

# HIFI CRITIC

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MAGAZINE**

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## **HIGH END 2016**

Jason Kennedy spent three days at Europe's biggest hi-fi show, but we only gave him two pages for his report

## **A PURR OF PRE-AMPS**

Julian Musgrave compares a number of pre-amps and passive system controllers

## **dCS ROSSINI PLAYER + CLOCK**

Chris Binns assesses dCS's Rossini CD player/DAC and its associated Master Clock

## **WHY DO WAV AND FLAC FILES SOUND DIFFERENT?**

Dr. Charles Zeilig and Jay Clawson measure the sound quality loss when interconverting FLAC and WAV files

## **WILSON AUDIO SABRINA**

Martin Colloms tries out an accomplished floorstanding, three-way moving-coil loudspeaker with ample power handling

## **ROGUE AUDIO SPHINX V2**

Paul Messenger auditions an affordable hybrid integrated amplifier that combines valves with digital amp modules

## **MUSIC & MORE**

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MFA Baby Classic  
Cambridge Audio Azur 851N  
Benchmark AHB2  
Thorens TD124  
Focal Sopra No2  
First Watt M2  
Naim NAP 500 DR  
Townshend Allegri  
Bespoke Audio  
Gamut D3i  
XTZ Tune 4  
NVA The Second Statement  
Exposure 3010 S2  
Rogue Audio Sphinx V2  
Glasshouse Passive #1  
Vincent SV-700  
Hattor Ultimate Passive  
Little British Monitor  
Roksan Caspian RPP  
dCS Rossini Player+Clock  
Glasshouse TVC  
MFA Classic 632 Phono Amp  
Rothwell Headspace  
Rothwell Simplex  
Lounge Audio Copla  
Lounge Audio LCR MkIII  
MFA 632  
MFA Classic Step Up





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As we rush headlong into the future, let us not forget that hi-fi has been around for most of our lifetimes, and that most of what the music business considers as progress has been about improving access and convenience rather than quality, through such initiatives as the widespread popularity of MP3-encoded files.

I'm currently feeling somewhat exasperated, as my computer, *iPad* and smartphone have decided to stop communicating with my Naim *UnitiServe*, and I've not the slightest idea why. I've tried restarting various bits and pieces, so far without success, and the control Apps simply refuse to make the connection.

This may well be because I have no real enthusiasm for wrestling with computers, but suspicion inevitably falls on the 'software updates' that seem to have become an inevitable and regular part of life these days. Nobody seems interested in explaining why software engineers don't get it right in the first place, but I suspect that one reason behind the continual 'updating' is simply that it's possible to do so. By their very nature, home computers and their ilk are foxy little devices that are well able to change their spots almost on a whim.

Fortunately I still have access to my music *via* plenty of 'oldfashioned' CDs and vinyl – and indeed the numerous tracks that are stored on my laptop. But you'll probably have to wait until the next issue to find out about access to my server.

## Towards the Future?

In the meantime it may well be high time I got into streaming. It's something I've not really bothered with to date, largely because I've spent more than fifty years collecting enough discs (vinyl and compact) to keep my CD and vinyl players busy for years. (Indeed, simply because I've already got plenty of material, my disc collecting seems to have tailed off somewhat in recent years.)

However, I've recently been staying for a few days with my younger brother in Sweden, who streams his music *via* a Spotify subscription. While this may not particularly appeal to my hi-fi sensibilities, I have started to appreciate the easy access to all manner of tracks that it brings. And although I've always regarded my music collection as reasonably comprehensive, it does inevitably have some gaps (usually around the time that progeny are arriving), so a streaming service does therefore have some advantages (especially since contact with my server has temporarily been lost).

I should have got streaming up and running by the next issue too, so will be able to report on any of the practical difficulties this computer phobic encounters along the way. As a parting shot, however, it seems to me that the advantages of streaming may well depend on the size of one's music collection, which is likely to be a function of one's age.

