USB/Network DAC & headphone amp
Made by: Naim Audio Ltd, Salisbury
Supplied by: Naim Audio Ltd
Telephone: 01722 426600
Web: www.naimaudio.com
Price: £2399

AUDIO FILE

hi-fi news OUTSTANDING PRODUCT

Naim Audio Uniti Atom Headphone Edition

The evergreen Uniti Atom all-in-one platform, complete with custom streaming solution, is adapted to service the needs of the most demanding headphone users

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

Never let it be said the product name isn't long enough – in the 12 years since Naim launched its network audio all-in-one, to which the buyer need only add speakers, it's grown from the simple NaimUniti of the initial model, all the way to this, the £2399 Naim Audio Uniti Atom Headphone Edition. And yet here, less is more.

This new arrival, despite being the same price as the existing Atom, which continues in the range, has shed the power amplification of what is the company's most compact streaming system, slotting in below the full-width Nova and Star models. Here the unit is re-purposed as a dedicated device for followers of the 'head-fi' trend, complete with a choice of conventional and balanced headphone outputs. Well, that's almost the whole story…

STREAM CITY

This is the latest evolution of Naim's in-house streaming platform first unveiled with the arrival of the current Uniti models [*HFN* Nov '17], and which has gone on to underpin not only the Uniti range, but also both the Mu-so lineup and its latest-gen ND-series of network players [*HFN* Sep '18]. The intention of futureproofing has been borne out, not least with the inclusion of Chromecast built-in, along with both Bluetooth and Apple AirPlay 2.

Just about anything you want to stream from your computer, phone or tablet is accommodated here, along with a high-res UPnP/DLNA interface able to handle files up to 384kHz/32-bit and DSD128. There's also Roon-ready capability for those who swear by it, such as myself.

But back to the Uniti Atom Headphone Edition, and having had good experiences using both Uniti and Mu-so systems as part of multiroom set-ups – another facet of the Naim eco-system, although the company is no longer unique in this respect – I was interested to see how this unit would adapt to the headphone world.

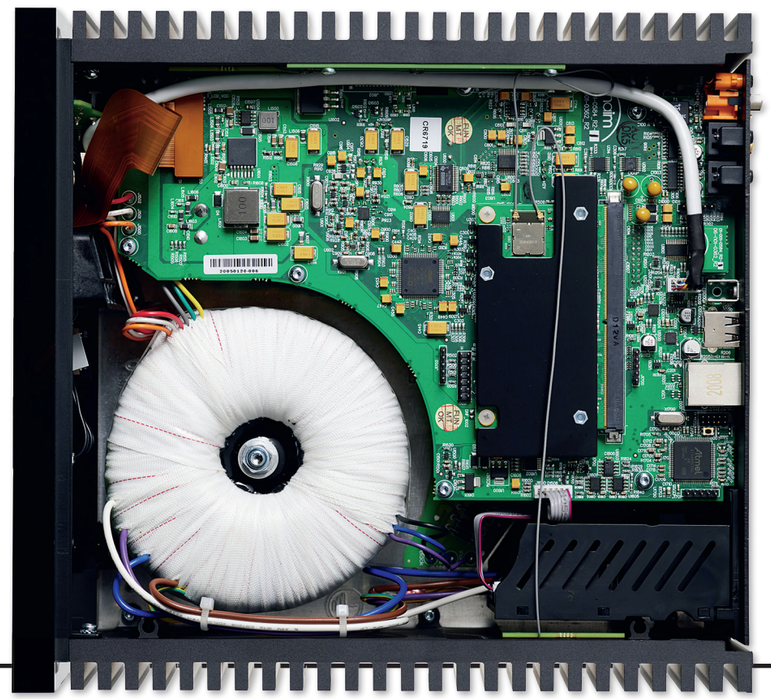
The Atom HE may not be the company's first foray into headphone listening – that was the Headline headphone amp. Also, the DAC-V1 was designed in part as a bridge between PCs and 'phones. Similarly, much play was made of the quality of the Supernait 3's integral headphone amp a couple of years back – but the Atom HE is otherwise Naim's most complete offering to date for fans of personal listening.

