

## PRE/POWER AMPLIFIER

Preamp/DAC & power amplifier. Rated at 350W/8ohm  
Made by: The Rotel Co. Ltd, Japan  
Supplied by: Rotel Europe/B&W Group, West Sussex  
Telephone: 01903 221500  
Web: [www.rotel.com](http://www.rotel.com)  
Prices (pre/power): £1395/£2395

**AUDIO  
FILE**

# Rotel RC-1590/RB-1590

This new heavyweight, but disarmingly affordable, pre/power combination sits at the top of the Rotel range. Can it challenge the big-hitters of high-end hi-fi?

Review: **Andrew Everard** Lab: **Paul Miller**

**T**hose who think that Rotel only makes the entry-level components for which it is justifiably famous would do well to have a quick perusal of the company's catalogue. There you'll find an almost dizzying variety of products, from those aimed at hi-fi's newcomers, such as the £350 RA-10, right the way through to a range of receivers, processors and power amplifiers sufficient to satisfy even the most power-crazed home cinema enthusiast.

### PRECISION AND LOGIC

The company also has a hard-won reputation in two-channel pre/power amplification combinations, gained both by offering affordable models in the past and by giving buyers a clear upgrade path through the range. To its stereo offering has now been added a duo sitting atop its upmarket '15-Series' line: the £1395 RC-1590 preamp and the massive (in every sense of the word) RB-1590 power amplifier, which sells for £2395.

In the Rotel tradition, these are both fairly simple units – whenever I've had discussions with people from the company in the past, the point has been made that while other manufacturers put a lot of emphasis on the way their products *look*, Rotel's aim has always been to spend the money in the 'engine room' rather than on the 'superstructure', by investing in high-quality parts and elements such as custom-wound transformers, all of which play their part in the sound quality.

OK, so that focus can tend to make Rotel products appear a little anonymous, although the silver finish option of the review samples goes some way to

addressing that (if you like that kind of thing), but in my experience what you lose in looks is more than compensated for by the performance, even right down at the bottom of the Rotel range.

That said, there's nothing to complain about when it comes to the fit and finish of the components we have here: both preamp and power amp are solid, neatly turned-out and have controls with a precise and well-engineered feel. And as you'll see from the internal shots on these pages, both also have a clear, logical layout, and use high-quality components.

The RC-1590 is steeped in the Rotel way of keeping things simple – it's essentially an analogue preamp with a MM phono input and four line-ins (one set on balanced XLRs), but with the addition of an onboard DAC with optical and coaxial digital inputs (three of each), plus a USB-B computer connection able to accept PCM content at up to 192kHz/24-bit plus DSD64/2.8MHz.

In fact, Rotel says the analogue and digital sections were designed by different specialist teams, the latter offering fully isolated input stages and 768kHz/32-bit conversion to accommodate the digital stage's upsampling and DSD decoding.

As is usual, drivers are needed when using the USB-B input with a Windows computer, and are supplied on a CD with the preamp. There's no need for drivers when using the RC-1590 with a Mac. There's also an

iOS-friendly front-panel USB-A for connection to portable players and USB memory, and aptX Bluetooth complete

with a rear-panel antenna.

An Ethernet connection is provided on the back of the preamp, but don't get all excited about streaming, Spotify or Internet radio – it's there purely to allow the software to be updated, and to provide IP control when the RC-1590 is used in integrated custom installations. On which subject, there's also an RS232 connection for system control, an input for an external IR receiver (handy if you want to hide the unit away), and connections for the company's Rotel Link control system.

Audio outputs are on both RCA phono and XLRs, with two sets of each to keep fans of biamping happy, and there are also two subwoofer outputs, both of which are fed a summed mono signal. The menu system allows a range of adjustments to be made, including balance and tone controls, with the bass and treble circuits bypassed by default, and enabled via the menu. It's also possible to switch the rear-panel USB input between Class 1.0 and Class 2.0, and to set a fixed level on any of the inputs – for example for use with an external surround processor. The chosen level can be anywhere on the preamp's scale of 1-95, or set to maximum level. All these settings are accessible from the remote handset supplied.

