

Matrix Audio Element X

This unit may be compact, but it's a highly comprehensive DAC/headphone amp/preamp, with full network audio capability encompassing a huge range of formats
 Review: **Andrew Everard** Lab: **Paul Miller**

Based in Xi'an, the ancient city in northwest China that's home to the famous Terracotta Warriors, Matrix Audio has a classic hi-backstory: it was founded by three audio/music enthusiast schoolmates who regrouped some years later to launch a company to develop and produce hi-separates. The DA-100plus DAC was its inaugural product in 2006 since which time the company has evolved its lineup to encompass a range of digital and streaming products that covers just about all the bases, from the X-Sabre Pro DAC [HFN Nov '17] to the new £2795 Element X.

The latter, a compact box – just 350mm wide and standing 60mm tall – is not only capable of driving a wide range of headphones, it can also be used as a source to feed conventional amplification or as a DAC/preamp, with variable output and the option of a 10dB boost if required. Multiple digital inputs are provided, and it supports everything from network streaming to MQA, Roon, 768kHz PCM and DSD1024 via an ESS ES9038Pro DAC. To put it mildly, it's pretty much future-proofed.

WALK THIS WAY

It's possible to use this unit straight out of the box, whether as a DAC to feed your system, a streamer or a headphone amp. A large part in that is played by the company's MA Remote app, available free for both Android and iOS. While some manufacturers may follow the path of suggesting buyers use their products with readily-available third party apps, the Matrix Audio approach really shows the benefit of creating something bespoke.

Plug in the Element X and re up the app on your phone or tablet, and it will walk you through network connection and set-up. After that you just need to point it to your network store – if that's what

you'll be streaming from – using the app's 'Library' tab, or to a USB device (or even a tiny MicroSD card, if that's where you have your music), and then to any streaming services to which you wish to connect.

There is an even easier way to control stored music and streaming services: use the Element X as a Roon endpoint. Yes, you'll need a computer running Roon Core, and a Roon subscription, which at the time of writing runs at \$6.99 a month, or \$699.99 for the lifetime plan. But you could always try the 14-day offer, which will allow you to see how you get on with it.

The Element X's front panel controls are no more than a power button, what looks like just a volume knob and a pair of further buttons, but this is an exceptionally flexible device, with all manner of user options selectable via a menu accessed by those two buttons and pushes and twist of the main control. For a start you can select inputs and outputs, the Element X

DAC having two coaxial, two optical and an LVDS/I²S digital input, as well as a USB-B for computer connection and two USB-A host ports for storage devices.

