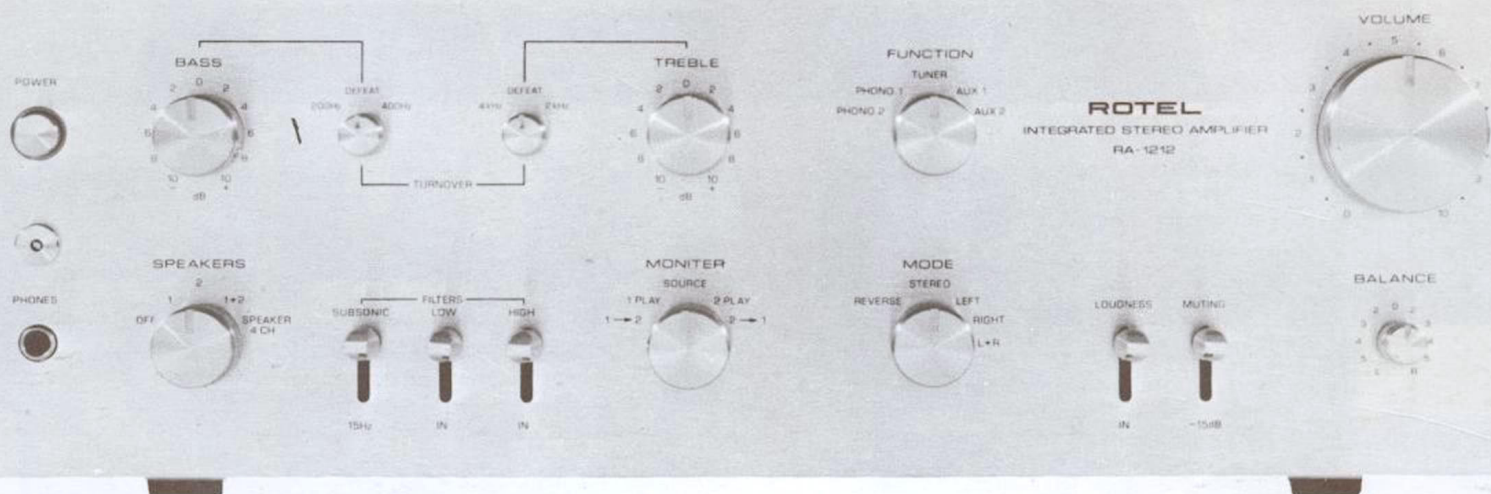


Owner's Manual

Stereo Integrated Amplifier

RA-1212



ROTEL®

INTRODUCTION

We would like to take this opportunity to congratulate you on your purchase of our audio component. With the latest technology and workmanship that goes into making this equipment, you can be assured of its high quality performance for many years to come.

We have fitted a comprehensive range of controls and features for your convenience. Designed 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, allowing you to experience true high fidelity. 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. In order to obtain the maximum use out of your equipment, we urge you to read the following pages of this Owner's Manual carefully.

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

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BEFORE ENJOYMENT

For safety sake keep in mind the following cautions:

1. Do not connect the unit to the AC power line without speakers connected beforehand.
2. Make sure also that the power switch is left off and the master volume control is set at minimum before plugging in the power cord to a wall outlet.
3. **Speakers**
 - a) **Impedance** — Be sure to use speakers rated at 8 ohms or higher up to 16 ohms. In the event your speakers are rated at 4 ohms or lower than desired 8 ohms, you may operate with one pair of such type of speakers at a time but never two pairs of speaker system simultaneously. This measure is to prevent any severe overload and distortions from happening due basically to too low impedance to draw excessively high current. When you are uncertain on your speakers rating values, consult with the dealer or store you purchased.
 - b) **Connection** — Before connecting speaker leads to the terminals on appliance make sure also no loose stray strands of wire is left in order to prevent any shorting between speaker leads or terminals to main chassis. This shorting malfunction may be common cause of blown fuses or overload.
4. Always use the fuse, if necessary to replace, of same type and rating as the one installed on the unit. Replacing fuse incorrectly with higher rating will defeat the purpose of protection and may cause severe damage instead.
5. **Furnished Convenience AC Outlet**
 - 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.

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 or moisture. Leave at least 5 cm (2 inches) clearance on each side and in the rear of the unit, and about 10 cm (4 inches) above the unit. Never directly place an object on the top of the unit.