Not only can it stream music from the user's own collection, be it located on network storage or USB devices, it can also deliver online services including Spotify Connect, Qobuz and Tidal, not to mention the 'hi-res' 320kbps AAC BBC radio streams as part of its Internet radio capability.

PREAMP TOO

All these services are best accessed via the Naim app, although the unit also comes with an RF remote handset [see p53]. In addition there are both optical and coaxial digital inputs as well as a single set of analogue ins, the latter digitised at 48kHz [see PM's Lab Report, p53].

It should be noted that one of the gains made in the development of the current Naim platform was greatly improved Wi-Fi capability. Despite the absence of any external antennae for this or its other wireless modes, the Atom HE is fully capable of handling hi-res PCM or even DSD given a reasonable home network signal strength, although many will want the reassurance of the wired Ethernet connection located on the rear of the unit.



RIGHT: Large toroidal transformer [lower left] feeds separately-regulated supplies for internal Wi-Fi solution [centre, right], Atmel micro-based USB and Network inputs [right], main SHARC DSP [centre], TI PCM1791 DAC-based analogue stage [top] and headphone preamp [far right]

LEFT: To the left of the large colour display are a USB-A port, 6.3mm and balanced 4.4mm headphone outputs while buttons to the right cover play/stop, input and 'favourites' settings

So regardless of input, all signals pass through Naim's long-refined SHARC-based digital signal processing, and the company's favoured TI PCM1791 DAC, and thence to the output stage – which is something Technical Director Steve Sells and his team have reportedly spent much time fettling.

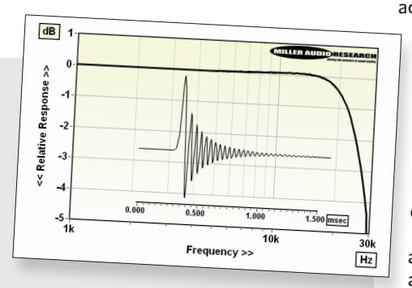
Yes, this is a headphone amplifier, with both 6.35mm unbalanced and 4.3mm Pentaconn balanced sockets on the front panel, plus a four-pin XLR balanced headphone output to the rear, but it can also be used as a preamp, thanks to both RCAs and XLRs round the back.

'B&W's P9 'phones were made to work for their living'

IN THE BALANCE

Now this is rather interesting, as there's no sign of Naim's usual DIN connectivity here, although the company is at pains to emphasise that the current Uniti models have never offered such provision. However, balanced XLR preouts – and matching power amp inputs – are only currently found on the company's flagship Statement pre/power [*HFN* Jun '15], alongside the familiar DINs used for unbalanced working. So it will be interesting to see whether Naim launches more mainstream power amps (and indeed preamps) equipped with balanced XLRs.

DIGITAL DOMAIN



The response and time domain behaviour of the Uniti Atom's digital heart is entirely determined by Naim's custom 16x upsampling digital filter. This brickwall IIR filter is executed on a SHARC DSP and is combined with two series-connected 3rd-order analogue filters (6th-order roll-off) at the output. In common with the proprietary WTA filter used in Chord Electronics' DACs, Naim's bespoke filter cannot be adapted to accommodate MQA, should either company have been inclined to offer this facility in the first place. Specifically, Naim's digital filter avoids acausal pre-ringing, but does exhibit extended post-ringing [see inset Graph]. The partnering Burr-Brown PCM1791, a legacy 'Advanced Segment' DAC, operates up to 192kHz/24-bit and DSD64, but its response here does not exceed 30kHz with either 96kHz or 192kHz media. Instead, Naim's digital filter cuts in earlier, delivering a ~60th-order roll-off at –3dB/27kHz [see Lab Report, p53]. PM

Most of my listening to the Uniti Atom Headphone Edition was, unsurprisingly, carried out using a variety of headphones, but I also tried it running as a preamp into my main system.

EASY DOES IT

It acquitted itself well in both roles, though I wouldn't have minded a fixed output option on the preamp sockets, enabling it to be used as a source as well as a streaming pre. It's also worth noting that Naim says all three headphone outputs can be connected simultaneously, which could be handy given that rear-panel XLR output, but that for best performance it's best to stick to using one output at a time. Incidentally, the front headphone outputs will mute the preouts when 'phones are connected, while a button above them switches the rear output on and off.