*Paul Messenger*  
Editor

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# Naim NAP 500 - the DR upgrade

THE EDITOR IS STILL WAITING FOR HIS NAP 500 DR-UPGRADE (SCHEDULED FOR JULY), BUT MARTIN COLLOMS HAS MANAGED TO BLAG A REVIEW SAMPLE OF NAIM'S LATEST TWO-BOX POWER AMP

*"I knew instinctively just how good it was on a familiar CD track, from the very first note of percussive bass"*



When I reviewed the original *NAP 500* for *Hi-Fi News* in August 2000, tagged with 'Naim's long awaited all-new flagship power amplifier sets the pace for the 21<sup>st</sup> Century.' Looking back, it was a good review: I applauded the notable qualities of pace, rhythm and timing, particularly when used with the high end Naim *NBL* loudspeakers that were on hand at the time. However, in the context of the international audiophile scene, driving speakers such as the Wilson *WATT Puppy-6*, I also felt that it just missed out on the last measure of slam and dynamics that I experienced from the bigger Krells. That review *NAP 500* was an early sample and very soon afterwards the protection circuit was revised to optimise power delivery into more awkward speaker loads. Also, we were probably insufficiently experienced with the almost inordinate time many Naim products take to run in fully (sometimes months) at that time.

In a Naim system context the *500* was very well received. It has sold well over the past 15 years despite premium pricing, and was described as a design assault on the state of the art. Considerable electronic circuit expertise was applied to minimise both steady state and dynamic related noise. In its way it was the *Statement* design of its time, much of the design and construction steps taken then were also employed to create the *Statement* power

amplifier itself, including the balanced output stage, albeit more recently and ambitiously applied.

The dramatic redesign applied to the *DR* version of the *NAP 500* means that it is effectively a brand new amplifier and much more than just a 'discrete regulator' upgrade. Indeed, those returning a *500* for revision will discover that there's a waiting list for the work (*too true* – *Ed*), and the radical changes required will cost £4,200 and take several days to complete. Major circuit boards are exchanged, and the new and more powerful *NA0009N*-series power transistors must be fitted, for both the amplifier outputs and the multiple high power regulators. This two-box amplifier is not configured as two monoblocks; rather the larger case contains the stereo power amplifier, while a smaller, plainer unit contains the power supply components. The larger unit has centralised grounding for maximum operating dynamic range, and an attractive sculpted appearance thanks to a heavily finned central heat-sink. If the going gets tough, for example through supplying sustained high power into lower impedance loads, a near-silent two-speed fan takes care of the excess heat. The plainer looking power supply should be placed adjacent to the *500DR* rather than stacked, to minimise any magnetic and vibration interference. This slim but heavy power supply is linked to the amplifier by a pair of huge, high current, locking Burndy connectors, with hawser like multi-core cables. These industrial grade connections are vibration- and environment-proofed, and have a high current capacity with stable and ultra-low contact resistance.

The power supply may be factory set for 220V or 110V operation, and is protected by a user-replaceable fuse. The amplifier runs cool at idle, and in fact stays quite cool when running hard. Although this amplifier has XLR balanced type input sockets, the inputs are intrinsically single-ended. The left channel uses pin1 for signal and the right channel signal is on pin3; pin2 carries the ground for both XLR inputs. Just to confuse things, the speaker

MARTIN COLLOMS

outputs are truly balanced, do not have a ground or earth reference and must only be connected to normal passive, non-grounded loudspeakers. (Their outputs cannot be sent forward to subwoofers or other electronics.)

### Sound Quality

I had become completely comfortable over the past several months with the highly communicative and capable *DR*-modified *NAP 300*, and now felt that I knew it like the back of my hand. I had also recently experienced Naim's *Statement* for an extended period, and had been able to compare it to the *DR*-equipped *NAP 300*.

Then came the *DR*-modified *NAP 500*. As we each began assessing this new version of the *NAP 500*, I commented to Chris Binns that I knew instinctively just how good it was on a familiar CD track, from the very first note of percussive bass. As the listening project unfolded, it became a joyous exploration of my music library. The amplifier had been run in a little, and was already very good. A few extra weeks put some more polish on the overall performance, but that immense emotional involvement was unmistakable from the very beginning.