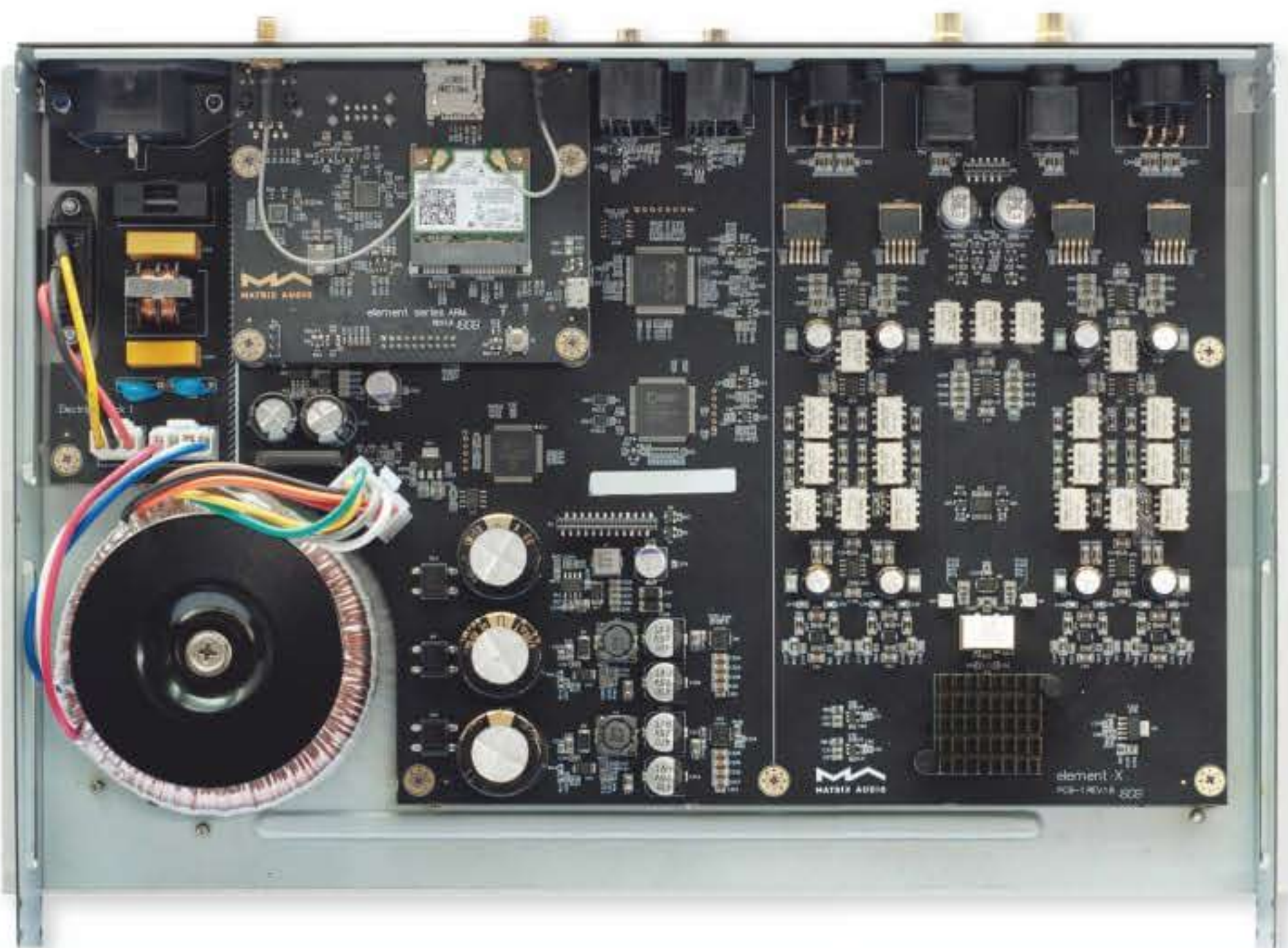
SEVEN FILTERS

As well as a choice of headphone outputs – two XLR/6.35mm combination sockets, and a further 4-pin balanced XLR output – you can also output analogue audio via either XLRs or RCA phono, the amplification using four discrete channels to deliver true balanced working when required. All these options can be selected or disabled

in the menu system, delving deeper into which reveals such niceties as seven digital filters [see PM's Lab Report, p55], a choice of DSD low-pass settings, dither, 'jitter elimination', DPLL bandwidth for tackling shaky digital feeds, and headphone gain.

There's a lot in there, so it's handy that one of the two front-panel buttons, marked 'O', can be preset for quick access

'The Element X makes it big, rich and full of vitality'



RIGHT: A substantial linear PSU [lower left] has separate regulation for the quad-core ARM CPU [top left], Xmos and Xilinx processors (USB/MQA) [centre], ESS Sabre 9038Pro DAC [lower right] and headphone amp [top right]



to a given set of functions: input or output selection, digital filters, or information shown on the display about the unit's hardware and software status. There's also a slimline remote to access basic functions including volume and input selection.