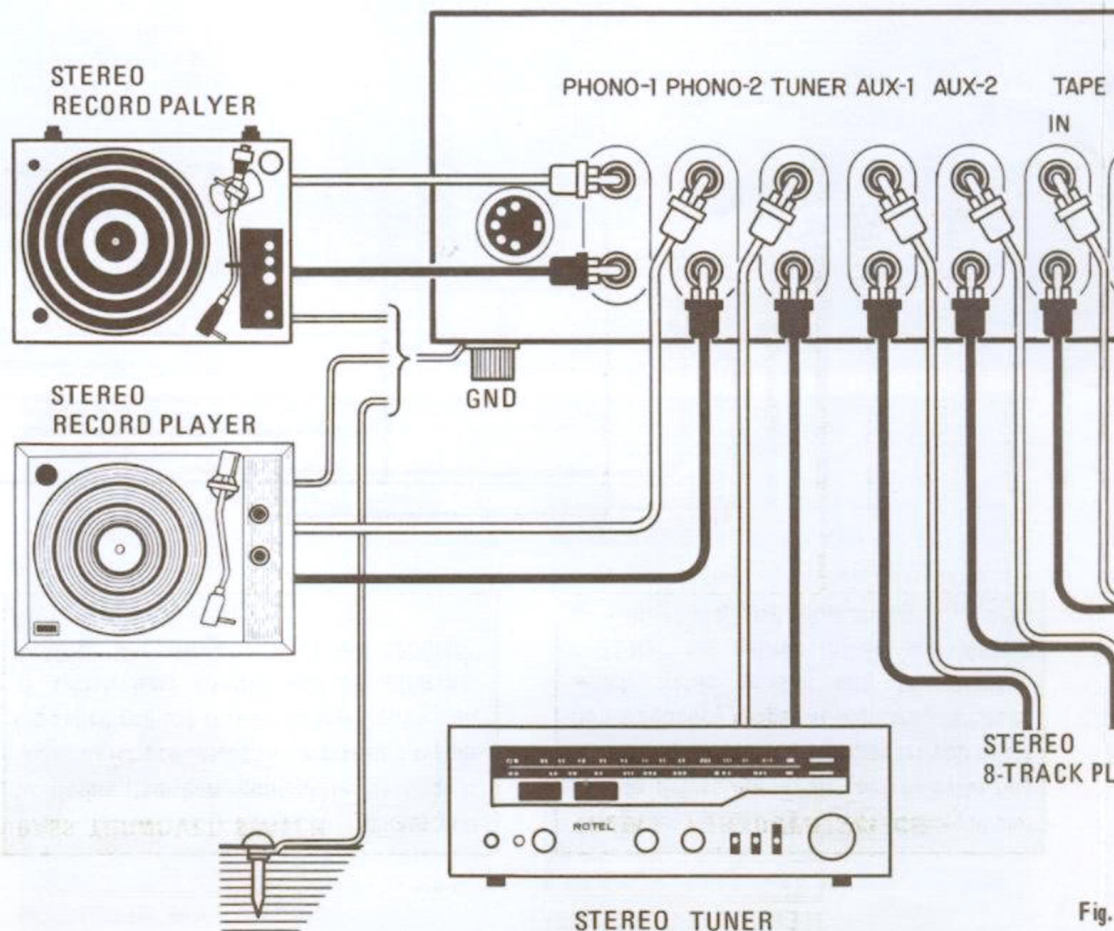
SPEAKERS PLACEMENT

1. **MAIN SPEAKERS** — Referred to a pair of speakers connected to the SPEAKER 1 terminals on the unit's rear panel. Place the main 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 3 to 4 meters (10 to 15 feet) 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, you can connect another pair of speakers to the SPEAKER 2 terminals. Though you may require long cables between the unit and the remote speakers, make sure they are not longer than 15 to 20 meters (50 to 60 feet) in length and that they are of heavy duty shielded type in order to prevent loss of volume level. Follow the procedure described in the item 1 above for placing the remote speakers.

SPEAKER CONNECTION

As shown in Fig. 1, the speaker terminals are quick screw insert type, and are arranged into two boards, one for SPEAKER 1 (main) and the other for SPEAKER 2 (remote). Unscrew each terminal, slip the bare wire at the free end of the speaker lead into the vertical hole of the terminal, and screw back to grip the bare wire intact. (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 insert and also prevent shorting among stray strands). Make sure the positive (+) lead of each speaker is connected to the (+) terminal and the ground (-) lead to the (-) terminal, and right to RIGHT and left to LEFT.

TURNTABLE CONNECTION

If your turntable comes with RCA-type plugs on output cables, connect them correctly to corresponding RIGHT and LEFT jacks of PHONO inputs. If there is ground (earth) cable emerging from the turntable besides the output cables, connect it to the ground screw terminal marked GND or \perp . If your turntable comes with a DIN plug on output cable, simply plug in to the DIN socket marked PHONO 1.