The innate tonal balance or timbre seems to be entirely neutral. I could detect neither deficiency nor emphasis in any part of the frequency range, and this desirably colourless character did not appear to alter when used with any particular type or model of loudspeaker or with loudness. This was something more than simple neutrality, as it somehow sounded less 'electronic' and more musical and 'valve-like', yet without any hint of false richness or softening. Furthermore, our listeners found that the sound quality was very stable over the full range of usable power, with no loss of detail or transparency at low volume settings and (equally important) no discernible change in timbre over the power range to full output. Thanks to the fully regulated power supplies, moderate clipping is subjectively tolerable, as the distortion levels here are substantially lower than those found in other amplifiers with unregulated supplies. The *DR*-equipped *NAP 500* really did perform as if a full 250W/ch was on tap.

One might have assumed that a *500DR* would essentially be a moderately louder version of a *300DR*, but this didn't prove to be the case. Although the *300DR* is undoubtedly a class leader in image scale, detail, and rhythmic musical drive, the *500DR* adds substantial extra majesty, alongside a further expansion of spaciousness, the image width, and depth actually rivalling the *Statement* monoblocks. How much of this will actually be

heard depends on the system, though even with less costly loudspeakers than our Magico *S5*, much of the *500DR*'s advantage was still present. At the time it was felt that some of the *300DR* improvement was a result of superior regulated supplies with very low noise floors. The *500DR* goes one step further, as its balanced circuit topology further cancels out residual supply noise, especially that arising from dynamic music related power delivery. Although the *300DR* undoubtedly has excellent transparency, the *500DR* somehow goes an extra mile here. Timbres for complex percussion were delightful: beautifully differentiated, and most natural.

I could not find any specific association between the *500DR* and the type of music or the format of the recording, so evenhanded was its presentation. The particular difference between the best 'hi-res' recordings and unadulterated Red Book CD was clearly present, yet CD itself somehow sounded refreshed, sweeter, more dynamic, more spacious and more involving than usual. This apparent improvement was greater than the perhaps more aesthetic advantage heard with the better 'hi-res' program on lesser systems. LP was also very good indeed, the amplifier extracting the full measure of richness and inner dynamics from original all-analogue discs. Some mid-1960s Decca recordings were spectacularly good, the discernible advantage in low frequency power, precision and clarity from this amplifier bringing out the most in these recordings.

We struggled hard to define an overall score with the several loudspeaker systems tried. This is one of the world's great power amplifiers, and gets remarkably close to the *Statement* in its way, albeit understandably missing out on the significantly greater dynamic range potential of the substantially larger amplifier. Checking our marking and comparing power amplifiers, we rate the *DR*-modified *NAP 500* at an outstanding 375 points, as it manages to combine classic audiophile qualities with drive, speed, rhythm and slam. This power amplifier both seduces and rocks.

### Conclusions

This verdict came as something of a surprise. The scoring and the sound quality characteristics reach well beyond the non *DR* version, and it now combines the best international 'high end' qualities of subtle harmony, inner balance, power and drive, with fine slam, bass tune playing with lightning speed. As with the *300DR*, the subjective frequency response seems rather wider than before, while the soundstages expand in every dimension. It unequivocally receives *HIFICRITIC*'s highest Audio Excellence rating.



### Review System

Constellation *Inspiration PreAmp 1.0*, Townshend *Allegri* control units. Constellation *Centaur* monoblock and *Inspiration Stereo 1.0*, Naim *NAP300DR* power amplifiers. Linn *LP12* player with *Keel* and *Radikal*, Naim *Aro* arm, Lyra *Delos* cartridge, Naim *SuperLine* phono stage. Naim *UnitiServe* network server and S/PDIF source, *NDS Streamer-DAC*. Wilson Audio *Sabrina*, Magico *S5*, Focal *Sopra No2*, Quad *ESL63*, BBC *LS3/5a* speakers. Naim *FRAIM* racks. Transparent *MM2* and Naim *NAC A5* speaker cables, Naim *Super Lumina*, Transparent *MM2* and Van den Hul *Carbon TFU* interconnect cables.

