Network-attached DAC/streamer
Made by: Naim Audio Ltd, Salisbury
Supplied by: Naim Audio Ltd
Telephone: 01722 426600
Web: www.naimaudio.com
Price: £4999

Naim Audio NDX 2

The Naim 'platform for the future' has brought new facilities, and a new look, to its network music player range – but have the signature sonic fireworks been retained?
Review: **Andrew Everard** Lab: **Paul Miller**

There was a certain inevitability about it. Back in October 2016, when Naim Audio launched its four 'new Uniti' models, based around what MD Trevor Wilson described as the company's 'platform for the future', the elephant was in the room throughout the press event. Eventually it was unleashed, and the question asked: would this new technology also be applied to the ND-series of network music players?

I think we all knew the answer already, as the description was given of the cost, both financial and in development time, of the new combination of hardware and software. Yet as I recall, the response was along the lines of 'Yes, that would be logical', delivered with something almost approaching a knowing wink. Now, with the arrival of the ND 555, ND 5 XS 2, and the NDX 2 we have here, that plan has come to fruition. Selling for £4999, the NDX 2 sits in the middle of the new lineup, which replaces the NDS, NDX and ND 5 XS with much more capable models.

MEET THE FAMILY

The entry-level ND 5 XS 2 is a simplified design, shorn even of a display panel to put all the effort into 'sound per pound' performance – like the others, it's best operated with the Naim app – while the ND 555 is £12,999 without the obligatory power supply, for which you should budget another £6999 for a 555 PS DR. Yes, you could use two power supplies if you wish, as you could with the outgoing NDS, and yes, this first network player in Naim's premium 500 Series is said to be the best source component the company has ever made, but then you might hope it to be, given that it'll set you back £20k in 'get started' form.

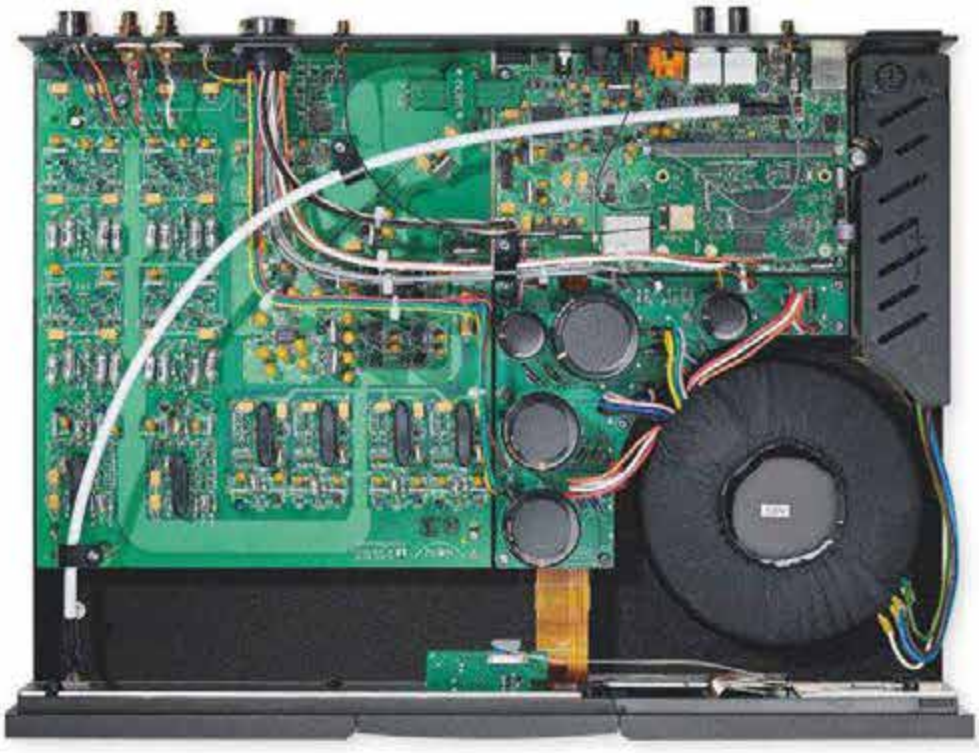
The NDX 2 is a somewhat simpler device than the ND 555 as it lacks the flagship model's extensive use of suspended circuitboards, multiple Naim DR voltage regulators and shielded as well as decoupled streaming board and inputs. The PCBs in the NDX 2 are also decoupled, but not to the extent of those in the ND 555, which float on massive brass platforms, and neither does this machine use the top model's suspended Faraday Cage design.

