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MOON NEO 430HA



Moon Nēo 430HAD desktop headphone amplifier/DAC

by Chris Martens

At a trade show roughly ten and a half months ago, Moon's representatives took me aside and asked if I would like a sneak preview of an upcoming, very high performance, headphone-centric product from their firm. As a self-proclaimed 'headphonista' and long-term student of all things headphone-related, I naturally jumped at the chance. What the Moon team showed me, in the form of then-embargoed specifications documents and a handful of design drawings, turned out to be a prospectus for their highly ambitious Nēo 430HAD desktop headphone amp/DAC (£3,300), which began to ship around November of last year.

Actually, to be more precise, I should say that Moon showed me a preview of two very closely-related products: the amplifier-only Nēo 430HA (£2,700, where 'HA' presumably stands for 'Headphone Amplifier'), and the Nēo 430HAD (where 'HAD' apparently means 'Headphone Amplifier/DAC'). In essence, the Nēo 430HAD is a 430HA that is fitted out at the factory with Moon's extremely versatile DAC3 Engine module. Interestingly, 430HA owners who decide they would like to add the DAC3 Engine module after the fact can do so for an upgrade/installation charge of £800.

As many of you know, a quiet revolution in the world of high-end audio has been taking shape over the past several

years—one centred upon high-performance headphone-based audio systems. In far too many cases, traditional high-end manufacturers and enthusiasts alike have reacted to this emerging market trend with everything from benign indifference on through to outright hostility or disdain (sad to say, we audiophiles sometimes can be a hidebound lot who find change difficult to embrace). This is a shame, because—whether audiophiles personally choose to use headphones or not—today's finest headphone-based systems undeniably serve up levels of performance deserving of their respect.

Happily, the good people at Moon well and truly 'get' this fact, and to their everlasting credit they immediately grasped that it would take great care, a ton of critical headphone listening, and some very, very serious design skills in order to craft a world-class headphone amplifier. It also helps that Moon has made a point of keeping a finger on the pulse of veteran headphone users to better understand their needs and wants. Accordingly, Moon approached the design of the Nēo 430HA/430HAD with the expectation that it would need to leverage everything it has learned through decades of building top-tier preamps, power amps, digital-to-analogue converters, and even low-noise phono stages (because headphone amps, like phono stages, must handle low-level signals with clarity, precision, and utter freedom from noise). As a result, I'm pleased to say, Moon's Nēo 430HA has emerged ▶



“The NĒo 430HA is a fully-balanced, wide-bandwidth, low-noise, and extremely powerful (8Wpc @ 32 Ohms) headphone amplifier.”

▶ as a truly great headphone amplifier—one that establishes performance benchmarks that only a tiny handful of competitors can hope to meet or exceed.

The NĒo 430HA is a fully-balanced, wide-bandwidth, low-noise, and extremely powerful (8Wpc @ 32 Ohms) headphone amplifier that provides four stereo analogue inputs (three single-ended, one balanced), two rear-panel stereo analogue outputs (both single-ended, one with fixed and the other with variable outputs), plus three front-panel headphone outputs (one single-ended and two balanced, one via a 4-pin XLR connector and the other via dual 3-pin XLR connectors). The amp provides a bevy of front-panel control buttons: buttons for Standby, Gain (to select either 14 or 20 dB of gain), Display (to turn the display, which shows the input selected and the volume setting, on or off), Crossfeed (to engage a so-called ‘crossfeed’ circuit designed to give more realistic, three-dimensional soundstages through headphones), up/down Input controls, Mute, and MP (to engage the front-panel ‘Media Player’ input), plus a large rotary Volume control encoder. Moon SimLink ports on the rear panel enable the 430HA to control (or be controlled by) other SimLink-equipped components. The industrial design is straight out of Moon’s NĒo-series playbook, which is to say simple, elegant, well-made, and attractively finished—but not ostentatious. Completing the picture is Moon’s multipurpose CRM2 remote, which can also be used to control other Moon components.

