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Network-enabled media player/storage/USB DAC
Made by: Astell&Kern, Seoul, Korea
Supplied by: Computers Unlimited, London
Telephone: 0208 200 8282
Web: www.astellnkern.com; www.unlimited.com
Price: £8999

Astell&Kern AK500N

Having redefined portable hi-fi, Astell&Kern has turned its thoughts to music at home: the result is as idiosyncratic as you'd expect, but the sound is remarkable

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

There's an apparently amusing note in the instruction manual for Astell&Kern's AK500N, the company's new £8999 network player. It says 'This device was tested for typical body-worn operations with the back of the portable music player kept 5mm from the body.'

While still sniggering that anyone would want to lug around an 11.4kg unit clearly designed for home use (albeit powered by an internal battery), I received a picture of an AK500N user doing just that, employing a frame on his back built by Japanese company VanNuys, which also makes cases for the more obviously portable A&K products. Oh well…

APPS ON THEIR WAY

The AK500N is the first 'desktop' model from the Korean company, and is set to be joined this year by a matching power amp and enhanced supply, thus creating a complete 'just add speakers' system.

More on that in our interview with A&K's James Jeong [see p37], but for now we have a unit combining the functions of network server/player, CD ripper, USB/MicroSD card player and DAC with asynchronous USB and Bluetooth – and all in a strikingly styled, almost cubic package.

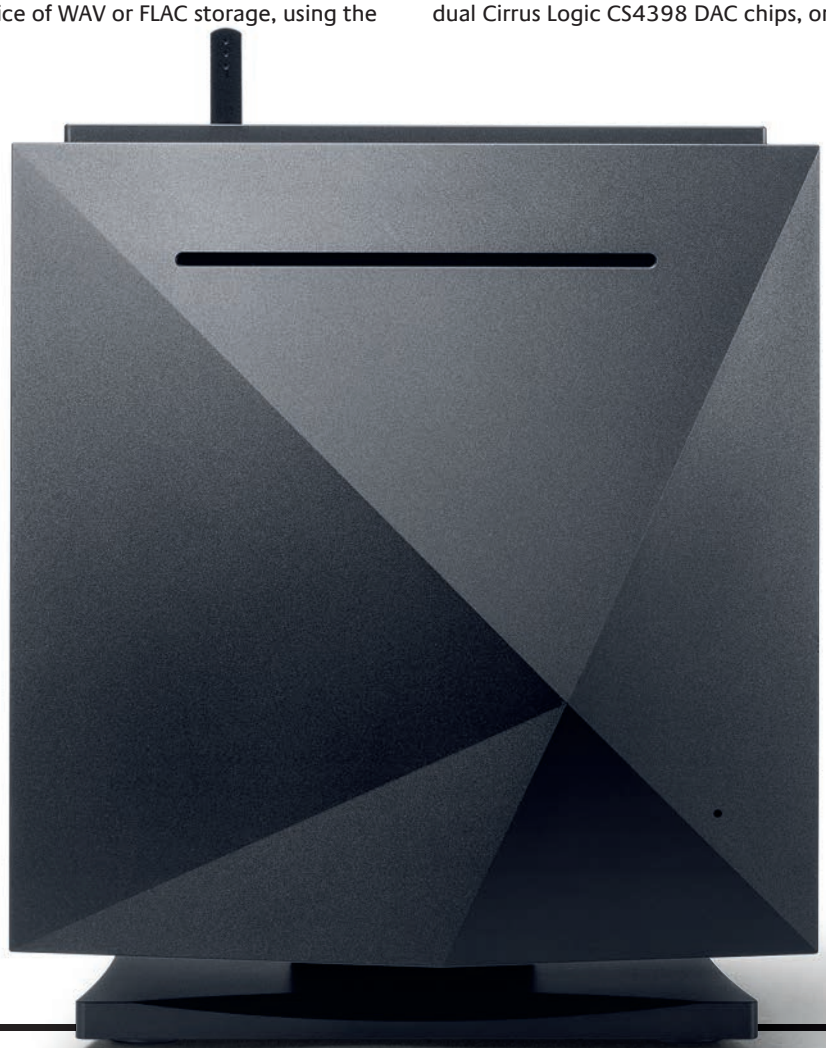
It's smaller than pictures might suggest, standing just over 240mm tall and a little less in width and depth. There's a slot-loading CD transport for disc-ripping only, not playback, in the front panel, while the slightly offset sculpting reminds me more of 'stealth' technology than the mountain said to have inspired it (the Swiss Matterhorn). The flip-up 7in (178mm) WXGA touchscreen panel on the top plays host to an extensive series of set-up and control options.