NOTE: To avoid loss of high frequency response due to excessively long output cables, shielded cables not exceeding 10 feet (3 meters) in length should be used to connect your turntable. Usually, cables supplied with your turntable are sufficient. Make sure your turntable comes with a regular magnetic cartridge.

TUNER CONNECTION

Connect the outputs of your stereo tuner to the LEFT and RIGHT TUNER input terminals on the rear panel with shielded cables. If you have another tuner, connect it to AUX terminals.

AUX CONNECTION

Two sets of AUX input terminals are provided for connection of equipment such as tape deck without recording facility (e.g., 8-track player deck). Connect the output cables of such equipment to input terminals in the same manner as the tuner.

TAPE RECORDER CONNECTION

A facility for tape recorder is referred to as TAPE MONITOR and is used in conjunction with the monitor control 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 a reel-to-reel deck, a cassette recorder deck or a 8-track cartridge recorder deck.

If the tape recorder comes with RCA-type

plugs, connect input cables to corresponding TAPE MONITOR jacks marked OUT and output cables to the jacks marked IN. Input jacks IN are for playing back pre-recorded tapes and output jacks OUT are for recording programs such as broadcasts, records and live sounds.

If the tape recorder comes with DIN plug, simply connect it to the DIN socket marked REC/PB at TAPE MONITOR 1.

POWER SUPPLY CONNECTION

For power the unit requires the normal house electrical current (AC). Simply plug the unit to a wall outlet.

If in any doubt about connecting to the power source, consult a qualified electrician. If you live in U.K. and your unit comes with 3-core cord without a plug, be sure to read the page 7 of this manual before connecting to power.

