

USB DAC/headphone amplifier  
Made by: Novatron, Gyeonggido, South Korea  
Supplied by: SCV Distribution, UK  
Telephone: 03301 222 500  
Web: www.cocktailaudio.com; www.scvdistribution.co.uk  
Price: £2199

AUDIO  
FILE

USB DAC/HEADPHONE AMP

# Novafidelity HA500H

Best known for its music rippers and servers, the Korean company has now entered the personal audio market with a comprehensively-equipped DAC/headphone amp  
Review: **Andrew Everard** Lab: **Paul Miller**

When it comes to affordable music players with hard disk storage, few companies have the pedigree of Korea-based Novatron. Its range of products, sold under the Cocktail Audio brand worldwide – including here, before a UK-only rebranding to Novafidelity – starts from as little as £650 for the X14 model. In this instance the user is able to decide how much storage capacity to have installed, or even buy the unit ‘bare bones’ and add their own choice of drive.

Now, having expanded its range into higher-priced, high-end machines such as the £5000 X45Pro streamer/server/DAC [HFN May '19], the company is further stretching its brand with the addition of some associated components beyond its core lineup. The £649 N15D is a network/USB adapter and DAC, but still has a 2.5in HDD/SSD slot for direct music playback, but the £2199 HA500H DAC/headphone amp featured here really breaks the mould for there's no networking, and not a sniff of any provision for onboard storage.

**BACK TO BASICS**

There's not even a USB Type-A socket to which an external drive can be connected, though in common with other products of this type, the HA500H does have a USB-B socket to connect a computer, as part of its range of digital inputs. As well as its main function as a headphone amplifier, it can be used as a simple DAC/preamp: it has a single set of analogue ins, on both RCAs and balanced XLRs, and a matching complement of analogue outputs, which can be run at fixed or variable level. So you could also use it as a DAC to feed a conventional amplifier or preamp, or take a feed from your existing amp and set it up as a standalone headphone amplifier. Or, indeed, both.

**RIGHT:** A screened toroidal transformer [lower right] feeds independent switchmode and linear PSUs for the wireless Bluetooth receiver and DSP [left], ESS9018 DAC/analogue stage [top centre] and ECC82 triode tube output buffer [top right]

In addition to that USB-B and optical, coaxial and AES/EBU XLR inputs, there's an I<sup>2</sup>S digital connection made via HDMI, partnering components such as the company's £1799 X50D streaming ‘transport’, which can support up to DSD256 via its I<sup>2</sup>S outputs, and its up-specced £3999 X50 Pro variant. The HA500H also has a wireless Bluetooth input for quick and easy streaming from your smartphone, tablet or even a computer. It supports A2DP and AVRCP profiles, and SBC, aptX, AAC and MP3 audio formats.

Novafidelity refers to its HA500H as a ‘Hybrid Headphone Amplifier, DAC, Preamplifier and Asynchronous USB DAC’ but just in case you thought ‘hybrid’ referred to those multiple functions, there's more to it than that. The user can select either a solid-state output or one using a pair of ECC82 valves, the company helpfully suggesting that the HA500H ‘will

let you choose a different sonic signature in reproducing music according to your feelings and music character’.

**SPLENDID ISOLATION**

It's not quite that simple, of course, but it's also worth noting that it employs a pair of ESS Sabre ES9018K2M DACs – one per channel – and completely isolated circuits for the analogue and digital sections right down to using a custom toroidal transformer in the PSU. All analogue inputs are converted via an ADC to digital within the HA500H

*‘I have never heard these ‘phones driven so convincingly’*

while the analogue output stages remain fully balanced. This is all about keeping the circuitry as low-noise as possible, while at the same time rejecting interference.

The USB DAC input supports MQA-encoded files, DSD up to DSD256 and PCM to 384kHz/32-bit, and the headphone output is available on both a single-ended



jack socket and an XLR balanced feed, with a choice of ‘High’ or ‘Low’ impedance settings to suit a wide range of headphones [see PM's Lab Report, p67]. In ‘High’ mode the HA500H claims up to 1100mW, and 450mW in ‘Low’, both into 16ohm via the unbalanced headphone output.

Thanks to clear controls and a remote handset, the HA500H is simple to use: I especially like the front panel buttons for basic functions, from turning the ‘tube’ mode on and off, to choosing high/low impedance and switching between line and headphone output and balanced/unbalanced ‘phones. It's so much better to have direct controls rather than having to delve deep into menus to make the most commonly-used changes.

It's all helped by a large, sharp display panel able to show a range of screens, from virtual swing-needle meters – fun for about ten minutes and then very distracting – to bar-type readouts (ditto) and graphic

representations of the input in use. Helpful, too, is a display able to show at a glance the state of all the selectable parameters.