There's no conventional remote control handset, but iOS and Android control apps for smartphones and tablets are due in April. However, it's also possible to 'drive' at least the playback functions of the AK500N using third-party apps, A&K recommending Network Music Player for iOS, or Bubble UPnP on Android. I found Bubble UPnP the more convenient, which is perhaps not surprising given that the player runs on an Android operating system. I also had good results using PlugPlayer on OS X. When the apps become available the update will also add internet radio functionality.

> 'At the heart of the AK500N is a terabyte of SSD storage'

As a CD ripper, the A&K offers the choice of WAV or FLAC storage, using the cdparanoia extractor software and the GraceNote database for metadata look-up, and a choice of ripping speeds, but its capabilities go way beyond CD-quality music: it can handle content up to 384kHz/24-bit, as well as offering native playback of both DSD64 and DSD128 files using a dedicated chipset.

In fact, all the files it plays can be repurposed to DSD before they pass through the onboard digital-to-analogue conversion, which uses the same dual Cirrus Logic CS4398 DAC chips, one



RIGHT: The unusual faceted front panel is said to be derived from the shape of the Matterhorn; slot-loading CD drive is only for ripping

MUSIC AT A TOUCH

Apart from the quirky looks, what sets the AK500N apart is the flip-up touchscreen for set-up and control, looking for all the world like an add-on tablet computer. This can be used to drive the system for playback (although forthcoming apps may prove more convenient), but a touch of the standard 'cog' symbol takes you into the settings menu. You can go as deep as you like – moving and copying files between folders on the SSD storage, or accessing USB devices connected to it – and these menus also let you select gapless playback (though it's not infallible), or decide whether or not the AK500N will convert all your files to DSD before they hit the DAC.

It's possible to decide the format you want when ripping discs inserted into the front-panel slot (WAV or FLAC), and choose whether the player charges, or isolates itself completely, during playback. Experience suggests the latter is preferable. The panel also allows setting of the USB-B input to the rear, so you can decide whether it's allowing the unit to function as a DAC, or in 'MTP' mode for file transfer from a computer, and enabling various 'housekeeping' settings.

LEFT: The AK500N's top touchscreen is its control hub: side connections allow for 'phones (2.5, 3.5 and 6.35mm) plus USB and MicroSD storage. The only conventional controls are for volume and power

for each channel, found in the company's very upmarket AK240 portable player.

STEPS TO EXCLUDE NOISE

At the heart of the AK500N is 1TB of SSD storage, upgradable to 4TB if required, and that internal battery, designed for total isolation from any mains or power-supply noise. Unless you choose the 'charge while playing' option in the menus the system can be disconnected from the mains for up to seven hours or so, when in use.

This idea of noise-exclusion extends to the input and output provision, which includes fixed and variable-level RCA and balanced outputs, AES/EBU, optical, coaxial and BNC digital inputs and outputs, USB-B and USB-A ports to the rear and USB-A and MicroSD card slots on the side-panel. There's also a choice of balanced or conventional headphone output, using 2.5mm, 3.5mm and 6.35mm sockets – also on the side. Each of the audio connections can be enabled or bypassed individually using the menu system, meaning those not in use are unable to create interference or allow noise ingress.

All-in-all, this unusually-shaped unit is a very long way beyond the novelty it may seem at first glance: clearly a lot of attention, and a lot of the knowledge gained in creating the company's range of high-quality portable players, has gone into its design and construction, and the optimisation of its performance.

What's more, while the menu system may seem complex, simply because it's so comprehensive, with a little familiarisation it's easy to get to grips with the set-up of the AK500N. As soon as it connected to my home network (it can use either Wi-Fi or

LEFT: Internal view reveals quite a lot of fresh air between the CD drive and rest of the player electronics. Lower down is the dock for up to four SSD hard drives [left], and the battery power supply [right]

Ethernet) it performed a firmware update – seemingly inevitable with any network-connectable product! – and was then ready for action.

It can work directly as a USB DAC with a wired connection from a computer, also necessary if you want to copy music from your computer to the A&K, and don't want to put it all on a USB drive. Connecting it to my MacBook Air, I was able to use Android File Transfer to copy music to the unit's internal storage.

The AK500N will function as a standalone device, as a network player for content stored locally on a NAS device or on a computer running UPnP/DLNA server software – for Windows users, the company provides MQS Streaming Server for download – and it will also make its stored content available to any other playback devices on the network.