## Technology

Back in the early 1990s, the *NAP 500* project was originally conceived as an assault on the state of the art. Right from the inception of the long established *NAP 250*, the virtues of a fully regulated, high power supply were apparent in the great stability, detail and dynamics. This model showed just how much could be wrought from the generic quasi complementary Naim amplifier design.

However, despite those fully regulated supplies the designers failed to achieve still lower noise with its promise of greater dynamics and clarity. The *500*'s decision to adopt bridged operation was not specifically taken to increase power output (although there is a welcome gain of a couple of dB, and in theory it could have been 6dB for the same power supply voltages). Rather the idea was to release the usual negative speaker return terminal from the amplifier ground. Instead it is connected to that second power amplifier inside the *500*. Conventional amplifiers always demonstrate a design struggle over the reference ground point (the zero signal reference), as the partly distorted current returning from the loudspeakers has to get back to the central ground of the power supply, and some signal contamination is usual.

When bridged correctly, the half-wave audio supply current no longer appears in the current return path, so the effect of the power supply and ground related noise will be considerably reduced (and in theory almost perfectly nulled).

Naim describes this as follows: "A bridged configuration allows for maximised open and closed loop speed, less intrusive protection circuitry and reduced interaction between input and output signals, as the very high drive currents to the loudspeaker do not flow through the system earth."

The *500* is a quasi-complementary design, using high current 350W NPN devices with a 70A

peak rating, specially designed for Naim. Eight were used per channel: four for the regulators, and two for each amplifier phase. The *B2 Spice* program analysed the circuit behaviour in detail, leading to a very low noise of -125dB. The output was designed for a rated 200W of bridged output into 4ohms, and as before this is achieved for these inverting amplifier sections by operating one in shunt feedback (*ie* non inverting) and the other

with series feedback (*ie* inverting), thus generating a balanced output for a common input drive.

Signal conditioning for gain, bandwidth and impedance was done using a discrete circuit, low level, wide bandwidth buffer amplifier of Naim design, in fact good enough perform critical current-to-voltage conversion for a precision DAC. Furthermore, fitting the new high performance *DR*-grade regulators to this critical buffer stage has had a considerable effect. The low noise performance has been reinforced by the established use of the separate *500PS* power supply. This supply has a 1.1KW toroidal transformer to ensure power rail stability (even before the lines are fully regulated), so no wonder it's so very heavy.

For the latest *DR* version the same core amplifier circuit remains, again with a quasi-complementary output. The *500DR* gets the *NA009* power transistors, operating with a copper spreader plate as before, but with the new ceramic heat couplers. A few passive components are adjusted to compensate the new lowered impedances of the power regulators. Altogether, a *NAP 500DR* has no fewer than 20 of the *DR* regulators. As before, *B2 Spice* was still used in the initial design stages, as it continues to get the designer a long way, but there's nothing like getting a prototype onto the test bench, where real world electromagnetic fields and stray impedances influence the performance. This procedure has lead to extensive fine tuning alongside prolonged critical listening.

During an upgrade, a customer's *NAP 500* is completely disassembled by the same team that builds them in production. Once disassembled, two complete and tested amplifier channels are rebuilt, and new fans and gaskets are fitted too. The metalwork and logo are also carefully inspected and changed where appropriate. This work can now be done in one day as the amplifier channel assemblies are pre-built and tested. Once re-assembled, they are again tested, as if for new *NAP 500DR*. (Incidentally, a new production *NAP 500DR* takes 40 hours to build, and uses 2,392 parts.)

The designer Steve Sells spent a considerable time designing the massive regulators that are used in the *Statement*. They had to be quiet, stable, deliver 100A-plus, have a very low impedance and also fast recovery following high current transients. The same regulators are used here, but downscaled to fit the lower output current. The regulator design could then be optimised, taking advantage of the discrete circuitry to fine tune component values.





