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PEAK PERFORMER

JBL's mighty Everest DD67000 horns

McIntosh MHA100

Bespoke headphone amp

DirectStream DAC

PS Audio's 1-bit wonder

HEADPHONE GROUP TEST

On the move,
in the home...

Five supra-aural cans rated



Pro-Ject Super Pack

Stunning deck, arm and MC

ModWright hybrids

Signature pre/power amps

CAPTAIN
BEEFHEART
TROUT MASK REPLICA

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• **OPINION** 11 pages of letters and comment • **VINTAGE REVIEW** Philips' CD450 – the first 16-bit/4x CD
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MUSICAL FIDELITY

MF-100

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NEODYMIUM DRIVE UNITS

RIGHT: Bigger than your average headphone amp – the MHA100 from McIntosh, p56



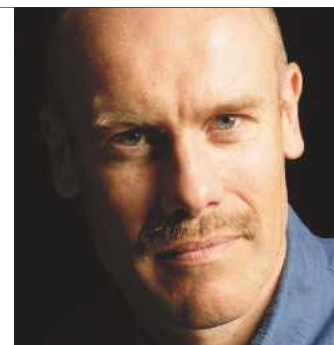
ABOVE: A DSD-compatible DAC with a difference, as PS Audio's Perfect Wave DirectStream DAC converts all inputs to 1-bit... See p30

There are moments in every audiophile's listening life where they are exposed to a quality of sound – a tangible realisation of a musical event – that is so profound the aural memory stays with them for life. It might have been at a hi-fi show, a dealer's or even, if we are very lucky, through some happy coincidence of components at home.

I am not just talking about the consistently great sound we all strive to achieve with our hi-fi systems but something far more ephemeral, a sound that, until experienced, might otherwise have seemed utterly improbable. I've had a few of these moments in my career but being surrounded by audio equipment from every corner of the globe for several decades, frankly so I should.

I'll never forget the first time I heard a very early-generation 1-bit DAC. I stayed up all night listening to one CD after another as the room was filled with the most incredible music, instruments and performers dancing around me as if the loudspeakers and walls of the room had not existed.

That's another story for another day, and while production bitstream players never quite achieved that same exalted state, the technology did evolve to inspire the 1-bit



SACD format, still the choice of many audiophiles the world over. It's also the choice of PS Audio's new DirectStream DAC which translates any digital input into a very high speed stream of single bits, followed by a genuine 1-bit conversion (in practice an elegant low-pass filter). Over 20 years on from the first 1-bit

'JBL's Everests are a truly unforgettable musical experience'

players, we reassess the state of the bitstream art on p30.

This issue features another transcendental coincidence as the latest in JBL's long line of exquisite, but massive horn-loaded Everest loudspeakers receives its first airing (p20). Coincidence? Yes, because I was lucky enough to review the very first Project Everest DD55000 speaker back in 1986 and just as our reviewer discovered for himself, it is an experience that no audiophile will ever forget.

PAUL MILLER EDITOR

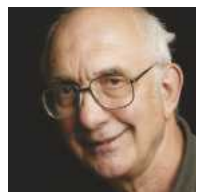


VINYL: Clashing rhythms ahoy in Captain Beefheart's *Trout Mask Replica*, this month's Vinyl Icon (p72), while Steve Sutherland rates Muddy Waters' Grammy-winning *Hard Again*, on 180g LP (p70)

RIGHT: *Hi-Fi News & RR* is the exclusive UK representative of EISA's Audio and Home Theatre panels. Paul Miller is EISA's Audio and HT Panel Manager



HI-FI NEWS' EXPERT LINE UP: THE FINEST MINDS IN AUDIO JOURNALISM BRING THEIR EXPERIENCE TO BEAR ON ALL AREAS OF HI-FI & MUSIC



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JOHN BAMFORD
JB brings huge industry experience, a penchant for massive speakers and a love of hi-res audio in all its diverse guises



KEN KESSLER
is currently our Senior Contributing Editor and almost singularly responsible for the renaissance in valves and 'vintage hi-fi'



KEITH HOWARD
has written about hi-fi for 30 years, and edited *Hi-Fi Answers* for nine. KH performs our speaker and headphone lab tests



STEVE HARRIS
Former Editor of this very title from 1986 through to 2005. A lifetime in audio and a love of jazz makes Steve a goldmine



JOHN HOWES
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STEVE SUTHERLAND
Worked on *Melody Maker* and then edited *NME* from 1992-2000, the Britpop years. Steve brings a unique slant to our Vinyl Release pages



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LEFT: It may look like a conventional CD player, but the Canor CD 1.10 comes with twin 192kHz/24-bit DACs on board that enable it to serve as a 'digital hub'. What's more, it uses tubes... See p52.



ABOVE: For our Group Test of £160-£330 headphones, turn to p41

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FREE! Chord's 'Outstanding' SilverPlus USB cable See page 82



M Project

MAGICO CELEBRATES ITS 10TH WITH LIMITED EDITION SPEAKER

Ten years young, the loudspeaker brand that brought us solid aluminium cabinets with constrained layer damping, bespoke 'Nano-Tec' drivers and massive motor systems is celebrating its birthday in characteristic style. Weighing in at 180kg, only 50 of Magico's M Project floorstanders will be produced – this three-way, five-driver loudspeaker taking its cues from both the new S and older Q series models.

The M Project has a refined curved cabinet with carbon-fibre side cheeks, the ensemble designed to minimise internal resonances while still employing the minimal amount of damping. Magico's signature contoured front baffle is blended into edge-

free top and bottom plates while the driver complement now includes a new 28mm diamond-coated beryllium dome tweeter with improved motor system and acoustic back-chamber (see inset picture). The 6in Nano-Tec mid unit comes directly from the Q7 and incorporates a 55mm titanium voice coil and underhung neodymium motor.

Also created exclusively for the M Project is a new 10in Nano-Tec bass driver boasting a high maximum SPL of 120dB at 50Hz/1m. Three of these long-throw woofers are combined in each enclosure. Overall sensitivity is rated at 91dB. **Magico LLC, 0208 971 3909; www.magico.net; www.absolutesounds.com**

Gato's digital hub

DANISH LINE-LEVEL 'DIGITAL' PREAMP

Danish brand Gato Audio have been on a mission to prove that high-end hi-fi can also make a stylish statement [*HFN* Oct '13]. The PRD-3 preamplifier is the latest addition to its range of components, all built into matching and very distinctive non-magnetic cases. In addition to its three analogue line inputs (two on RCAs, one balanced via XLR), the PRD-3 also includes S/PDIF (coaxial and optical) and USB-B digital inputs, all fed to a 24-bit/192kHz Burr-Brown PCM1794 DAC. After conversion, digital inputs are routed via a bespoke I-to-V stage and low-Q analogue filter to a choice of two balanced and one single-ended output. The balanced outs are rated at a substantial 13V with a 75ohm source impedance. Overall voltage gain is +10dB and price is £2190.

Gato Audio, 01333 425999; www.gato-audio.com; www.audioemotion.co.uk



HI-FI NEWS' NUGGETS

PRO-JECT USB BOX S+

Matching the familiar form-factor of other models in Pro-Ject's Box Design 'S' range, the new USB Box S+ is a truly minimalist USB DAC. Priced at just £169 it offers a single USB-B input (no coaxial or optical S/PDIF) along with a single, fixed-level analogue output on RCAs.

A combination of the popular XMOS USB front-end and a 32-bit Burr-Brown PCM5102 DAC is employed inside. The latter offers a direct 2V output (simplifying the analogue stage), compatibility with inputs up to 384kHz and a choice of standard FIR (brickwall) or IIR (apodising) digital filters. DoP (DSD over USB) does not appear to be supported, however. www.henleydesigns.co.uk

WIREWORLD USB

The price for Wireworld's 1.5m Silver Starlight USB cable was misquoted in last month's Group Test. The correct price is £270. The *HFN* SQ rating and verdict are unaffected. www.wireworldcable.co.uk

Titanium TechDAS

AIRFORCE TURNTABLES JOINED BY NEW MC

For the analogue-loving audiophile who already has everything – including a TechDAS Air Force One turntable [*HFN* Jun '13] – comes this new partnering MC pick-up, based on the TechDAS TDC01 but now housed in a solid titanium body. The weight of the TDC01 Ti is necessarily high at 17g and while compliance is not specified, it looks ideally suited to high effective mass tonearms. Its pure boron rod cantilever is equipped with a semi-line contact diamond (3x30µm) and tracking force is rated at 2.0-2.3g. The 0.45mV output and recommended 100-200ohm loading confers broad compatibility with most phono stages.

TechDAS/Stella Inc, 0208 971 3909; www.techdas.jp; www.absolutesounds.com





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TechDAS/Stella Inc, 0208 971 3909; www.techdas.jp; www.absolutesounds.com



Preda – the premium pre

AURORASOUND UNVEILS ITS STATE-OF-THE-ART LINE PREAMP

With the success of its Vida phono stage already under its corporate belt [see *HFN* Jul '13], the Japanese Aurorasound brand has announced the addition of a sophisticated, line-only preamp. The £8000 Preda offers a maximum +10dB gain via six selectable inputs, two of which are balanced via XLRs. There is one balanced and one single-ended output. Aurorasound's newly-developed widebandwidth discrete op-amp modules form the active heart of the Preda while its 54-step volume control is achieved, not via a traditional stepped attenuator, but via an autoformer whose multi-tap output is configured through a series of Pickering reed relays. Remote control of input, volume, balance and phase is offered. **Puresound, 01822 612449; www.aurorasound.jp**



JBL's new Synchros cans

STYLISH HEADPHONES FOR LISTENING ON THE MOVE

With sales of headphones booming, JBL is keen to grow its share of the market with its latest and very style-conscious Synchros series. The two top models are the £110 E50BT and £80 E40BT (pictured). The latter's smaller profile, with 40mm rather than 50mm drivers, makes it an on-ear design though both are equipped with wireless Bluetooth receivers and offer connection to a second Synchros headphone via JBL's innovative 'ShareMe' feature. Colours include white, black, red and blue. **Harman Consumer, 01707 278113; <http://uk.jbl.com>**



Verity's Anniversary

HIGH-END CANADIAN LOUDSPEAKER CELEBRATES 20TH



Inert, isolated cabinet structures elevate Verity Audio's new Parsifal Anniversary floorstanders from the run-of-the-mill, as does the asking price of £19,995. The critically-damped and braced enclosures are made from 'inhomogenous' materials, the upper cabinet housing a 5in polypropylene

mid unit and proprietary 1in tweeter while the lower box has a rear-facing and reflex-loaded 8in polypropylene bass driver. Sensitivity is rated at 89dB/1W/1m and impedance a nominal 8ohm. **Verity Audio, 01900 601954; www.verityaudio.com; www.selectaudio.co.uk**

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Upcoming Events

IMPORTANT DATES FOR YOUR HI-FI DIARY

- 08-10 AUG** High End Audio Visual Show, Hong Kong
- 05-10 SEP** IFA Berlin, The International Funkausstellung, Germany
<http://b2c.ifa-berlin.de>
- 05 OCT** Audiojumble, Tonbridge; www.audiojumble.co.uk
- 17-19 OCT** High End Swiss 2014, Hotel Moevenpick Zuerich Regensdorf, Switzerland; www.highendsociety.de/
- 01-02 NOV** The Hi-Fi Show Live 2014, Beaumont Estate, Windsor;
www.hifinews.co.uk/show

Munich High End 2014

Words & pictures: Ken Kessler



There's no longer room for debate: the Munich High End Show is now the world's most important hi-fi event. Here's how successful it is: as others are shrinking, this one had to add another hall for 2014. It was magnificent, a reminder of the era when hi-fi shows had queues outside, and nearly every exhibitor had something worth hearing.

As expected, the increase in the number of headphones and headphone accessories outnumbered everything else, but the brands all turned up with other important new products, from KEF's Blade Two to a nifty mini integrated amp from Micromega. It is simply the best traditional hi-fi show of them all – and it's worth the trip even if you have to fly Ryanair.

Vertere has followed its outrageous Reference Tonearm (the one that lights up and has a price like a BMW X1) with this gorgeous turntable, the Standard Groove Record Player system. It consists of the SG-1 Record Player with five-level isolation system, SG-1 TPA Precision Tonearm and SG-1 Standard Motor Drive Power Supply. Also available is the dearer Reference Groove player. www.verteareacoustics.com



Following the successful MyDac is Micromega's Myamp with the same teensy 140x140mm footprint. This cute little treasure offered in black or white – price is only €499 – delivers 2x30W and has three analogue and three digital inputs, subwoofer output and multi-way binding posts, as seen in this rear view, with front panel headphone socket, and a bank of tell-tale LEDs for all sources. It comes with an RC5 remote. www.micromega-hifi.com

Astell & Kern uprated the AK100 and AK120 digital players with a new look taken from the top-of-the-line AK240, and added II suffixes as well. The AK100 II has 64GB of internal memory and a single DAC while the AK120 II seen here has 128GB of memory and twin DACs. Balanced output features, too, and optional remote and cradle. www.astellnkern.com



Oppo showed its clever PM-1 Planar Magnetic headphones [HFN Jul '14] and the HA-1 amplifier, shown here with the LCD displaying a pair of 'analogue meters'. Inside is an ESS9018 Sabre32 Reference DAC (used in its universal players), a stereo preamplifier, a digital audio dock for mobile devices, and facility for driving balanced 'phones. Review next month! www.oppodigital.co.uk

Audio Research showed not one but three models in the all-new G Series, inspired by the company's earliest models, such as the immortal D-150 amp and SP-3 preamp, as seen at the top. Priced below the Reference range, it consists of a GSPre preamp, GS150 stereo power amp (155W/ch) and the GSi75 integrated amplifier (75W/ch). The amplifiers' output tubes are KT150s, two per channel in the integrated and four per channel in the GS150. The 'G' is short for Galileo, begging the question: why name an American valve amp line after an Italian astronomer?

www.audioresearch.com



While everyone was drooling over the new Reference Series, they might have missed that KEF had also turned up with a smaller version of the supersexy Blade called Blade Two. Dimensions are only slightly reduced at 1461x475x338mm (hwd) versus the original's 1590x540x363mm, as the pic shows. Drivers are a Uni-Q with 25mm vented aluminium dome tweeter with a 125mm mid, plus four 165mm side-firing aluminium woofers. Sensitivity is 90dB. The Blade Two is offered in seven colours. www.kef.com

darTZeel added the LHC-208 Integrated Streaming Amplifier to its catalogue, one of the company's most slick products yet, thanks to the handsome full-colour touch screen. The compact unit measures only 440x350x130mm (wdh), features four analogue and six digital inputs, a HT bypass and delivers a claimed 200W/ch plus 24-bit/ 352.8kHz processing via dual DACs. www.dartzeel.com



Music Hall's Roy Hall had no info whatsoever on his brand-new headphones, only that he was as compelled as any to join the remaining growth sector in the audio biz. Music Hall being what it is – devoted to affordable kit – one can expect the price to be sensationally low. Construction was excellent, comfort high and the colour a refreshing change from the norm.

www.musicchallaudio.com



oppo

PM-1

Planar Magnetic Headphones



Proprietary Planar
Magnetic Technology

Life-like, Natural Sound
Quality

Balanced Ohno
Continuous Casting cable

Cable for mobile devices

Wooden storage box

Selvedge denim carry
case

High Sensitivity &
Scalability

Plush Padding &
Reduced Weight for
Exceptional Comfort

oppo-bluray.co.uk



Serbia's Auris Audio showed its gorgeous wood-and-leather-clad electronics including the HA-2 headphone amplifier, seen above the Largo preamplifier/DAC. The HA-2's integrated 24-bit/96kHz DAC will accept music sources from PC or Mac and can be also used as a preamplifier. The HA-2 costs only €1380, while the Largo sells for €4680, with battery power supply for an additional €780. www.aurisaudio.rs



Not sure if I heard correctly, so I'm nervous writing that EAT's brand-new turntable – seen here in prototype form – costs as little as I was told, like, er, under €3000 with tonearm. Called the C-Sharp, following the E-Flat, its plinth and floating top plate are made from carbon fibre, with a beautiful pattern, while the platter features a distinctive sloped edge. www.euroaudioteam.com



Estelon's handsome Extreme were heard with power courtesy of Vitus Audio's 700W/ch MP-S201 Masterpiece Stereo Amplifier. The Extreme has variable height of 1770mm-2070mm to contain its pair of 10in woofers, 10in aluminium mid-woofer, 7in ceramic inverted dome mid and 1.5in diamond tweeter. www.estelon.com; www.vitusaudio.com

A new brand making speakers under BBC license? Graham Audio – not to be confused with tonearm manufacturer Graham Engineering – displayed the LS5/9 as part of its series called 'BBC Historical Products'. Of course, my first question was, 'What about the LS3/5A?' Er, watch this space? www.grahamaudio.co.uk



Legendary tube amp maven David Berning's 211/845 OTL monoblocks should set a few hearts a'fluttering. Like the model's name suggests, this output-transformerless 60W Class A triode amplifier accepts either of the two veteran valves. These are optimised with automatic biasing and the amplifier also features proprietary switch-mode power supplies. rbhifi1@gmail.com

Karl-Heinz Fink has designed enough speakers for others. Seen here is his Triple-F Concept Speaker A, a prototype that shows what he can do without constraint. The three-way design uses two 12in woofers in a side-firing array with closed box alignment, two 6in midrangers and an air-motion transformer tweeter. karl-heinz@fink-audio.com





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MartinLogan's new Neolith was one of the show's hits, a new electrostatic flagship hybrid with a cone woofer. It boasts a 22x48in electrostatic transducer above a 15in rear-firing woofer plus a 12in forward-firing woofer, for a response to 23Hz. The speaker is wider than 'Logans of late – imagine a CLS perched on top of a subwoofer to get an impression of the size. www.martinlogan.com



Antony Michaelson gleefully showed the newest nuvistor-powered unit, reviving a much-loved and sorely-missed range. The NuVista 800 integrated amplifier has its own light show, with the nuvistor illuminated in green. Power is 300W/ch, and the price is €9,999. www.musicalfidelity.com

Gato Audio's DIA-250 is an integrated with Class-D output stages rated at 250W/ch, with onboard DAC using a Burr-Brown PCM1794 that upsamples to 24-bit/192kHz. Digital inputs include USB, coaxial and Toslink, two single-ended analogue inputs, balanced in and out, and line-out. The similar DIA-400 amplifier delivers 400W/ch. www.gato-audio.com



TechDAS' TDC01 Ti, is an extension of the TDC01 Reference MC launched at the Tokyo Show in November. Its egg-shaped body is fashioned from titanium, while the cantilever is made of pure boron, tipped with a semi-line contact stylus. The weight of the cartridge is 17g while output is said to be 0.45mV. Loading is 100-200ohm. It comes with an electronic stylus gauge. www.techdas.jp

Crystal's latest loudspeaker is the Minissimo, a small two-way fitted with Scan-Speak's beryllium-dome tweeter and Illuminator woofer. Colours were sublime, including this aquamarine hue that looked like it belonged on a 1957 Fender Stratocaster. www.crystalcable.com



EAM Lab from Italy showed a full range of balanced solid-state amplifiers including the Reference 352. It's a stereo unit said to be good for 350W/ch into 8ohm, or 1400W/ch into 2ohm, in Class AB. Centre panel is available in white as seen here, or in black. Matching preamp is called the Reference C301. info@eamlab.com



Next month

Hi-Fi News reports from T.H.E Show at Newport Beach, CA

Czech revolution

Ken Kessler goes behind the scenes at Pro-Ject's HQ in the Czech Republic

RIGHT: Every turntable, like the Signature 10 seen here, is set up, measured and fully tested before shipping. Despite the factory's age, the test equipment is modern and comprehensive

It's all about context and perspective: those of us unimpressed by the so-called 'vinyl revolution' have been less-than-dazzled by global annual sales that are fewer than what The Beatles would do on their own in a single day in 1965. Five million LPs? Ten million LPs? 'Bupkes', as my grandfather would have spat. But turntable sales? Now there's a measure we haven't considered.