THRILL OF IT ALL

After set-up and the inevitable over-the-air firmware update, the Element X was used with a variety of headphones – both balanced and single-ended – including the B&W P9 Signature [HFN Mar '17], Focal Spirit Pro [HFN Dec '15], the Oppo PM-1 [HFN Jul '14] and Philips Fidelio X3. I also used it into both integrated and power amplifiers, including the excellent Denon PMA-A110 [HFN Dec '20] which allowed me to make use of both fixed and variable outputs on the Element X, thanks to the integrated's power amp direct input.

Operationally it proved impossible to trip up, being based on a solid platform including a powerful quad-core ARM

processor, running in-house Linux-based software, and – apart from keeping track of all the options selected – the Element X is smooth and simple to use.

However, there's nothing smooth or simple about the sound here: instead it's direct, superbly scaled and never short of entirely thrilling, whether listening with headphones or as a source/preamp. Of course, you can while away the hours playing with the digital filters, but I found no consistent reason to stray from the default 'MOD1 filter', which is a fast roll-off, minimum phase setting. With this in use the Element X sounds fast, tight and punchy when required, yet with excellent bass warmth and detail retrieval.

There's more than enough power here, and superb grip, to drive and control even the most demanding headphones, and without resorting to any tricks of processing the sound is both open and airy with no sense of claustrophobia, even when using closed-back designs like the

ABOVE: With a push, a twist and a click or two, you can access a comprehensive menu system, while sockets accommodate both balanced XLR headphone outs and a standard 6.35mm feed

B&W P9. In fact, if there's any disadvantage here, it's that you'll play the music too loud through your 'phones of choice, so cleanly will the Element X drive to very high levels.

For obvious reasons, excessive in-ear SPLs should be avoided but it's hard not to like the way a piece such as Widor's *Toccata*, played by Olivier Latry on the Notre Dame de Paris organ [from BNL 112617], sounds when played loud through good headphones. Mind you, with a fine amplifier and speakers on the end of the Element X, it's even more thrilling when those pedals start the listener's whole body shaking!

JUST MAGNIFICENT

This combination also serves well the tripping, pounding beats of Dub Pistols' *Addict* [Sunday Best SBESTCD89], which allows the weight, slam and speed here to combine to excellent effect, while also giving an ultra-clear view of everything going on in the mix above. This isn't just toe-tapping stuff; it's everything-tapping, and sounds just magnificent, with every lyric crystal clear, right from the opening title track.

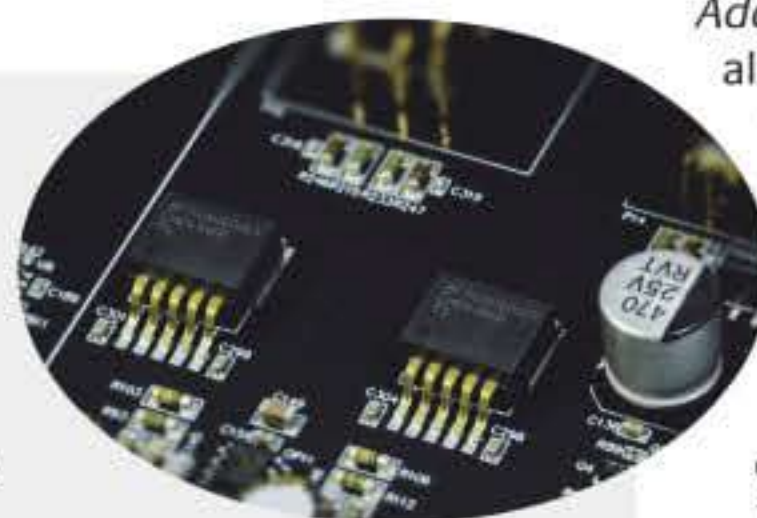
That ability to deliver a full-scale sound, rammed with information and its drama intact is also much in evidence with the recreation of the 1985 Live Aid set on Queen and Adam Lambert's *Live Around The World* [EMI 00602507394066], which is full of almost all of the swagger of the original and treated to a spectacular live mix. The Element X makes it big, rich and full of vitality, just as it should be, proving that this DAC/amp isn't just an exercise in technical excellence and 'hi-fi-ness' but also very much built by people who love music.