SOLIDITY AND SPEED

To say that I was taken aback by what the AK500N can do was something of an understatement. From the off it impressed with the kind of big-boned yet agile and finely detailed sound one would expect only from the very highest of 'fi – which I guess, given the price, is just what it is.

Cast aside any expectations of gimmickry you may have when surveying its unusual form-factor. This is a very serious piece of equipment, daring to be different when it comes to its aesthetics, and demonstrating that not *all* good things come in 430mm-wide packages. I tried all the various input and playback options available here (and there are quite a few!) and found the A&K to be most impressive when playing from its internal storage or as a network player for music from my NAS, where it delivered a sound with as much scale and information as any high-end streaming device, especially from higher resolution PCM and DSD files.

There's a solidity and speed to the bass that very few network devices, let alone CD players, can match, while the sense of soundstage depth, focus and presence shows just how well midband and treble information is handled.

> 'It reaches the heights when streaming from its SSD storage'

The AK500N also copes very well with high-resolution files on USB storage, either via the rear or side ports, but to my ears sounds a little softer when connected direct to a computer via a USB cable, and used in DAC mode [see Lab Report, p39]. It's still very impressive, and more than a match for many an offboard USB DAC, but it never quite reaches the heights it can when streaming from its own SSD storage.

The Bluetooth option, meanwhile, is – well, a Bluetooth input: as ever it's a triumph of convenience over substance, and ought only to be used in emergencies (or at least only for short-term listening).

I've already mentioned the effect of the battery power but, to reiterate, it's perhaps best described as removing a slight thickening of the sound encountered when you opt for the 'charge while playing' setting. I got the best results with the power supply disconnected completely, which was a bit of a pain as the multipin ⇢

JAMES JEONG

As general manager of the strategic planning team at Astell&Kern's parent company since 2001, James Jeong has been closely involved with the development of the AK500N. Asked why A&K had expanded into 'home' audio, he replied that 'our medium and long-term goals were always to build a strong brand position in high-end home hi-fi while continuing to develop and progress our award-winning portable line. We want to provide our customers with more options.'

That unusual styling, he says, was 'inspired by images in nature. The core design features multiple facets coming together in a single point, symbolising the greatness of Switzerland's Matterhorn, ever-changing with time and the amount of light.' Talking about two of the major elements of the design, he told me the decision to offer DSD upconversion was simply because 'it's the format many audiophiles enjoy', but he also revealed that the most challenging part of the design was ensuring reliability for the battery PSU.

James also revealed the AK500N will be joined by a matching power amplifier, the AK500A, and an outboard power supply dubbed the AK500P. First seen at the International CES 2015, they're due to be launched at the High End Show in Germany in May. And he agreed that, while there are no specific plans he can announce yet, there is scope for the AK500N design to be trickled down to lower-priced home products in the future.

LEFT: There's a choice of balanced or RCA phono outputs, and either fixed or variable level, plus a good range of digital input options, Ethernet and USB A/B

connector is fiddly to reattach, since it's at the back of the unit.

Similarly, I experimented a lot with the AK500N's 'convert everything to DSD' option, and while it added some heft to the sound of MP3 files and some CD rips, I found it rather over-egged higher-res files, giving them a sheen of smoothness allied to a slightly sacchariny treble. So I hope the forthcoming apps will have a button to turn this facility on and off, as I have a feeling it may suit some tracks and not others.

The only other glitch was a hesitation with some albums with music stretching across multiple tracks – there's an on/off button for gapless playback, but even so some (not all) high-res content seemed to catch it out in this respect.

WHO DARES WINS

However, when the AK500N is good, it can be stunning. Opening listening with some high-resolution content, namely David Bowie's *Ziggy Stardust* in DSD [EMI 521 9002], I was immediately impressed with the thump of the bass as the album opened, and the sheer impact of the acoustic guitar, sharply focused along with Bowie's voice, plus the way the sound maintained its integrity and clarity even when the tracks got rather rockier.

Similarly with ELP's *Brain Salad Surgery* [96kHz/24-bit HDtracks download, Razor & Tie ELP0BSS401-DL], the A&K showed its stuff with real drive from the drums and guitar, allied to a wonderful bass snarl from Keith Emerson's bank of synths when required, such as in the 'not on the album' title track included as part of the 40th anniversary package. And in the transition between the first two parts of 'Karn Evil No 9' there was no hint of a gap!