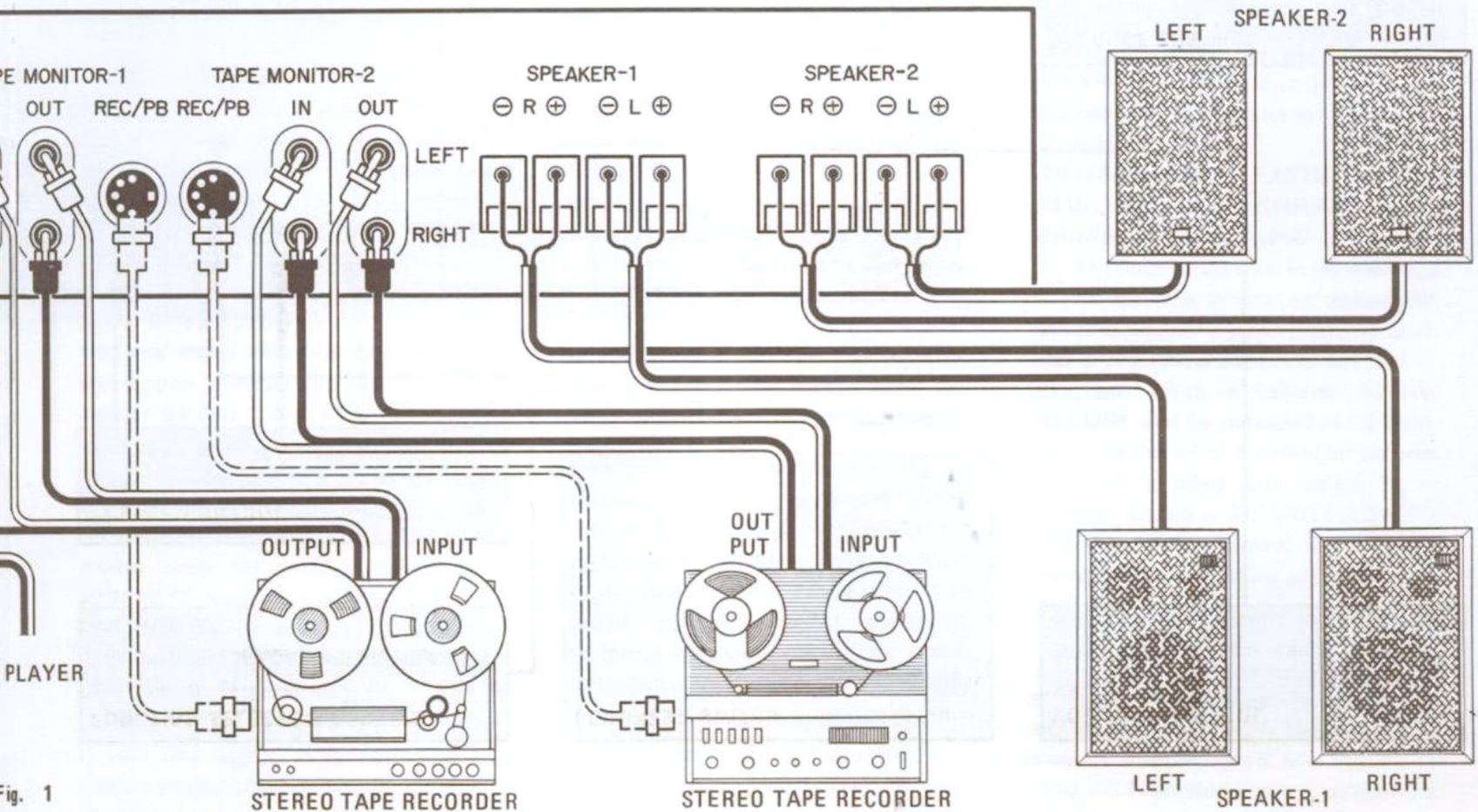


Fig. 1



BASS CONTROL — regulates low frequency sounds, as desired, to suit personal taste, speaker characteristics, etc. The center position gives normal (flat) frequency response. Rotating clockwise increases the bass, and counterclockwise reduces the bass.

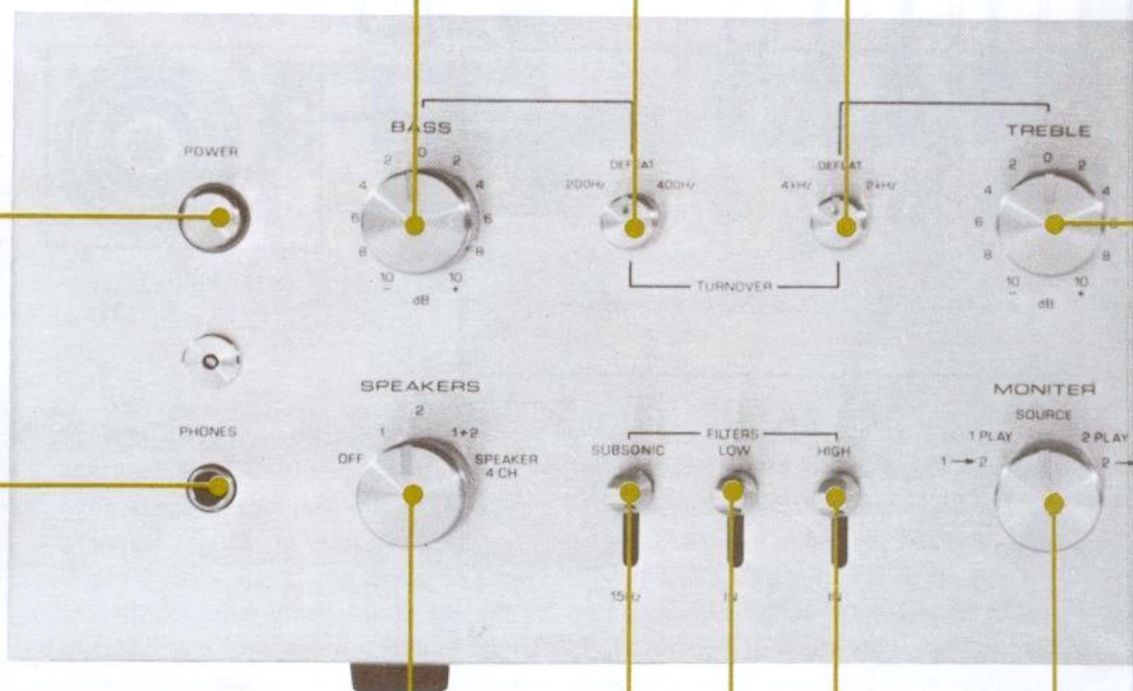
BASS TURNOVER SWITCH — allows you to defeat the bass control by setting at OUT, or let you select two frequency ranges (so-called roll-off curves) at low frequencies at which bass control will be effected. "400Hz" for normal roll-off and "200Hz" for roll-off at lower range.

TREBLE TURNOVER SWITCH — allows you to defeat the treble control by setting at OUT for a flat response, or let you select two frequency ranges at high frequencies at which treble control will be effected. "2kHz" for normal roll-off and "4kHz" for roll-off at higher range.

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 pilot light will be illuminated.

NOTE: Sound will not come out for about 10 seconds due to the relay protection circuit used to prevent loud pop noise when the switch is pushed ON.

HEADPHONES JACK — simple plug in your stereo headphones lead to the receptacle for private listening. Turn to OFF the speakers control. If you are listening to the headphones only.



SPEAKERS CONTROL — allows you to select your speaker systems for activation. OFF to deactivate all speaker systems when such as listening to your headphones privately, 1 to activate your speaker systems connected to SPKR-1 terminals on the rear chassis; 2 to activate your systems connected to SPKR-2; 1+2 to activate both systems SPKR-1 and SPKR-2; SPKR 4CH to activate speaker matrix for simulated 4-channel sound using both SPKR-1 and SPKR-2 Systems.