Before you start cracking the champagne, note that current global turntable sales are also insignificant when one considers that Garrard alone, back in its 1960s heyday, produced 2,000,000 decks per annum. Add to that *all* of the units from Thorens, BSR, AR, Rek-O-Kut, Empire, Goldring and Lenco, ELAC, Dual, PE, Collaro, Connoisseur, B&O, Phillips, every Japanese brand and countless others. One can only imagine just the number of Pioneer PL-12Ds sold back in the day.

MARKET LEADER

This seemingly glum prelude is only to prevent you from thinking I've gone to Scotland to learn a jig: Pro-Ject is now – apparently – the world's largest maker of hi-fi turntables (as opposed to £29 plastic USB crud). And while that is no mean achievement, please keep your elation in check... or should that be Czech.

Founder Heinz Lichtenegger has created a company, soon to



celebrate its 25th Anniversary, that is able to boast of turntable production in six figures. Its monthly production alone averages a thought-provoking 10,000 units. It says as much to this scribe as does the entire record industry's boast of six million (or ten, or three, depending on the source) LP sales.

To put that into context – again depending on which slaving vinyl booster you ask – a conservative estimate of Pro-Ject's retail activity alone, at an average price of £300 per deck, is equal to street sales worth £30,000,000. Sales of 6,000,000 LPs at an average of £20 means that Pro-Ject – on its own – has retail turnover *just for its record decks* equal to a quarter of the global retail sales of LPs. It's a sobering thought that speaks more of Heinz's business acumen than of the record labels who tried to kill off vinyl in the first place.

LESSONS LEARNED

To experience just what Heinz has achieved, and without including Pro-Ject's electronics or accessories, I visited the factory in Litovel in the Czech Republic where the decks

are manufactured, to the northeast of Pro-Ject's Vienna headquarters. It was a 'blast from the past' that taught me a few lessons, not least in serving as a reminder that the Czechs had a sterling reputation for engineering before clashes with Russia destabilised the country.

Keep in mind the accurate use of the word 'manufactures', not 'assembles'. Working with a mix

'The company is now the world's largest maker of hi-fi turntables'

of deliciously vintage lathes and drills and presses finished in that wonderful baked enamel green midway between olive and lime, a colour also seen

on vintage British machinery, the workforce occupies what was once the old Tesla factory. Pro-Ject's requirements are enough to keep the six-storey building buzzing with a staff of 300, and Pro-Ject is the *only* audio company using the facility. The only other clients of which I'm aware are Märklin, needing small parts for its delightful train sets, and Škoda.

A contented Mr Jiri Mencl, the director of the factory, and Mr Jan Jelínek, the chief of the technical department, greeted me and told me about the workings,

RIGHT: The inauspicious access to the 'world's largest turntable manufacturer', the Communist-era Tesla factory (a throwback to Khrushchev-era Czechoslovakia) now sub-contracted by Pro-Ject





ABOVE: Stacks of all-metal platters fresh from finishing and awaiting balancing and matching to the turntables

LEFT: Mostly female staff, seen here assembling the new, entry-level Elemental

one-time project of only 200 pieces. They hated my modifications to their existing models.

'They didn't understand why there must be a better cable, a better cartridge. It took me about four months to get them to understand what is "black"! I had all sorts of blacks, green-ish, red-ish, yellowish-ish, blue-ish – whatever you want *except* black. Yes, we had some blacks, but it would be too rough, too shiny, too matte – simply not right for our plans.'

FIRST PROBLEMS

Heinz sighs with the memory of those early efforts. 'The initial problem was explaining to them why we in the West think like that. They had to understand how crazy we are. Everything I wanted, they had no understanding of it. So the biggest problem in the beginning was not selling the product, but getting these guys to make it.'

It wasn't simply the direct situation of manufacturing: Heinz also had to deal with pre-*glasnost* Eastern European paperwork, the factory's new owners and a number of other distractions. ☺

particularly after I explained that my only knowledge of Tesla-branded products were valves.

HAPPY ACCIDENT

In recounting just how Pro-Ject was born, I was reminded that the funky NAD 5120 turntable of flat tonearm fame was devised and manufactured by Tesla, making it possibly the only product from the company that enjoyed sales in the countries outside Russia's reach.

Unlike just about any story in the annals of hi-fi, Pro-Ject's began with a happy accident. Obsessive music lover Heinz learned of a turntable

factory about to close, only a few hours away from Vienna, where he was importing, distributing and retailing high-end audio components. Before this occurrence, Heinz was, in fact, looking for turntables to sell, the demand having slowed but not halted by the late 1980s/early 1990s, while the choice had diminished.

Based on the existing Czech design he had found purely by coincidence, 'Our first turntable, Pro-Ject 1, was produced against the resistance of the factory. They wanted to *close* the factory. They didn't want to produce this model, a

BELOW LEFT: Old machinery, in 'classic National Health green' enamel, still performing admirably, and attesting to Czech engineering skills

BELOW RIGHT: Fully-tested turntables await final inspection before packing and shipping



Vena

Compact Digital Amplifier



Quad celebrates 77 years of audio innovation with the launch of Vena: a compact integrated amplifier sporting a wide range of digital and analogue inputs, plus superior-quality wireless streaming over Bluetooth with aptX support. D/A conversion is handled by the same high-performance 24-bit/192kHz chipset used in the company's acclaimed Platinum CD players and, as one expects of Quad, the Class AB power amp section is of the highest quality. With a range of finish options to suit any setting, Vena is an exceptionally neat solution for superb sound from any source: from smartphones, tablets, PCs and Macs to traditional hi-fi separates.



INVESTIGATION

cartridge, it was a joke. Just fitting an Ortofon cartridge – it changed the whole world! The original cables were a disaster, so we put proper copper cables in. Boom!

'In the end, I have to admit: I'm not a designer. I have designers in my company who translate my ideas into perfect products. This was always the case, because the factory had excellent technicians. Everything I have, I found somewhere in the marketplace. I copied it. And I made it *better*.

'And less expensive.'

NEW TONEARM

It's a formula that has worked on every level. Pro-Ject's catalogue is massive, with turntables at every price increment from around £150 up to the mid-thousands.

Meanwhile, its OEM clients are happy to engage Pro-Ject's willingness to manufacture turntables for them, distinct

from Pro-Ject's own models. Coming soon is an affordable tonearm that will appeal to LP users on a budget, and – I suspect – the entry-level

Elemental will sire other stripped-down models.

As of 2014, the Czech factory makes everything (another in Slovakia produces the Box electronics), from the motors to the tonearms to the platters to the plinths, in-house. There are snooty watch brands that aren't even this ➔

"Just fitting an Ortofon – it changed the whole world!"



'The factory had laid off a lot of people [before Pro-Ject's arrival] because it was hardly economical. They had their own hospital, their own medical care, their own doctors, a football club. These 2000 people were really productive. My own cost was several hundred per cent of the production price.'

Working with Tesla's existing design, Heinz 'changed everything that I knew made a turntable sound better. At the end of the day, what you hear from a turntable is a combination of resonances – every element has to be OK, the arm the cartridge, the bearing, the suspension. You make one part of it wrong, and nothing is working.'

NOTHING NEW

Heinz knows his audio history: he has a turntable museum to show that he's done his homework, with – what? a hundred? – rarities

ABOVE: Two shots indicating the number of platters Pro-Ject uses. Seen here are the Elemental Line and Essential Line platters to the left, Debut and RPM platters on the right

BELOW: Dearer Signature models (left) await their main bearings; rear view of an Elemental (right) after final inspection and awaiting packing

from obscure Thorenses to Duals to Garrards to Trio's L-07D, Swiss and German and British and Japanese and American.

'We must state that everything in turntable design in 1990 had already been invented. High mass platters, string drive, vacuum, air-bearings – whatever you name, it already existed 25 years ago. Nothing new.

'What Pro-Ject did – we didn't do anything new. We only took all of our knowledge and put it into turntables to make them better... and at a lower cost.'

As Heinz maintains in the philosophy of Pro-Ject's 'Box' range of mini-components, 'We brought the high-end price down. We put in the low-cost turntable a good Ortofon cartridge. The original Tesla





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vertically- and laterally-integrated. I saw trays of bearings and motors, graded according to price points. I witnessed the same levels of attention paid to the Elementals (already having sold in the many thousands) as to the dearest models.

Rows of platters being finished, wire looms being trimmed, dustcovers and coil winders and plinths. Here, a prototype for an all-new Pro-Ject top-end model, there a working prototype of EAT's forthcoming C-Sharp turntable. The place was buzzing.

NAD INSPIRED

But back to Tesla's own turntable for NAD, now all but forgotten, for some nice, circular 'closure'. Heinz's wife Jozefina, known initially in the audio community for her EAT valves, the ones made by hand in the Czech Republic (and awaiting a future 'Investigations' instalment), also manufactures turntables, constructed by Pro-Ject. Following her Forté models, Jozefina unveiled the E-Flat.

Its tonearm? A beefed-up, wholly modern, ultra-rigid design inspired by the tonearm fitted to the original Tesla/NAD 5120 LP spinner, thus demonstrating that what goes around, comes around. And around, and around, and around. ☺

ABOVE: A batch of carbon-fibre tonearms for EAT's E-Flat turntable, inspired by the NAD 5120's arm – the turntable that triggered the entire Pro-Ject venture

BELOW: Prototype of the EAT C-Sharp turntable launched at Munich High End in May [see p11], at least a generation or two prior to the one seen in finished form at the shows



PRO-JECT DEBUT AND THE ANALOGUE REVIVAL

Pro-Ject's raison d'être isn't simply supporting analogue: Heinz Lichtenegger [right] is obsessed with restoring some sense of value for money, especially for non-audiophiles who find hi-fi prices to be ludicrous. His desire to bring down prices resulted in one of hi-fi's all-time best-sellers: the Debut turntable.

'It is the main product in the revival of the turntable. The Debut changed everything because it was the lowest-cost turntable you could make – in the beginning, it was something like £200. Less expensive bearing than the Pro-Ject 1, definitely "one class" cheaper, but looking quite similar.

'It said two things. The first was that it wanted to create a new market besides these old audiophile guys. There's no exclusivity anymore, so we are going to the mass market. We needed a price point where the customer can say, "This is such good value! We'll buy it because it's hot. All of the hi-fi products are too expensive."

'That's why hi-fi wasn't and isn't moving. Because when you look at the product, and you look at the value of the product, the price tag for what they're charging... where is the money going? You have some products, say, "wonder feet", costing \$100, and the customer thinks, "Why do they cost \$100? The material is, maybe, ten bucks!"

When it came time to do it all over again in 2013 with the

Elemental, Heinz used the same formula: he lowered the profit margin. Did retailers complain?

'Oh, yeah, they complained big-time. When I introduced the Debut in 1999, they complained then, too. When I went to the markets, to Best Buy, they killed me – they said, "You'll ruin our business!"

"People saw turntables and were amazed they still existed"

'Exactly the opposite happened, because the Debut created so much traffic, the price point was so hot – if you make 28 or 33 points instead of 40, you'll sell a lot more, and you'll bring in new customers. I put the Elemental in place because I realised that the big companies were selling hundreds of thousands of pieces of plastic crap, those USB turntables made entirely of plastic.

'I also know that people will not jump from \$100 to \$300. It's too big a gap. But to go up from \$100 to \$159, \$199 – that's good publicity. Then, if they want to go up, it's only \$299 for Essential.'

Heinz has been careful – thanks to his years in retail before entering manufacturing – to pay attention to what the consumer really wants. It's why his catalogue has so many turntables at what may seem like close price points. But the idea of a consumer looking at a £35,000 speaker not being frightened by spending another £5000 doesn't work with 'normal' consumers. Knock off a zero or two, and the ratios are the same.

'With the Debut, I was looking for Pro-Ject to gain exposure. Everybody cares about the margin – nobody cares about exposure. I put these in the best shops in the best streets. People walked by, saw turntables, and were amazed they still existed. "£200! Wow! This is great! I have ten records at home – I want to play them!"

'That made analogue hot – not the audiophiles. It's not about analogue being better than CD. That's not the problem. It's the feeling of analogue, the sense of analogue, the participation that makes analogue so popular.'



JBL Project Everest DD67000

JBL's flagship monitor has been upgraded with new bass drivers, improved crossover parts and a beefed-up enclosure. Strap yourself down and be prepared to be thrilled...

Review: **John Bamford** Lab: **Keith Howard**

At the pinnacle of JBL's loudspeaker range, the Everest is where Harman International's top design engineers showcase their latest driver technologies. It's a monster of a speaker weighing 142kg and priced at a whopping £35k each, its 250 litre enclosure 1110mm wide to accommodate two 15in drivers side by side. The cabinet is unusually shallow, however: just 470mm front-to-back. So while it doesn't require an enormous listening space, a room does need to be adequately wide in order to space a pair apart satisfactorily.

The Everest has been JBL's flagship 'Project' speaker for nearly three decades [see boxout], this recent DD67000 model superseding the DD66000 of 2006. It might be considered the 'big daddy' of JBL's K2 S9900, whose affecting sound quality has stayed with me ever since we reviewed it [*HFN* Aug '10].

TWIN BASS DRIVERS

Carried over from the out-going Everest model are the speaker's two horn-loaded beryllium compression drivers: the 100mm diameter 476Be high frequency unit which operates from 850Hz to 20kHz and the 25mm 045Be-1 'UHF' supertweeter, working up to a claimed 60kHz. The K2 features the same beryllium UHF driver, married with JBL's slightly less costly 476Mg high frequency driver, which employs a 100mm magnesium diaphragm.

The speaker's curved baffle provides the side-walls for the main high-frequency horn. Top and bottom horn flares are accomplished by the attachment of precision moulded Sonoglass horn 'lips' to the enclosure's upper surface. The UHF driver is in a separate Sonoglass horn which is mounted to a diecast aluminium housing.

What makes the Everest significantly different from a K2, of course, is the inclusion of *two* rather than one 15in

woofer. And JBL's 1500AL-1 – featured in the K2 and the previous Everest – has been substantially re-engineered here.

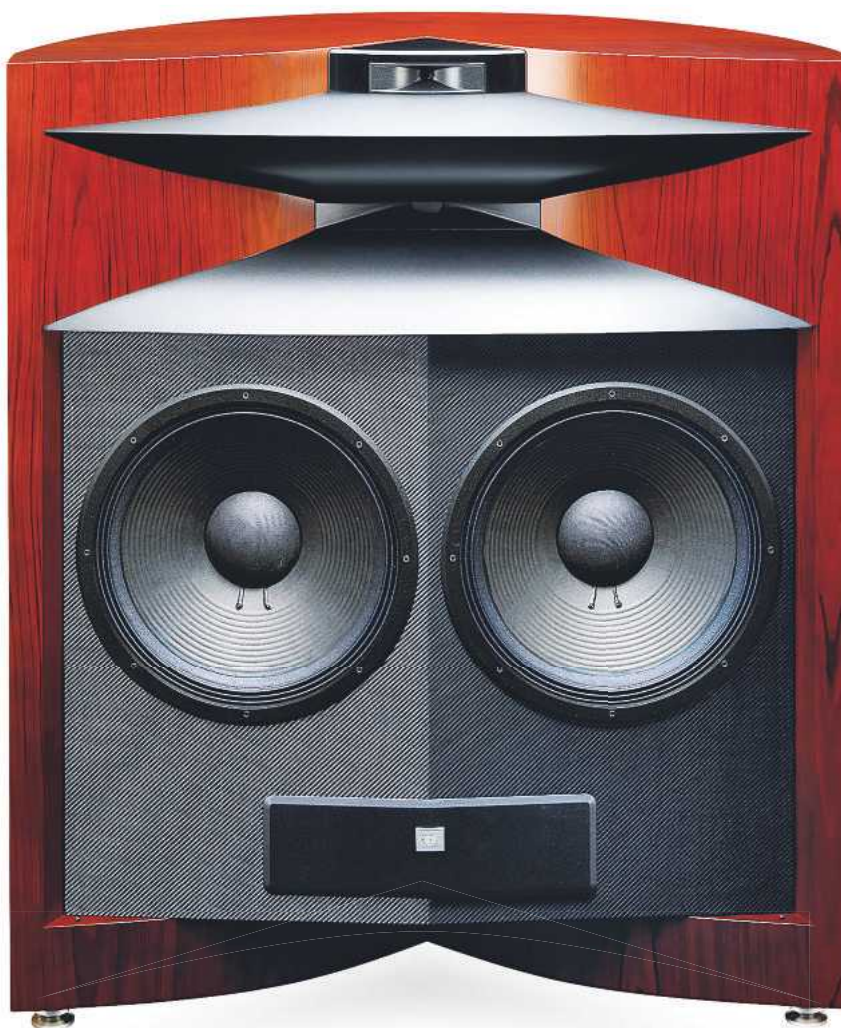
The new 1500AL-2 is housed in a cast aluminium frame and features a three-layer laminated cone comprising an inner and outer layer of pure pulp with an inner foam core. Claimed to give a more taut and articulate LF response down to 29Hz (-6dB in half space), it also features

a newly designed accordion-pleated poly/cotton surround for 'a more consistent tonal balance at any volume'. Its 4in voice

coil is immersed in an Alnico 5DG magnet, while a copper and steel laminated top plate contributes to a more linear motor function, says JBL, along with inherently lower distortion [see

Lab Report, p23] and greater immunity to temperature changes.

'The timbre and transient attack of instruments is shockingly real'



RIGHT: The 250 litre enclosure has two 380mm drivers, one operating below 150Hz, the second crossing over to a horn-loaded compression driver augmented by a supertweeter

To exploit the new bass drivers, the Everest's 45mm-thick hybrid baffle, made from layers of birch plywood and MDF, has been strengthened with a covering of carbon fibre cloth.

FINE ADJUSTMENT PROVISION

The basic configuration, then, is what JBL historically has referred to as an 'augmented two-way'. In the 1950s and '60s, JBL primarily built two-way systems with a 12in or 15in woofer crossed over to a large-format compression driver/horn combination. Some of the systems would be augmented by a UHF driver: in days past, JBL's 075 ring radiator operating above 8kHz. Such systems would have only a single crossover point in the middle of the audio range, to minimise sonic degradation caused by the dividing network. In the DD67000 this occurs at 850Hz, as one of the woofers is blended to the 476Be compression unit. Both woofers operate below 150Hz, but only one of them extends up to the midrange crossover point. The second woofer

SCALING EVEREST

The lineage of JBL's high-end 'Project' loudspeakers – such as the K2 and this mighty Everest – dates back to the Lancing Hartsfield of 1954. Designed to out-perform the hugely successful Klipschorn of that era by featuring better drivers and a more rigid enclosure, the corner horn Lancing Hartsfield had an impact on the luxury audio market which cannot be overstated. Thanks to *Life* magazine declaring it 'the ultimate dream loudspeaker', it immediately gave the JBL brand national recognition in the USA. It was followed in 1957 by the Paragon, a stereo speaker system fitted into a 2.7m wide enclosure resembling a 'kitsch' sideboard. The first Everest model, the DD55000, appeared in '86, since when it has undergone continuous refinement. For those who can't quite stretch to today's DD67000 there is a less costly Everest variant available: the £28k DD65000 which has a magnesium diaphragm rather than beryllium compression drivers. You'll find that two Everests are used for the front channels in JBL's no-holds-barred Synthesis home theatre systems!

operates solely at LF to around 150Hz, where it is rolled off at 6dB/octave.