It's worth sticking to that 'one headphone at a time' suggestion for while the Atom HE doesn't sound laboured even if you do use all the outputs simultaneously, there's a useful gain in impact and clarity to be had, whether or not balanced 'phones are being used. And that 'useful gain' in quality is sufficient to take the Atom HE from excellent to superb.

In fact whichever kind of headphone output you use, this is a device able to bring out the best in a wide range of accompanying models, from easy-going moving-coil types to demanding planar magnetic designs such as the balanced Oppo PM-1 [*HFN* Jul '14].

But whichever you use, the essence of the Atom Headphone Edition is that it manages to drive headphones with both ease and conviction, while at the same time maintaining those Naim-esque qualities of detail and rhythmic acuity.

Even relatively lush headphones such as the B&W P9 Signature [*HFN* Mar '17] are kept under strict control and made to work for their living, while more obvious 'monitor' designs including the original Focal Spirit Pro [*HFN* Dec '15] – still among my favourites – sound fast, wide open and thrilling, without straying into harshness.

Without resorting to the complexities and 'fiddle factor' of designs such as SPL's Phonitor xe [*HFN* Jul '21], Naim has managed to design a headphone amp all ⇨

ABOVE: Alongside wireless [inside] and wired Ethernet ports are USB-A, coax, two Toslink optical and one pair of analogue inputs (RCAs). Preamp outs are offered on RCAs and balanced via 3-pin XLRs, with a balanced headphone output on a 4-pin XLR

about the most important sonic trait – the direct communication of music. And that means just about every style of music you choose to throw at this streaming headphone amp, including really raw recordings like Motörhead's *No Sleep 'Til Hammersmith* [Bronze BMGRM023LP] sounds suitably driving and thrilling, for all its abrasive edge. Similarly, a characterful vocal such as Sonja Kristina's cover of ELP's 'Still… You Turn Me On' [Purple Pyramid records' *A Tribute To Keith Emerson And Greg Lake*; CLO 1539] is beautifully resolved and has superb character.

By the way, should you ever want to hear the original 'god of hellfire', Arthur Brown, tackling the first part of 'Karn Evil No. 9' in his 70s, or Keith Emerson's son and grandson attempting 'Fanfare For The Common Man', this curiosity is the one for you.

MAJOR SCALE

The sound here is never less than entirely focused on the performance, as is clear with *American Quilt* [675 Records 538668572], the rootsy Paula Cole set of standards across a variety of genres. The singer's voice is revealed with all its textures intact, to glowing effect, while the accompanying musicians are exceptionally placed, for example on the stomping 'Black Mountain Blues'.

LEFT: The illuminated keys on Naim's RF 'Zigbee' remote allow full access to its menu and features, even in low-light conditions

Without recourse to any obvious signal-manipulation, the Naim Atom HE seems to do a fine job of dispelling that 'shut in' effect sometimes afflicting headphone listening, even when powering closed-back designs such as the Focal Stellias [*HFN* May '19].

And the Uniti Atom HE puts in a good showing with the scale and drama of classical music, too, whether it's the gentle, small-scale scoring of the *Brazilian Landscapes* album of recorder, percussion and guitar [OUR Recordings 6220618; DSD 128, see p94], which is treated to a lucid, beautifully-measured view of the instruments, or the weight and power of the Budapest Festival Orchestra/Iván Fischer recording of Brahms' Third Symphony [Channel Classics CCS SA 43821; DXD].

From the opening chords of the Brahms, the Atom HE, driving the Oppo PM-1 headphones in this case, delivers a sound of real drama and impact, but packed with detail and with a delicious sense of the orchestra ranged before the listener. The wide-ranging ability of this compact but substantial streaming headphone amp is never in doubt.

HI-FI NEWS VERDICT

Although it's had headphone amps in its lineup before, Naim is something of a latecomer to the whole streaming head-fi arena. However, the arrival of this unit, delayed by you-know-what, was well worth waiting for. The Atom HE sounds magnificent across a range of musical styles and partnering headphones, combining fine detail, power and control. It's even a respectable streaming preamp, too.

