£73 - 15

ROTEL®

RA-311

STEREO PRE-MAIN AMPLIFIER

HERE is the best example of ROTEL's cost-performance outperformer. RA-311 is a new and very versatile stereo pre-main amplifier that let you handle all kinds of program sources. Besides record player, note two tape recorders you can operate and with dubbing, too. And yet another input for an additional component, not counting one for tuner. All can be simply and smoothly controlled by this amplifier's ample 20W+20W RMS continuous power both channels driven at wide frequency response and negligible distortion, along with other efficient controls and switches.

ROTEL

RA-311

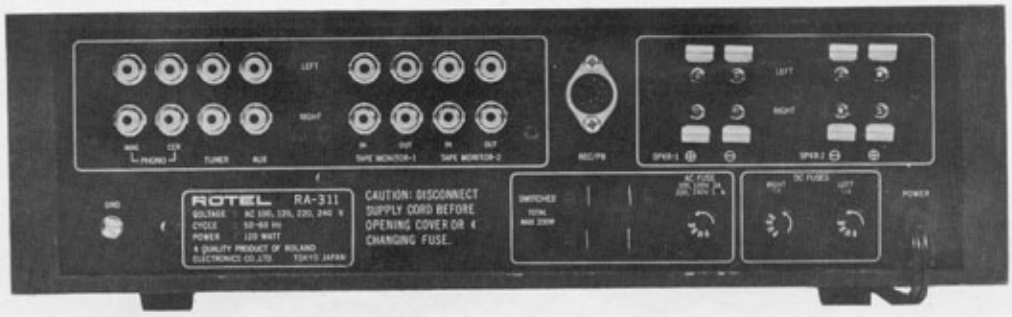
SPECIAL FEATURES

* Geared to let you enjoy genuine high fidelity sound
* All advanced solid state electronics design
* All low-noise silicon output transistors
* Handsomely trimmed aluminum extrusion panel
* Control layout designed with optimum human engineering
* Rotary — Speakers, Bass, Treble, Balance, Volume and Function Selector
* Pushbuttons — High Filter, Loudness, Mode, Tape Monitor 1 and Tape Monitor 2
* Convenient headphone jack and power beacon
* Facilities for magnetic and ceramic phonos, tuner, two tape recorders and auxiliary component
* Tape dubbing from tape 1 to tape 2
* Speaker 4-channel matrix for simulated 4-channel surround sound effect
* Wood cabinet included

SPECIFICATIONS

Total Music Power (IHF)	100W at 4 ohms
Continous Power (RMS)	30W+30W each channel driven at 4ohms
	24W+24W each channel driven at 8ohms
	25W+25W both channels driven at 4ohms
	20W+20W both channels driven at 8ohms
	(all less than 1% THD at 1 kHz)
Harmonic Distortion	0.1% at 18W+18W RMS, 8ohms
IM Distortion	0.3% at 18W+18W RMS, 8ohms
Frequency Response	15 to 70,000Hz, -3db at 8ohms
Power Bandwidth (IHF)	20 to 50,000Hz at 8ohms
Input Sensitivity/Impedance:	
PHONO MAG	2.5mV/40K ohms
PHONO CERAMIC	140mV/94K ohms
TUNER	170mV/46K ohms
AUX	170mV/46K ohms
TAPE MONITOR IN, 1&2	150mV/46K ohms
TAPE DIN	330mV/100K ohms

Signal to Noise Ratio:	
Phono	65 db
Aux	73 db
Tuner, Tape In	73 db
Residual Noise	1.5mV
Damping Factor	50 at 8 ohms
Loudness Control	+9db at 50 Hz,
	+4 db at 10 kHz
Bass Control	±10db at 50 Hz
Treble Control	±10db at 10 kHz
High Filter	-9db at 50 Hz
Phono Overload	100 mV
Phono Equalizer	RIAA ±0.5 db
Crosstalk	-45db at 10 kHz
Power Voltage	100, 117, 220, 240V, 50/60 Hz
Dimensions	14"(W)x7½"(D)x4½"(H)
Weight	12 lbs/5.5 kg



Note: Features and specifications subject to change without notice.

ROLAND ELECTRONICS CO., LTD. 1-36-8, Ohkayama, Meguro-ku, Tokyo, Japan

AUDIO JULY '74.