The cabinet is ported at the rear with a tuning frequency of 32Hz. Two 100mm-diameter flared ports are combined with the input connections on a three-piece diecast aluminium structure. Take off the grille and you'll find a removable panel behind which are linking bars to determine which of the woofers operates up to the 850Hz crossover point (this should be set to be the innermost driver) and further links to disable the network for active drive with an external electronic crossover.

An HF switch is provided to tweak the 476Be transducer by approximately $\pm 0.4\text{dB}$ over the 1-8kHz range. A second switch cuts or boosts the output level of the low-range woofer by 0.5dB in the 40-120Hz range, for in-room tuning.



REALISM!

Almost every night became a party night during the time I played host to the Everests. And such was their astonishing resolution of fine

detail, rediscovering gems each day in my music collection was like delving into new chapters from the Book Of Revelations. I invited several audiophile friends to hear them, most of whom went home gob-smacked, having experienced something of a hi-fi epiphany.

I didn't just like them: I absolutely *loved* them. In the same way that the smaller K2 had me captivated by its remarkable clarity, the Everest similarly puts you in the hot seat of a studio control room – but with additional scale and effortless bass power and dynamics. Treble, in particular, is fabulously lifelike.

Play easy-on-the-ear recordings like 'No Sanctuary Here' from Chris Jones' *Roadhouses & Automobiles* [Stockfisch Records SFR 357.6027.2] and you'll certainly consider the sound 'nice' – as you wallow in rich, deep and thickly-textured bass, a warm midrange and appealingly delicate, sparkling highs. But there's nothing sweet or delicate about the manner in which the Everest recreates the blast of a trumpet, the wail of a soprano sax, or the sound of wooden sticks striking percussion. The timbre and transient attack of instruments is shockingly *real*.

There is a downside: hearing the *true* nature of a recording can often result in disappointment. Stevie Wonder's 'Superstition' from 1972's *Talking Book* [Motown 157 354-2] was torn apart layer by layer by the Everest. Wanna hear how low-fidelity, tinny, and coarse the recording of the brass is? How about those biscuit-tin-lid drums? Admittedly the bass walloped away agreeably and the track boogied, but it sure sounded of its age, the Everest proving that 'Superstition' really isn't a track with which one should judge the fidelity of a playback system.

But I soon lost count of the number of occasions the Everest had me transfixed ➡



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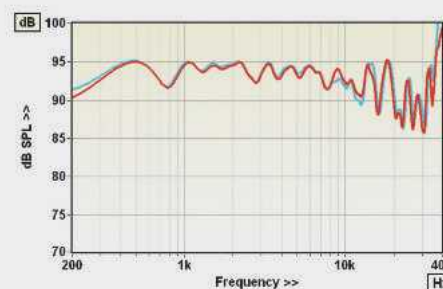
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LAB REPORT

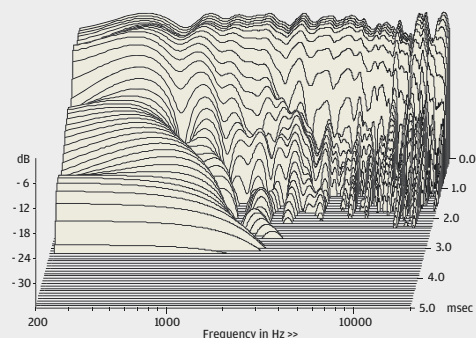
JBL PROJECT EVEREST DD67000

JBL claims a high 96dB sensitivity for the DD67000 but that's not a figure our measurements support. We recorded 93.6dB on pink noise, 93.8dB using the IEC 60268-1 simulated programme spectrum, so 94dB is justifiable – but still well above average. And this is achieved without recourse to low impedance. We measured a minimum modulus of 4.5ohm at 20kHz – too low to justify JBL's 8ohm nominal impedance but high enough that you couldn't really argue with a 6ohm figure. Impedance phase angles are large at low frequencies, though, so the EPDR (equivalent peak dissipation resistance) drops to a minimum of 2.0ohm at 72Hz, and at the other end of the audible spectrum to 2.1ohm at 18.6kHz. So the DD67000 is far from being a testing amplifier load, but it isn't a pussy cat.

The forward frequency response [Graph 1, below], measured on the axis of the main tweeter, is flat in trend up to about 7kHz after which it begins to decline, albeit with large ripples almost certainly due to mouth reflections in the horn. (Ignore the dip at 760Hz which would almost certainly have filled in had we been able to measure at 2m rather than 1m distance.) Despite this treble unevenness response errors were restricted to ± 3.6 dB and ± 3.5 dB respectively for the pair, 300Hz-20kHz. Matching over the same frequency range was less impressive at ± 1.9 dB but below 8kHz fell to a remarkable ± 0.3 dB. The diffraction-corrected near-field bass response indicated a fast roll-off below 70Hz, reaching -6 dB/43Hz (re. 200Hz), so some sacrifice of bass extension has been made to achieve the high sensitivity. But bass distortion was extremely low at 0.02% for 90dB SPL at 1m at 100Hz – amazing! KH



ABOVE: Flat bass/midrange response but HF ripples are due to reflections across the mouth of the horn



ABOVE: Fast decay and no obvious bold resonance modes, but some mild peaks in the presence/treble

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	93.2dB/93.6dB/93.8dB
Impedance modulus min/max (20Hz–20kHz)	4.5ohm @ 20kHz 24.5ohm @ 52Hz
Impedance phase min/max (20Hz–20kHz)	-60° @ 62Hz 23° @ 43Hz
Pair matching (300Hz–20kHz)	± 1.9 dB
LF/HF extension (-6 dB ref 200Hz/10kHz)	43Hz / >40 kHz/ >40 kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	$<0.1\%$ / 0.1% / 0.1%
Dimensions (HWD)	1109x965x469mm



ABOVE: Cover plate on the baffle conceals switches for tweaking HF/LF levels, and links to handle the speaker and disable the network for active drive

by its honesty, as recordings I thought I knew intimately were exposed in a new light. My collection of hi-res audiophile recordings had me spellbound as the speaker divulged the true-to-life sounds of instruments and voices, and the acoustic settings in which they had been captured.

ALL THE SLAM YOU'LL NEED

As for rock-for-the-boys, Metallica's eponymous black album sounded cosmic at 96kHz/24-bit ripped from DVD-Audio [Elektra 61113-9], as did innumerable prog-rock and jazz-rock masterpieces from the early 1970s. And playing Steely Dan's classic *Royal Scam* [Japanese SHM-CD Geffen UICY-93519] while pressing hard on the loud pedal during the title track resulted in yet another of those countless 'OMG' moments as the Everest's breathtaking clarity caused our jaws to drop into our laps. The myriad backing tracks in this studio concoction were laid out explicitly, the depiction of piano and trumpet spookily lifelike.

The Everest doesn't require a brute of an amp to deliver deafening SPLs, but it is ruthlessly revealing of amplifier quality. It sounded great with my Levinson No.383 100W integrated, even more open and clear with Ayre's beautiful AX-5 [HFN Jun '14], and sublime with Levinson's flagship No53 monoblocks [HFN Jan '11] which were supplied during the review period to show the Everest

at its best. The improvement the No53s wrought was particularly noticeable in the bass, with increased articulation. Curiously, the Everest's low frequencies can appear 'detached' from the music. It took a while to realise that this is because of the speaker's superlative bass control and no matter what mayhem is occurring at LF the rest of the range remains entirely unaffected.

If you want bone-crushing dynamics this speaker delivers in spades. If you're chasing electrostatic panel-type soundstage depth and imaging, it provides that too. And if you've a penchant for enjoying rock/pop/dub/electronica at, ahem, *realistic* SPLs, the Everest supplies sufficient slam to be considered an offensive weapon. Seriously: a pair of Everests will fill a community hall with hi-fi sound without breaking into a sweat, never mind an audiophile's listening room.

If you want music to sound 'live', this is where you'll find it. ☺

HI-FI NEWS VERDICT

Given sufficient room to allow them fully to give of their best, JBL's flagship Everest DD67000s won't fail to blow you away. They allow forensic inspection of recordings and deliver revelatory detail, as if you were sitting at the mixing desk in a studio control room, yet without any of that brittle treble, or 'matter-of-factness', often experienced from studio monitors. These Everests sound simply awesome.

Sound Quality: 90%



ModWright LS 36.5/KWA 150SE

There can be good arguments for teaming a tube preamp with a big solid-state power amplifier. But does this US hybrid combination really give the best of both worlds?

Review: **Steve Harris** Lab: **Paul Miller**

Many designers might agree with ModWright's owner Dan Wright when he says 'Valves are great voltage amplifiers. Solid-state devices are great current amplifiers. As a result, I prefer valves in preamp, source and phono stages, and I prefer a *good* solid-state design for power amplifiers. I feel that this gives the control, bandwidth, resolution and accuracy of solid-state with the beauty and organic sound of valves.'

And this does avoid some practical and economic drawbacks too. Big tube power amps that can really give 100W or so tend to be overweight, cumbersome and demanding: high-maintenance creatures that produce a lot of heat.

On the other hand, making a powerful tube amp 'user friendly' and foolproof (as VTL has done successfully) means adding a lot of solid-state control electronics as a support system for the tube circuit. And that inevitably makes the product much more expensive than a 'hair shirt' enthusiast valve amp, or a solid-state equivalent. So does Wright's approach really make the most sense?

DONT CHANGE THE TUBE TYPES!

To find out, we're looking at the top of the range 'DM' dual-mono version of the LS 36.5 preamp, with its separate PS 36.5 power supply, and the KWA 150 Signature Edition power amplifier.

While the standard LS 36.5 has one 5AR4 (or 5U4GB) rectifier tube, the PS 36.5 contains two, which peep up rather quaintly through the top plate and so need to be installed by the dealer or end user.

Unlike the standard LS 36.5, the DM system has tube regulators too, a pair of 6EA7s (or GZ34s). These are installed before shipping, as are the two 6H30 double triodes in the LS 36.5. Essentially, the 6H30 is a development of the familiar

6922 or ECC88 double triode, but these are not compatible. ModWright warns that changing the 6H30s for other tubes will damage the unit.

MOTORISED SOURCE SELECTION

Naturally, the mains inlet socket is at the back of the PS 36.5 PSU, but to power up from standby you just touch the LS 36.5's front-panel power button, which causes the PS 36.5's two LEDs to light while its projecting tubes begin to glow visibly. After a few seconds, a single blue LED lights on the preamp itself, and it's ready to play.

Despite the LS 36.5's inclusion of remote control and balanced inputs, the front panel layout closely resembles the old SWL 9.0 [HFN Mar '07]. The central rotary control is a source selector, its five detents marked by dots rather than anything more informative, but the leftmost position now selects the balanced input while the

far right one is a home theatre bypass or HT/BP loop. There are also three normal unbalanced line inputs.

Also marked with dots, until you get to the final '11' position, is the volume control, but both this and the source selector are motorised for remote operation. Between the two, replacing

the toggle switches of the SWL 9.0, are three push buttons for Mute, Phase (for phase invert) and HT/BP. The preamp always powers up 'in phase', indicated by blue LEDs inside the

unit, which go out when you select invert.

The HT/BP button comes into action only when you have set this input using the selector switch, and toggles it between HT/BP and standard preamp mode. You have to take care how you use this input, because it defaults to HT/BP mode when powered down – the input will then go straight to the main outputs at full volume.

'A bias setting option trades off sound quality against efficiency'



RIGHT: Inside the PS 36.5 power supply unit, which provides 'dual mono' power for the LS 36.5 preamp. Next to each of the rectifier tubes is a smaller voltage regulator tube



LEFT: A clean, simple preamp fascia layout follows on from the earlier SWL 9.0SE. On the power amplifier, the big illuminated logo is the on/off switch

circuitry said to improve dynamics and resolution. There is cryo-treated input wiring and 12 gauge audio-grade stranded wire to the binding posts. Finally, the capacitor banks have been redesigned to give greater capacitance and lower impedance for faster current delivery to the output stage.

That illuminated central front-panel logo also forms the mains on/off switch, not just a standby. Once pressed, it flashes blue while the amp remains muted until a stabilisation sequence is completed.

CIRCUIT PROTECTION

Multiple levels of circuit protection are included to prevent damage to amplifier or speakers. DC input protection is provided by the input coupling transformer,

while thermal protection is provided by internal heat sensors. In case of thermal overload, the amplifier will shut down completely, and can be turned on again when cool.

Short-circuit or current overload protection is provided by ModWright's proprietary Total Silent Protection circuitry, which is completely outside the signal path. When this is triggered, the affected channel will mute, or the amp will shut down, but it can then be powered off and restarted. Finally, internal fuses are fitted but these are not accessible to the user.

In the centre of the back panel, starting from the top, there is the small toggle switch for high/low bias, then a much chunkier one for stereo/mono, and below this a single pair of speaker output terminals for use in bridged mono mode.

Below this, just above the mains inlet, is another small toggle switch to control the internal LEDs which, if desired, flood the interior with blue light and send a blue glow into the room. Then, to left and right are the expected balanced/unbalanced inputs and stereo speaker outlets.

One intriguing feature of the KWA 150 power amplifier is the bias switch. It arrived after PM's lab testing with the switch in the

At the back are balanced XLR inputs, plus four pairs of phonos. Then there is one pair of XLR balanced outputs and the three pairs of phono outputs, Main 1, Main 2 and Tape. Alongside a small grounding post is a toggle switch, which can be used in case of hum problems to disconnect the internal signal and power supply grounds from the chassis and mains earth.

Five of the ten buttons on the neat metal-cased ModWright remote control duplicate all the front-panel functions.

It's now around three years since ModWright's KWA 150 power amp was joined by the upgraded Signature Edition reviewed here. This is a direct-coupled fully-differential design using no global feedback. The 'first watts' are said to operate in Class A, and unusually, there is a high/low bias setting switch, which trades off sound quality against efficiency.

For the Signature Edition, there's an upgraded model of Lundahl input transformer, with revisions to the input

THE WRIGHT STUFF

After graduating in mechanical engineering, Dan Wright became a professional engineer in the field of heating and ventilation systems, but he was a passionate audiophile. He was soon finding ways to improve existing products with parts upgrades and improved power supplies, and this became a serious spare-time activity. Wright got some welcome encouragement when his upgrade modifications for a Perpetual Technologies DAC were endorsed by the manufacturer, and in 2000 he took the plunge and launched ModWright as a full-time business. The initial offering was a tube-output-stage upgrade for the Sony CDP-777ES CD player, and similar mods for other models followed. By 2003, Wright was ready to launch a product of his own, the SWL 9.0SE preamplifier. As he explains, 'The tube stage used in our first mods, is a "Mu" stage, designed by Alan Kimmel. This initial circuit became the basis of a lot of different tube circuits that we used in our mods, and eventually in our first production piece, the SWL 9.0SE. It should be no surprise that I continue to consult with Alan Kimmel.'

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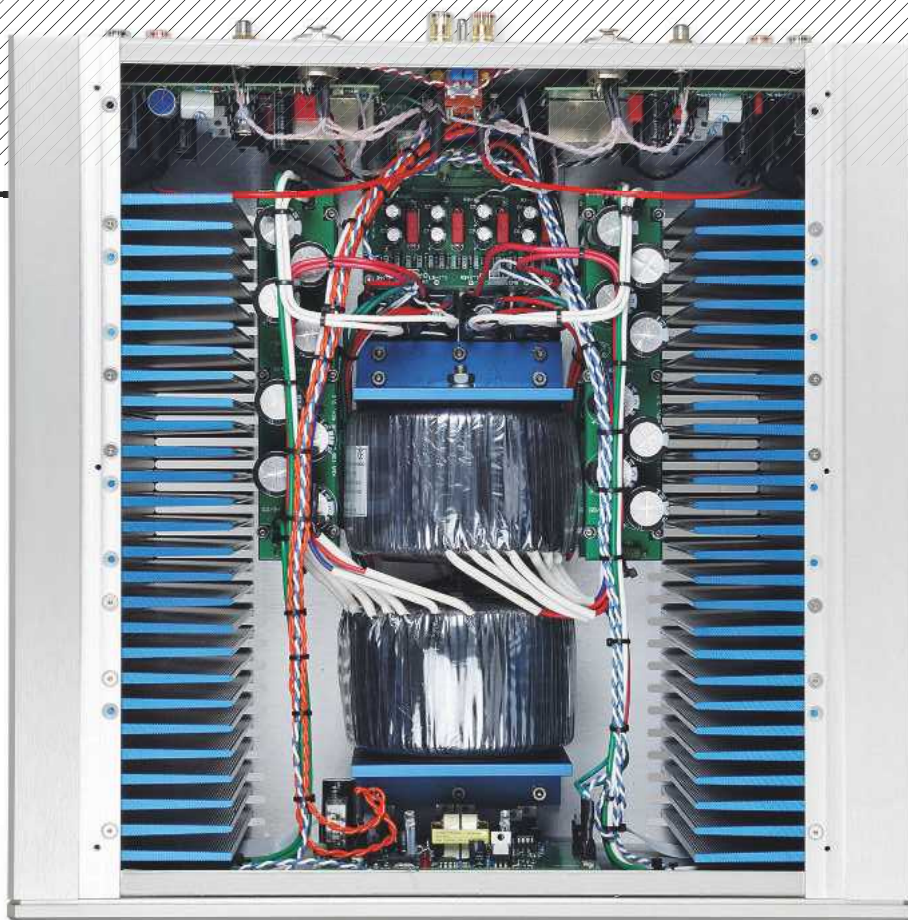


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DAN WRIGHT

Today there are really two ModWright businesses under one roof. ModWright Modifications handles mods for the Oppo BDP-105 and Sony HAP-Z1ES HDD audio player, for example [details at <http://www.modwright.com>], while ModWright Instruments Inc builds the complete products.

'Personnel-wise, I do have separate technicians who handle the day-to-day production of the ModWright Instruments products,' says Dan Wright. The modification work is done largely by an independent contractor who has worked for me since the early 2000s. The production crew also builds the external supplies for the mods and does most of the PCB assembly.

'In total, there are now seven people that work for ModWright Instruments and a handful of design consultants that I contract with for digital design, microprocessor programming and analogue design. I actually contract out the digital design of our products and focus on the analogue stage and power supply designs.'

On the subject of high-resolution audio and the Sony HAP-Z1ES [*HFN* Mar '14], Wright says 'When the music is mastered from DSD or similar high-res source, it is brilliant! I think that it is ridiculous, however, to remaster PCM-encoded music to DSD – you cannot add what was not there to begin with!'

'Having said that, in the case of the HAP-Z1ES, the DSD engine that converts any lower resolution format to DSD really *does* sound good!'



High position, but naturally I experimented with this before doing anything else.

FINE DETAIL AND BODY

When I put on Rebecca Pidgeon's *The Raven* [Chesky SACD 329], though, a quick comparison was enough. On the Low setting, the amplifier lost what I'd already identified as a great combination of fine imaging and unforced detail. In imaging terms, Pidgeon's vocal was now diffuse and imprecise, while the mid and treble generally took on a slightly blaring quality. Really, the sound was inferior in almost every way you could think of.