Moon says the NĒo 430HA features high-quality circuit components throughout, a sophisticated fully-balanced audio circuit for reduced noise and superior rendition of low-level details, and a low-operating-temperature design for greater long-term longevity. Moreover, the amp uses what Moon terms an “oversized power supply” based on two toroidal transformers and featuring eight stages of DC voltage regulation. Further, the amp uses four stages of the proprietary M-LoVo (Moon Low Voltage) DC regulation circuit—a circuit said to be “virtually free of noise” and to



yield “an exceptionally fast, precise, and stable DC voltage.” Interestingly, the same M-LoVo circuit is also used in Moon’s top-of-the-line Evolution-series 810LP phono preamplifier and 740P preamplifier, and is said to make for “a power supply with a virtually unmeasurable noise floor.” Then, expanding upon the themes of low-noise and precision, the NĒo 430HAD uses the firm’s 530-step, M-eVOL2 volume control, which is said to prevent “sonic degradation of the signal, regardless of the selected volume setting,” with channel-matching accurate to within 0.1 dB. In short, Moon sweated countless details large and small in crafting this design.

The optional DAC3 Engine, which once installed turns the NĒo 430HA into a NĒo 430HAD, adds a dramatic range of digital audio options to the headphone amp. Specifically, the DAC3 module provides four digital inputs (one optical TOSLINK, two coaxial S/PDIF, and one USB Type B port), and supports decoding for PCM files at bit depths and rates up to 32/384, and decoding for DSD64, DSD128, and DSD256 (though some of the highest resolution file-types are only supported via the USB interface, which is typical for most high-performance DACs these days). The DAC section’s intrinsic jitter carries an admirably low rating: < 25 picoseconds RMS.

One important note in passing is that Moon indicates the NĒo 430HAD requires fully 300 hours of run-in before it ▶



▶ sounds its best, and I must tell you they are right. Straight out of the box, the 430HAD sounds overly tightly wound, somewhat edgy, and more than a little bit stiff and 'dry-sounding'. But, given the time it deserves, the amp/DAC's sound gradually becomes much smoother, more expansive, and free-flowing, becoming more natural-sounding as the hours roll by.

To put the versatile Nêo 430HAD through its paces I compared it to my reference AURALIC VEGA Digital Audio Processor, TAURUS PRE preamplifier, and TAURUS MkII fully balanced headphone amplifier. In the course of my listening tests I tried the Moon at the front end of my traditional, speaker-based reference system, and with a wide range of headphones, including the superb Abyss AB-1266, the Audeze LCD-3, the HIFIMAN HE-560, and the Oppo HA-1 (with revision 2 ear pads). In all cases, the system was fed a mix of standard and high-res PCM, DXD, and DSD music files from my Lenovo/Windows/JRiver-based music server.

Viewed purely as an analogue headphone amplifier/preamplifier, the Nêo 430HAD is by any objective standard superb. In fact, I would say it is easily one of the two or three best-sound headphone amplifiers I have yet heard at any price. What I particularly liked about the Moon was the fact that it was highly detailed (yet not oppressively 'detail-obsessed') in its presentation, was exceptionally quiet (meaning it worked equally well the high and low-sensitivity headphones), was highly controlled (yet not unduly 'uptight'), was reasonably natural-sounding (yet never as a result of artificial warmth or a softly-focussed demeanour), and offered what can only be called bottomless-pit-like reserves of super-abundant power (this amp fears no headphone load of which I am aware).

Put all these characteristics together and you really do have an amp that gives top-tier performance through any headphone you wish, playing any kind of musical material

you choose, at any volume level you prefer, with no ifs, ands, or buts about it. Honestly, the only hard part is finding source components good enough to keep up with the Moon, as it will instantly and effortlessly reveal even small differences between sources.

To grasp the benefits on offer, try playing rollicking good-times pop/rock/funk music (e.g., 'Musicology' from Prince's album of the same name [Sony]) through an intensely power-hungry headphone like the Abyss AB-1266, and note how crisp the ultra-precise guitar and percussion transient sounds, or how cleverly inflected Prince's voice can be at times, or how taut and thunderously powerful bass notes of all kinds can be. This amp never, ever runs out of clarity or power so that after you listen through it for a while you may start to feel as if it makes other amps sound, by comparison, somewhat compressed-sounding or lacking in definition.

Or, try a track that is rich in subtle textural, transient, and reverberant details, such as 'Stank' from Jamey Haddad, Mark Sherman, and Lenny White's *Explorations in Space and Time* [Chesky], and note the effortless way in which the Moon envelopes you in layer upon layer of luxurious music details. On this particular track, the Moon's resolution and low-noise not only help each of the instruments in play to sound more realistic and complete, but also helps to reveal the acoustic context of the recording, allowing you to hear the interactions between the instruments' voices and acoustics of the recording space in a vividly three-dimensional way. Quite honestly, there is little to quibble about in the Moon's sonic performance, apart from the fact that the run-in period can seem to take forever and a day.