## Lab Report

Intriguingly the *300DR* tested in the last issue actually has greater peak output current (25.3A), versus the 18A maximum for the *NAP 500DR*. This amounts to 1.5dB less for the *500*, but conversely the *500* will swing greater output voltage, so is capable of producing 230W into 4ohms and 320W into 2ohms (significantly greater than the *300DR*'s corresponding 165W and 244W). On sheer undistorted loudness the *500DR* will therefore deliver almost twice the power into speaker loads in the 2 – 8ohm range. But if the loudspeaker loading is really severe and dips below 2ohms the *300DR* might go just a smidgeon louder before current clipping occurs. Taken overall, the *500DR* also has very slightly lower distortion as the high frequency intermodulation measured -96dB against the still excellent -93dB of the *300DR*, but this is splitting hairs.

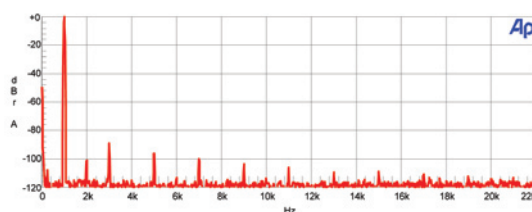
The *500DR* idles at a very low 34W standing power, and also runs very cool under high power program drive. It's fully protected against overdrive in high ambient temperatures, safeguarded by a low noise, computer grade fan on the back panel (which we only managed to invoke under full power 20kHz operation into 4ohms). We inadvertently tried to short circuit this power amplifier and it protested by blowing the input power line fuse (replaced in seconds). It took a few days of playing music to recover the full measure of the characteristically subtle sense of musical equilibrium after the lab torture tests.

Note that the output impedance figures in the table include a 5m run of *NAC A5* cable, so the actual value is about 0.1ohm less. High frequency intermodulation was an excellent -100dB at 1W (0.0001%), and pretty well all the results show that this is a very well designed and load tolerant amplifier. Although measurements may be helpful, they cannot by themselves guarantee a great sound: that is down to the designer, and how well the listening tests are coordinated with the design process.

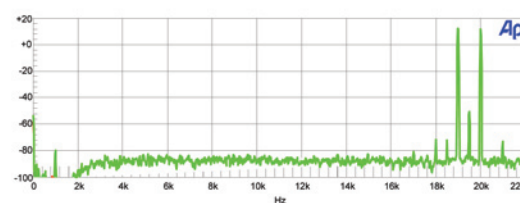
Frequency response is essentially flat, 20Hz-20kHz, with -0.5dB at 10Hz and 23kHz. Wideband material is actually uncompromised, as the high frequencies extend to 103kHz, -6dB. Absolute phase is maintained, while the input impedance, a moderate 18kohm, may not be ideal for some valve pre-amplifiers (which prefer 50kohm or more), but solid state pre-amps will have no difficulty. DC offset was less than 1mV, which is very low.

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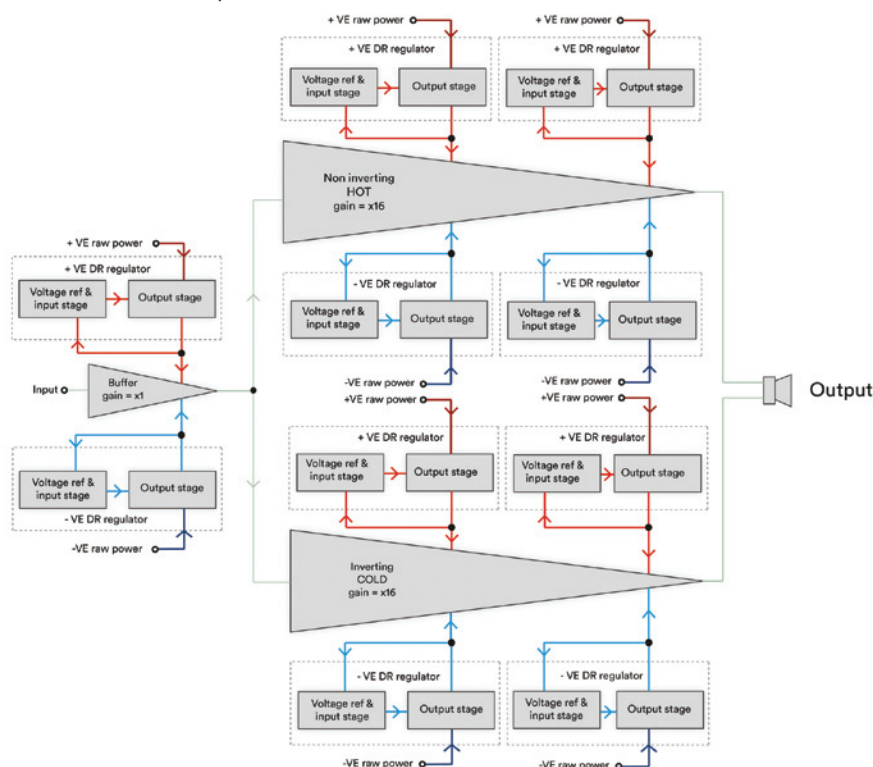
Naim 500DR 1kHz 1W 8 ohms distortion