So this is not really a sonic option. Until I read the manual properly, I wondered why the Low bias setting is provided at all. It's really there in case you want to run the amp with less current consumption and consequently less heat dissipation; ModWright states that the High position will give the best sonics.

After this, of course, I listened to Rebecca Pidgeon right through to 'Spanish Harlem' and 'Remember Me'. And the amplifier really did seem to bring a fresh charm to Pidgeon's heartfelt and optimistic love songs. With the ModWright combination, as a generalisation, the sound was just bigger than with several other solid-state amps I have tried, and it was also very dynamic.

A case in point was pianist Zoe Rahman's almost unexpectedly great album

ABOVE: The KWA 150 has massive toroidal mains transformers and generous heatsinking. An input transformer protects the amp from DC

Live [Manushi MANUCD003], recorded in 2007 at the Pizza Express in London. This time, Rahman's energy was simply jaw-dropping, first of all absolutely conquering the audience and the venue on her version of Abdullah Ibrahim's 'The Stride' and then hitting new heights in duet with brother Idris on clarinet. Gene Calderazzo's drums had power and speed and Oli Hayhurst's

bass solos came over with gripping intensity.

ModWright's aim has never been to emulate the supposedly 'soft and cuddly' sound of valves. But you certainly couldn't say that this combination lacked

warmth, and when used with the B&W CM10 speakers [*HFN* Sep '13], it could be generous and full-bodied.

It was entirely captivating on 'Intuité' [Favored Nations 2130], where guitarist Pierre Bensusan often gets his instrument to sound more like an oud, with the help of added ambience in the studio sound. And yet the presentation here excelled in detail too, as the precisely-captured finger and string noises helped bring a tangible and inviting reality to the performance.

Always revealing of recording quality, the ModWright combination seemed to dissect the sound of Ry Cooder's pioneering digital recording *Bop Til You Go* ➔

'Finger and string noises brought a tangible reality to the performance'

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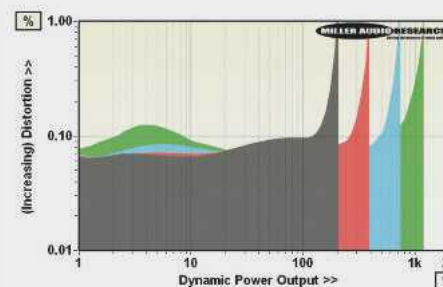
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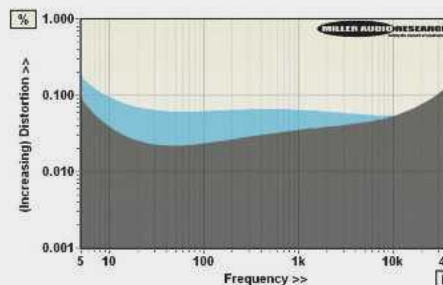
MODWRIGHT LS 36.5 / KWA 150SE

If you are looking for synergy between a pre and power amplifier, then here it is. The LS 36.5 preamp, with its unity-gain balanced-in/balanced out configuration, has evidently been designed to work with line-level sources which provide >1530mV to drive the KWA 150SE to its rated 2x150W/8ohm output. Ultimately, the '150SE will deliver 2x185W and 2x315W into 8/4ohm with 200W/390W available under dynamic conditions. Into lower 2/1ohm loads, the solid-state output stage musters a full 730W/1190W, equivalent to 34.5A at <1% THD, via a modest 0.065ohm source impedance [see Graph 1, below]. Distortion, largely determined by the tube driver stage, is broadly unaffected by reducing load impedance.

The pattern of distortion versus output level and frequency seems perfectly matched between pre and power amp. For example, distortion increases uniformly from 0.007% at 1W/8ohm to 0.025%/10W, 0.09%/100W and 0.13%/150W via the KWA 150SE which complements almost exactly the same level of THD from the LS 36.5 preamp as it outputs the necessary voltage to drive the power amp to these power levels. Distortion versus frequency is similarly well-matched, with both amplifiers delivering ~0.03% at 20Hz to 1kHz and 0.055%/20kHz at the level required to maintain 10W/8ohm [see Graph 2, below]. The preamp's frequency response is ruler-flat from 3Hz-30kHz rising to +0.4dB/100kHz while the power amp has a similarly extended bass allied to a 'sweeter' treble, reaching -0.3dB/20kHz and -2.9dB/100kHz. Readers may view comprehensive QC Suite test reports for the ModWright LS 36.5 preamp and KWA 150SE power amp by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads



ABOVE: THD vs. extended frequency; LS 36.5 (1V out, blue trace) vs. KWA 150SE (10W/8ohm, black trace)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	185W / 315W
Dynamic power (<1% THD, 8/4/2/1ohm)	200W / 390W / 730W / 1190W
Output imp. (20Hz-20kHz, pre/power)	140ohm / 0.063-0.075ohm
Freq. resp. (20Hz-100kHz, pre/power)	+0.0 to +0.45dB / +0.0 to -2.9dB
Input sensitivity (for 0dBV/0dBW)	1000mV (pre) / 124mV (power)
A-wtd S/N ratio (re. 0dBV/0dBW)	94.5dB (pre) / 87.9dB (power)
Distortion (20Hz-20kHz, 1V/10W)	0.078-0.054%/0.028-0.053%
Power consump. (pre/idle/rated o/p)	88W / 155W/498W
Dimensions (WHD LS36.5/KW 150SE)	445x121x318/432x216x432mm



ABOVE: Rear view shows the preamp's balanced inputs and outputs [centre box], while the unlabelled toggle switch is a ground lift. On the power amp [bottom], the small toggle switch is for high/low bias, the larger one for bridged mono operation

Drop [Warner Bros 7599-27398-2] in an arresting way. On the complex mix of 'Little Sister' it gave real intelligibility to the vocals and even the quite far-back voices seemed to have some welcome space around them. All those sizzling guitar parts wove their way through as logically separated threads in the music. Bass guitar was agile and tuneful and the track really rocked along.

RISING TO THE OCCASION

The ModWright amplifier's inherently graceful sound, authoritative bass and excellent imaging all came into play again when I put on Fauré's *Requiem*, with the RPO and London Symphony Chorus under Richard Hickox [Carlton Classics 30366 00092]. In the *Offertorium* it was nice to hear the choir almost tangibly placed in space, and the way the sonorous cellos and basses paved the way for the solo baritone voice with organ below.

Turning finally to another jazz favourite, I put on *Art Pepper Meets*

The Rhythm Section [Contemporary 0025218633826], to see how the great alto saxophonist would sound with the ModWright amp in control. In that opening solo on 'You'd Be So Nice To Come Home To', you could really feel the intensity and stress of the engagement – a record date that came after a terrible period of strung-out inactivity, and which had been organised to put him in the company of the hottest rhythm section of the day.

Then, as things progressed, you could hear how brilliantly Pepper rose to the occasion. And so, in this happy listening session, did the ModWright amplifier. ☺

HI-FI NEWS VERDICT

With this hybrid amp system, you hear a sound that seems to bear the hallmark of long and thoughtful development by a talented and dedicated designer, with careful component choice and attention to every detail, and it's a sound that really lets the music into the room. Perhaps it can't quite match the ultimate 'liquid' mid transparency of the finest all-tube systems, but it's still a winning combination.

Sound Quality: 84%



ABOVE: ModWright supplies a solidly built handset: phase reversal is included

PS Audio DirectStream DAC

PS Audio's new flagship DAC represents a new paradigm in audio according to its designers, as it converts incoming PCM data to DSD. Might this be hi-fi's Holy Grail?

Review: **John Bamford** Lab: **Paul Miller**

There's nothing like a bit of controversy to get you noticed. And with its latest DirectStream DAC supplanting its PerfectWave II at the top of the company's line-up of D-to-A converters, PS Audio has certainly hit the hi-fi headlines. SACD lovers and Direct Stream Digital (DSD) evangelists will be going all dewy-eyed, while audio engineers in the 'PCM camp' – who consider DSD coding a folly – might be aghast... because PS Audio's PerfectWave DirectStream DAC converts *all* incoming data to DSD – whether you like it or not!

FPGA PROCESSING

PS Audio is declaring its new DAC a 'game changer'. In some ways it is, especially if you want to hear native DSD files played back unsullied rather than 'fudged' by today's 'DSD-compatible' delta-sigma DACs. It doesn't employ any off-the-shelf DAC chipsets. Like the high-end DACs made by Chord Electronics, it features a Field Programmable Gate Array storing custom-written digital processing software.

Chord Electronics' DACs feature sophisticated upsampling and conversion technology developed by Rob Watts, one of the founders of the original Deltec Precision Audio firm back in the 1980s. PS Audio's FPGA features a unique 1-bit processing methodology developed by digital engineer Ted Smith, who partnered with the company a couple of years ago so that they could bring his ideas into a real-world product [see boxout]. It runs input processing at 170MHz, oversamples at 56MHz (10 x 'DSD64') and then down-converts data to 5.6MHz/1-bit (DSD128).

The output of its DSD engine is fed directly to an output stage employing high speed video amplifiers and purely passive low-pass filtering including a high bandwidth audio transformer at the

output. The DirectStream *is* a unique DAC, sure enough.

Priced at £5250 in its basic DAC form as featured here, the DirectStream can also be a UPnP network music player with the addition of a plug-in PCB. Called the Bridge, it is based on a Qualcomm/Ubicom platform, employing code mostly hand-written by PS Audio in-house. This card slots in once a blanking plate has been unscrewed from the rear panel.

When fitted with the Bridge the DirectStream costs just £300 more, which is very reasonable considering the prices asked by some brands for 'Ethernet-to-S/PDIF converters'. Meanwhile the DAC's feature set is comprehensive, ticking pretty much all the boxes most computer audiophiles will have on their wish lists.

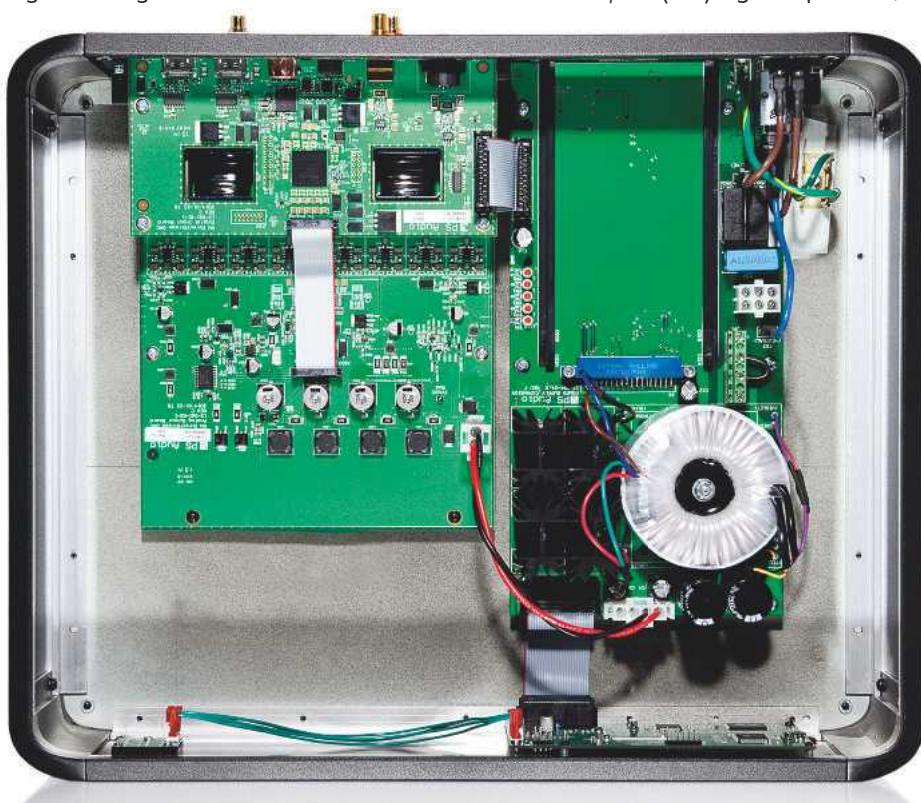
We've witnessed outboard D-to-A converters evolving rapidly since the acceptance of computer audio as a legitimate high-end source and the

first hi-fi DACs appearing on the market sporting USB inputs. Only last year I wrote saying that you can count on your fingers the number of DACs available which are compatible with the recently-agreed DSD-over-PCM (DoP) protocol enabling playback of DSD files.

Such is the march of progress that now pretty much any new audiophile DAC is DoP-compatible via its USB input – and since its *raison d'être* is that it's a 1-bit DAC, naturally the DirectStream is compatible with both single rate (2.8MHz/DSD64) and double rate (5.6MHz/DSD128) DSD when native DFF or DSF files are played out via DoP using appropriate playback software.

TOUCHSCREEN CONTROLS

At the rear, in addition to its USB-B socket, the DirectStream has two S/PDIF inputs – one optical (Toslink) and one coaxial (RCA) – and an AES/EBU (XLR) digital input. And,



RIGHT: There are no DAC chips, a Xilinx Spartan 6 FPGA handling all input processing and oversampling. The space top right of photo (above the toroidal transformer) is where PS Audio's optional 'Bridge' network card sits



in fact, these inputs are DoP-compatible as well. This might be of particular interest to audiophiles running desktop computers fitted with specialist soundcards, although PS Audio's user manual does state that the DirectStream's asynchronous USB interface is the 'preferred' computer hookup.

All inputs accept PCM data at all rates up to 192kHz/24-bit. Actually, because double rate DSD is packaged in a 352.8kHz/24-bit container when transferred using the DoP protocol, the DirectStream's XMOS USB interface accepts sampling rates up to 384kHz as well – but the DAC's processing engine doesn't currently decode 352.8/384kHz files. We might expect a software upgrade for this in the future.

The DirectStream furthermore has two non-standard HDMI inputs on its rear panel for connecting other PS Audio source components via I2S – such as the company's PerfectWave disc player and NuWave Phono Converter ADC.

Bereft of control buttons other than an illuminated power standby on/off push switch in the top left corner, the fascia is dominated by a 95x55mm touchscreen display. Input selection, absolute phase

reversal, volume up/down, mute and display brightness (three level settings) can all be controlled via the touchscreen. Inputs can also be given custom names.

Unless you're sitting right next to your equipment rack, you'll most likely drive it using the supplied infra-red RCU. It's a PS Audio system controller that includes power on/off and control buttons for one of PS's PowerPlant mains regenerators

as well as direct input switching buttons for the DirectStream.

A 'dim' button turns off the display but, annoyingly, doesn't turn it back on with a second press. Stabbing any other key brings the screen

temporarily back to life and a quick press of the power button cancels the 'dim' function! Finally, a button erroneously labelled 'filter' reduces the DAC's analogue output level. This function is provided in case you're partnering the PerfectWave with a power amplifier possessing unusually high input sensitivity. The volume control is calibrated on a 0-100 scale, with 100 representing 0dB and each step dialling in 0.5dB of attenuation.

PS Audio has purposely designed the DirectStream into an identical form factor

'PCM conversion lacked the weight and "energy" of DFF'

ABOVE: PS Audio logo disguises a power standby button. Input switching and other controls are via the DAC's touchscreen panel or the unit's infra-red RCU from your listening seat

as its £2500 PerfectWave II DAC, thereby enabling current owners to replace the innards with the new DSD engine. The full upgrade kit costs £2500. But since 99% of your music library will comprise PCM audio files, will you consider converting them to a high-speed single bit-stream the way to go? Does the DirectStream DAC 'represent a major advancement in the art of recreating the musical event' as claimed?

THE BEST DSD I'VE HEARD

As someone who has always considered Sony's claims regarding the 'superiority' of DSD over hi-res PCM somewhat disingenuous, I have to say I was blown away by the sound of the DirectStream when listening to recordings actually recorded in DSD. Indeed, when listening to files downloaded from Channel Classics I witnessed the best sound quality I've ever heard from these DSD recordings.

With other DoP-ready DACs I've heard in my system, such as the outstanding £2890 Auralic Vega processor [HFN Jan '14], I've been underwhelmed by them, finding their sound rather too soft and lacking transient 'snap', with subjectively blunted dynamics. I actually thought the sound better – more vibrant and lifelike – when the recordings had been converted to 96kHz or (even better) 192kHz/24-bit PCM files. But this was not the case with the DirectStream.

Listening to a DFF file excerpt from Mahler's Symphony No 1 by the Budapest Festival Orchestra with Iván Fischer [Channel Classics CCS SA 331 12] revealed an uncommonly 'clean' and uncontaminated sound, rich in timbral colours and textures. Hearing the same recording after it had been converted to 176.4kHz/24-bit PCM I thought it sounded slightly 'bleached' and less wholesome, lacking the weight and 'energy' of the DFF.

Of course, what we hear from our systems depends on myriad component

SINGLE-BIT VISION

Visit PS Audio's website and you'll find links to numerous videos documenting the background story of its PerfectWave DirectStream DAC. It's been a labour of love for electrical engineer and computer scientist Ted Smith, an audiophile whose prototype design so impressed studio engineer Gus Skinas, director of the Super Audio Center in Boulder, Colorado, that Skinas introduced Smith to PS Audio's founder and CEO Paul McGowan, saying: 'Paul, you've really *must* hear this!' Then came the challenge of making it into a moderately affordable consumer product, something that has taken PS Audio more than two years. Says Ted: 'The constraints in having everything in one chip are onerous, so the choice of using a Xilinx Spartan 6 FPGA was easy as it allowed me complete freedom of processing power and clock choices without conflicting other functions on the board, most of all the analogue output. The DAC is entirely DSD-based since DSD is inherently linear, it soft clips when overdriven, and it's simple to convert it with a low pass filter. Most DAC chips today utilise a sigma-delta modulator to get a DSD-like signal anyway. Similarly most A-to-Ds are sigma-delta based.'

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DIRECTSTREAM DAC



ABOVE: There are USB, coaxial and Toslink S/PDIF, and AES/EBU digital ins, plus I2S connections via HDMI, with RCA and XLR outs. Bridge module adds Ethernet

factors – and how our systems perform in our rooms (as well as personal subjective preferences). For example, with an analogue live recording of Keith Greeninger and Dayan Kai performing 'Looking For A Home' [Blue Coast Collection, Blue Coast Records], the DFF file sounded a little too 'rounded' and fulsome through my system [see <http://www.hifinews.co.uk/news/article/meet-the-team;-john-bamford/9884>].

Playing a 176.4kHz/24-bit PCM file of the recording resulted in a leaner presentation that added sharpness and sparkle to the sound, particularly noticeable in the 'snap' of the sharply-struck acoustic guitar strings. Nevertheless with all the DSD files I played I felt that I was hearing them at their best – the way they were *intended* to sound, with a sense of purity and unsullied naturalness to the replay quality.

DELECTABLE SOUNDS

What does the DAC sound like when listening to lossless rips of standard-resolution CDs? Does its unique 1-bit processing methodology deliver unprecedented sound quality to reveal, as PS Audio claims, 'musical information that may have previously been hidden or covered up by other DACs, in digital audio media'? Well, methinks PS Audio is a little guilty of over-egging the marketing-speak pudding here.

Frankly, if you're aching for a hefty dose of 'Never-have-I-heard-this-recording-with-such-clarity' you'll truly only achieve such an epiphany by upgrading your monitors. But the DirectStream *is* a delectable sounding DAC.