Change pace entirely to the classic 1965 EMI Abbey Road recording of Martha Argerich, then only in her mid-20s, playing Chopin [EMI Japan TOGE-11072; DSD64], and that freshness and detail is to the ☞

SQUEAKY CLEAN CANS

For its headphone preamp, Matrix Audio uses a pair of TI's high specification LME49600 buffers per channel, each rated at 500mW/32ohm at vanishingly low levels of distortion. And, indeed, the Element X's can-driving performance is state-of-the-art. Tested here in 'High' gain mode – which adds another +10.5dB but has no impact on the maximum power – its unbalanced headphone output registers 9.26V at '+14.0dB' volume at just 0.00003% THD and with a massive 119dB A-wtd S/N ratio. THD increases to 0.006% at the '+14.5dB' volume setting before clipping at 1% THD for 10.2V at '+15dB' (all re. 0dBFS digital input). Adjusted for a 600ohm load this represents an output of 160mW while the amplifier retains sufficient current to support 1250mW/32ohm and an impressive 620mW/8ohm at <1% THD, the latter impedance representative of the very toughest earphones. In general, distortion is very low indeed at typically ~0.0002% through bass and midrange and 0.001%/20kHz at the reference level of 10mW/32ohm.

The response of the headphone output is determined by your choice of digital filter [see Lab Report, p55] but its low 700-1000ohm source impedance means the Element X will manage the varying load of low impedance 'phones without significantly modifying any existing peaks and dips in their acoustic response(s). Channel separation is >95dB (20Hz-20kHz) and noise, too, is very low, ensuring an equally cavernous 116dB A-wtd S/N ratio. So the Element X will drive the most sensitive of headphones without adding background hiss or hum. **PM**



NETWORK-ATTACHED DAC



ABOVE: Digital ins include wired/wireless Ethernet and I²S on an HDMI socket (up to 768kHz PCM, DSD256 as DoP and DSD1024 natively), USB-B (also 768kHz PCM and DSD256 as DoP), 2x optical/coax S/PDIF and external les via MicroSD and USB-A. Analogue outs (xed or variable) are offered on RCA s and balanced XLRs

fore, along with a lovely sense of the studio acoustic wrapped around the glorious performances. The passion, dexterity and lightness of touch in the C-sharp minor *Scherzo* is nothing short of breathtaking when the Element X is driving revealing headphones, such as the Philips Fidelio X3 – it's tempting to hit the repeat button just to experience it all over again! The warmth and spirit of the sessions comes through marvellously, and the sheer levels of detail on offer will amaze those who think that great sound began when we all went 'hi-res' a few years back.

POWER TRIP

Talking of being amazed, lightness of touch doesn't even come into it with Stokowski's wonderfully lush and overblown *Rhapsodies* set for RCA 'Living Stereo' from the very early 1960s [RCA Red Seal LSC-2471; DSD64]. Subtle it ain't, with the orchestra – RCA's in-house 'Symphony Of The Air' – seemingly on as much of a power trip as the conductor with its great swathes of Hollywood musical strings, and no

turn left unstoned.

The Element X brings out all the gloriously over-the-top dynamics of this still-staggering recording – what must it have sounded like to listeners at the time? It's a riot, if

LEFT: In addition to the MA Remote app (for iPhone, iPad and Android), the standard IR remote offers input selection, volume, mute and access to the seven digital lters (LPCM only)



not always for the right reasons. So if you ever need something get you up and ready to invade a neighbouring state, Stokowski and his merry men storming up 'The Moldau' – via the Element X, a gutsy amp like the Denon and a pair of big speakers – should do very nicely indeed.

That's the great strength of Matrix Audio's Element X: it gets you to heart of a recording, whether you're playing it from a computer or USB storage, summoning it up from a NAS drive or streaming it. Of course, that could also be its undoing if the music you play is a bit on the rough side, but some judicious juggling with the digital lters can soften things down a little.