Sound Quality: 88%

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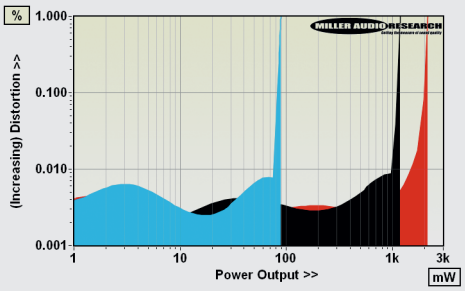
LAB REPORT

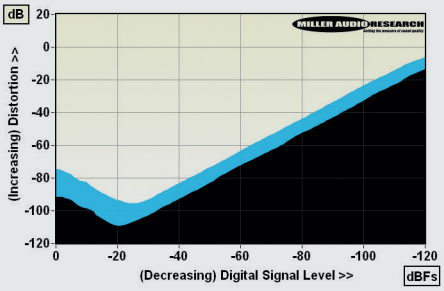
NAIM UNITI ATOM HEADPHONE ED

All inputs are eventually routed via Naim's choice of PCM1791 DAC, including the *analogue* RCAs which run through a PCM1803A ADC at 48kHz/24-bit. This limits the frequency response to –3dB/22kHz while all other 88.2kHz+ *digital* inputs are limited to –3dB/27kHz courtesy of Naim's custom IIR digital filter solution [see boxout, p51]. The DAC/preamp path offers a modest 104dB A-wtd S/N ratio but excellent ±0.1dB linearity over a 100dB dynamic range, low distortion that falls to 0.0002-0.001% over the top 30dB of its range [20Hz-20kHz, Graph 2] and exceptionally low <15psec jitter with all input sample rates.

Note that the ADC clips with analogue inputs above 2.9V and that the maximum balanced line output is 4.75V via analogue or full-scale digital inputs. Gain is a higher +12.5dB via the headphone output and so its maximum output is 7.1V with a 0dBFs digital input (clipping at volume '92') or 7.8V via the analogue input. The maximum single-ended power outputs [see Graph 1] are 89mW/600ohm (voltage limit), 1190mW/32ohm and 2225mW/8ohm (current limit), all perfectly in line with Naim's rated 1500mW/16ohm. The output impedance is not vanishingly low at 5.2ohm, representing a signal loss of some 1.2dB/32ohm, but this and any possible response variations, will be minimal into higher, 600ohm headphone loads. Moreover, the –93dBV (22µV) unwtd residual noise suggests the Uniti Atom will serve high sensitivity 'phones with usefully quiet backgrounds. Finally, headphone distortion actually reduces under load here from 0.006% at 0dBV/unloaded to 0.005%/30mW/32ohm through the midrange, albeit with a slight increase from 0.0075% to 0.01%, respectively, at 20kHz. **PM**



ABOVE: Continuous power output vs. distortion into 600ohm (blue), 32ohm (black) and low 8ohm (red) headphone loads. THD is largely unaffected by load



ABOVE: Preamp distortion vs. 48kHz/24-bit digital level over 120dBFs range (1kHz, black; 20kHz, blue)

HI-FI NEWS SPECIFICATIONS

Maximum output (<1% THD into 47kohm)	7.8V (Balanced XLR preamp)
Max. power o/p (<1% THD; 8/32/600ohm)	2225mW / 1190mW / 89mW
Output Impedance (20Hz-20kHz)	5.2-5.3ohm (22-296ohm, XLR)
A-wtd S/N ratio (re. 10mW/0dBV)	85.5dB / 103.7dB (DAC/pre)
Distortion (20Hz-20kHz, re. 10mW/0dBV)	0.004-0.01%/0.002-0.009%
Frequency resp. (20Hz-20kHz/30kHz)	+0.dB to –0.6dB/–14dB
Digital jitter (48kHz / 96kHz)	15psec / 12psec
Power consumption	12W
Dimensions (WHD) / **Weight**	245x95x265mm / 7kg