In common with other products in the Novafidelity catalogue, construction here is solid and workmanlike without succumbing to the excesses of some high-end equipment, with CNC-machined aluminium, polished to a good finish, on a steel chassis. In use, the HA500H feels more like a functional piece of equipment rather than a piece of audiophile jewellery, but there's nothing at all wrong with that.

**PURE AND SIMPLE**

When one is used to do-it-all devices able to stream music as well as offering DAC/preamp functions, something as simple – well, sort of – as the HA500H takes a spot of familiarisation. What's clear is that this isn't a standalone product, even if you want to do no more than play music through headphones. You will need some

**ABOVE:** The thick, CNC-machined alloy chassis is adorned with a configurable 5in TFT display that provides an informative readout of input/output selection, signal and volume level, tube option and jack/balanced XLR ‘phone modes

form of source component, whether that's a network player or even just a computer.

I used the HA500H both with a Naim ND555/555PS combination [HFN Apr '19], connected using analogue and coaxial digital cabling, and a Mac mini computer running Roon. It was connected as a preamp and at fixed level as a pure DAC, while headphone choices to hand for testing included the ultra-revealing Focal Spirit Pro [HFN Dec '15], and B&W P9 Signatures [HFN Mar '17], with the sadly now defunct Oppo PM-1 headphones [HFN Jul '14] used to test the balanced and unbalanced connection options.

The short version of the story is that the HA500H sounds best when used as simply as possible. For example, there was no advantage when paired with the Naim player to using analogue or digital connections, beyond the 555's ability to play DSD64/128 files (although these also come down to 192kHz/24-bit when output via the player's digital connection).

Passing the signal through the Naim ND555's DAC into the HA500H's ADC/DAC chain robbed the music of some of its life, notable with the big, bold sound of the Utah Symphony/Thierry Fischer recording in Prokofiev's *Alexander Nevsky* [from Fresh! FR-735; DSD64]. Indeed, via this complex signal routing both the weighty, deep bass and open, airy vitality of the orchestra, choir and soloists were somewhat restrained. Playing it via USB from the Mac mini computer, either via Audirvana or Roon, was a much happier experience. ↪

**A HEADY COCKTAIL**

Based in the city of Yongin, about 45 minutes south of Seoul, Novatron may not be on the same scale as its relatively close neighbour Samsung, whose Digital City in Suwon has some 35,000 employees, but it's been building a strong reputation in digital music storage and playback systems since it was founded in 2003. Its first CD ripper/storage solution was launched under the Cocktail Audio brand in 2006, with the intention of combining in one box all that consumers needed to copy, store, index and play their music libraries. The brand's goal was clear: ‘...to lift existing computer-based sound technology to audiophile grade’. This, while enhancing user-friendliness, was the challenge for all brands in this sector, not least because the IT industry of that era was not especially focused on either sound quality or ease-of-use. But Novatron has persevered more successfully than most, the company saying its products ‘replace the need for computers since they are able to play all relevant formats quickly and get out of the way, and do all of this more elegantly’. It has certainly kept up to date with the latest digital music trends, accommodating new services and formats as they appear – from Tidal, Qobuz and Roon through to DSD256 and DXD playback.

## NOVAFIDELITY HA500H



**ABOVE:** Digital inputs span S/PDIF (coaxial, optical), AES/EBU (on XLR), USB-B for computer connection, HDMI for I²S, and wireless Bluetooth. Analogue inputs and fixed/variable analogue outputs are on RCAs and balanced XLRs

This effect wasn't just noted with works of this scale, or indeed only with DSD tracks. Playing 'What Have I Done Wrong', the opening track from veteran (to say the least!) bluesman John Mayall's *Nobody Told Me* set [Forty Below FBR 022], complete with Joe Bonamassa on guitar, showed the 'drying' effect of the HA500H's analogue inputs.

Playing it through USB from the computer was altogether more fulfilling, while kicking in the valve output stage gave just a shade more warmth, making the recording sound a little more organic and 'live'. However, I suspect this will be a matter of taste, and subject to the balance of the amp and speakers with which the HA500H is used.

### CLOUD 'N' CONTROL

Similarly, using the unit as a preamp as well as a DAC was less impressive than when it was fed at fixed level into a conventional preamp, suggesting the volume control here is best reserved for use when playing music through headphones. On which subject, it's when used as a headphone amp that the HA500H really comes into its own, being capable of an effortlessly dynamic sound regardless of the 'phones you throw at it.



With everything from radio drama to the cleanly-recorded jazz of the Kathrine Windfeld Big Band's *Latency* album [Stunt Records STUCD 17062], the amp delivered impact, detail and richness through

**LEFT:** Dedicated remote control governs volume, input selection, mute and navigation of the set-up menu

the generous-sounding B&W P9 Signature. Furthermore, the triode tube option rescued what was initially a somewhat brash, super-analytical 'Focal presentation' – but then the Spirit Pros were designed as monitoring headphones.