SUBSONIC FILTER — allows you to cut out undesirable noise characteristics which may exist on subsonic frequencies. Normally used with records.

LOW FILTER — allows you to reduce the low frequency response whenever you wish to minimize annoying record and tape rumbles, etc. However, normally leave the switch OUT for optimum frequency reproduction.

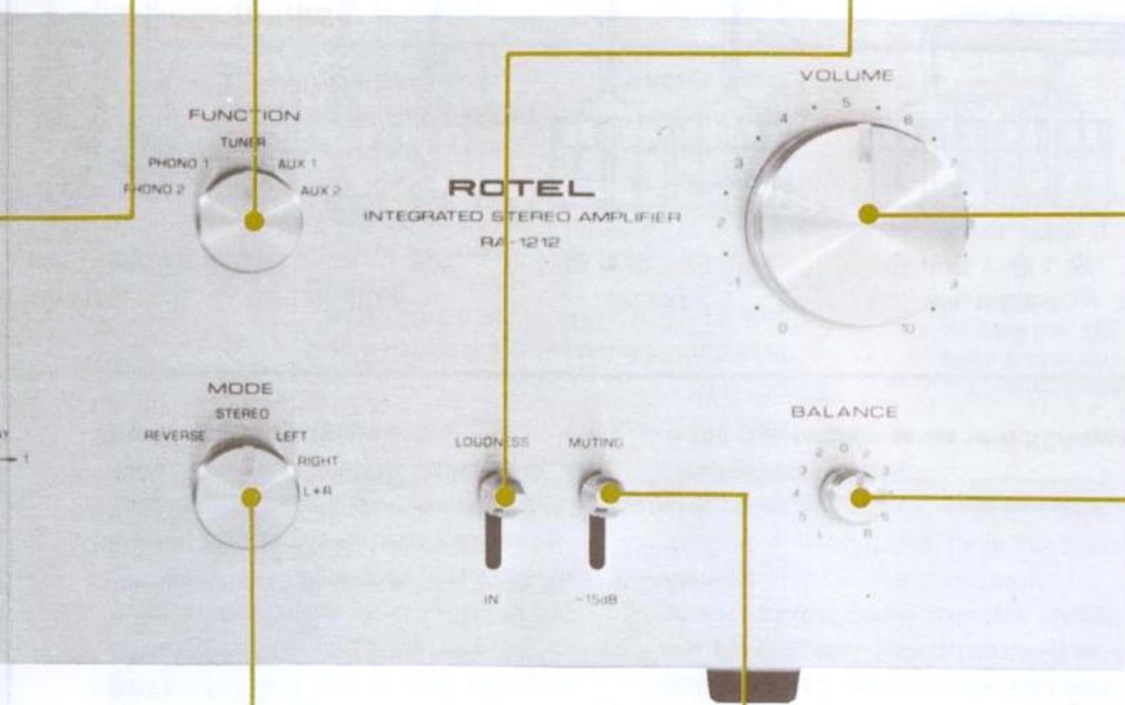
HIGH FILTER — allows you to reduce high frequency interference whenever you wish to clear annoying record scratches, tape hiss, FM background noise, etc. Normally leave the switch OUT for optimum frequency reproduction.

FUNCTION SELECTOR CONTROL – enables you to select the function you desire from PHONO 1, PHONO 2, TUNER, AUX 1 and AUX 2.

TREBLE CONTROL – regulates high frequency sounds, and operates in the same manner as the BASS CONTROL.

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 OUT at normal and high volume settings to prevent booming noise or overload on some speakers.

VOLUME CONTROL – regulates the volume level of all channels simultaneously. Rotate the knob clock-wise to increase the volume and counterclockwise to decrease.



BALANCE CONTROL – regulates the relative sound outputs from each channel. Normally the control is adjusted to provide the effect of mono signal coming from a point midway 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 counter-clockwise for the left channel.

MONITOR CONTROL – allows you to playback, monitor, and dub (record each other) two tape recorders. "1 → 2" to dub the tape recorder connected to MONITOR 1 by the tape recorder connected to MONITOR 2; "2 → 1" to dub the other way around. "1" to playback the tape recorder connected to MONITOR 1, and "2" to playback the tape recorder connected to MONITOR 2. Set to "SOURCE" position whenever tape recorder is not being played but other material is being played. If your tape recorders have separate playback heads, "1" and "2" positions can be used as monitors when recording; setting to either of this position will allow you to listen to program as actually being recorded.

AUDIO MUTING SWITCH – allows you to reduce the level of volume for momentary quieting when you do not wish to change the volume setting but must lower volume temporarily.