### A NO-NONSENSE BRUISER

As is usual for Rotel, extensive use is made of custom components, including two toroidal transformers (one each for the



digital and analogue sections), and the use of slit-foil capacitors in the power supplies' regulation. The power amp, however, flies in the face of the company's recent use of Class D ICEPower modules, seen in its 15-series models from the RB-1562 stereo power amp up to the five-channel RMB-1575: the RB-1590 is a big ol' no-nonsense Class AB bruiser. It's rated at 350W per channel into 8ohm, but with the company making the proviso that it should be used with speakers of 4ohm or greater impedance. As PM's lab report shows [p51], while it comfortably exceeds its nominal power figures, delivering just over 800W into 4ohm, it doesn't do that big power amp trick of continually doubling output as impedance falls. Instead, go beyond that specified minimum load, and the power starts dropping pretty rapidly.

That said, this is a true dual-mono design, with a symmetrical layout and twin toroidal transformers, along with eight British-made BHC capacitors in the power supply sections, chosen for their low loss and fast response. Input is on both RCAs and XLRs, with a switch selecting between the two. Outputs are on two sets of five-way binding post/4mm socket terminals for each channel, and there's 12V trigger switching for remote on/off. A two-stage relay operates on switch-on, and there's extensive protection against excessive heat, current and voltage to keep the amplifier well behaved. ➔

The size of the RB-1590, which – as well as weighing 38kg – stands almost 24cm tall, means some thought will have to be given to positioning it. You could use a purpose-made low-level stand, but I resorted to my usual big amp solution – a 600mm concrete paving slab! The amp was connected to the preamp using 2m runs of balanced interconnect from The Chord Company, and to the speakers using Chord Odyssey. Sources were my usual Naim NDS and MacBook Air.

### EASY-GOING?

With my main speakers, the PMC OB1s, the initial impression was of an amplifier carrying its considerable clout fairly lightly, having both speed and agility to partner its power. What's more, despite that rather unusual reaction to falling impedance – which after all should only really be an issue with the most difficult speakers – the Rotel pre/power manages both impressive dynamic ability and a deceptively easy-going

presentation, with the kind of smoothness more commonly associated with amps with less ambitious power outputs.

In short, it never sounds like a massively powerful combination until you want it to, with a spot of 'everything nailed down' rock 'n' roll blast or a massive orchestral work. It did unleash some of the beast within when playing Bach *Toccatas* performed by E Power Biggs on the four organs of Freiburg Cathedral – all at once, in a 1970s quad recording re-released on SACD back in 2003 [Sony SS 87983], and here played as stereo DSD64 files through the RC-1590's USB input. With my usual reference network music player for

comparison, played in through the preamp's analogue inputs, this revealed rather more of the intricate internal detailing of the pieces, but there was no arguing with the ability of the Rotel's internal

DAC stage when it came to presenting the sheer impact of the sound – helped of course by that power amplification.

Similarly with the rather more laid-back sound of Eric Clapton's classic album *461 Ocean Boulevard* [Polydor B0003638-36] the Rotels did a fine job of motoring the rhythms along while presenting the layering of harmonies and instrumentation with plenty of detail. OK, so in absolute terms the bass is a shade overnourished, and as a result just a little slow-sounding. So, rather than having really solid attack, there were times when staccato kick- ➔ drums could become a bit blurred – although never to the point when the impetus of the music was lost – and really deep electric bass could tend to turn into more of a deep growl rather than distinct notes. It's a very impressive deep growl, admittedly, but lacks the last nuances of definition.

### CLARITY TO MATCH

However, this bass warmth doesn't dominate matters, and the Rotels deliver very good midband and treble definition, whether with digital or analogue inputs, right through to the respectable MM phono stage – which will be more than good enough for use with a modest turntable as a secondary, or even tertiary, source.