The achingly beautiful 'Hey Now' from London Grammar's *If You Wait* [Metal & Dust Recordings/Ministry of Sound MADART1] sounded sublimely smooth and velvety, with 'relaxed' highs and a lusciously thick, creamy bass quality. A/B-ing my resident

T+A DAC 8 showed the PerfectWave to be a little less forward-sounding and more 'rounded' – although, of course, the sound character of the T+A can be altered markedly via its choice of four filters!

Singer Hannah Reid's youthful voice was considerably more full-bodied via the DirectStream, but the comparatively leaner and more up-front presentation delivered by the T+A better suited my own system.

Similarly hearing 'No Deal', the title track from last year's album by Belgian songstress Melanie De Biasio [Play It Again Sam, PIASB335CD] with its sparser and more brightly-lit sonic presentation, the PerfectWave sounded satisfyingly wholesome and 'rounded' – rather analogue-like and 'tubey', if you will. Only the last ounce of extension in the very low bass was disappointing, the infrasonic notes which pump as 'No Deal' segues into 'With Love' weren't as robust or obvious as I've heard with some other DACs.

As I continued to explore my music collection, enjoying the DAC's uncommon civility even with 'torture tracks', I found myself concluding it might well be manna from hi-fi heaven for many analogue lovers who find digital audio 'sterile'. ☺

HI-FI NEWS VERDICT

While it's bound to divide opinion due to the fact that all incoming data is converted to DSD, make no mistake: this is a lovely sounding DAC, its tonality sumptuously rich and easy on the ear. It's certainly *the* way to hear native DSD recordings 'decoded' at their very best, while CD-res and hi-res PCM files also sound incredibly full-bodied. Analogue lovers sensitive to 'digititus': form an orderly queue...

Sound Quality: 85%

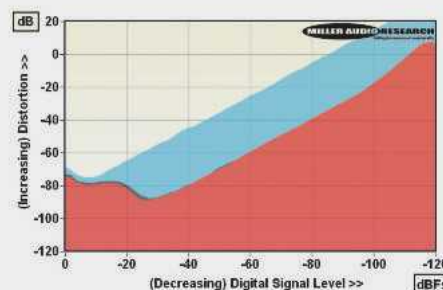


LAB REPORT

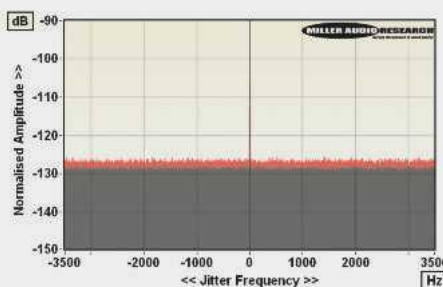
PS AUDIO PERFECTWAVE DS DAC

While PS Audio highlights its PerfectWave DirectStream DAC's compatibility with 24-bit/192kHz inputs, the realisable frequency response is only a little wider than that achieved by 96kHz inputs at -4.0dB/40kHz out to -16.7dB/50kHz. This is a consequence of upsampling/truncation all digital inputs to a 10x DSD (56MHz) Bit Stream with noise-shaping and final analogue filtering, and not because 192kHz inputs are downsampled to 96kHz. The impulse response shows extended pre/post ripples in the time domain and, along with other DSD converters, an increase in (white) noise through the audioband itself. This has two consequences – reducing the A-wtd S/N ratio to a '16-bit' 96dB while also masking low-level jitter sidebands [see Graph 2, below]. When PS Audio says its measurable jitter is zero, it is correct, but if the background noise were lower we might detect *some* (albeit <10psec). On the other hand, noise of this type often has very positive subjective consequences!

Maximum output is 2.8V through a 140ohm source impedance (balanced) but distortion is 20-30dB higher over the top 20dB of its dynamic range than typical with some ~0.02% through the midrange. Distortion is very high indeed at low (<100Hz) frequencies, reaching a full 3% at 20Hz/0dBfs. Thanks to the swell of ultrasonic requantisation noise, THD+Noise is necessarily higher at >20kHz below -20dBfs [see blue infill, Graph 1 below]. Some differences in sound quality may be attributed to the sensitivity of the partnering amplifier to this ultrasonic noise alone. Readers may view comprehensive QC Suite test reports for the PS Audio PerfectWave DS DAC's S/PDIF and USB inputs by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Distortion vs. 24-bit/48kHz digital signal level over a 120dB dynamic range. S/PDIF input (1kHz, red) and USB input (1kHz, black; 20kHz, blue)



ABOVE: High resolution jitter plots with 24-bit/48kHz data (S/PDIF, black; USB, red). Noise masks sidebands

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	2.78Vrms at 137-145ohm
A-wtd S/N ratio (S/PDIF / USB)	96.7dB / 96.8dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.026% / 0.0045%
Dist. & Noise (20kHz, 0dBfs/-30dBfs)	0.037% / 0.02%
Freq. resp. (20Hz-20kHz/45kHz)	-0.53dB to -0.0dB/-10.3dB
Digital jitter (48kHz/96kHz/USB)	<10psec / <10psec / <10psec
Resolution @ -100dB (S/PDIF / USB)	±0.6dB / ±0.6dB
Power consumption	18W
Dimensions (WHD) / Weight	430x100x360mm / 13.5kg

Pro-Ject Xtension 9 Super Pack

The Xtension 9 Evolution is the latest in Pro-Ject's highly prolific turntable range, and forms a constituent part of UK importer Henley Designs' latest 'Super Pack'

Review: **Adam Smith** Lab: **Paul Miller**

One of the main concerns facing someone who may be a newcomer to vinyl, or even re-visiting it after a diversion to the digital dark side, is the same thing that made many breathe a sigh of relief when CD arrived over 30 years ago: namely, the whole rigmarole of pick-up cartridge setup and alignment.

At the budget end of the market, plug-and-play units are relatively common but as one ventures up the price and quality ladder, it is invariably expected that purchasers will source their cartridge themselves, or have their dealer install it for them. Not so for Henley Designs, as one of its chief selling points has always been the excellent value turntable, arm and cartridge packages that it puts together for its UK audience.

The latest of these is the Pro-Ject Xtension 9 Super Pack, mating the Xtension 9 Evolution turntable and 9CC Evolution arm to the new Ortofon Quintet Black MC.

The Pro-Ject line-up starts with the £159 Elemental and stretches through a wide variety of different models to the magnificent statement of intent that is the Signature 12, but its range is eminently sensible. Unlike some car manufacturers, for example, who spring forth new models left and right, appearing often to compete with no-one but themselves, Pro-Ject is rather more careful, and the new Xtension 9 Evolution is a perfect example of the company's forethought.

The Xtension range premiered in 2009 with the Xtension 12, a fine beast of a deck designed for 12in arms which sported a SpeedBox SE PSU integrated into its plinth but with, unfortunately, a footprint too large for many racks. This was followed by the Xtension 10, containing the same basic innards but shrinking the plinth for use with 10in arms. The Xtension 9 is therefore an obvious next step, being slightly smaller

still, and as the name suggests, configured for 9in tonearms. The plinth itself measures a nicely compact 465x350mm and so size-related rack placement is not an issue.

PUT THE RIGHT FOOT FORWARD

The plinth is made from MDF and filled with metal granulate to produce a non-resonant, high mass base all topped with a very swish paint finish in High Gloss Red or White. The deck stands on three aluminium feet that are damped with a Thermo-Plastic Elastomer [TPE] and these magnetically decouple the plinth from the surface on which it sits. All three are pre-adjusted for level at the factory and so care must be taken during installation to mate the correct foot to the right mounting location, but further fine adjustment of level is available by loosening the mounting threads with a screwdriver if required.

The platter consists of a non-resonant alloy that is internally damped close to its periphery with further TPE material and, although it is much thinner than that of

the Xtension 10, it is only around 300g lighter. The platter spins on an inverted ceramic bearing which is in turn aided by a magnetic suspension system to reduce the load seen by the bearing even further. The platter is topped with an interface layer made from recycled records and a heavy record puck is supplied – the use of further mats is not recommended.

The motor sits in the left hand rear corner of the plinth and is normally sheltered beneath a sturdy metal cover. A single push-button at the front of the plinth starts and stops the platter and also selects 33.3 or 45rpm; it contains a green LED to show when the deck is powered and in standby mode. During its start-up phase, the green LED in the switch extinguishes and the appropriate blue speed LED blinks to indicate that the motor has activated, subsequently changing to a steady glow once speed is attained, according to the instruction manual.

However, there is no rotational feedback from the platter or any kind of load



RIGHT: The recycled vinyl platter topping requires no further mat and is a carry-over from previous Xtension variants. The arm yoke is, however, increased in size for this model



detection built into the motor itself, so this is a nominal time delay pre-programmed into the control circuitry and should only be treated as an approximation.

Pre-fitted to the deck is the latest version of Pro-Ject's 9CC Evolution tonearm, which consists of a single piece, variable-thickness carbon fibre armtube and headshell, pivoting on high quality ABEC7 bearings. Four sorbothane-damped counterweights are available for cartridge matching and, unusually, all four are supplied as standard with the deck, which is a highly commendable touch. The arm is fully and easily adjustable for VTA (via arm height) and azimuth; the latter via a single screw that loosens the entire armtube for adjustment.

The bearing yoke on the latest model has grown even larger than before in order to better the arm's ability to sink vibrations away from the cartridge. Underneath, signal wires terminate in a standard 5-pin socket and Pro-Ject provides a 'Connect-It' lead that is manufactured in conjunction with Van den Hul cables. An unbalanced

lead terminating in twin phono plugs is standard, but a balanced version with XLR connectors can be provided as an option.

The Super Pack deal is completed by the addition of the range-topping Black variant of Ortofon's new Quintet cartridge range, which is a conventional low output MC design and retails for £649 on its own. This uses high quality coils of 'Aucurum' wire in conjunction with neodymium

magnets, all encased in a non-resonant ABS body and sporting a fine nude Shibata stylus.

For review, the deck was located on my Atacama Equinox Celebration LE rack and connected to an Anatek MC1 phono stage, Naim Supernait amplifier and PMC twenty.24 loudspeakers.



SILENT BACKGROUND

With the deck fully set up, cartridge aligned and permitted a good few days of settling in, I was pleased to hear that the Xtension 9 Evolution Super Pack exhibits that certain indefinable sonic 'rightness' that generally characterises the upper reaches of the Pro-Ject range for me.

'The Super Pack has a certain indefinable sonic "rightness" to it'

ABOVE: The Xtension 9's plinth is compact enough to sit on a conventional rack and is available in gloss red or white. The Ortofon Quintet Black MC is a new, range-topping model

I have always found them to be designs that offer no short-term sonic fireworks or any kind of dubious superficial impressiveness that soon wears off. Rather, they make music in an understated and alluring manner that simply seems more and more enjoyable as different material is played. In the case of the Xtension 9 Evolution, I was immediately struck by the superbly low levels of groove noise and general background mush.

The reviewer's old favourite, the 'inky-black silence', has become a cliché but I couldn't stop it from springing to mind when the run-in groove of my first chosen LP was genuinely impressively quiet. The record in question was The Eagles' *Long Road Out Of Eden* [Universal 060251749243 1] and as the title track warmed up, I was pleased to hear that the Pro-Ject was also more than capable when it came to *music*, and not just silences!

The song starts with some quiet instrumental artefacts that stretch off into the soundstage on the left hand side and the Pro-Ject captured the scale and depth of these perfectly, sweeping the action dramatically and precisely from left to right when the full band began. I was also very pleased to hear Don Henley's vocals large, solid and locked perfectly in between my loudspeakers. The album is a good one and well recorded, so it takes a spectacularly inept turntable to ruin it, but the Xtension 9 Evolution lifted it that essential bit above the easily achievable norm to give a truly captivating result.

At the top end, no doubt aided by the highly capable Ortofon cartridge, the Pro-Ject managed to be detailed, smooth, ☺

HENLEY DESIGNS

Pro-Ject's UK importer, Henley Designs, recognised the abilities of the company's products early on and was quick to capture the potential market that resulted from the resurgence in vinyl over the last 10-15 years. As well as introducing UK-only special editions of some models, Henley has also become well known for its range of virtually plug-and-play turntable packages that occasionally add in an accessory of some sort, but nearly always feature an Ortofon cartridge at a consequent cost-saving. At the lower end of the range this generally means a high output MC like the MC1-Turbo or a model from the 2M range; but as the turntable price increases, so does cartridge quality, right up to the older Rondo and now the new Quintet Series. In the case of the Xtension 9 Evolution, the deck is currently only offered in the UK as a component of the Super Pack.



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LAB REPORT

PRO-JECT XTENSION 9 SUPER PACK

Inspired by Pro-Ject's earlier, and costlier, Xtension turntables [HFN May '09] the DNA of this Xtension 9 is clear for all to see. The 5.4kg platter is damped by a ring of soft elastomer that's poured and set into its underside, helping to reduce rumble from the inverted ceramic (ball) bearing from -67.6dB (through-bearing) to 68.7dB (through-groove). The platter damping is further assisted by its top surface of 'recycled vinyl', providing a good impedance match with the LP that's held firmly in place by Pro-Ject's record weight. Start-up time is a swift 5secs thanks to the torque motor although the deck's peak wow is a little higher than anticipated at 0.07% [see Graph 1, below] and certainly bested by other turntables, perhaps using the same synchronous motor, from the Pro-Ject stable.

The partnering 9CC Evolution tonearm features a one-piece carbon-fibre tube with integrated headshell and this rigid, lightweight structure not only confers a mere 9g effective mass but also pushes its primary beam resonance up to a high 270Hz. As we've witnessed with earlier Pro-Ject Evolution arms, the carbon-fibre tube also exhibits a series of higher frequency, high-Q modes, seen here at 440Hz, 580Hz, 925Hz and 1.37kHz, although the presence of lower-level resonant 'hash' through the presence and treble region is greatly diminished in this example [see Graph 2, below]. Whether this is due to the oversized 'anti-resonance' gimbal yoke is debatable although the combination of very low friction (<10mg in both planes) and no detectable play is very impressive indeed. Readers are invited to view full QC Suite reports for Pro-Ject's Xtension 9 turntable and 9CC Evolution tonearm by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: A socket at the rear accepts the 15V DC input from the supplied power pack. One of the deck's three magnetically-decoupled feet can also be seen here

crisp and yet mellow all in one. Some older Pro-Ject arm designs have tended to exhibit a certain fizziness across the upper midband and treble but, as suggested in the Lab Report, the new 9CC Evolution has successfully overcome these and the result is a clarity and insight that puts it right up there with the best of its contemporaries at the arm's price point.

As a result, Anita Baker's vocals on 'Caught Up In The Rapture' from her *Rapture* album [Elektra 960444-1] were beautifully clear – a very pleasant surprise given the rather average quality of this mid-'80s pressing. Equally, the drum strikes backing her were taut and well defined, helping to render the whole performance as a tightly cohesive whole. Better still was the Pro-Ject's fine sense of image stability that painted a vivid and expertly scaled sonic picture in my listening room.

SMOOTH AND ASSURED

With an equally aged copy of The The's *Soul Mining* [Epic EPC 25525] to hand I had no hesitation in cueing up the track 'Uncertain Smile'. Although my favourite track by the band, the original recording is something of a let-down, being splashy in the upper registers and lightweight down the bottom, but the Pro-Ject appeared to approach it with a calm and knowing 'stand aside – leave this to me' kind of attitude. So again I found myself easily listening through the recording's shortcomings and simply enjoying the music; in particular Jools Holland's superb and impactful piano solo.

A well designed arm and cartridge, plus a good quality drive system and heavy platter should also be a recipe for a good bass performance and so it generally proved to be with the Pro-Ject. As

per the rest of the frequency range, there was a pleasing sense of quiet competence in the way in which the deck approached the lower end of the frequency spectrum. Albums were underpinned by good weight and a rhythmically adroit guiding hand – although occasionally, I did feel that the Xtension 9 Evolution was approaching the limits of its comfort zone with more punchy, fast-paced material.

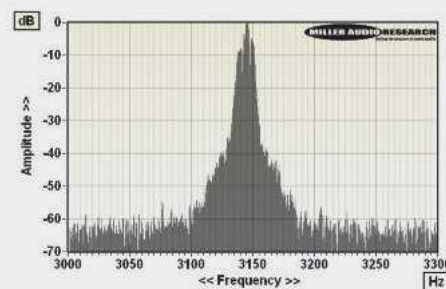
The most notable example I found of this was courtesy of Galaxy And Phil Fearon's 12in single mix of 'Dancing Tight' [Ensign 12ENY 501], a fine slice of early 1980s disco with a funky beat underpinning it. Here the Pro-Ject certainly never strayed as far as to sound wobbly or make the track lose its cohesiveness, but the low end was definitely slightly lacking its customary sense of spot-on timing and impact.

Fortunately, this only seemed to come to light with extreme examples such as this. Generally speaking, I found the Pro-Ject to be assured and smooth at the low end with fine levels of detail, no matter whether the instrument in question was acoustic or electronic. ☺

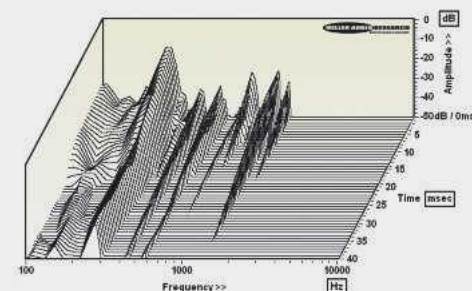
HI-FI NEWS VERDICT

The Xtension 9 Evolution Super Pack is yet another combination of which Pro-Ject and Henley Designs can be proud. The careful downsizing of the original Xtension design, plus the addition of an updated tonearm that incorporates immediately obvious improvements, results in a turntable combination with few vices. Add in a superb cartridge at a discounted price and the result is a veritable bargain.

Sound Quality: 81%



ABOVE: Wow and flutter re. 3150Hz tone at 5cm/sec (plotted ± 150 Hz, 5Hz per minor division). Wow is a little higher than typical for a Pro-Ject deck



ABOVE: Cumulative tonearm resonant decay spectrum, illustrating various bearing, pillar and 'tube' vibration modes spanning 100Hz-10kHz over 40msec

HI-FI NEWS SPECIFICATIONS

Turntable speed error at 33.33rpm	33.27rpm (-0.18%)
Time to audible stabilisation	5sec
Peak Wow/Flutter	0.07% / 0.02%
Rumble (silent groove, DIN B wtd)	-68.2dB / -68.7dB (with clamp)
Rumble (through bearing, DIN B wtd)	-67.6dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-61.1dB
Power Consumption	6W
Dimensions (WHD) / Weight	465x185x350mm / 16kg

"The P10 will have an effect ranging from positive to positively startling".

Hi-Fi News



PS AUDIO

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Mr Sheridan, Belfast

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- 3 regenerated outlets (for front end or low output amps) and 1 high level conditioned outlet (for high output amp)
- Fan cooled (run silent)
- **Price £1,950.00**



P5

- 1kw of continuous regenerated power (1.2kw on peak)
- 4 regenerated outlets including 1 high current (amp)
- Fan cooled (run silent)
- Touchscreen display
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P10

- 1.25kw of continuous regenerated power (1.5kw on peak)
- 9 regenerated outlets
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- Heat sink cooling (no fans)
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All products in the range provide stable mains to your system, reduce incoming harmonic distortion to virtually nil, and have the ability to step up/down the incoming voltage to provide regenerated mains at the level you require. The result will be obvious to you: improved dynamics, far better base and a much bigger soundstage - always.