MODE CONTROL – "LEFT" to operate only the sound from the left channel coming out from both speaker systems; "RIGHT" for the right channel only. "STEREO" for stereophonic operation, and "REVERSE" for reversing the left and right channels of stereophonic sound. "L + R" to activate monophonic operation. "LEFT" and "RIGHT" positions allow you to test each channel or compare each other. "REVERSE" position allows you to change listening effect. "STEREO" and "L + R" positions depends upon program source – stereophonic or monophonic.

Terminals & Switches

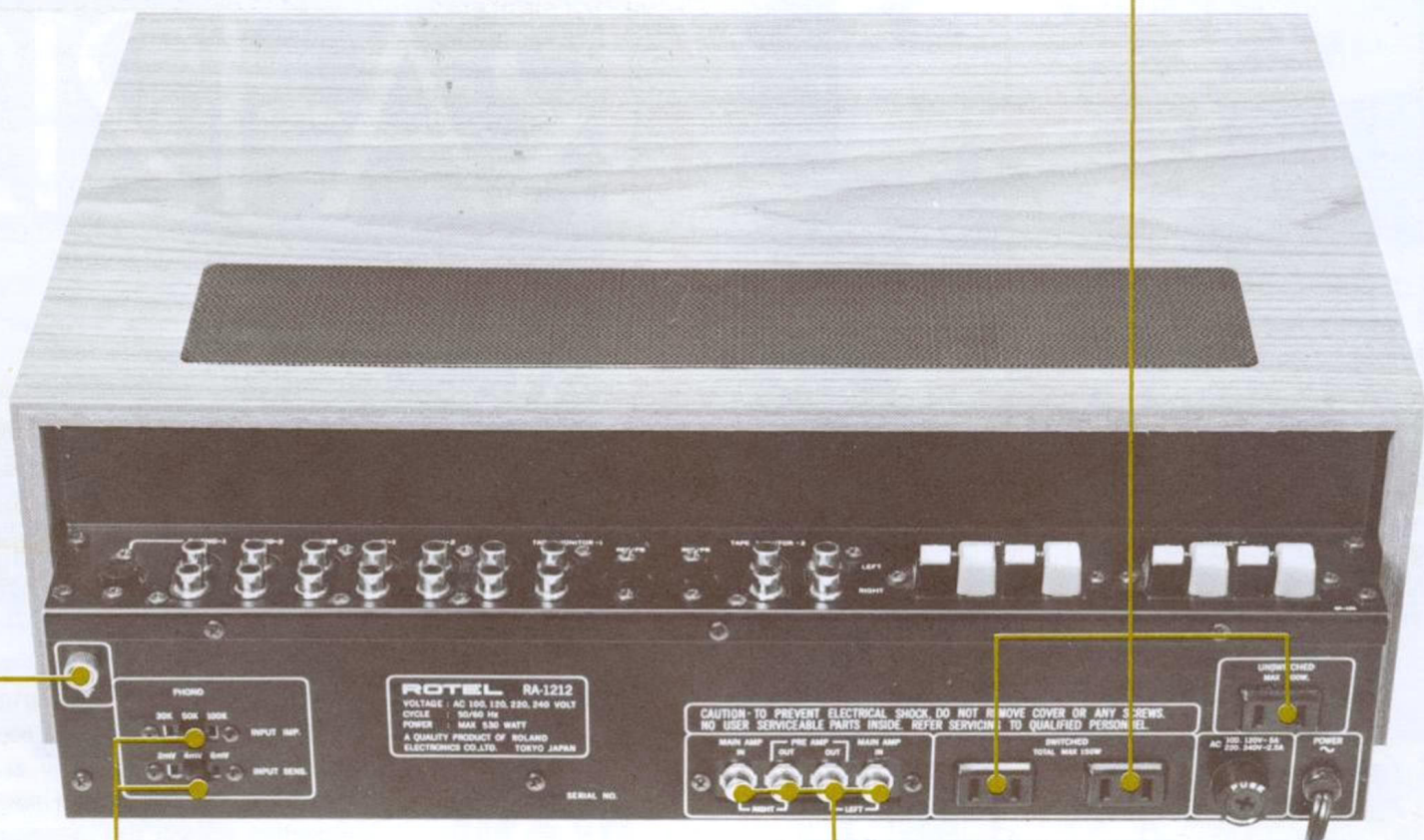
GROUND (EARTH)

The GROUND screw terminal is provided on the rear panel to provide means for all equipment chassis to be at the same potential in a Hi-Fi installation.

CONVENIENCE AC OUTLET

The outlets marked SWITCHED on the rear panel provide 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.