Naim 500DR I/M 40W 19/20kHz 8 ohms



Naim 500DR Power Amplifier



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# Subjective Sounds

PAUL MESSENGER

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*Martin Colloms, Publisher*

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Three issues ago (*HIFICRITIC Vol9 No3*) I wrote about a very practical, sensible and inexpensive *irDAC* from Arcam. At a typical price of £425, it naturally made no attempt to set the sort of high standards one might encounter from brands like dCS or MSB. But it proved most effective at doing the very basic job of extending the analogue inputs of my system pre-amplifier into the digital domain, with full remote control over input selection too – a vital feature in my view.

Not long after that review had gone to press, however, I received an e-mail about a new *MkII* version. The differences seem quite minor, but are the reason for covering the new version here. For examples, the replacement does include a price rise to £495, which is still quite inexpensive in my opinion, but also seems to have addressed a couple of irritations that snuck up on me after I'd already written the original review.

Although I was happy enough with the original, a couple of minor niggles that emerged included a tendency to 'click' when changing either sources or TV channels. This was only mildly irritating, but the DAC also showed an occasional tendency to 'crash' (as all computers seem wont to do), which was certainly rather more exasperating. The good news is that the 'click' seems to have completely disappeared from the latest version, and (after a couple of weeks) it hasn't yet crashed (he says, carefully touching wood).

I normally use one of the two optical (Toslink S/PDIF) inputs for the TV, a USB type II input for my laptop (which only started working after I restarted it and went to a sub-menu), and one of the two electrical S/PDIFs for the Naim *UnitiServe* (when it's working, which it isn't right now – see *Editorial*). That leaves three inputs that are currently unused – one optical, one electrical, and one other. On the original *irDAC* this 'other' was labelled '*iPod*' on the handset, and appeared to add an extra USB type I on the unit, but the new *irDAC-II* has replaced that input with a Bluetooth capability, which is why a stubby little aerial now attaches to a screw terminal on the back. Another difference between the old and the new models is that the 'digital out' socket has been replaced by a pair of variable analogue outputs (which I naturally ignored).

The new handset is the same intelligently small and light plastic affair as its predecessor, though it actually has three fewer buttons, eliminating an unnecessary on/off and others labelled 'AES' and 'filter', neither of which I used previously (or indeed knew what they did!)

Since CD now seems to be in decline, I reckon I'll stick with vinyl as my prime source. Although the arrival of downloads, servers and streaming might have made digital stuff more musically interesting, it has also become much more complicated too, as computers, networks and the internet have effectively taken over from the much more straightforward (and reliable) CD player. This might be no problem for those who enjoy interacting with computers and computer technology, but digital audio seems better avoided by people like yrs trly that consider them useful but also a pain in the proverbial.

I'm perfectly happy for others to follow a digital audio future, but I myself will continue to regard it as a secondary source: certainly worth having, but hardly meriting the sort of expenditure I'll happily lavish on the analogue gear. Simply as a remote-controllable switch-box for digital sources, Arcam's £495 *irDAC-II* is clearly exceptional value for money, so the no-frills Best Buy rating of its predecessor definitely deserves to continue.