The detail on offer here is always impressive, particularly in the way in which ambience and the size and

acoustic character of a recording venue is conveyed – and especially so with higher-resolution files such as the live recordings available on some orchestras' own labels.

The same characteristics also make acoustic jazz and singer/songwriter recordings both lively and captivating, thanks to that close focus on the character of performances, and the explicit delivery of the strike of pick on string or that snatched breath between a vocalist's phrases. It just goes to show that *this* heavyweight amplification isn't all about 'going loud', but rather it has refinement and clarity to match its muscle.

Indeed, some of the most enjoyable listening I experienced during my time with the Rotels was not with the amp pumping great dollops of level, but with it at what was clearly little more than tickover. Arguably similar results would be available with amplification with less muscle at its disposal, but the Rotel is both exceptionally well-mannered and priced sensibly enough to be bought almost in spite of that big-numbers specification, rather than due to it. ☺

### HI-FI NEWS VERDICT

There's no denying that the Rotels deliver a lot of bang for the buck, and though in absolute terms this isn't the most refined amp combo in the world, it does a fine job of delivering a wide range of music with detail and excitement intact. That Rotel has managed to offer all this for very sensible money, along with wide-ranging input flexibility and fuss-free behaviour, is a tribute to its design and manufacturing.

Sound Quality: 80%

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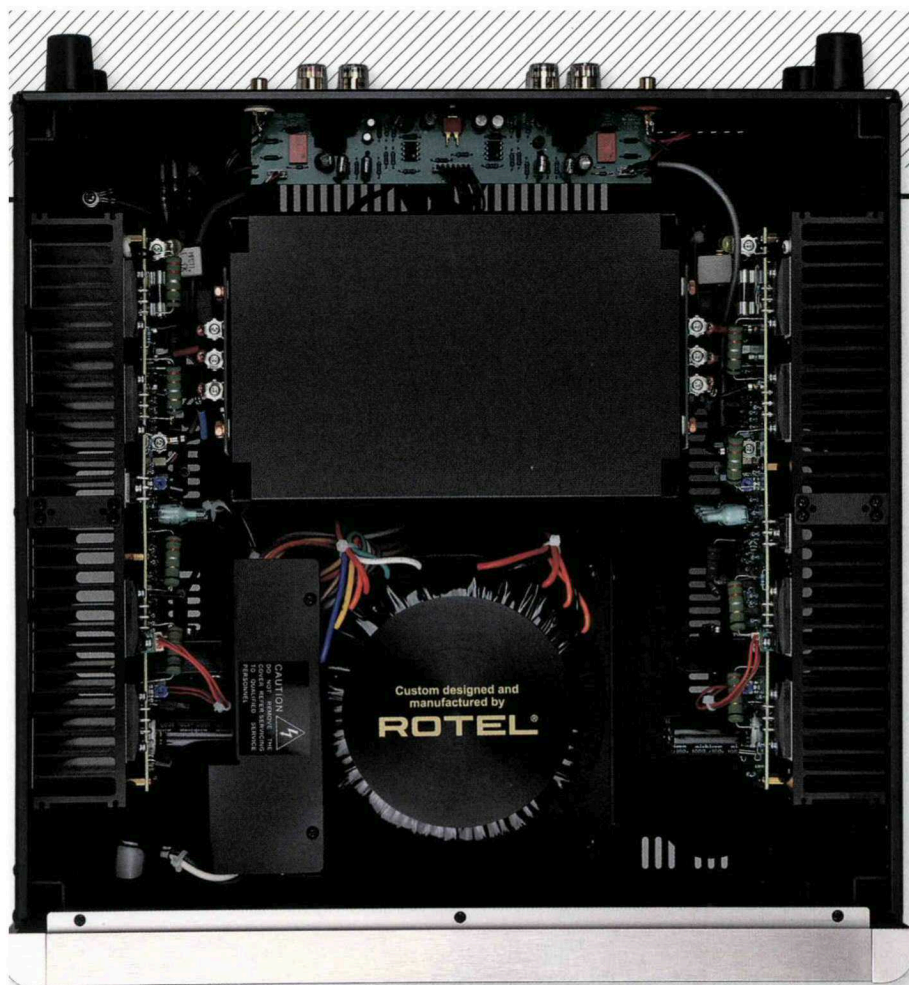
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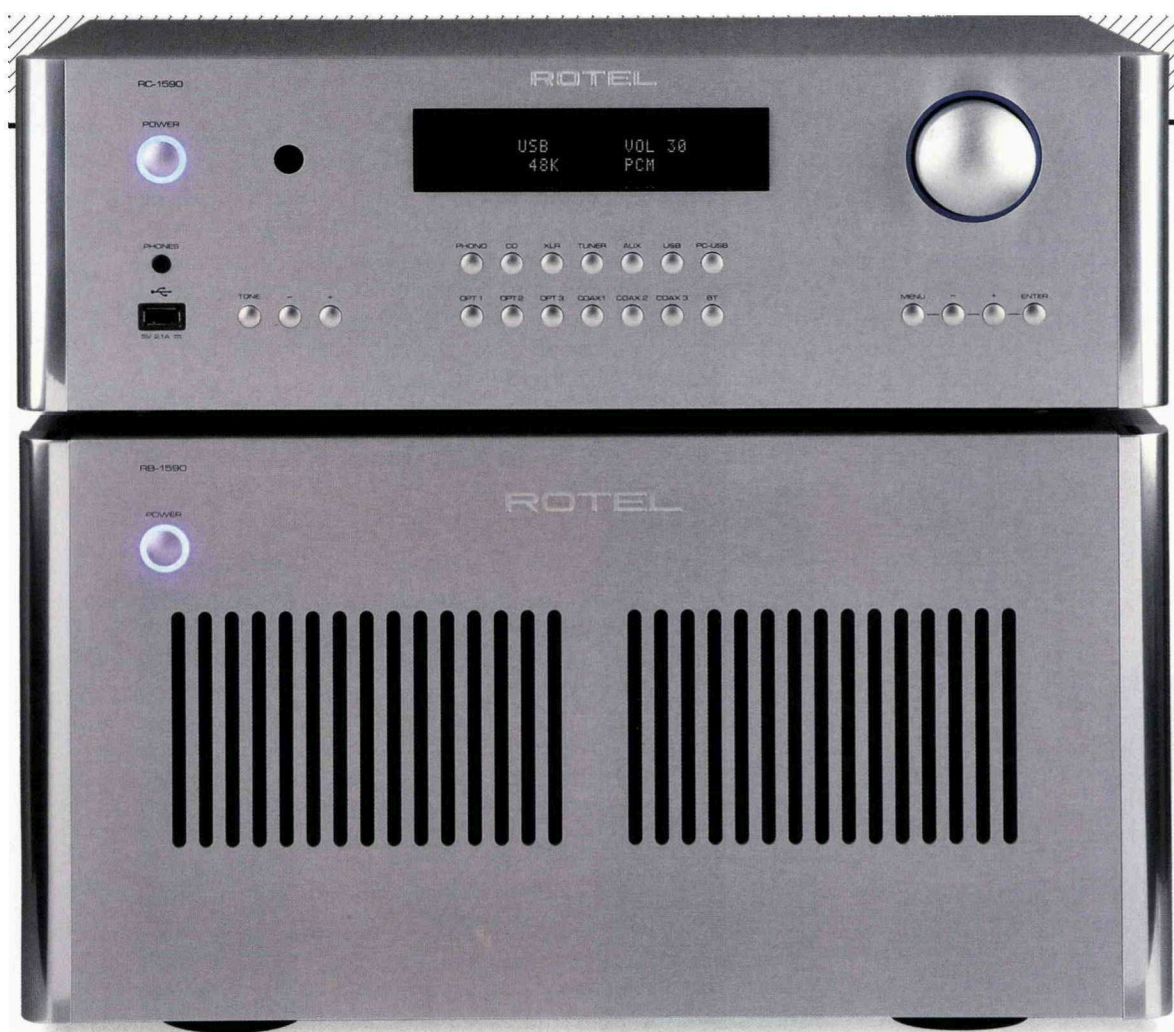