However, pick a good recording such as Billie Eilish's 'No Time To Die' [Darkroom/Interscope; n/a cat no] – about as close as any of us are going to get to 'Bond 25' this side of next Easter – and the Element X delivers a beautifully intimate view of the vocal in throttled-back mode. Then it opens up all the cylinders as Hans Zimmer's great orchestra soars into action around about the point where the movie titles will be telling us he did the music. It's suitably dark, and decidedly glorious. ⏻

HI-FI NEWS VERDICT

If you're thinking 'Matrix who?', you're in danger of missing out on one of the more conspicuous hi- bargains of the moment. In a world rapidly becoming overpopulated with big-ticket DAC/headphone amps, this modestly-proportioned contender has the wherewithal to soar to the top, thanks to its exibility, ease of use – either with the MA app or Roon – and performance that's never short of thrilling.

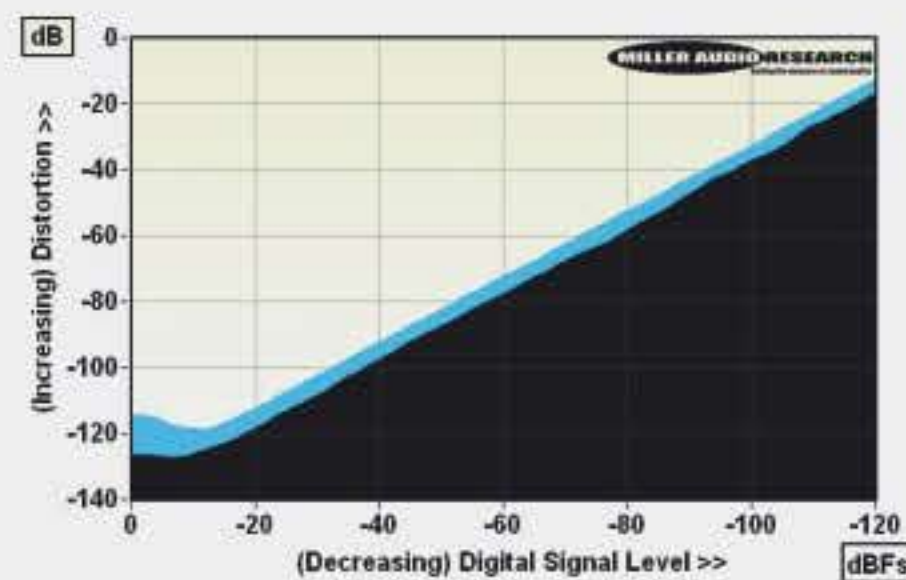
Sound Quality: 88%



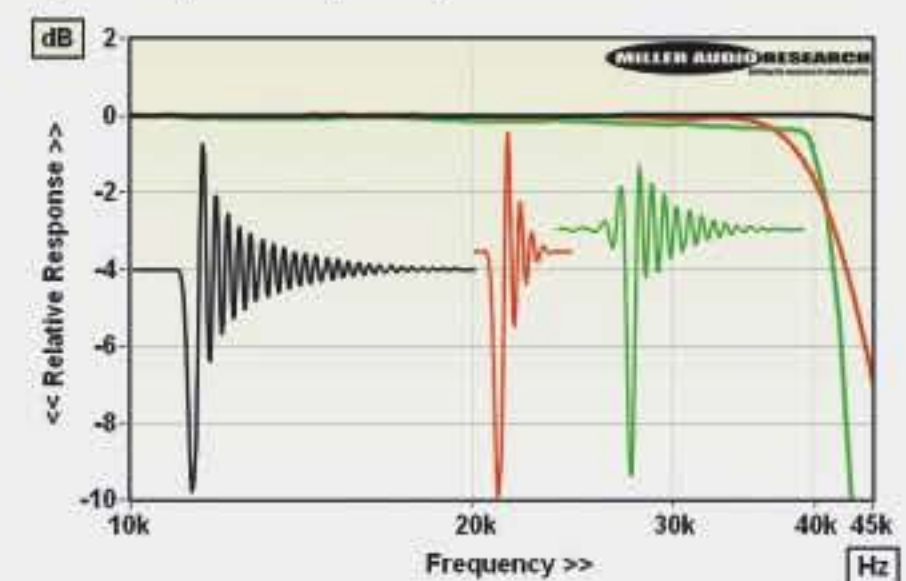
MATRIX AUDIO ELEMENT X

Since our review of Matrix Audio's X-Sabre Pro [HFN Nov '17] the company has improved its ES9038 Pro/32-bit Sabre DAC-based platform still further [see boxout, p53, for the headphone amp test results]. Most notably the 'untidy' 200psec jitter revealed in my lab report for the X-Sabre Pro has now been fully resolved – the Element X incurs just 5psec/48kHz and 55psec/96kHz, the latter a very low-rate ±6Hz pattern. Distortion is spectacularly low at 0.00003-0.0002% at the maximum 4.3V balanced output (20Hz-20kHz), holding to a mere 0.00015-0.00027% over the top 30dB of its dynamic range [Graph 1, below], while the A-wtd S/N is a class-leading 116dB via all digital inputs and resolution true to ±0.05dB over 100dB and ±0.2dB over a 110dB range.