PHONO INPUT SENSITIVITY & IMPEDANCE SELECTORS

Set to either 2 mV, 4 mV or 8 mV for sensitivity, and to 30 kohms, 50 kohms and 100 kohms for impedance depending on specification of your cartridge (if specification does not correspond exactly, set to nearest value is also satisfactory as each setting covers a range to extent).

PRE AMP OUT AND MAIN AMP IN RECEPTACLES

There are pairs of terminals marked PRE AMP OUT and MAIN AMP IN, connected with a pair of jumper pins on the rear chassis. Normally with the pins in place, your receiver is the combined equipment of integrated preamplifier and main-amplifier sections. However, by removing the jumper pins, your unit in essence becomes two independent components consisting of one pre-amplifier and one main-amplifier.

These receptacles are intended for use with any necessary equipment designed to be

installed between the preamplifier and the main-amplifier or for separate use of either section alone. Such equipment as electronic audio equalizer or reverberation unit can be used; or another pre-amplifier or main-amplifier may be hooked up. Simply disconnect the jumper pins and follow the instructions supplied with the accessory equipment. When no auxiliary equipment is being used, the jumper pins MUST be installed in place in order to use your amplifier.

This unit is designed to handle two record players with magnetic cartridges, two stereo tape recorders and two additional auxiliary components such as 8-track cartridge deck. We recommend that you familiarize yourself with basic operations before connecting any such units. Be sure to read instruction manuals of such components as well for maximum operational convenience.

TURNTABLE

Push the function switch PHONO 1 if you wish to operate the turntable connected to the PHONO 1 terminal, or set to PHONO 2 if you wish to operate the turntable connected to the PHONO 2 terminal. This equipment has input sensitivity and impedance settings to accommodate a variety of magnetic cartridges.

TUNER

Push the function switch to the TUNER position, and set the mode control to "STEREO" or "L + R" depending upon the program selected. Use all other controls and switches according to taste and listening conditions. Set to the AUX if your tuner is connected to AUX terminals.

TAPE PLAYBACK

To listen to a playback of pre-recorded tape, turn the monitor control to 1 or 2, depending on which TAPE MONITOR terminal the tape recorder is connected. The setting of the function switch is irrelevant in this case and may be left at any position.

TAPE RECORDING

You may record with your tape recorder any program materials that can be played through this unit. Push the function switch to TUNER, PHONO 1, PHONO 2, AUX 1 and AUX 2 depending on which program you wish to record, and operate the tape recorder while listening to the program.

Always leave the monitor control at SOURCE if your tape recorder has no separate playback head (look up its instruction manual to see if the tape recorder is equipped with separate playback and recording heads).

If your tape recorder is equipped with a separate playback head, turning the monitor control to 1 or 2 will cause the input source to be bypassed and will permit you to listen to the recording being made on the tape.

Setting at the SOURCE position will permit you to listen to the input source. Thus, with the monitor control you may monitor or compare the recording being made with the source being recorded. When dubbing, only the tape recorder that is recording will be monitored.

NOTE: You will not obtain any sound if the monitor control is set at 1 or 2 unless the tape recorder has a separate playback head. Also volume, bass, treble and balance controls of this unit will have no effect upon the recording, so you should use the controls on the tape recorder.

TAPE DUBBING

To record off (dubbing) the tape recorder connected to MONITOR 1 by the tape recorder connected to MONITOR 2, turn the monitor control to 1 → 2. Set to 2 → 1 if the other way around. When dubbing only the tape recorder that is recording will be monitored.

AUX

Turn the function switch to either AUX 1 or AUX 2 depending on which equipment you wish to play. Adjust volume, balance, bass and treble controls to suit your personal tastes and listening conditions.

MICROPHONE & MIXING

Make sure your microphone is ordinary dynamic type with high impedance of around 50 kohms. Plug the microphone into the MIC jack and pull ON the MIC mixing level control. You can adjust the sound level from microphone by turning the level control. Play any program from AM, FM, records or tapes, and mix your voice or other live sound with such program for special entertainment through speakers or headphones.

NOTE: Do not place the microphone close to speakers or turn the volume up, as howling may be caused. The microphone sound will come out from both left and right speakers.

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 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 plug at the power source. Plug in the record player and if hum or howling appears, reverse the record player power plug or re-mount 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 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 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.

EXCLUSIVE NOTE FOR U.K.

If your unit comes with a 3-core cable without a plug, make certain live, neutral and (where appropriate) earth leads are connected to the proper terminals. Check that the terminals are screwed down firmly and no loose strands of wire are present.

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.