Rotel amplifier RA-311

By John Earl

This is another pleasant little amplifier of moderate power and price embodying useful facilities. The unobtrusive 'brushed aluminium' fascia displays matching controls for loudspeaker selection, bass, treble, balance, volume and source selection and press buttons for power on/off, treble filtering, loudness, mono/stereo mode and tape monitoring. The knobs are arranged in line along the bottom of the fascia — that for volume being the largest — while the mains on/off button lies in the top left-hand corner and the remainder in line towards the top right-hand corner. Below the power button are a power light indicator and headphone jack socket. The controls are clearly indicated and the knobs rotate against resetting marks.

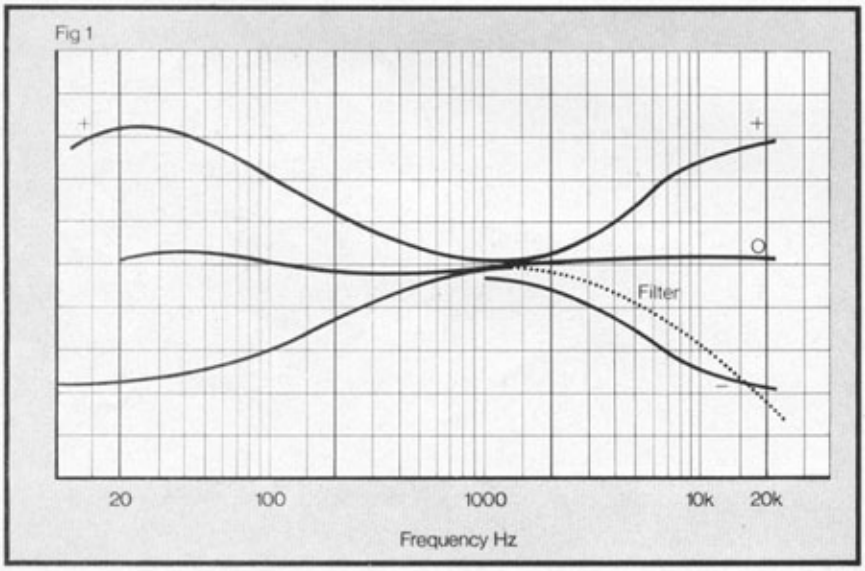
The rear is equipped with RCA 'phono' type signal sockets, and a socket duplicating one tape circuits provides for the direct connection of a DIN orientated tape machine. The mains is conveyed via three-core cable, allowing earthing, and is also available at two outlets for powering ancillary equipment without the need for going back to the household mains plug.

Surround Sound

The design caters for two pairs of loudspeakers which are connected to convenient spring-loaded terminals and operated by a five-position fascia switch. One position switches both pairs off, allowing the headphone set alone to be used, two positions operate pair 1 or 2, the fourth position brings in both pairs together and the fifth position switches in a simple 'ambio' matrix so that one pair will yield the differential of the stereo signals while the other pair is delivering the ordinary stereo information. When the pair responding to the differential is placed behind or to the sides of a listener a sort of 'surround stereo' effect is achieved. This, of course, is not true four-channel or 'quadraphonic' reproduction, but there is no doubt that with certain stereo information, such as that containing big-hall ambience, a worthy enhancement in reproduction is realised. The effect is also obtained when SQ or QS matrix discs are played, but there is not then the 'accuracy' of image placement as when such discs are played via a corresponding matrix and four separate power amplifier channels. The RA-311 is equipped only with two channels, the power for the back loudspeakers in this mode being abstracted from these in sympathy with the changing phase of the two stereo channels.

Two Tape Circuits

The amplifier is also equipped with two tape circuits and with push button switching for monitoring from either circuit. The scheme also facilitates dubbing from one machine to the other, and with machines with separate playback heads the monitoring buttons make



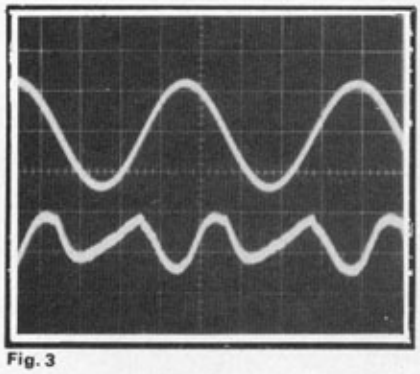


Fig. 3

Fig. 1. Tone control and high filter characteristics.