It was with the Oppo headphones run balanced that the HA500H really showed what it could do. I can safely say I have never heard these headphones driven so convincingly, and with such clout, control and sheer musicality – not even with Oppo's own late lamented HA-1 headphone amp [HFN Sep '14], with which Novafidelity's compact chassis has many superficial similarities.

It seems using the amp as intended – as a high-quality headphone-driver, with the luxury of that selectable output stage (which is much more than solid-state detail or lush valves) as a subtle tone control – is to hear it at its best. Indeed, it performs this task so well, some of its slight shortcomings when one explores its peripheral abilities are easily forgiven. For owners of headphones with balanced capability this alone must make this new Korean arrival worthy of serious consideration. Buy it to do one job exceptionally well, and you won't be disappointed. ☺

### HI-FI NEWS VERDICT

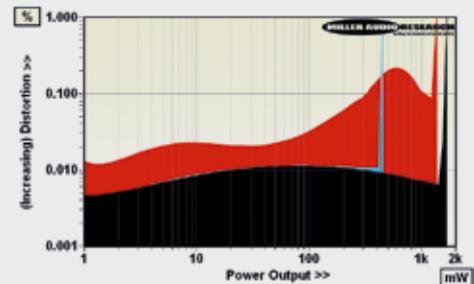
The HA500H may not have the massive do-it-all specification of some of its stablemates, but its focused USB DAC/preamp approach still remains very tempting. Frankly, it shines brightest when you overlook the frills and consider it purely as a headphone amplifier fed from one of the company's streaming players or, even better, just from a computer via USB. Keep it simple, and it really delivers.

Sound Quality: 85%

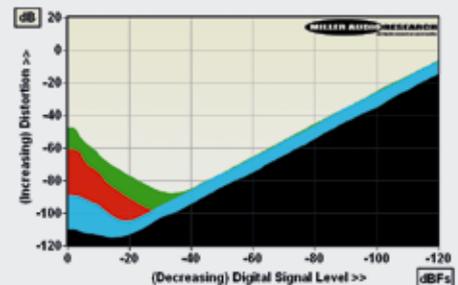


This product is a story of two halves: a dual-ESS9018-based USB DAC/preamp with solid-state and triode-tube output option, and a very capable analogue headphone amplifier. The latter has 'Low' and 'High' output options, ostensibly to match low and higher output headphone impedances, but both settings have the same high-ish 10ohm source impedance, potentially exaggerating swings in response with low/variable impedance headphones. Into a 'flat' 25ohm load there's a 2.5dB signal loss but the response extends from 9Hz-65kHz (-1dB). In practice, 'Low' and 'High' set the HA500H's overall gain at +7dB and +13dB, respectively, and determine the maximum output voltage into high impedance loads (4.6V and 9.1V) together with the maximum power into lower loads (448mW and 1650mW/25ohm). Very low impedance phones are well served too as the HA500H delivers a full 1350mW (1.35W) into 8ohm [see Graph 1] – sufficient to drive the super-sensitive Avantgarde Primo Duo XD speakers [p36]! Distortion is very low at 0.0004-0.002% into high impedances, increasing with decreasing headphone impedance and lower frequencies to 0.008%/1kHz and 0.025%/200Hz and 0.048%/20Hz (all 10mW/25ohm).

The DAC/line output offers 4.13V at 0dBfs (balanced XLRs) with a maximum A-wtd S/N of 114.2dB and distortion falling as low as 0.0002-0.005% (20Hz-20kHz) over the top 30dB of its dynamic range [see black/blue traces, Graph 2]. Responses reach out to ±0.01dB/20kHz (Fast digital filter), -2.9dB/20kHz (Slow) and ±0.04dB/20kHz (Minimum phase) with CD/48kHz data. The tube buffer has little impact on S/N but THD increases to 0.13-0.50% at maximum output [see red/green traces, Graph 2] while the low frequency response rolls away to -1.0dB/20kHz. PM



**ABOVE:** Power output vs. distortion (25ohm load, black = High gain, blue = Low; 8ohm load, red = High gain)



**ABOVE:** THD vs. digital level over a 120dB range at 1kHz = black (red = tube), 20kHz = blue (green = tube)

### HI-FI NEWS SPECIFICATIONS

Max. output (re. 0dBfs into 47kohm)	4.13V (preamp out, max vol)
Max. power output (25ohm, 1% THD)	1650mW (headphone out)
Output imp. (20Hz-20kHz, pre/headph.)	45ohm / 10.2-10.6ohm
A-wtd S/N ratio (DAC)/headphone)	114.5dB / 92.9dB (re. 10mW)
Distortion (20Hz-20kHz, pre/10mW)	0.0003-0.004%/0.0025-0.048%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to -0.01dB/-0.3dB/-0.1dB
Digital jitter (48kHz/96kHz; 24-bit)	40psec / 35psec
Power consumption	22W (1W standby)
Dimensions (WHD) / Weight	270x90x333mm / 6.9kg