However, unlike the ND 555, the NDX 2 is usable straight from the box, thanks to built-in power supplies fed from a substantial toroidal transformer, of a size one might expect to find in many an amplifier [see inside shot, below]. There's also a small switch mode power supply which operates only when the unit is in standby – switch on and this decouples and the main linear PSU takes over. And being a Naim, the player can be upgraded with the addition of an XPS or 555 PS DR if required, once a link plug in the rear panel is removed. Add one of these power supplies and the internal supply is completely bypassed – indeed, the player's mains connector must be removed before it is fired up in 'two box' form. More on the effect of the add-on power supply later…

KICK INSIDE

So what's new here? Well the NDX 2, like all the new Naim ND-models, comes in the company's full-width casework, with subtle variants to the styling and finish for the three tiers of the range represented by the ND 5 XS 2, NDX 2 and ND 555. But beyond that 'best basic black with green logo' look, almost all is new inside the NDX 2, as is clear from that large colour screen to the right, with its row of four 'hard buttons' ranged vertically beside it.

There's also a new remote control to set it apart from the old. Shared with the new Uniti models, it's square, glossy, and operates over RF rather than IR, and once paired with the NDX 2, which takes all of



RIGHT: Massive linear PSU would power an amp but has independent regulation for Naim's custom streaming platform and FPGA-based filter/upsampling [top right] and PCM1792 DAC-based analogue board [centre and left]

ABOVE: Large, clear colour display will also show album artwork; 'hard buttons' to its right control power, play/pause, input selection and favourites; slot on left is for USB memory

a few moments, it can be used without needing line of sight to the player.

Under the lid, the star turn here is that new platform, which takes the capabilities of the old ND-series and brings them thoroughly up to date. Notable among the additions is the flexibility brought about by the inclusion of Chromecast Built-in, which opens up the player to a whole range of streaming audio possibilities at up to 192kHz/24-bit. It's this that allows the NDX 2 to stay in tune with newly-launched music services, as well as being able to play soundtracks from movies streamed on connected computers, tablets and smartphones. The NDX 2 is also compatible with streaming services including Tidal and Spotify, is Roon Ready, has AirPlay via its network connection, Bluetooth aptX HD wireless connectivity, and of course the familiar vTuner Internet radio capability.

Network music playback is also greatly enhanced over the original ND-range, its UPnP capability now extending to 384kHz/32-bit and DSD128. Naturally, the NDX 2 also has optical and coaxial digital inputs, plus front and rear USB Type A sockets via which it can play music stored on memory devices or portable players. Wi-Fi is provided as well as Ethernet connection, Naim saying its improved 2.4/5GHz implementation allows greater flexibility for the wireless streaming of higher-resolution files.

FAST REACTOR

I did find the NDX 2 more stable when streaming higher-resolution music wirelessly than previous Naim network products, but I have to say I stuck mainly to the wired connection for most of my listening – not for any reasons of sound quality, but mainly because that's what I'm used to, and how my digital music system is set up. And from the off it was clear that while this new network player may have just gained a whole load more flexibility, both in services and the range of files it can play, its sound remains resolutely 'Naim'. So it's both fast and exciting and bold and rich, allied to a highly nuanced view of the detail within a recording, and the presence and ambience of a performance.

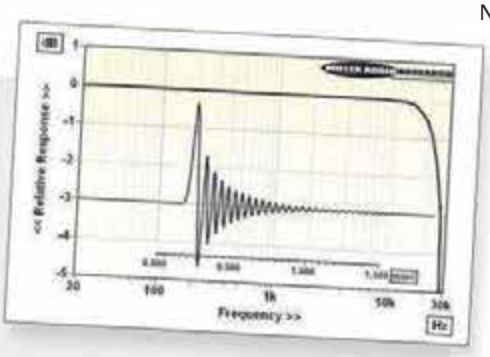
> 'What can sound thin, takes on scale and guts with the NDX 2'

That means that the driving rhythms of the mixed bag that is the *Graceland: Remixes* version of Paul Simon's classic album [Legacy Recordings; 44.1kHz/24-bit download] are delivered with speed and deftness, with 'remixed' power in the bass and real attack in the electronica making these familiar tracks all but unrecognisable. Basically, all that remains of the original is the odd snatch of vocals, but when Simon's voice does emerge it soars with expression and character, almost despite the repetitive shenanigans going on below it.