'Extra' by Chip Taylor and Carrie Rodriguez [*Let's Leave This Town* – Trainwreck TWO19] saw the AK500N demonstrating its ability when it comes to the sound of real instruments (in this case guitar and fiddle) and the tonality of voices, giving the track all of its good-natured immediacy and humour. Mind you, it can also deliver all the power and weight you could want with those big operatic and orchestral pieces, grabbing the attention with the texturing of the instrumental timbres.

By any standards this is a remarkable digital player/streamer/ripper thingy – just how do you describe it? – and even more striking for daring to be different.

HI-FI NEWS VERDICT

However unlike a conventional network storage/player device it may appear (and the design shows the greater freedom such hardware brings), the AK500N is even more extraordinary in the way it performs. Don't let the looks put you off, as the sound from this innovative unit is nothing short of remarkable, with excellent slam and weight allied to very fine detail and serious, sustained musical involvement.

Sound Quality: 88%

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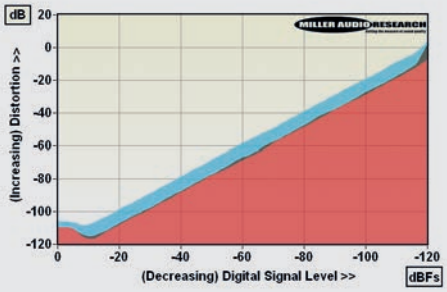
LAB REPORT

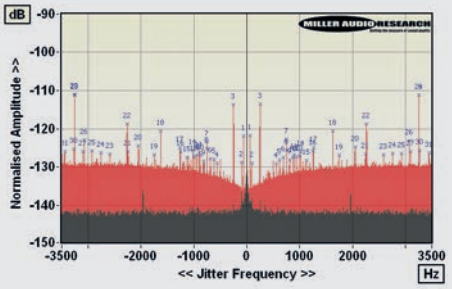
ASTELL&KERN AK500N

Although A&K employs a *pair* of CS4398 DACs this chip is still only a 192kHz device, but its compatibility with DSD2.8 and DSD5.6 streams allows the AK500N to service higher rate LPCM/DXD files by conversion to DSD without downsampling. Nevertheless, while our sample was lab tested before any firmware updates were received, the results suggested that 48kHz inputs via S/PDIF and USB were also being converted to DSD while 96kHz and 192kHz inputs remained as LPCM... The rise THD+N at high frequencies was marked – 0.05% for 48kHz/24-bit versus 0.00085% for 96kHz/24-bit (20kHz/–10dBFs signal). All else was consistent with sample rate, including the wide 112dB A-wtd S/N ratio, excellent ±0.1dB resolution over a 100dB range, the 3V maximum balanced output (fixed XLR) and fabulously low 3ohm source impedance.

Jitter was a little higher than anticipated at ~275psec via the digital inputs [red trace, Graph 2] but proved exceptionally low at <10psec via both internal or external SSD storage (the latter via USB Type A connection). This is clearly illustrated by the black spectrum in Graph 2, below. Distortion via SSD was lower with 48kHz/24-bit files because, unlike via S/PDIF, the conversion appeared to be LPCM throughout. A figure of 0.0008% (20kHz/0dBFs) is truly excellent [see Graph 1, below] as is the 112dB A-wtd S/N ratio, unchanged from the S/PDIF and USB tests. Responses are ruler-flat too, extending to 45kHz within ±0.1dB (96kHz files) and 90kHz within ±0.4dB (192kHz files). Readers may view comprehensive QC Suite test reports for the S/PDIF and USB-drive audio performance of the Astell&Kern AK500N by navigating to *www.hifinews.co.uk* and clicking on the red 'download' button. **PM**



ABOVE: Distortion versus 24-bit/48kHz digital signal level over a 120dB range at 1kHz (S/PDIF, red; SSD/USB disc, black) and 20kHz (SSD/USB disc, blue)



ABOVE: High resolution 24-bit/48kHz jitter spectra comparing S/PDIF (red, marked) with USB disc (black)

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	2.97Vrms at 3ohm
A-wtd S/N ratio (S/PDIF / USB disc)	112.0dB / 112.0dB
Distortion (1kHz, 0dBFs/–30dBFs)	0.00019% / 0.00017%
Dist. & Noise (20kHz, 0dBFs/–30dBFs)	0.0008% / 0.0032%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	–0.0dB to +0.0dB/+0.1dB/+0.4dB
Digital jitter (S/PDIF / USB disc)	275psec / <10psec
Resolution @ –100dB	±0.1dB
Power consumption	13W (9W standby)
Dimensions (WHD) / **Weight**	214x243x238mm / 11.4kg