The frequency response(s) depend on which digital lter is chosen [see Graph 2, below] while the negative-going time/impulse responses show the Element X is phase inverting. Filters 1 (Minimum Phase/Fast), 3 (Linear Phase/Fast), 5 (Brickwall), 6 (Hybrid) and 7 (Apodising) all have sharp roll-offs, with Filters 2 (Minimum Phase/Slow) and 4 (Linear Phase/Slow) offering gentler treble roll-offs, reduced 'ringing' but poorer stopband rejection. Otherwise, Filters 1, 3, 5-7 offer a similar 73-83dB rejection of digital aliasing images with 48kHz media, but just 18dB/14dB with Filters 2 and 4 which are better suited to higher sample rates. With CD/48kHz les the responses reach out t o –0.1dB, –5.0dB, –0.1dB, –3.5dB, –4.0dB, –12.3dB and –0.8dB/20kHz (Filters 1-7, respectively). With 96kHz media, the 45kHz response limits are –0.09dB, –7.0dB, –0.4dB, –4.9dB, –14dB, –23dB and –7.5dB while, with 192kHz les, the 90kHz response limits are +0.2dB, –6.9dB, –0.3dB, –4.8dB, –14dB, –23dB and –7.3dB. PM



ABOVE: THD vs. 24-bit digital level over 120dB range (1kHz, black; 20kHz, blue). Note extended Y scale



ABOVE: Time (Minimum phase/Fast Filter 1, black; Minimum phase/Slow Filter 2, red; Hybrid Filter 6, green) and HF magnitude responses at 96kFs

HI-FI NEWS SPECIFICATIONS

Max. output (<1% THD, DAC/Pre)	4.34Vrms at 97ohm (Balanced)
Max. output (<1% THD, headphone)	10.2V/600ohm / 1250mW/32ohm
Headphone output impedance	700-1000mohm (20Hz-20kHz)
A-wtd S/N (S/PDIF / USB / headph.)	116.2dB / 116.1dB / 115.9dB
Dist. (20Hz-20kHz, DAC/headph.)	0.00003-0.0002%/0.0005-0.0048%
Freq. resp. (20kHz/45kHz/90kHz)	+0.0dB to –0.02dB/ –0.1dB / +0.1dB
Digital jitter (48kHz/96kHz)	5psec / 55psec
Power consumption	13W
Dimensions (WHD) / Weight	340x60x281mm / 4.2kg