INTEGRATED AMPLIFIER

This stereo integrated amplifier has been designed for high performance. It has **Symmetrical Circuit Paths**; something we have been doing for a over a decade. These are utilized to ensure absolutely identical timing between the two channels of the amplifier. If the music is changing time and swirling around in the room, it is because the artist has chosen this effect, not the RA 945.

The Power Supply derives from a large, powerful ROTEL Designed Toroidal Power Transformer and ROTEL Custom Designed Slit Foil Capacitors to improve the speed and control of the amplifier. We believe in Highly Regulated Power Supplies and build these into all of our products. Some companies design their amplifiers to have high *peak* power ratings and *poor continuous* power ratings. *This does allow them to build with low cost parts* but it doesn't give the amplifier the control and power it needs for a large bass note while *at the same time* having the ability to recreate the delicate sounds of a triangle. We feel the extra expense of building in an excellent power supply is worthwhile because IT IS GOOD FOR THE MUSIC.

INSTALLATION OF THE RA 945

Please place the unit on a **DRY**, level surface away from direct sunlight. *Avoid placing objects on top of the RA 945, as they may cause the amplifier to overheat*. If the amplifier is mounted inside a cabinet, please be certain that there is adequate air flow to ensure proper cooling. *Do not allow water or objects to fall into the RA 945 as these will damage the circuitry*. Avoid installing the amplifier in a location where excessive humidity, vibration or moisture will be a problem. We recommend installing the RA 945 in furniture designed to house Hi Fi components. *This will allow the amp to be on its own shelf with nothing stacked on top of it*.

This will minimize heat and potential interference from other components in your system. Component furniture will also reduce or suppress vibration and all audio components will provide improved sound when free from vibration. Ask your **ROTEL hi fi Authorized Dealer** for advice about component furniture and proper installation of audio components.

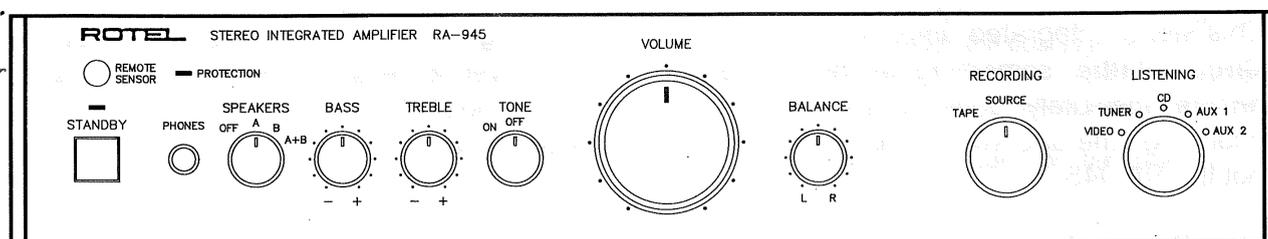
ELECTRICAL REQUIREMENTS

This amplifier is designed to work on AC voltage and the correct voltage is displayed on the Back Panel. **Do not attempt to operate the amplifier on incorrect voltage as this will damage the circuitry and will void your warranty**. If you are in doubt about the correct voltage for this amplifier we please read the label on the back panel, the label on the packing

carton or consult your **ROTELhi fi Authorized Dealer** for confirmation of the correct voltage.

Connect the power cord to your wall socket for AC power. When you wish to disconnect the power cord from the wall always hold the plug firmly and then pull it out of the wall socket. *Do not unplug the power cord from the wall by pulling the cord only. This may damage the power cord and create a hazardous condition.* We strongly recommend that the amplifier be connected to the mains wall socket, not an extension cord. There are **NO** user serviceable parts inside the RA 945. **Please do not open the cabinet as this will expose you to the risk of potentially dangerous high voltage and the risk of shock.** This could also damage the circuits and possibly void your warranty.

If you wish to clean the cabinet on the RA 945 we suggest that you clean it with a soft, DRY cloth. *Never use cleaning compounds or solvents to clean the cabinet as they may damage the finish or remove the labels.* This could also damage the circuitry if any residue falls inside the amplifier.



Please refer to this drawing of the Front Panel when reading the section about Controls on the RA 945.

CONTROLS ON THE RA 945

We have designed this integrated amplifier to be a no compromise, convenient design. The controls are simple but comprehensive, well labeled and easy to use.

The **STANDBY** button will turn the sound **ON** and **OFF**. Push it in and the sound will turn ON. The Volume control light and the Function light will illuminate. The **PROTECTION** light will also light for a brief time. If you push the Standby button again the RA 945 will be enter STANDBY mode, the PROTECTION light will illuminate briefly and no sound will be heard.