I'm still not sure that I'm that sold on this set, though it's hard not to like Richy Ahmed's thumping take on 'The Boy In The Bubble' when the NDX 2 gets to grips with its deep, heavy bassline, or the trippy 'shotoree shotoree' run Groove Armada take at 'You Can Call Me Al'. What can sound thin and insubstantial through lesser systems takes on scale and guts with the NDX 2 running through a system able to show what it can do. I was using my NAC 52/NA 52PS/NAP 250 DR [*HFN* Dec '15] combination into PMC OB1 loudspeakers, and the ability of the player to drive hard even with really low bass, while keeping treble detail focused, was never in question.

On to more familiar audiophile fare, and Pink Floyd's *Wish You Were* [in DSD64 from EMI 522 4332] sounded big and magnificent via the NDX 2, the long slow build of 'Shine On You Crazy Diamond' tingling and shimmering through the speakers in a broad sharp-focused soundstage that was almost three-dimensional in aspect. The familiar guitar line cut through the room with almost surgical electricity, the power of the rest of the instrumentation building behind it in a manner fit to have you turning up the volume and trying it again.

IN-HOUSE DSP



Co-developed by Electronic Design Director, Steve Sells, the custom brickwall IIR filter employed in the NDX 2 is executed on a SHARC DSP and combined with a gentle 6th-order analogue filter at the output. This digital filter type suffers no pre-ringing, but does exhibit extended post-ringing [see inset Graph] and, therefore, very little acausal distortion – just like a pure analogue filter. All incoming sample rates are increased to one of two elevated base rates – 768kHz (for 48k/96k/192kHz media) and 705.6kHz (for 44.1k/88.2k/176.4kHz media and DSD64 files). The Burr-Brown PCM1792A DAC, used here in current output mode with discrete I-to-V conversion, may handle 768kHz/24-bit data natively but the NDX 2's response does not stretch out to 45kHz (with 96kHz media) or 90kHz (with 192kHz media). Instead, Naim's custom IIR filter coefficients cut in earlier, delivering a 60th-order roll-off at 25kHz [see Lab Report, p59]. PM

ABOVE: Two Toslink optical and coaxial digital ins (one on BNC) are joined by USB-Type A and wired/wireless Ethernet for network audio. Outputs are on RCAs and a 5-pin DIN. Note the large connector to accommodate a DR-series PSU upgrade

Or in this case, turning the volume down, tinkering with the NDX 2's connections and moving my 555 PS from the Naim NDS to power the new player, and then just jaw-dropping at the 'more of everything' and heightened sense of realism it brings. The bass appears better extended and yet even more tightly controlled, and the midband and treble more finely resolved while further 'of a whole' with the rest of the sound. Yes, yes – I'd promised myself I was going to wait until the listening was over before resorting to external power, but the 'what if' temptation was too hard to resist.

CLOSE QUARTERS

So let's get this out of the way right here and now, courtesy of an extended session with the 555 PS'd NDX 2. OK, a 'wife's away, house next door awaiting new tenants' all-nighter (I love it when a plan comes together!): the NDX 2, when used in this two-box form, sounds nothing short of magnificent, bringing the listener closer to the music than almost any other network player I know. And it does so by combining oodles of information, superb insight into recording and performance, and an entirely 'unswitchoffable' addictive quality that really did have me endlessly doing the 'wonder what this sounds like?' thing over and over again.

Note that I said 'almost any other network player I know', for I have to admit that after lengthy back-to-back comparisons, I think the 'old' NDS, used with a single 555 PS DR power supply may give away a shade of detail to the NDX 2/555 PS DR combination, but it has just a bit more 'boogie factor' to it, making music the tiniest bit more captivating. Now I freely admit this may just be to do with my sheer familiarity with the old flagship player, but to these ears it just sounds a little more 'real'.

That parked, back to the NDX 2 in self-powered mode, and whether with its digital inputs, streaming music from network storage or playing tracks stored on USB sticks, there's no doubt that the new Naim network player offers remarkable insight into the music. This is clear with the Budapest Festival Orchestra/Iván Fischer recording of Mendelssohn's music for *A Midsummer Night's Dream* [Channel Classics CCS SA 37418; DSD128].