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HiFi World, July 2013

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hi-finews GROUP TEST

If you want to enjoy music on the move and don't like in-ear headphones then a compact closed-back over-head model is the obvious alternative. But just how well do they perform?

HEADPHONES £160-£330

TESTED THIS MONTH

AUDIO-TECHNICA ATH-ES88	£229
B&W P7	£330
BEYERDYNAMIC T51P	£245
PHILIPS FIDELIO M1	£160
SENNHEISER MOMENTUM ON-EAR	£170



Cutting-edge gear, cherry-picked by the *Hi-Fi News* editor



The pinnacle of sound quality within its peer group



Great sound, great value and a cut above its rivals

• CD PLAYERS • TURNTABLES • CARTRIDGES • HEADPHONES • AMPLIFIERS • AM/FM TUNERS • SPEAKERS •

Much as we espouse a purist approach to hi-fi at *HFN* we are not insensitive to the fact that many people today don't have the time or the space – or perhaps the wherewithal – to realise the archetypal vision of enjoying a pair of loudspeakers and a separates electronics system from the comfort of an optimally positioned armchair.

For a large number of music enthusiasts listening time is mostly restricted to car journeys or to the use of mobile devices. In the latter case you'll want a headphone that is compact enough to carry around but sacrifices little in ultimate sound quality so that, ideally, it can cut the mustard if occasionally hooked up to a proper hi-fi system.

Given that requirement, your eyes might well alight on the headphones we've assembled for this group test. All five make plain their intention for use with portable music sources by having short connecting leads and closed-back capsules to block out ambient sound. But all are costly enough – and have received plaudits of sufficient enthusiasm – to be expected to deliver high quality

sound whatever the context they are used in.

Four of the models we've assembled come from headphone manufacturers of long standing – Audio-Technica, Beyerdynamic, Philips and Sennheiser – and use supra-aural ('on-ear') capsules to help reduce size. But they are nothing like the supra-aural capsules of the iconic Sennheiser HD414 with earpads of open-cell foam. To exclude external sounds these supra-aurals don't just have closed-back capsules, they have conventional squishy earpads, albeit of small enough size to rest on the ear rather than around it. This can pose sealing problems that affect bass response.

DIFFERENT GENES

Our fifth headphone, by contrast, is from a relative newcomer to headphone manufacture – B&W – whose reputation was of course established making loudspeakers. Aside from this different set of genes, B&W's offering also opts for larger earpads that, if your ears are small, are just big enough to be circumaural rather than supra-aural.

Whatever its intended usage, any headphone reveals its ultimate capability only when driven by a top-quality headphone amplifier. So I used a Teac HA-501 for the listening tests – the best headphone amplifier I've heard to date [*HFN* Apr '14]. It was fed analogue signals from a Chord Electronics QuteHD DAC, and digital signals via S/PDIF from a TC Electronic Digital Konnekt x32 FireWire interface downstream of a Mac mini running Windows XP and JRiver Media Center v17.

OUR MUSIC CHOICES

Four disparate pieces were chosen for the listening comparisons: the 24-bit/96kHz download of Daft Punk's disco tribute 'Lose Yourself To Dance'; the 'Miller's Wife's Dance' from Falla's *Three Corners Hat* – the classic Ansermet/Decca – a 24-bit/88.2kHz conversion from a rip of the Japanese import SACD; 'Hold Your Head Up' ripped from Argent's *All Together Now*; and 'Dreaming', from the CD *Duo* by Wesseltot and Schwarz. ➤

REVIEWS & LAB TESTS
BY KEITH HOWARD

• CD PLAYERS • TURNTABLES • CARTRIDGES • HEADPHONES • AMPLIFIERS • AM/FM TUNERS • SPEAKERS •

Audio-Technica ATH-ES88

Audio-Technica has a track record for conceiving new ways to design headphones, evinced by the 3D Wing Support system it uses on its larger models in place of a conventional headband. The ATH-ES88 is different to all the others in this group in eschewing the usual extensible headband approach for adjusting capsule position and substituting what AT describes as 'a unique mechanism located at each end of the headband that allows the earpieces to "swing" to a desired position'. In fact the pivots – which lie just in front of the capsules – are detented rather than freely rotating to hold a set position.

Exactly what advantage this might confer isn't clear but it's perhaps worth noting that while being the second-lightest headphone in this group – just 2g heavier than the Philips – the ATH-ES88 nevertheless shows little if any sign of headband resonance. So it is possible to make a headphone that's featherweight but structurally inert, although it's a trick few in this test pull off so well.

Also noteworthy is the ATH-ES88's fixed Y-cable which connects separately to each capsule. This may seem like an aesthetic issue only, but it is possible that, by eliminating the shared earth impedance typical of single-cable connections, it will reduce electrically induced inter-channel crosstalk.

While the capsules rotate to a flat position for storage they don't fold up into the headband. So the supplied string-pull soft pouch, the only accessory, is still quite large – too large for most pockets.

DELIVERS IMAGE SCALE

Some of Audio-Technica's best large headphones – I'm thinking of the ATH-AD700 and ATH-A900X – have idiosyncratic tonal balances that trade a little transparency for a big, open sound that is all but irresistible. The ATH-ES88 doesn't belong in such exalted company but it does have a somewhat different tonal balance to the rest here – less

bass, thank goodness – and, partly as a result, does a better job of delivering image scale.

Its bass was still a little full on the Daft Punk track and there was a lack of treble detail. But clarity was otherwise quite good and, most importantly, the musical pulse was infectious. Overall the ES88 was better than all the others here.

As it was on the Falla, where the tonal balance avoided being excessively warm and the stereo image was quite spacious. There was a lack of leading edge 'bite' to the violin sound, cymbals were recessed and there was a general thickening of textures, but the essential dynamic sweep of the piece was well maintained.

While the Argent track isn't particularly testing, it benefits from clarity and a little by way of bass lift, which it got from the ES88 and was enjoyable as a result, being just a little more open-sounding than it was via the Beyerdynamic.

'Dreaming', from our *Duo* CD rip, gives any system a wide-bandwidth transparency test and here the ATH-ES88 was distinctly better than the Beyerdynamic T51p – and the others too – with a richer palette of tonal colours at its disposal although, in ultimate terms, was still wanting for some fine detail.

Sound Quality: 80%

0 - - - - - 100



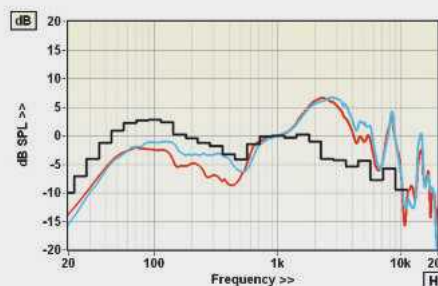
ABOVE: AT's 40mm driver is claimed to offer a frequency range of 9Hz to 26kHz and will accept up to 1W of input power

RIGHT: Novel swing arm capsule adjustment mechanism marks the ATH-ES88 out from the crowd and works well



HI-FI NEWS LAB REPORT

Audio-Technica claims a sensitivity of 103dB per milliwatt for the ATH-ES88, equivalent to 117.7dB per volt at the specified impedance of 34ohm. We measured 120.6dB at 1kHz, so the spec. is conservative. Over the audible range (20Hz-20kHz) the impedance varied from 35.2-40.4ohm, equivalent to negligible frequency response changes of 0.3dB/0.5dB with a 10ohm/30ohm source impedance. Little if any carry-over of sound from the left to the right capsule was heard on the impedance test but in the frequency response measurements the ATH-ES88 proved very sensitive to positioning on the artificial ear. Despite this, capsule matching error was good at ± 3.3 dB. The diffuse-field corrected frequency response [black trace] is one of the flattest here but bass roll-off begins at 100Hz. KH



Graph: L/R capsule uncorrected responses [blue/red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	120.6dB
Impedance modulus min/max (20Hz-20kHz)	35.2ohm @ 20Hz 40.4ohm @ 75Hz
Capsule matching (40Hz-10kHz)	± 3.3 dB
LF extension (-6dB ref. 200Hz)	28Hz
Distortion 100Hz/1kHz (for 90dB SPL)	0.1% / <0.1%
Weight (inc cable)	140g

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Sound Quality: 80%

0 - - - - - 100



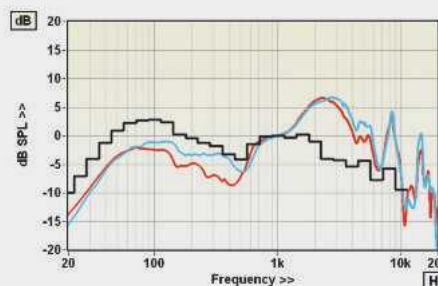
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Graph: L/R capsule uncorrected responses [blue/red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	120.6dB
Impedance modulus min/max (20Hz-20kHz)	35.2ohm @ 20Hz 40.4ohm @ 75Hz
Capsule matching (40Hz-10kHz)	± 3.3 dB
LF extension (-6dB ref. 200Hz)	28Hz
Distortion 100Hz/1kHz (for 90dB SPL)	0.1% / <0.1%
Weight (inc cable)	140g

B&W P7

Currently top dog in B&W's three-model range of headphones (ignoring the Maserati edition of the P5 and the in-ear C5), the P7 distinguishes itself from the lesser P5 and P3 – plus all the others in this group – by being a circumaural (over-ear) rather than supra-aural (on-ear) design. But space is at a premium within the P7's compact earpads, so they'll be truly circumaural only for those with petite pinnae. My ears were bent and my earlobes squashed wearing the P7, and it had by far the highest head clamping force of the group. Stir in the fact that it is also by a long way the heaviest headphone here and it was, unsurprisingly, the least comfortable to wear.

The upside of the circumaural earpads is that the P7 formed the most reliable sealing to the ear during measurement and listening, ensuring consistent bass output – whereas achieving that with the others was more hit and miss.

And there are some neat features to the design like the magnetically attached earpads that can be easily removed for cleaning, and the internal connector in the left capsule that allows the connecting cable to be swapped between one incorporating a remote control and mic (for use with iPad, iPhone and iPod) and one without.

Uniquely here, the P7 capsules fold up into the headband, so while it is inherently the largest headphone in this group it doesn't have a bigger carrying case. The supplied case is soft rather than hard-shell, though, and its resemblance to a small handbag may put off more macho male buyers. No aircraft adapter is supplied but a ¼in jack adapter is included with the 'phones.

CLEAN AND TUNEFUL

The P7 has too much bass but at least it was clean and tuneful on the Daft Punk track. If the result was nevertheless not the most limb-stirring it was because of a lack of crispness to the sound which my

notes described as 'a bit muffled like the Philips'. Confirming what I've already said about wearing the P7, it's also relevant that the very first word I wrote – on donning it after the other four – was 'uncomfy'.

This same reticent character expressed itself as a lack of detail and drama on the Falla orchestral piece, and a narrowing of what should be a wide and deep stereo image. Here I recorded the bass as thickened and noted that, even though the Beyerdynamic had excess bass too, I preferred it overall on this track (having listened to it immediately beforehand).

The cleanliness of the P7's generous bass was an asset with 'Hold Your Head Up', though, clarifying the left channel percussion taps during the intro – a detail that none of the other models elucidated as well. But at the same time, I thought it lacked the clarity of the Audio-Technica ATH-ES88.

Predictably given the aforesaid, 'Dreaming' offered a clean, controlled sound but one not exuberant enough, so the end result was somewhat bland. I also found the left hand of the piano and bass drum were weightier than ideal, despite which – reversing my earlier preference – on this track I preferred the P7 to the Beyerdynamic.

Sound Quality: 74%



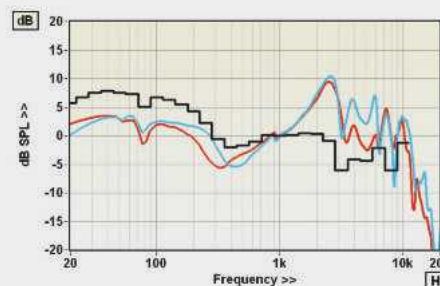
ABOVE: Driver in the P7 is also of 40mm diameter and incorporates a resistive film to control diaphragm movement

RIGHT: Unlike the other models here the P7 has circumaural (over-ear) capsules – but they're a tight fit



HI-FI NEWS LAB REPORT

B&W claims a sensitivity of 111dB per volt at 1kHz for the P7 but we measured a much more competitive 117.6dB. Impedance is specified at 22ohm, with a range of 21.4-26.3ohm measured on the left capsule (20Hz-20kHz). This is sufficient to introduce frequency response changes of 0.5dB on a 10ohm source or 1.0dB on a 30ohm source. Clear carry-over of sound from the active to the inactive capsule was heard. The small circumaural earpads proved their worth on the artificial ear by keeping the LF response very consistent but disparities at higher frequency gave rise to a capsule matching error of ± 7.0 dB (40Hz-10kHz) – a typical figure for a headphone. Diffuse-field corrected frequency response [black trace, below] is pretty good from 300Hz upwards but below that the bass shelves up by around 6dB. KH



Graph: L/R capsule uncorrected responses [blue / red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	117.6dB
Impedance modulus min/max (20Hz-20kHz)	21.4ohm @ 4.2kHz 26.3ohm @ 52Hz
Capsule matching (40Hz-10kHz)	± 7.0 dB
LF extension (-6dB ref. 200Hz)	<10Hz
Distortion 100Hz/1kHz (for 90dB SPL)	<0.1% / <0.1%
Weight (inc cable)	296g

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Beyerdynamic T51p

Beyerdynamic has had a thoroughgoing makeover. It used to make some of the most staid looking headphones on the planet; now, like the T51p, they exude class. And I do mean 'class' rather than blingy-primary-colour-wow-factor: the black and silver finish may not be eye-catching but neither is it in the least cheap-looking.

That said, I'm less than certain that Beyerdynamic has got the basics right in the construction of this headphone. With the thin, exposed metal strips of its headband and the slotted capsule extension slides, the T51p reminds me visually of a large Jubilee clip, and it's no great surprise to find that if you tap the headband when wearing it you hear resonance. The inevitable result is that the carry-over of sound from one capsule to the other is subjectively greater than with any other model here.

While the 'T' in the T51p's designation indicates that it benefits from Beyerdynamic's Tesla technology, so called because it aims to maximise the flux density in the magnet gap, sensitivity is good rather than exceptional – but plenty high enough to provide ample loudness capability and good battery life with portable music sources.

Like the Audio-Technica, the T51p has a Y-cable linking separately to each capsule and the connections are captive not plugged. The capsules rotate flat for storage but don't fold up into the capsule so the supplied Velcro-fastened soft case is quite large but does incorporate a carrying handle. Aircraft and ¼in jack adapters are included.

A CLOUDED QUALITY

My initial reaction on playing 'Lose Yourself To Dance' via the T51p was that there was too much bass. It doesn't have the crazily excessive low frequency output of the Sennheiser, which is a bonus, nevertheless there's an obvious surfeit that is noticeable not just in itself but as much for its effect on the 'pulse' and clarity of the

music. In what was to become a recurring criticism I also noted that the sound was clean and controlled but the music 'not very infectious' – something of a problem when that music should attract you irresistibly to the dance floor. Because of this I actually preferred the Sennheiser Momentum on this track despite its voluminous bass.

Much the same characteristics were heard on the Falla 'Miller's Wife's Dance' track. Bass excess thickened the sound and made this exciting, colourful music seem rather ponderous. 'Overall lacklustre and short on analysis,' I wrote, although I also noted that I nevertheless preferred the T51p to either the Sennheiser or the B&W.

The lesser demands of 'Hold Your Head Up' elicited a better outcome. This track appeared clean, clear, controlled, with good percussion, a solid Russ Ballard guitar, and a distinctive Hammond timbre.

But the Duo track 'Dreaming' – an altogether tougher proposition for any headphone – brought forth further criticism of the T51p's clouded quality and bass dominance, which rendered the piano sound left-hand dominant. The electronic percussion sounded clean but not quite vibrant enough; and there was less sense of varied tonal colours.

Sound Quality: 76%



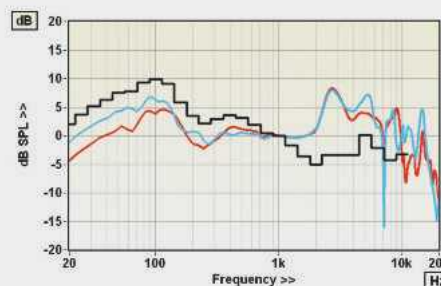
ABOVE: Beyerdynamic says very little about the T51p's driver save that it uses Tesla technology to maximise sensitivity

RIGHT: Classy, minimalist looks distinguish the T51p – but the undamped headband is a source of resonance



HI-FI NEWS LAB REPORT

Beyerdynamic offers no specification of sensitivity for the T51p but we measured a competitive 117.3dB for 1V/1kHz. This is achieved without recourse to unusually low impedance: 32ohm is specified and we measured a range of 33.6-53.3ohm (20Hz-20kHz). Still, this is sufficient to introduce response changes of 0.8dB with a 10ohm source impedance and 1.6dB with a 30ohm source – both on the high side. Earpad sealing proved variable during the response measurements but the ±6.9dB capsule matching error is nothing untoward. However, on the impedance test the T51p had the group's most obvious carry-over of sound from the active to inactive capsule. Diffuse-field corrected frequency response [black trace] shows a rising response below 1kHz followed by early bass roll-off below 100Hz. KH



Graph: L/R capsule uncorrected responses [blue / red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	117.3dB
Impedance modulus min/max (20Hz-20kHz)	33.6ohm @ 1.0kHz 53.3ohm @ 115Hz
Capsule matching (40Hz-10kHz)	±6.9dB
LF extension (-6dB ref. 200Hz)	12Hz
Distortion 100Hz/1kHz (for 90dB SPL)	<0.1% / <0.1%
Weight (inc cable)	182g

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Philips Fidelio M1

Do you like orange? I ask because if you don't much care for the national colour of Philips' homeland, the Fidelio M1 in this guise is likely to grate as soon as you set eyes on it.

In addition to having orange fabric in the middle of its earpads it has orange pivot screws for the capsules, orange stitching on both sides of the headband (of an evenness unlikely to impress the judges in *The Great British Sewing Bee*) and woven orange sheathing on the connecting cable. There's even an orange drawstring on the soft carrying pouch. You may find this funky but if not there is an all-white 'le blanc' version to soothe jangling optic nerves.

More substantively by way of criticism, it proved difficult to achieve a good seal of the M1's earpads to the artificial ear, particularly to the left ear. This didn't just make the M1 a pain to measure (my problem), it also indicates that achieving consistent bass output will be problematical with some real ears too – a far more important issue.

Uniquely here the M1 features a small captive lead from the left capsule, terminated in a mini-jack plug. This connects to an extension lead that completes the cable and incorporates a remote control for compatible mobile devices. The headband incorporates graduations on the sliding capsule extensions that potentially aid consistency of setting, although I doubt that many users will bother. Unfortunately, there is clear carry-over of sound from one capsule to the other.

A WANT OF AIR

'Excessive, muddy bass' I thought, when the M1 was pointed at Daft Punk's disco homage. Again it wasn't as overblown in this department as the Sennheiser – few headphones are, unless categorised for DJ use – but it compounded its excess by being muddy in quality. This undoubtedly contributed to the somewhat muffled nature of the

overall sound; but a lack of presence band output was culpable too and resulted in a reduced sense of stereo image width.

Tonal balance wasn't so obviously out of kilter on the Falla orchestral track but there was an overlying blanket of thickened textures and a reduced sense of acoustic space and 'air' – qualities that make the difference between a recording sounding rather dead or having the vibrancy of a live event.