Fig. 2. Deviation from RIAA curve A. Loudness characteristic at — 30dB curve B.

Fig. 3. Distortion factor oscillogram at 10+10W, 1kHz and 8ohms, corresponding to 0.11%.

Fig. 4. Half power squarewaves (a) 10kHz 8ohms. (b) 10kHz 8ohms in parallel with 2μF. (c) 40Hz 8ohms.

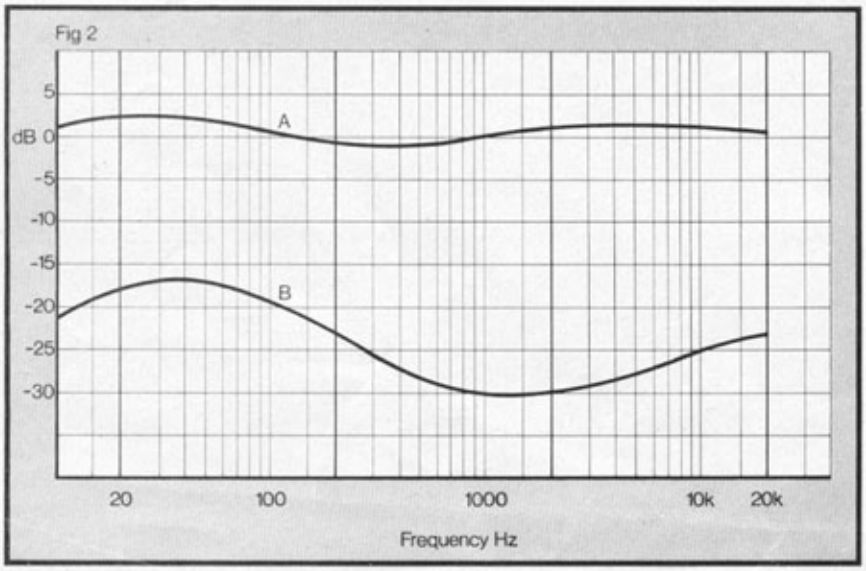
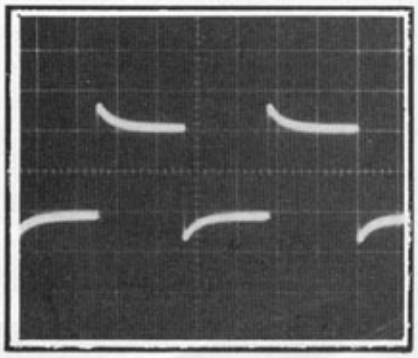


Fig. 2a



it possible to listen to the signal just recorded so that it can be immediately compared with the source signal.

The vast majority of the manufacturer's parameters were met by the lab measurements, but a little confusion arose over the power measurements. The specification contained on page 6 of the owner's manual that partnered this particular test sample states that the total harmonic distortion is less than 1.5% at 18W/channel RMS. At 1kHz and with one channel only driven this parameter was met, the distortion factor into 8 ohms then being less than 1%. However, with both channels driven together, also into 8ohm loads, clipping of the peaks of the sinewave occurred at 18+18W. The confusing bit is that another parameter of the same specification gives the power as 24W/channel at 8ohms. This sort of power can be recorded on an average responding audio voltmeter when the drive is increased so that the output is well into clipping!

Power Yield

The power yield, of course, is also influenced by the mains voltage applied to the amplifier and on the voltage to which it is adjusted. My tests refer to exactly 240V input and with the mains adjustor of the amplifier set to that voltage. With the adjustor set to 220V and 240V applied, 24W/channel (one channel only driven) can be secured to the clipping threshold. My test results also refer to the threshold of clipping — not into clipping. Perhaps Rank Audio Products would care to comment on this apparent ambiguity of the specification. It is more than likely a misprint.

The distortion factor below the clipping threshold was found to be acceptable for a moderately-powered amplifier in this price range, both at mid-spectrum and at low and high frequencies. The accompanying distortion factor oscillogram shows but minor crossover artifacts on the residual. Unweighted hum and noise performance was also very acceptable, as was the residual with the volume control turned right down.

Mild phase shift is indicated by the half power squarewave oscillograms, but the overshoot into heavily capacitively reactive loads was fairly well controlled. Clipping is signified by the 40Hz display.