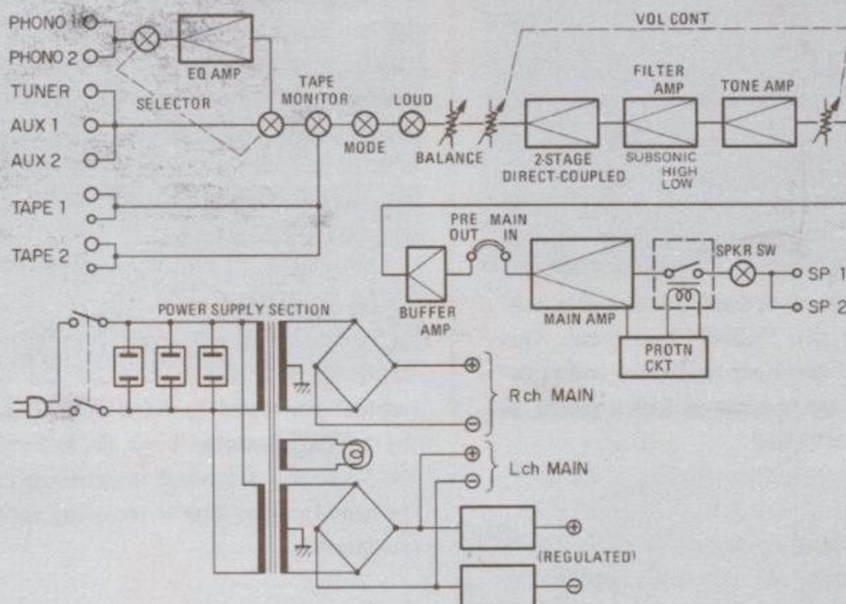
The wire which is coloured GREEN/YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp , or coloured GREEN or GREEN/YELLOW.

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 adapter or at the distribution board.

PROTECTION

This equipment is protected by a special automatic resettable protection circuit and the fuses installed inside the chassis. If the unit fails to operate when plugged in and turned on or if it suddenly becomes completely inoperative while playing (i.e. one or both speakers are silent regardless of speaker switches and function selector control position), the protection circuit is probably activated due to an overload condition such as shorting by stranded speaker wires at the speaker terminals. Once the fault is found and corrected, the protection circuit will be deactivated automatically and the unit will work. **Caution:** If the unit does not operate, or if it becomes inoperative within a short time, consult your dealer or a ROTEL service center.

Block Diagram



Specifications

Power Amplifier Section:

Continuous Power Output	70 Watts per channel, min. RMS, both channels driven into 8 ohms from 20 to 20,000 Hz with no more than 0.3% total harmonic distortion
Harmonic Distortion	0.3% maximum at rated power output from 20 to 20,000 Hz.
Intermodulation Distortion	0.05% at 1 kHz, rated power output -1dB
Frequency Response	4 - 100,000 Hz, -1dB at 1 watt per channel
Input Sensitivity/Impedance	980 mV/33kohms
Damping Factor	70 ± 10%
Speaker Impedance	4 to 16 ohms, 1 or 2 ; 8 to 16 ohms, 1 + 2

Pre-Amplifier Section:

Output Voltage/Impedance	980mV/100 ohms 2 v maximum
Harmonic Distortion	Less than 0.08% at rated output voltage
Frequency Response	3 - 50,000 Hz ±1dB
Signal-to-Noise Ratio	
Phono 1, 2	More than 75dB (IHF "A" network closed circuit)
Tape, Tuner, Aux 1, 2	More than 95dB (IHF "A" network closed circuit)
Residual Noise	Less than 1mV
Input Sensitivity/Impedance	
Phono 1, 2	2, 4, 8mV/30, 50, 100 kohms (Adjustable)

Tape, Tuner, Aux 1, 2 ... 150 mV/50 kohms

Output Level

Tape Out (RCA Jack)	270 mV/2.7 kohms
Tape Out (DIN Jack)	60 mV/80 kohms
Phono Overload	More than 200mV at 0.3% total harmonic distortion
Phono Equalization	RIAA STD ±0.5 dB

Tone Controls

Bass at 100 Hz	±10 dB (400 Hz turnover) ±7 dB (200 Hz turnover)
Treble at 10 kHz	±7 dB (4 kHz turnover) ±10 dB (2 kHz turnover)
Filters	
High	12 dB/oct at 7 kHz
Low	12 dB/oct at 70 Hz, 15 Hz (subsonic)
Audio Muting	-15 dB
Loudness Control	+7 dB at 50 Hz/+3 dB at 10 kHz
Crosstalk	50 dB overall

General Information

Power Consumption	530 watts (maximum)
Dimensions (overall)	430(W) x 140(H) x 380(D) mm
Weight (net)	13 kgs/29 lbs.

Semiconductors Used

Transistors	38
Diode	14

Note: For future improvements features, specifications or appearance may be subject to change without prior notification.