The shortfall in presence band energy meant that there was a lack of leading edges on the violin sound – indeed the whole portrayal was softened. Immediately beforehand I'd listened to the same track over the ATH-ES88 and felt then that it was more open and dynamic.

As with all the headphones here, the M1 was more at home with the lesser challenges posed by early-'70s rock. Its handling of 'Hold Your Head Up', was not bad, but let down by a lack of clarity – it became something of a *mélange*. Despite the Beyerdynamic tending to a clouded sound too, the M1 couldn't match it, let alone the Audio-Technica.

'It's the old story,' I wrote down when I played 'Dreaming' – 'clouding of the sound, not enough energy in the electronic percussion, and bass drum overly weighty.'

Sound Quality: 70%

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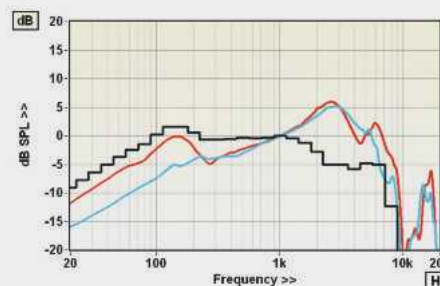
ABOVE: Capsules feature an aluminium outer shell, a 40mm drive unit, memory foam earpads and reflex bass loading

RIGHT: If you wouldn't be seen dead in orange don't worry – Philips also offers an all-white alternative



HI-FI NEWS LAB REPORT

Philips specifies 107dB sensitivity for the M1 but not the input. If we assume 1mW then that equates to a high 125dB for 1V at the specified 16ohm impedance and the M1 doesn't fall that far short at a measured 121.8dB at 1kHz. The low impedance explains this, and it's maintained consistently enough at 17.2-19.7ohm (20Hz-20kHz) that frequency response change is 0.4dB for a 10ohm source impedance and 0.8dB for a 30ohm source. Carry-over of sound via the headband from the active to the inactive capsule was obvious and the M1 also proved reluctant to form a reliable seal with the artificial ear during response measurement. Capsule matching error was fair at ±5.3dB despite this but it was partly responsible for the diffuse-field corrected response tailing off below 120Hz. KH



Graph: L/R capsule uncorrected responses [blue/red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	121.8dB
Impedance modulus min/max (20Hz-20kHz)	17.2ohm @ 6.5kHz 19.7ohm @ 20kHz
Capsule matching (40Hz-10kHz)	±5.3dB
LF extension (-6dB ref. 200Hz)	44Hz
Distortion 100Hz/1kHz (for 90dB SPL)	<0.1% / <0.1%
Weight (inc cable)	138g

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Sennheiser Momentum

Sennheiser's Momentum On-Ear is a simple design to the point of minimalism. The stainless steel capsule carriers don't slide in and out of the headband as usual, instead they are fixed to the headband and the capsules slide up and down within long slots in the metal. The downside of this is that the capsules neither rotate flat nor fold up into the headband, so in its zip-up soft carrying pouch the MOE makes for quite a bulky package.

Those long, thin metal strips also suggest that the Sennheiser will perform badly in respect of headband resonance but the MOE defied this expectation in our testing, subjectively having only low-level carry-over of sound from the active to the inactive capsule.

Where the Momentum On-Ear unquestionably excels is in the range of finishes it offers. There are four combinations of headband and capsule colour available, from the dowdy ivory option pictured here to more vibrant pink, green and blue.

Less positive is the MOE's below average sensitivity: the B&W and Beyerdynamic are about 4dB more sensitive, and the Audio Technica and Philips 7dB and 8dB more sensitive respectively – differences that are not explained by disparities in impedance.

Cable connection is via plug to the left capsule. Two leads are supplied: one with an inline remote for controlling compatible mobile devices and one without. A thin drawstring bag is supplied in addition to the carrying case but no aircraft adapter or 1/4in jack adapter is included.

TOO SHORT ON CLARITY

I was overwhelmed by bass, right from the opening bars, when listening to the Daft Punk track via the Momentum. Trying to listen past that, the clarity of the sound was passable and the infectiousness of the dance rhythm quite well maintained – but the bass excess was inescapable. And if I thought that classical programme material

might fare a little better I was quickly disillusioned when playing the Falla, a piece which should exude Latin exuberance. Instead it sounded as if the Suisse Romande Orchestra had been transported to a large cave. There was much too much bass, instrumental textures were thickened and, as an inevitable consequence, the music evinced little light and shade.

The sound was so much worse than from all the other models in the group that I wrote an affronted 'Yuk' in my summary. Things were a little better on the Argent track but the Momentum's signature bass excess seemed to bog the music down rhythmically without achieving the same clarity of the intro's percussion taps as the B&W.

'The rest is OK,' I recorded, 'but with a pervasive cloudy quality.' The Momentum was back in deep water on the more challenging 'Dreaming', where there's nowhere to hide if the sound has a skewed tonal balance or lacks transparency.

Here it was manifestly short on clarity and impact – particularly in the electronic 'percussion' parts – and it suffered clouding of the piano sound due to the over-generous LF. Yes, that meant that the bass drum was thunderous – but unquestionably overstated.

Sound Quality: 60%

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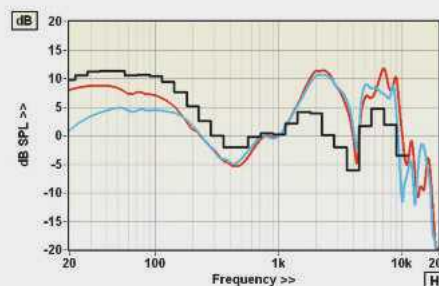
ABOVE: Drive units 'take technology from the high-end headphone sector' but offer the lowest sensitivity

RIGHT: The Momentum On-Ear is offered in four different colour schemes – this, the most staid, is ivory



HI-FI NEWS LAB REPORT

Sennheiser specifies the Momentum's sensitivity at 112dB for 1V/1kHz, and although we measured better at 113.5dB this is easily the lowest in this group. High impedance would have explained this but we measured a range of 25.0-28.3ohm (20Hz-20kHz) – higher than the specified 18ohm but lower than others here. With a source impedance of 10ohm the resulting frequency response change is 0.3dB, rising to 0.6dB for a 30ohm source. Carry-over of sound from the active to inactive capsule was perceptible but at a low level. The Momentum's earpads didn't seal well to the artificial ear but ± 7.3 dB capsule matching error is down to disparities at high frequencies. Diffuse-field corrected frequency response [black trace] shows a bass shelf that raises output below 100Hz by about 11dB (re. 1kHz). KH



Graph: L/R capsule uncorrected responses [blue/red] and averaged diffuse-field corrected response [third-octave, black]

Sensitivity (SPL at 1kHz for 1Vrms input)	113.5dB
Impedance modulus min/max (20Hz-20kHz)	25.0ohm @ 2.8kHz 28.3ohm @ 44Hz
Capsule matching (40Hz-10kHz)	± 7.3 dB
LF extension (-6dB ref. 200Hz)	<10Hz
Distortion 100Hz/1kHz (for 90dB SPL)	0.8% / <0.1%
Weight (inc cable)	164g



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"The S-200 offers endlessly absorbing, effortless musical enjoyment. Warmly recommended."

Hi-fi News, July 14



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GROUP TEST VERDICT

• CD PLAYERS • TURNTABLES • CARTRIDGES • **HEADPHONES** • AMPLIFIERS • AM/FM TUNERS • SPEAKERS •

I have to say I was hoping for somewhat better from this group of headphones, each of them from a prestigious marque. Although they are all primarily intended for use with handheld music sources, I thought there was a fair chance – not least because of the positive receptions they have achieved elsewhere – that they might also cut it in the listening room. Well, they don't quite.

My advice is to reserve them for their intended use, where their compact dimensions and sound isolation are essential assets, and buy yourself a good circumaural open-back 'phone for use with your hi-fi system: you'll be rewarded with sound that's a notch or two superior.

But let's assume, as we must, that you have these models in your sights because on-the-hoof listening in noisy environments is what you have in mind. Which of them delivers the best inherent sound quality?

*“Do no harm”
seems to be the
AT's guiding
principle’*

First to fall by the wayside for me is the Sennheiser. All these headphones have too much bass to my ears but only one of them takes low frequency excess to a tragi-comic level and that's the Momentum On-Ear. It's passably good in other respects but I can only imagine it appealing to bass-obsessed listeners who mistake LF quantity for quality.

While none of the other models here has the bass 'generosity' of the Sennheiser, as I've said they all have over-egged lower frequencies to some degree. This might seem odd in the Philips' case given its measured response but sealing issues on the artificial ear probably explain that.

Unquestionably there is a surfeit of LF when you *listen* to the M1, and it isn't particularly adroit either. This contributes to its somewhat softened, muffled sound but lack of presence band energy is to blame too, and additionally bleeds spaciousness from the imaging.

Deciding between the Beyerdynamic and the B&W I found more difficult on the basis of sound quality alone. The Beyerdynamic is disappointingly bass-heavy and has a quality to it that, depending on source material, can make it sound rather closed-in and matter-of-fact, almost bland. (I'm also amazed that it has no channel identification on or about its capsules – you have to refer to the Beyerdynamic script on the headband to be sure to wear it the right way round.)

The B&W P7's bass can also be obtrusive and, like the T51p, it

lacks pizzazz. I wouldn't argue if you preferred one or the other on the basis of their sound quality but there's no question that the P7, with its additional weight, undersized circumaural earpads and vice-like head clamping force, is distinctly less comfortable to wear. As it's also considerably more expensive, I would therefore choose the T51p.

OUR FINAL CHOICE

If the Audio-Technica ATH-ES88 wins this test, and it *does*, it is to an extent by default. It doesn't have the transcendent sound quality of the ATH-AD700 or ATH-A900X but in the context of this group it succeeds by adopting the essence of the Hippocratic Oath. 'Do no harm' seems to be the ES88's guiding principle, and it's enough to secure it victory. But that's not to say that it succeeds in blurring the distinction between compact, portable headphones and larger models intended for the listening room. The best of the latter group – yes, even price-competitive ones – simply deliver more. ☺



ADJACENT: The Audio-Technica ATH-ES88 [right] is our default winner, the Beyerdynamic T51p coming second

• CD PLAYERS • TURNTABLES • CARTRIDGES • **HEADPHONES** • AMPLIFIERS • AM/FM TUNERS • SPEAKERS •

Canor CD 1.10

Can this Slovakian-built CD player/DAC compete with its UK, US and Japanese rivals and does its tube-rectified power supply and valve output stage give it an edge?

Review: **Nick Tate** Lab: **Paul Miller**

If a modern CD player is to survive the cut-and-thrust of today's high resolution digital audio world, it needs to have DAC functionality as well as the ability to spin silver discs. Although compact disc hasn't quite yet gone the way of the proverbial flightless Mauritian bird, it is surely approaching the twilight of its years. For this reason, the new Canor CD1.10 presents itself as a digital hub rather than just a simple disc player – giving it utility beyond the end of CD, whenever that may be.

The Canor is a hybrid machine then, and, as it transpires, in more ways than one. For as well as possessing modern, powerful 24-bit/192kHz PCM and DSD-compatible digital conversion, it also uses vacuum tubes. And it's not just a case of buffering a conventional solid-state analogue output stage, because this section of the CD1.10 is all-valve, and the power supply is tube-rectified for good measure. Once again then, old meets new, and it is the combination of these things that makes this machine actually quite a rare device in the great scheme of things.

MATCH TO THE POWER AMP

Indeed, the more time you spend with the CD1.10, the more you realise it's something of an oddball. As we shall see, its fine sound will endear it to many, but some might be less enamoured of its looks and feel, which don't quite have the sophistication of some price rivals.

Two things dominate the Canor's front panel, the first being an unusually large dot-matrix display. This glows a pleasing pale amber colour which is very easy on the eye, while the actual size means it's exceptionally easy to read from a distance.

The second feature worthy of note is the unusually big rotary control knob. It's a neat visual match for Canor amplifiers, but viewed in isolation some will find it

disproportionately large for the job it has to do. It certainly makes the play/pause and track forward/back functions easily accessible, although confusingly the related drawer open and close, stop and cue forward/back are tiny buttons set well below. The result is that the Canor requires a little more familiarisation than usual before it becomes 'second nature' to use. The good quality remote control, with its aluminium frontispiece, goes some way to helping here though.

Being a hybrid tube and transistor design, the Canor has a warm-up cycle that users of conventional CD players won't be used to. Switch on the machine and it doesn't snap into life as if on a hair trigger. Instead, there's a period of apparent inactivity, save for a small red LED flashing on the fascia. Finally, after what seems an age, the whole shebang bursts into life and

the vast display lights up like Blackpool on a dark night. To the uninitiated it is unclear just what the player is doing during its warm-up routine, which is why with this machine at least it's helpful to first read the instruction manual – the Canor isn't a typical CD player to use.

AN OVERALL SOLIDITY

Appearance is of course a matter of taste, but some will find its size excessive: simply because its height might demand the use of different shelf spacing on an equipment rack. In defence of the Canor, there is rather more inside it than with many machines – including the aforementioned valve complement which does need some air to circulate around it during operation.

Should you wish to site it outside a rack, then you might find the graphite grey powder coated steel case rather 'industrial'



RIGHT: A popular and proven StreamUnlimited CD mech feeds two Burr-Brown PCM1792 DACs that drive the tube analogue output stage. Note the valve-rectified (EZ81) power supply



looking. It isn't unattractive but it's fair to say that it lacks the visual sophistication of some price rivals. Canor obviously hasn't made this machine cheaply, but nor has it made it beautiful.

So the CD1.10 is quirky alright, but once you get used to all its foibles, one does appreciate its overall solidity. This extends to the inside, which sports a classy StreamUnlimited JPL-2580B disc mechanism, behind which sit the four valves (two 6922, two 12AX7LPS) that take care of analogue output duties. There are twin Burr-Brown PCM1792 192kHz/24-bit DACs, which incorporate fascia-switchable digital filtering (two settings only).

The printed circuit boards are specially milled to give a low level of dielectric loss throughout the circuit, Canor claims – this is a process the company has developed itself. The player also features a valve rectified power supply using a single EZ81.

Around the back, there's a choice of USB (2.0), coaxial and optical digital inputs, and coaxial and digital outs – so the machine can work as a transport as well as a DAC – and balanced XLR or RCA analogue phono outputs. My MacBook Pro running Audirvana immediately recognised the

Canor as a USB output device, and worked faultlessly with a wide variety of hi-res files during the test period. The aluminium and ABS compound CD loading tray proved swift and smooth in action, and lacked the plasticky feel of some rivals, (even ones at the Canor's not inconsiderable price). It's nice to see that the company has taken some care here: a good quality CD drawer is an often overlooked aspect of the compact disc playing experience.

A SILKY SOUND

Whatever type of music file you feed this machine, or indeed whichever silver disc you can find in your 'legacy' collection, the Canor makes it tonally sweet and smooth in a way that few machines at any price are able to do.

Indeed it is one of the 'nicest' sounding CD players I've heard in a good while, and this seems to come from a combination of excellent basic design allied to that triode valve output stage which gives a significantly richer and silkier sound than you often get from solid-state.

'It was good at letting the notes decay into an inky blackness'

ABOVE: Fascia styling is big and bold. The large rotary knob gives basic transport controls, others are by very small buttons below. Disc drawer is smooth and the display easy to read

For example, drop Simple Minds' 'Someone, Somewhere, In Summertime' [*New Gold Dream*, Virgin CDV2230] into its CD tray, and you're greeted by an unexpectedly lush soundscape that seems to be warmer and wider than when you last listened to it. The Canor fills the space between the speakers in a bigger and bolder way than most – there's a satisfying 'thunk' to the kick drum, while bass guitar takes on a little more

weight and warmth than is normal.

The midband is as inviting as a real fire on a cold winter's night, and is bathed in a 'yellowy' light rather than the bright white xenon given by some

rival solid-state machines. Actually, it's surprisingly detailed: everything is tightly placed in the wide stereo soundstage, and finely etched in a delicate and sophisticated way.

Indeed, so propulsive is the sound that you find yourself tapping your foot more enthusiastically than perhaps expected. The Canor gets into the groove and holds your attention, giving an enjoyable and immersive experience. It's lovely on vocals too: Jim Kerr's dulcet tones come over as smooth yet expressive, and the hi-hat cymbal work is a pleasure too, as sweet as fine sparkling wine. The overall tonal balance is a wee bit on the warm side, but not excessively so. It's just enough to take the edge off shrill systems – or indeed less than lovely recordings – yet it never loses the energy of the musical event itself.

I found it gave excellent synergy with a good, crisp mid-priced transistor amp ➤

A TUBE 'BIAS'

Canor is a name relatively new to Britain, but it is not a new company. Indeed, it has been designing and manufacturing good quality valve amplifiers for nearly two decades, although it's come relatively freshly to CD – with the CD1.10 being only its second model. Its Slovakian headquarters is a large, spacious building with extensive machinery and proprietary test gear – including specially designed tube-matching machines. It has a well equipped, acoustically optimised listening room which is as good as many UK factories'. Canor has set itself up as a tube 'specialist', and has made a number of fine sounding integrated amplifiers designed with the accent on ease of use and ruggedness – rather than anything wilfully avant-garde. The company also manufactures for other customers too, so is no stranger to higher volume output than its own brand requires. The company has its own tube optimisation and burn-in rig, and has developed a special printed circuit-board milling system, which is said to improve sound, too.

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True high fidelity from exaSound

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- Native DSD up to 12.288MHz
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- Headphones & pre-amp
- Detachable 12v power supply

CD PLAYER/USB DAC



ABOVE: Rear panel has coaxial and optical digital inputs and outs plus USB digital in, and RCA and balanced XLR line outputs. IEC mains socket sits below power switch

like Exposure's 3010 S2 driving a range of loudspeakers.

Thomas Dolby's epic 'One Of Our Submarines Is Missing' [*Golden Age Of Wireless*, EMI CDP 7 46009 2] also proved a joy: the electronic percussion bumped and bleeped away in the background, set behind swathes of fat Fairlight synthesisers. The Canor was very good at letting the notes decay gently into an inky blackness, and at setting clear spaces between the beats.

This gave a powerful, explicit sense of progression to the song, and the machine was good at accenting on individual notes – it always spelled out the phrasing of the song well.

However, in absolute terms, the overall dynamics of the song did sound slightly compressed. For example, as the song built to a crescendo in the chorus section, the CD1.10 didn't quite signpost the full power of the occasion. Instead, it gave a slightly understated feel to the proceedings, rather missing the poignancy of the music here.

A SENSE OF PERSPECTIVE

A major part of the machine's appeal is its DAC functionality, so it was interesting to substitute a Cyrus CD Xt Signature transport for the Canor's own optical drive. I found the CD1.10's internal mech didn't quite have the clarity of the top-end Cyrus transport, seemingly clouding the finest detail.

This tells us that the DAC is the stronger of the two component parts of the CD1.10, so I fired up my computer and tried some hi-res with excellent results. Everything

from Kate Bush's beautiful 'Snowflake' from *50 Words For Snow* at 96kHz/24-bit (WAV) to Alan Parson Project's *Eye In The Sky* at 192kHz/24-bit (FLAC) sounded superb, with a sweet, even and spacious feel.

The Canor's innately rich and verdant sound didn't change, in fact it sounded even more polished and luxurious. I was impressed by the accuracy of its wide stereo sound staging, and depth perspective was strong too – although it's fair to say that this machine sits you a little further back in the concert hall than some USB DACs. The result is a better sense of perspective, if at the expense of power and passion – regardless of file type.