Source Inputs

The amplifier has a host of programme signal source inputs, being two for pickup (magnetic and ceramic), one for auxiliary, one for tuner and two for tape. The tape circuits are selected (for replay) by the monitor buttons and the pickup, tuner and auxiliary by a three position rotary switch. There is just the one setting for pickup (phono), the magnetic or ceramic selection being by sockets at the rear.

The tone control characteristics are well tailored around the conventional mid-spectrum hinge point, but the high filter does little more subjectively than the treble control towards full cut. The departure from RIAA plot was made with the tone controls at 'neutral' and has a nature similar to that of the tone controls at zero setting.

All in all, then, a very interesting little amplifier. It is not all that powerful and, according to the specification, the absolute power is a little vague. Nevertheless, partnered with loudspeakers towards 1% efficiency sufficient sound intensity is produced to satisfy a wide section of the audio fraternity, excluding those, of course, who demand clip-free peaks of some 100dB RMS from loudspeakers of 0.3% efficiency and in rooms in excess of 65m³. Certainly an amplifier worth looking into if the requirement is for two tape circuits plus simple power matrixing for four-loudspeaker reproduction.

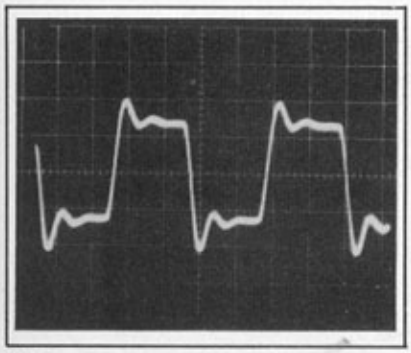
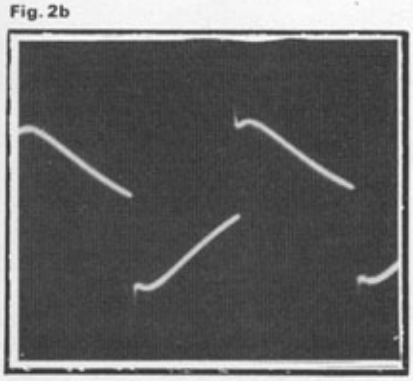


Fig. 2c

Fig. 2b



Parameter	Manufacturer's specification	Results	Comment
Power output RMS	30W/ch. THD < 1% at 4ohms 24W/ch. at 8ohms	17·5+17·5W at 1kHz	More power available one ch. only into clipping.
Harmonic distortion	< 1·5% at 18W/ch. RMS	< 0·3% 15+15W 1kHz 0·07% 1+1W 1kHz 0·06% 10+10W 10kHz	Reasonable values for power. Spec. not consistent with power parameter.
IMD	0·5% at 20W/ch.	Not tested	
Frequency response	15Hz—70kHz —3dB 8ohms	Agreed	Excellent.
Power bandwidth IHF	20Hz—50kHz	28Hz—65kHz —3dB	Ref. 15W 8ohms.
Damping factor	35 ref. 8ohms	Slightly negative	Ref. 2W, 40Hz & 8ohms.
Speaker Z	4—16ohms	Agreed	Power less at higher Z
Hum and noise			
Phono 1 and 2	65dB	65dB	Measured ref. 18W
Others	75dB	78dB	and 8ohms.
Residual hum and noise	1·5mV	Agreed	=2·8×10⁻⁷W
Sensitivity			
PU mag.	2·5mV(40k)	2·5mV	Useful values very
PU ceramic	140mV (94k)	140mV	close to spec.
Tuner/aux./tape	170mV (46k)	160mV	
Tape mon. & DIN	150mV (45k)	145mV	
Recording output DIN	30mV (80k)	30mV	Also 140mV at pin sk.
Mag. PU overload	100mV	Agreed	Adequate.
High filter	—10dB at 10kHz	Agreed see curve	6dB/octave rate.
Loudness	+10dB 50Hz & +4dB 10kHz	Agreed see curve	At —30dB volume setting
Bass control	±10dB 50Hz	See curves	
Treble control	±10dB 10kHz	See curves	
Crosstalk	45dB at 10kHz	Agreed	Adequate
Dimensions	14 × 7½ × 4½ in. (12lbs.)		
Distributor	Rank Audio Visual Limited. PO Box 70, Great West Road, Brentford, Middlx.		
Price	£57.18 plus VAT		
All measurements made with 240V 50Hz mains input exactly and loads of 8 ohms			