The STANDBY indicator light will *always be illuminated* when the RA 945 is connected to AC power. STANDBY allows remote control ON and OFF for the RA 945. It also switches power ON and OFF for the SWITCHED OUTLETS on the back panel, on some models. *Check to see that you do not exceed the power rating for the switched outlets, if your unit has them.*

To adjust the bass and treble content of the music, set the **Tone** switch to the **ON** position. This will allow the **Bass** and **Treble** controls to function. When the Tone switch is set to the **OFF** position, the tone controls are *bypassed* inside the amplifier. We have incorporated this switch to allow for adjustment of the music's tonal balance or to allow for the shortest circuit path for those people who choose not to use the Bass and Treble controls.

Our Bass and Treble controls work over a less extreme range than many other designs. We design our tone controls to adjust only the low bass or the high treble range of the music. We do not allow our tone controls to *color* the all important middle ranges (Vocal range) of the music. That is why we rate them for only 6 dB of increase (+) or decrease (-) at 100 Hz or 10 kHz, not the 10 or 12 dB common in many other designs. Turning the Bass or Treble controls

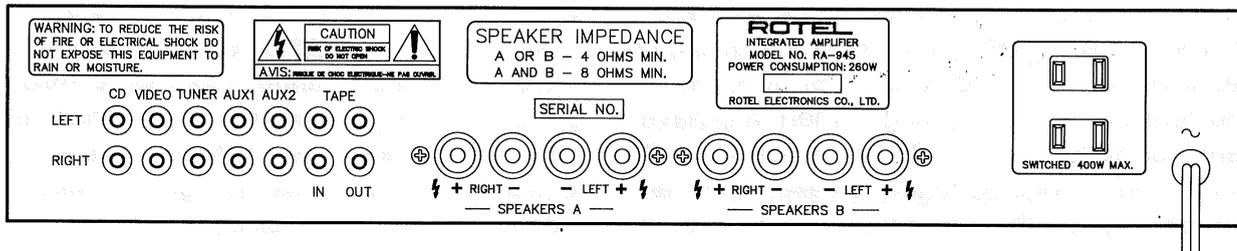
Clockwise will increase the amount of Bass or Treble. Turning the controls *Counterclockwise* will decrease the amount of Bass or Treble.

We have included switching and protection relays for the **SPEAKERS** on this amplifier. This will allow **A, B** or **A + B** speakers to be used at the same time. If you listen with Headphones, set the Speakers switch to the OFF position. (When using Speakers A + B, please ensure that all speakers are a *minimum of 8 ohms each.*) The **HEADPHONE** jack will provide a convenient connection for your headphones. If you have headphones with a 3.5 mm mini plug, ask your **ROTEL hi fi Authorized Dealer** for an adapter plug to convert them for use with the headphone jack on the RA 945.

The **VOLUME** control will allow you to turn both channels of music up or down in level at the same time. Rotate *Clockwise* to increase the volume, rotate *Counterclockwise* to decrease the volume of the music. The **BALANCE** control will allow you to change the relative level between the channels. Adjust it to have equal volume in both channels or if you wish, to listen to one channel only.

The **MONITOR** switch will allow you listen to the program you are recording, with a 3 head recorder, or to listen to the playback of your recorder. To do this merely set the **MONITOR** switch to **TAPE**.

The **FUNCTION** selector switch will select the source that you wish to hear. We have provided Inputs for Aux 1, Aux 2, CD, Tuner, and Video. If you wish to use a Turntable and an external phono stage, we suggest the **RQ 970BX Phono Equalizer**. This may be connected to Aux 1 or Aux 2. The Tape or Video position may be used for the audio outputs (L and R) of a Hi Fi or NICAM VCR if you wish to play movies or TV shows through your stereo. This is an increasingly popular way to view TV and movies at home. If your VCR is *monophonic* then you will need to have a "Y" connector to adapt it to play through both channels of your amplifier.



Please refer to this drawing of the Rear panel of the RA 945 when connecting components or speakers.

CONNECTING COMPONENTS TO THIS INTEGRATED AMPLIFIER

The back panel has the **RCA Input** connections and the **Speaker Terminals** for connection to the other components and speakers in your stereo system. The Inputs are clearly labeled and the Channels are also designated. Please be certain that the Left channel and Right channel connections are not reversed.

The CD and TUNER connections are clearly labeled for your convenience. Auxiliary 1 and 2 will be ideal for the connection of an external phono stage, a stereo monitor TV with audio output jacks, a video game, your personal computer's audio output jacks or a Laser Disc player.

The TAPE has IN and OUT connections. These are to send a signal to (OUT) the recorder and then to receive a signal back from (IN) the recorder. The labels of various brands of recorders are different but the usual labels are Tape In, REC IN, or Input and Tape Out, REC OUT or Output. The labeling can be confusing sometimes but the idea is to go **from** the RA 945 to the recorder and then **return** to the RA 945. Check all connections and read the owners' manual for your recorder if you are in doubt about the labels.