I have only two small nits to pick regarding the Moon's features/functions set. First, I do wish Moon had provided two Mute switches—one to silence the headphone outputs and the other to separately silence the rear-panel analogue outputs. I say this because there are moments where one ▶

“If you have yearned for a realistically priced, world-class headphone amplifier that can stand tall in comparison with absolutely any other amp being produced today, you need to look no further.”

- ▶ might want to use one set of outputs, but not the other (where as things now stand, both outputs are switched on or off together). Second, I would love to see Moon provide a set of variable-level balanced outputs for the 430HAD, as I think this would make it an even better preamp/DAC.

Assessed purely as a DAC, the NĒo 430HAD's DAC3 Engine is a very good and very versatile component, but one that is not quite the state-of-the-art performer that the 430HA amplifier is. This is not to take anything away from the DAC3 Engine option, though, as I think it arguably adds a huge amount of high-level digital functionality for not an awful lot of money. In side-by-side comparisons with the AURALIC VEGA Digital Audio Processor, I found I narrowly preferred the VEGA to the Moon DAC3 Engine, although the performance gap was narrow enough that I could happily have lived with either one on a long-term basis. In essence, the sonic differences amounted to the fact that the AURALIC offered a slightly more expansive, three-dimensional sound and an even more vibrant and natural sounding character overall. On the other hand, the DAC3 Engine option costs less than half what the AURALIC DAC does and is arguably much less fussy about device driver setup for those (like me) using Windows-based music servers.

If you have yearned for a realistically-priced, world-class headphone amplifier that can stand tall in comparison with absolutely any other amp being produced today, you need look no further than Moon's NĒo 430HA. If you already own a very high-quality, high-res PCM/DXD/DSD-capable DAC, then the 430HA is all you will need to start exploring the uppermost reaches of high-end headphone performance. If you don't already own a premium-quality, multi-format DAC, then going with the NĒo430HAD (and its embedded Moon DAC3 engine) makes an awful lot of sense. The DAC3 module offers very good performance, is ridiculously convenient to use, and will let you explore not only the high-res digital audio formats commonly available today, but also anticipates possible future format developments. Either way, Moon has a surefire winner on its hands. +

TECHNICAL SPECIFICATIONS

Type: High-resolution, fully balanced, solid-state, desktop headphone amplifier/DAC.

Inputs: One TosLink optical digital input (24/192-capable), two coaxial S/PDIF digital inputs (23/192 capable), one USB input (32/384 and DSD256-capable), two single-ended stereo analogue inputs (via RCA jacks), and one balanced stereo analogue input (via XLR jacks).

Outputs: One single-ended headphone output (via a 6.35mm headphone jack), two balanced headphone outputs (one via dual 3-pin XLR jacks, one via a 4-pin XLR jack), and two stereo analogue outputs (one fixed level and one variable level, both via RCA jacks).

Device drivers: PC environment (Vista, Windows 7 and 8) will support up to 384kHz sample rates and DSD64/128/256 with installation of a Moon-supplied device driver. Mac OS, iOS: no drivers are required.

Frequency Response:

Amplifier: 20Hz – 20kHz ± 0.1dB, 5Hz – 100kHz +0/-3.0dB

DAC: 20Hz – 20kHz ± 0.2dB, 5Hz – 72kHz +0/-3.0dB

Signal-to-Noise Ratio:

Amplifier: 120dB @ full output, 20Hz – 20kHz

DAC: >116dB @ full output

Distortion:

Amplifier: THD, 20Hz – 20kHz, 0.005%, IMD, 0.005%

DAC: THD @ 1kHz, 0dBFS (A-weighted), <0.001%, IMD, <0.004%

Power Output: 600 Ohms, 667mW,

300 Ohms, 1.33 Watts,

50 Ohms, 8 Watts,

32 Ohms, 570mW

Dimensions (H x W x D): 28 x 87 x 137mm

Weight: 10kg

Price: £2,700 for 430HA, or £3,300 for 430HAD version.

Note that the DAC3 Engine can be retrofitted to an existing 430HA for £800.

Manufacturer: Simaudio Ltd.,

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