The sheer weight and attack of the orchestra in the more exuberant passages is combined with the fine detail available in quieter moments, and the sense of the orchestra in a living soundstage before the listener. And when you add in its remarkable flexibility – and upgradability – this is clearly a very special player.

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

HI-FI NEWS VERDICT

Naim has given its ND-series players a complete update, and if the superb NDX 2 is anything to go by, the additional facilities have been achieved at no expense whatsoever to the sound, which remains thrilling, fulfilling, and entirely musical. The newcomer may lack a little of the old flagship NDS's sonic 'Naimness', but it has an entirely compelling presentation that's as enjoyable as it is insightful.

Sound Quality: 85%

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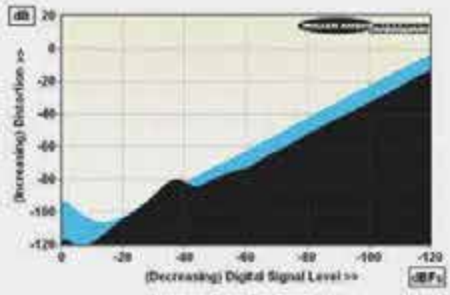
LAB REPORT

NAIM AUDIO NDX 2

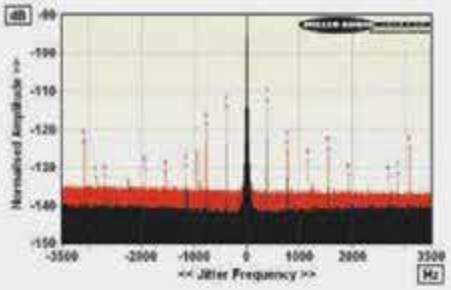
All digital inputs are processed via the same upsampling/jitter-suppressing 40-bit code and pass through the same PCM1792A DAC, a regime that's so effective there's no significant difference in performance whether data is delivered via S/PDIF, USB-A or (wired) network connections. The fixed analogue output offers a maximum 2.22V from a low 17ohm source impedance that increases to 190ohm at 20Hz. The NDX 2 offers a mere 0.0002-0.0055% distortion (1kHz, 0dBFs to –30dBFs) and 0.00075-0.0035% (20kHz, 0dBFs to –30dBFs) [see Graph 1, below] and a suitably wide 109dB A-wtd S/N ratio that enables a low-level linearity that's true to ±0.1dB over a 100dB dynamic range (±0.5dB over a 110dB range).

The response and time domain behaviour of the NDX 2's various digital inputs is entirely determined by Naim's custom upsampling digital filter [see boxout, p57]. This filter acts earlier than is typical, providing reduced attenuation of stopband artefacts immediately adjacent to the top-end of 48kHz music media (just –43.6dB at 26kHz re. 22kHz) and restricting the response of both 96kHz and 192kHz digital audio to a –3dB point of 27kHz. Lower 44.1kHz/48kHz sample rates feature a (subjectively insignificant) –0.65dB roll-off at 20kHz while Naim's dual-mono analogue stage layout [see far left of inside shot, p56] ensures that channel separation is >110dB from 20Hz-20kHz.

Jitter suppression is excellent if not absolutely state-of-the-art [see Graph 2, below] with evidence of very low-rate jitter (note broadened peak) and correlated sidebands at ±384Hz and ±768Hz (65psec with 48kHz/24-bit data) and extending to ±1152Hz, ±1536Hz, *etc* (105psec with 96kHz/24-bit data). **PM**



ABOVE: Distortion versus 48kHz/24-bit digital signal level over a 120dB dynamic range via S/PDIF/USB/network (1kHz, black; 20kHz, blue)



ABOVE: High resolution jitter spectrum via S/PDIF/USB/network (48kHz, black; 96kHz, red with markers)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	2.22Vrms / 17-191ohm
A-wtd S/N ratio (S/PDIF / USB)	109.1dB / 109.0dB
Distortion (1kHz, 0dBFs/–30dBFs)	0.00028% / 0.0053%
Distortion & Noise (20kHz, 0dBFs/–30dBFs)	0.0034% / 0.0012%
Freq. resp. (20Hz-20kHz/30kHz)	+0.0 to –0.65dB/–15.9dB
Digital jitter (48kHz / 96kHz)	65psec / 105psec
Resolution @ –110dB (S/PDIF / USB)	±0.6dB / ±0.6dB
Power consumption	16W (1W standby)
Dimensions (WHD) / **Weight**	432x87x314mm / 10kg