The Speaker Terminals will accept two pairs of speakers. Speakers A or Speakers B may be 8 ohm or 4 ohm designs, *if used separately*. If you intend to operate Speakers A + B *at the same time*, please be certain to connect 8 ohm minimum impedance speakers. **The minimum combined impedance load for A + B speakers is 4 ohms.**

You may connect the speakers with bare wire, Banana plugs, Spade lugs or 4 mm speaker plugs. Please be certain to observe the correct Polarity of the wires as well as the Channel Left and Right connections. The **RED (+)** Speaker Terminals are to be connected to the RED or Positive terminals on your speakers. The **BLACK (-)** Speaker Terminals are to be connected to the BLACK or Negative terminals on your speakers. If you incorrectly make these connections you will have a vague image and very little bass response from your system.

If you are in doubt about the sound when listening then you should reverse the Positive and Negative connections on the back of ONE SPEAKER ONLY. If the image becomes more specific and the bass improves then the speaker connections should be rechecked to ensure correct connection of both speakers. You may also confirm this by placing the speakers face to face 75 mm apart (3") and playing music with strong bass content as a source. The connection that has the most bass output is the correct connection. The incorrect connection will have very little sound output as each of the two speakers will attempt to cancel the sound that the other is making due to the opposite motion of the drivers.

If you connect your speakers to the RA 945 with bare wire, strip approximately 1-1/2 mm (0.4") of the insulation from the end of the wire and connect to the terminal of the amplifier by turning it around the center post of the speaker terminal. Ensure that **NO LOOSE WIRE** is outside the terminal housing. The RED or BLACK terminal should be turned Counterclockwise to extend the terminal for connecting. When you have wrapped the wire around the post, tighten the terminal by turning the Red or Black knob Clockwise to grasp the wire **FIRMLY**. Spade lugs should be connected to the speaker terminals by loosening the terminals enough to insert the Spade. Tighten them to ensure a firm grip on the spade lug. (Do not *over tighten* as this may strip the threads of the terminal.) Repeat this operation for all of the terminals.

If you use Banana plugs or 4 mm plugs they may be connected to the end of the Speaker Terminals by pushing them into the holes provided. Please observe correct polarity and channel connections.

TROUBLE SHOOTING HUM AND NOISE IN A STEREO SYSTEM

*In any high fidelity stereo installation it is possible for noise to be created by the physical location of some of the components. If your system has hum or excessive noise it is possible to diagnose this before trying to have repairs made to a properly functioning component. If the system only hums with one source component then that component should be unplugged from the system. Turn the volume *down* or turn the power OFF before you unplug the suspected component. If the system still hums after the suspected component has been removed, you may require service.*

First though, you should disconnect all of the other components *except* the speakers. If there is no hum after this, something in the system is either in need of relocation or repair. Connect the components one by one until the problem reappears. The component that *hums* may be malfunctioning. If you are unable to locate the source of the problem then you should consult your **ROTEL hi fi AUTHORIZED DEALER** for advice or service.

ABOUT THE SYSTEM REMOTE CONTROL FOR THE RA 945

The **RR 927B** remote control, included with some RA 945, will operate Philips code CD players, the RD 960BX cassette deck and the remote control tuners in the 900 Series. The **RR 927** remote control, included with some RA 945, will operate all 900 Series Rotel remote controllable CD players, RD 960BX cassette deck or RT 940AX and RT 990BX tuners. The remote control requires two AA batteries, included, for operation. Insert them in the battery compartment on the back panel according to the instructions and diagram on the remote.

A FINAL WORD FROM ROTEL ABOUT THIS INTEGRATED AMPLIFIER

We have designed this amplifier for high performance using test equipment and the human ear. We believe that both methods are useful in the design of audio electronics. *This is time consuming but we feel that the music benefits from this care and attention to detail.* We realize that there are many choices available in the market today and we thank you again for choosing our RA 945 remote control integrated amplifier to amplify your music. *Enjoy the music!*

SPECIFICATIONS:

Rated Power (RMS both channels driven into 8 ohms from 20-20,000 Hz with no more than 0.05% total harmonic distortion.)	40 Watts* per channel
DIN output rating (1 kHz, 1% THD, 8 ohm)	60 Watts
Total Harmonic Distortion (@ rated power)	< 0.05%
Intermodulation Distortion (@ rated power)	< 0.05%
Signal to Noise ratio (IHF A network)	100 dB
Frequency response (All inputs)	10-100,000 Hz +1.0 dB, -3.0 dB
Tone control response:	
Bass	± 6 dB @ 100 Hz
Treble	± 6 dB @ 10 kHz
Power requirements	115 volts, AC 50/60 Hz 230 volts, AC 50/60 Hz
Power consumption	260 watts
Weight	7.0 kg's / 15.4 Lbs.
IHF A Dimensions	440 (W) x 92 (H) x 347 (D) mm 17-3/8" (W) x 3-5/8" (H) x 13-11/16" (D)

* Measured pursuant to FTC Trade Regulation Rule or Power Claims for Amplifiers, applicable in the USA only.

All specifications are accurate at the time of printing. Rotel reserves the right to make improvements without notice.