**ABOVE:** The preamp (top) offers MM phono and four line inputs (three on RCA, one balanced on XLR) together with fixed line/sub outs and four variable outputs (two each on RCA and XLR). The power amp (below) has pairs of 4mm speaker posts to support bi-wiring and offers balanced and single-ended (RCA) inputs





**ABOVE:** Four pairs of substantial Sanken power transistors are bolted onto each channel's heatsink in this dual-mono power amp. Two PSU transformers and (screened) electrolytic caps fill the interior



**LEFT:** Styling is unashamedly minimalist, but not unattractive in its silver livery. Rows of soft-touch buttons govern analogue and digital input selection on the preamp, but it's the sheer scale of the power amp that dominates





**RIGHT:** Separate linear PSUs feed the RC-1590's digital and analogue circuits, the former based on an XMOS USB front-end and 32-bit TI DAC (maximum 192kHz/24-bit media supported)

## THE ROTEL WAY

Careful selection of components, usually chosen via extensive listening, a willingness to have parts built rather than settle for off-the-shelf convenience, and a long-running co-operation with its distributors in key markets in the design and voicing of its products – all have played their part in the 50-year success of the company. Rotel now carries out R&D, as well as production, in the Chinese factory it shares with Bowers & Wilkins. B&W makes the majority of its speakers in China – the plant in Worthing is for its range-topping models – and has staff permanently on site overseeing both design and manufacturing. For Rotel, it's the natural continuation of what it calls its 'Balanced Design Concept', which involves staff in the UK and at the factory working together on the internal layout, parts selection and critical evaluation of the sound: Rotel describes it as 'a disciplined synthesis of physics, electronics and mechanical engineering'.

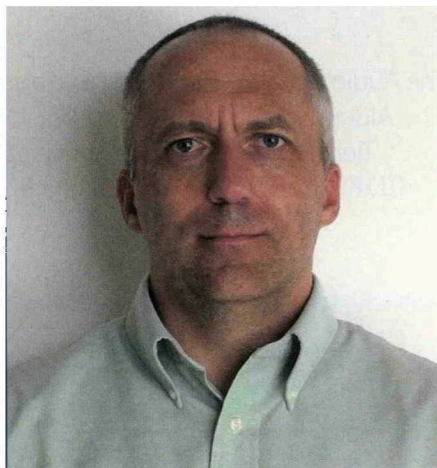
## DAREN ORTH

**Bowers & Wilkins'** Chief Technical Officer Daren Orth explains that the 1590 pre/power combo was designed as a 'statement product' for the Rotel range, with extensive use of new components. He says that Class AB is 'the heart and soul of Rotel's heritage', and suggests that while its Class D designs 'have a specific application where heat and/or space limitations are an issue, the Class AB designs don't necessarily need to prioritise those considerations. So the primary focus is firmly on performance.'

However, asked about the power-limiting evident in the RB-1590 [see PM's lab report, p51], he says that given the various ways the amp is likely to be used, for example in home cinema or custom installs as well as stereo set-ups, 'it would be remiss or even irresponsible not to use circuits like this.'

In fact, there are multiple layers of protection in the amp, and the Current Limiting Circuit 'is only used in the RB-1590 amplifier due to the enormous power involved. If something were to go wrong it could go very seriously wrong and the amplifier would self-destruct!' He adds that Rotel has measured an RB-1590 with the circuit physically removed: it can deliver well over 1.5kW/2ohm and 2.4kW/1ohm.

And asked whether Rotel is committed to the 'Macs and DACs' route, or is considering network streaming products, he replies that 'I'm delighted to give *HFN* readers early notice of our new RT-1570: it's available next month, and is among other things a network player!'



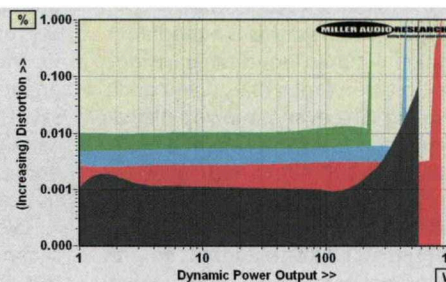


## LAB REPORT

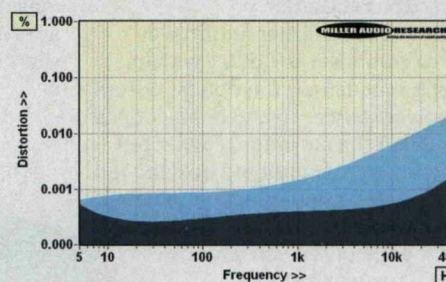
### ROTEL RC-1590/RB-1590

Rotel's flagship RB-1590 power amp is conservatively rated at 350W/8ohm but achieves closer to 490W/805W into 8/4ohm in practice. Nevertheless, hugely capable though it is into these moderate impedances, the RB-1590's output into lower impedance loads is limited to 455W/2ohm and 235W/1ohm – that's just 15.3A – under dynamic conditions [see Graph 1, below]. Ordinarily it would not be unusual for a 400/500W amp to deliver in excess of 1-2kW into low impedances. THD hovers at a consistently low 0.001-0.0016% across its full 350W range but increases with frequency from just 0.0006%/20Hz to 0.011%/20kHz [see blue trace, Graph 2 below]. The response is wide and flat at –0.03dB/20kHz and –0.3dB/100kHz into 8ohm but with a treble roll-off that increases with decreasing load, reaching –0.8dB/20kHz and –2.5dB/100kHz into 1ohm. The ~63dB stereo separation (20Hz-20kHz) is slightly weak but, and despite the physical size of the PSU, noise is low and the A-wtd S/N ratio an impressive 92dB (re. 0dBW).

The partnering RC-1590 pre is very impressive in 'analogue' guise, offering a full 90dB A-wtd S/N ratio, a wide 20Hz-100kHz response ( $\pm 0.05$ dB) and very low 0.0002-0.0005% distortion (20Hz-20kHz, 0dBV). The digital inputs' upsampling involves an apodising-style filter that minimises pre-echo. THD is *slightly* higher than the analogue in/out at 0.0011–0.0035%, the A-wtd S/N only 'average' at 103.5dB and jitter just a little untidy at 380psec. As expected, the HF response has an additional roll-off with 96/192kHz media of –0.7dB/45kHz and –1.5dB/90kHz. Readers may view comprehensive QC Suite test reports for Rotel's RC/RB-1590 pre/power combo by navigating to [www.hifinews.co.uk](http://www.hifinews.co.uk) and clicking on the red 'download' button. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green). Maximum current is just 15.3A



ABOVE: THD vs. extended frequency; RC-1590 (1V out, black trace) and RB-1590 (10W/8ohm, blue trace)

## HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	490W / 805W
Dynamic power (<1% THD, 8/4/2/1ohm)	565W / 870W / 455W / 235W
Output imp. (20Hz–20kHz, pre/power)	97ohm / 0.014–0.090ohm
Freq. resp. (20Hz–20kHz, pre/power)	–0.45 to –0.0dB / –0.14 to –0.03dB
A-wtd S/N ratio (pre/DAC/power)	90.4dB/103.5dB/91.8dB (0dBW)
Dist. (20Hz–20kHz, pre (DAC)/power)	0.0011–0.003% / 0.0006–0.011%
Digital jitter (S/PDIF / USB)	380psec / 220psec
Power consumption (pre/power)	23W/1.19kW (61W idle)
Dimensions (WHD, pre/power)	431x144x348/431x237x454mm