Switching to the 'Dynamic' digital filter setting from standard (the 'Natural' setting) gave a fractionally more impactful sound, but the effect was subtle. Everything came across with consummate ease and a fine sense of flow but there was no additional edge or attack. Subtlety, rather than hi-fi fireworks, is this Canor's key. ☺

HI-FI NEWS VERDICT

If sound quality is all, then this is a bargain, especially if your system already sounds rather forward and full-on. The Canor CD1.10 brings real sweetness and ease to everything it plays, and sophistication too. Better still, the built-in DAC is excellent, and shouldn't be regarded as a gimmick. However, not everyone will like its ergonomics or styling. It comes heartily recommended then, but do try before you buy!

Sound Quality: 81%

0 - - - - - 100

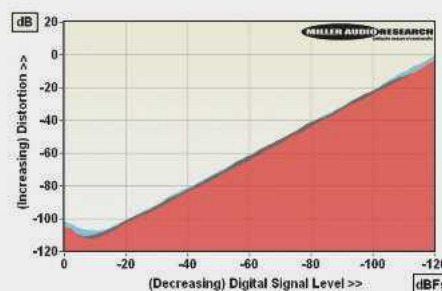


LAB REPORT

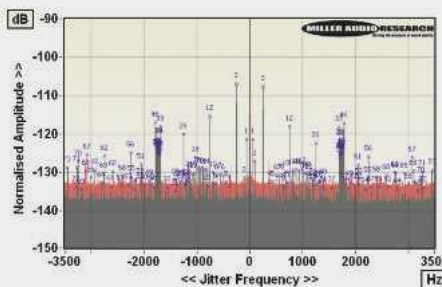
CANOR CD 1.10

Canor's use of a triode-based analogue output stage sets the tone for both distortion and noise performance, the 'character' of the player differing from typical PCM1792-based DAC implementations by virtue of its exceedingly well-matched THD vs. digital level vs. frequency trends [see Graph 1, below]. Neither is this achieved by simply increasing tube-distortion overall to deliver the same distortion at all frequencies! Indeed, distortion is very low through midrange frequencies, falling to a mere 0.00008% at -10dBfs and 0.0002% at -30dBfs, proving that tube line stages needn't be synonymous with moderate to high levels of THD. Our sample showed some slight difference in THD between L/R channels and in the 105dB/108dB A-wtd S/N ratio, but otherwise the output triodes were well matched.

The response(s) are mildly 'shaped' but not excessively so, its bass output down by -0.3dB/20Hz and treble by -0.8dB/20kHz, falling to -6.0dB/45kHz with 96kHz media and -17.6dB/90kHz with 192kHz media. Filter 2, the 'Dynamic' option, trades reduced pre/post-event ringing in the time domain for poorer stopband rejection in the frequency domain (just -7.8dB with 48kHz media) and a slightly more obvious HF roll-off (-9.7dB/45kHz and -21.3dB/90kHz). This filter really comes into its own with high-res 96/192kHz material. Jitter is lowest via the USB input at just 22psec and a little higher and 'untidier' via S/PDIF at 310psec [see black trace, Graph 2 below]. Readers may download full QC Suite test reports for the Canor CD 1.10's CD, S/PDIF and USB performance (and Filter 1/2 options) by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: THD vs digital level – 1kHz at 24-bit/48kHz over S/PDIF and USB, red; 1kHz at 16-bit/44.1kHz, black; 20kHz at 16-bit/44.1kHz, blue, via CD



ABOVE: High resolution jitter plots using 24-bit/48kHz data (S/PDIF, black with markers; USB, red)

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	4.06Vrms at 6ohm-2.67kohm
A-wtd S/N Ratio (CD / S/PDIF in / USB in)	109.5dB/108.0dB/106.7dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.00035% / 0.0002%
Distortion & Noise (20kHz, 0dBfs/-30dBfs)	0.00065% / 0.0007%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	-0.3dB to -0.78/-6.0/-17.6dB
Digital jitter (CD / S/PDIF in / USB in)	142psec / 310psec / 22psec
Resolution @ -100dB (CD / S/PDIF input)	±0.3dB / ±0.4dB
Power consumption	53W
Dimensions (WHD)	430x170x370mm

McIntosh MHA100

McIntosh calls the MHA100 its first-ever 'headphone amplifier', but this chunky component is also a DAC and a 50W/channel integrated – a rose by any other name?
 Review: **Ken Kessler** Lab: **Paul Miller**

Schizophrenia or liberal use of language? Ain't no way that McIntosh's MHA100 is 'just' a headphone amp. The genre is maturing so quickly that it has already splintered into sub-genres; this unit's niche is more a case of mistaken identity. Its capabilities are so broad that it's also a candidate for powering a second system.

With the portable headphone amp market now hosting USB versions, amp-only types and those with DACs, the mains-only alternative has subgenres of tube or transistor, amplifier on its own, or with DAC. A fully-loaded model like the MHA100 is – technically speaking – an integrated amplifier, because it drives speakers. But we must pardon McIntosh for targeting the headphone audience because it now makes its own cans, too.

UNMISTAKABLY 'MAC'

Even before you inspect it closely, you know that it's McIntosh, thanks to its blue-lit analogue meters. Mac could fit nothing else, any more than Leica would make a camera without the red dot. Its physical presence also distances it from most people's idea of a headphone amplifier. Which is not to say that all headphone amps are small: I've seen models measuring 430mm wide and bristling with a half-dozen valves. Nor is its price of £4995 that outrageous in today's market.

What makes this stand out from the crowd is its name and reputation: these count for a lot, especially as the venerable brand is enjoying a renaissance. Equally, its legendary build quality will appeal to many, while others who think laterally will appreciate the fact that line-out sockets let it serve as a preamp: a front panel output selector selects speakers or one of the headphone settings (more of which in a moment) but inserting headphones mutes the speaker taps regardless.

RIGHT: Massive heat sink and two Autotransformers dominate the chassis, which is pure McIntosh, right down to the chrome base. Note the gilded speaker terminals

For this review, however, the non-headphone-related aspects are secondary, as I will approach it mainly for the way it drives headphones. Suffice it to say, your £5k buys you an integrated with single-ended and balanced line inputs, and a host of digital inputs including USB, coaxial, Toslink optical and AES/EBU XLR.

Its power amp section, which includes the company's proprietary Autoformers, is rated at 50W/ch and the back contains stout multi-way binding posts to connect to the speakers. Where this will find unparalleled appeal for *serious* headphone users is its capacity for matching whatever headphones you wish to connect to its lone ¼in front panel socket.

This facility, via a front rotary, lets you choose between three headphone impedance ranges: 8-40; 40-150 and 150-600ohm. When you use near-mythical oddballs like the 25ohm Beyer DT48s, you'll appreciate just how this enables the user to optimise the performance, and level is never an issue. I tried ten different sets of cans to give this feature a workout,

and it is the feature I missed most upon returning the unit. They included the Musical Fidelity MF100, Sennheiser HD414 and PCX350, Beyerdynamic DT48, Grado RS-1, Monster Inspiration, Focal Classic, B&W P3, P5 and P7.

IMAGING FACILITY

A new feature is McIntosh's Headphone Crossfeed Director (HXD) technology, to create a facsimile of imaging like conventional speakers through headphones. McIntosh argues that HXD brings 'new depth and spatiality to personal listening... improves the sound localisation for headphone listening and restores the directionality component of the spatial sound stage normally experienced with loudspeaker listening.' It is accessed by pressing the volume control, and a light illuminates over the headphone socket to indicate that it's on.

McIntosh has always adhered to the school of thought that values protection, so the MHA100 offers its proprietary Sentry Monitor power output stage



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McIntosh has always adhered to the school of thought that values protection, so the MHA100 offers its proprietary Sentry Monitor power output stage





protection circuits. The circuit protects headphones in the event of an impedance mismatch, while built-in thermal protection circuits guard against overheating, and direct current detection and protection is provided for both headphones and loudspeakers. Power Guard technology, a waveform comparison circuit that continuously monitors both input and output signals, dynamically adjusting them when necessary, prevents potentially damaging clipping occurring during peaks.

For many years, McIntosh has offered user-set labelling, source trimming and tone control adjustment (the latter providing a five-step bass boost control of 0 to +12.5dB in 2.5dB steps at 40Hz) set into memory. Once you have this up and running in its most basic, I'm-in-too-much-of-a-hurry-to-read-the-manual form, settle down with a cuppa to find

'The MHA100 gives up its riches without any need to coax it'

out just how flexible and customisable it is. Accompanying the peak-responding blue-lit meters for indicating output level, the MHA100's OLED display indicates source, volume levels, trim settings and setup functions. A remote handset is supplied, and it also operates other McIntosh components such as tuners. The only surprise is that this overkill amp has but one headphone socket. (Chord's diminutive Hugo, for example, provides one ¼in and two 3.5mm, while Meridian's Prime offers two ¼in and one 3.5mm.)

A CONSISTENT FLAVOUR

Armed with the above cans, iPod and Astell & Kern AK120, I settled down to the longest bout of headphone listening I've undertaken that wasn't on a train journey or a flight. Curiously, the unit didn't seem to favour any one model, in part because

ABOVE: If you didn't know the MHA100 was only 292mm wide, you'd swear it was a full-sized Mac. Both rotaries are two-in-one concentric types, as the labelling indicates

I took the time to look up all of their impedances or sensitivities and factored these in for precise matching. Level setting was hit-or-miss, but – like setting the temperature for one's bath or shower – you knew when everything is 'just so.'

While I didn't spend too much time studying the unit as a DAC, I did hook up an Astell & Kern AK120 via optical for a direct digital feed – the recordings ranging from 44.1kHz/24-bit Beatles material on the 'Apple USB' to high-res downloads up to the MHA's limit of 192kHz/32-bit, to which it upsamples.

Due to the MHA100's even-handedness, the results that follow apply to the ten sets of headphones in general. Certain considerations, like the hunger of the Beyerdynamic DT48, or those distinctive sonic signatures like open-backed versus sealed, had to be addressed as much as level matching, but the MHA100 gives up its riches without any need to coax it. From the first blast through B&W P3s, the flavour remained consistent.

This unit will never be mistaken for a rich, vintage valve component, and it could sound 'sharp' at the top, but it was simply revealing the nature of the recording. Days before assessing this unit, I had undertaken a valves vs transistor demo at the Munich show [see p8], and had adopted a mindset for comparisons that were affected as much by the recording as the technology.

With the remastered Beatles catalogue from the 24-bit USB source, the MHA100 surprised me by retrieving all of the newly-exposed detail without sounding too ➔

GOING WITH THE FLOW

If McIntosh was going to get into the headphone game – its sibling, Audio Research, was more cautious in acknowledging the trend toward cans with a headphone amp in its latest preamp – it would have to be a 'statement product'. But don't think for a moment that overkill headphone amps are strictly a result of the new wave. We reviewed AudioValve's RKV back in 2002; before that there was the OTL EarMax, and one mustn't forget that Stax's energisers, though dedicated to their electrostatic headphones, were much more than mere power sources. Those are just the ones I remember without too much head-scratching. If there are any 'sure things' in high-end audio, it's that a flood of new headphone amps will follow in the next few years, because headphones – and 'soundbars' – are believed by many to be the only growth areas left to hi-fi manufacturers. My lips are sealed, but I know of one all-valve, all-singing/all-dancing model currently on the drawing board, and where McIntosh goes, others will surely follow. If a brand as conservative as this can embrace cans...



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ABOVE: In addition to balanced and single-ended line level inputs, a choice of four digital inputs and preamp and speaker outputs, the MHA100 also integrates with other McIntosh components with remote 12V power-on triggers

hygienic. The spaces between the voices and the instruments – despite my not applying HXD – matched the relative scale and positioning of the speakers I hooked up to it for comparisons: Spondor LS3/5As.

With open-back or even semi-open-back/on-ear types, the MHA100 is gloriously airy and open, 'Hey Jude' enjoying an enhanced sense of majesty countered by a surprisingly intimate sense of McCartney's vocals. Combining the personal touch with the panoramic? *A tour de force*, by any measure. Turning to the ear-enclosing Inspirations, P7s, DT48s and PCX350s changes neither the tonal quality nor even the perspective: they simply benefited from the natural, attention-focusing nature of headphones that isolate the listener from his environment.

A VICE-LIKE GRIP

Such optimisation of the headphone-listening experience, when applied to mono recordings such as Johnny Mercer's 'They Didn't Believe Me' [Decca DL 8109], reinforced the case for those who argue that one can only assess sources and amplifiers when they're freed from the gross distortions of even the finest loudspeakers and the room interface. Little sensations, soft piano tinkling under the backing vocals, the sweet brass – the MHA100 feeds them to headphones with an authority that, if anything, will win more converts for 'phones.

Less delicate material benefited too: bass enjoyed a spectacular richness and punch. Bad Company's 'Can't Get Enough' [Swan Song SS 8501-2] was suitably powerful, the raucous backing, fuzz guitars and scattergun percussion framing Paul Rodgers' vocals, detracting from them not one iota. This

recording isn't particularly messy or undisciplined, but it is inherently *loud*. The MHA100 retained its composure, allowing the song to flow. I can liken it only to changing one's exhaust system for flow-through pipes, as if someone had let go the reins without pandemonium ensuing. This unit exhibits vice-like control – another McIntosh trait that will enjoy greater currency among those listening via headphones, savouring the 'direct injection' nature of a transducer mere millimetres from one's ears.

The MHA100 addresses headphone listening for the purist who wants no compromises. But it also does it in a manner that's both unique and peculiar to McIntosh. Audiophiles will adore it, even those bound to valves, because its optimisation of one's favourite headphones is a feature that's undeniably a boon – offhand, I don't know who else makes a unit with this level of impedance and level matching. The biggest audience for this might even be competitors, who want to know just how good their own headphones can sound. ☺

HI-FI NEWS VERDICT

When simply opening a box and registering delight is matched by an experience that brooks no disappointment, one must judge a product a success. I loved everything about the MHA100, even without factoring in the DAC and speaker-driving capability. Purely as a headphone amp, for those who are serious about solitary listening, it's a joy. And as the heart of a second system? It's pretty cool for that, too.

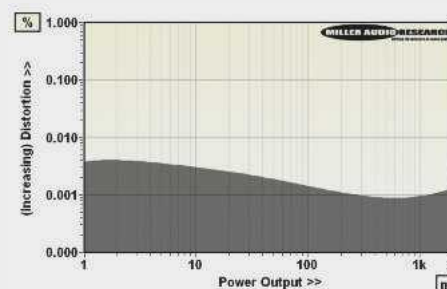
Sound Quality: 85%



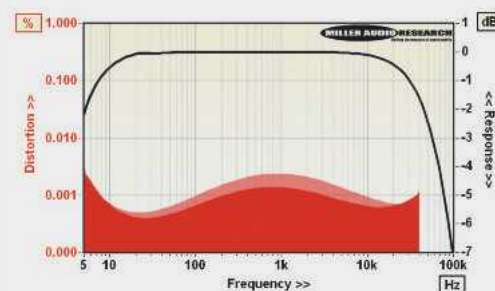
MCINTOSH MHA100

McIntosh's three-tap autoformer-coupled headphone output brings with it several configurable options. The 'Normal' (+12.9dB) gain setting has the benefit of lower distortion at a given output level than the 'High' (+18.9dB) setting at 0.0005% versus 0.002% (both 1kHz re. 1V output) but, of course, the latter is more capable of driving difficult/insensitive headphones. McIntosh rates its Normal output at 250mW and High output at 1W regardless of the selected 8-40ohm, 40-150ohm or 150-600ohm load settings. In practice, the High setting achieves 2065mW (2.07W) into 25ohm [see Graph 1, below] or 8V into a high impedance load (47kohm), the former suggesting the MHA100 will drive the lowest impedance 'phones with ease. The source impedance is usefully low too at 2.5-3.2ohm (20Hz-20kHz) with some variation at HF via the 40-150ohm and 150-600ohm taps. The response shows some HF tailoring under load, falling from -0.1dB/20kHz to -0.45dB/20kHz into 25ohm, but this isn't significant. Noise is very low indeed – the A-wtd S/N ratio a wide 91.8dB (re. 0dBV).

The MHA100 is also an integrated amplifier, besting its 50W specification at 2x68W/8ohm and 2x94W/4ohm with 105W, 180W, 125W and 35W available under dynamic conditions into 8, 4, 2 and 1ohm loads. THD is very low at 0.0004-0.005% (10W/8ohm), the response very extended at -0.5dB/100kHz and the A-wtd S/N ratio exceptional at 102dB (re. 0dBV). Readers are invited to view comprehensive QC Suite test reports for McIntosh's MHA100 headphone preamp and integrated amplifier by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Continuous power output versus distortion (up to 1% THD) into 25ohm 'headphone' load



ABOVE: Frequency response (black) from 5Hz-100kHz into 25ohm and distortion versus frequency (red, 1V; shaded, 40mW) from 5Hz-40kHz

HI-FI NEWS SPECIFICATIONS

Maximum output (re. 1% THD into 47kohm)	8V
Max. power output (re. 1% THD into 25ohm)	2065mW
Output impedance (20Hz-20kHz)	2.5 to 3.2ohm
Maximum gain (Normal / High)	+12.9dB / +18.9dB
A-wtd S/N ratio (re. 0dBV)	91.8dB
Frequency response (20Hz-20kHz/25ohm)	-0.1dB to -0.45dB
Distortion (20Hz-20kHz, re. 40mW)	0.0005-0.0024%
Power consumption (Idle/Rated output)	17W / 215W (1W standby)
Dimensions (WHD)	292x141x457mm



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p61
Chord cable
to come

Chord Signature Reference

Trickle-down tech from Chord's flagship Sarum has birthed a 'Reference' version of its shielded Signature speaker cable. Review & Lab: **Paul Miller**



Hand built to order, Chord's latest Signature speaker cable looks like the original but features improved conductors and dielectrics and is a mite more flexible too! This 'Reference' version is available in 1.5m pre-terminated lengths at £600, increasing to £2000 for the 5m pair reviewed here. Terminations include 24k gold-plated banana plugs and spade connectors and BFA Camcon connectors, while the nylon braid comes in black/black or, as illustrated here, red/black colourways.

Chord claims that its 2005 Signature was the 'first available speaker cable with high frequency effective shielding', but it was certainly not the first shielded speaker cable. My own lab test records show the graphite-screened QED Incon and braid-screened Silver Sounds 12/2 from 1992, both incorporating drain wires terminated at the 'amp end' of the cable.

There have been various screened cables launched in the meantime but all, as far as I can tell, have the signal and return conductors surrounded by a common shield. Chord's Signature, and today's Reference version, are distinctive because each conductor has its own separate screen, electrically isolated from the other. Moreover, because each conductor is effectively a substantial 10-gauge silver-plated coax with a high quality PTFE dielectric (rather than multiple coaxial cables connected in parallel) and the screen appears to be unconnected to



ABOVE: Like the original Chord Signature cable, the new Signature Reference uses shielded, coaxial signal and return conductors

either end of the cable, there's no penalty to its overall capacitance – just 35pF/m according to my measurements. The loose twisted-pair geometry does push the series inductance up a tad, to 0.9µH/m, but the substantial cross-section of those multi-stranded cores keeps the loop resistance down to a fabulously low 5.9mohm/m. The power loss is just 0.0064dB/m.

brightest brass and spot-lit percussion has slightly less 'reach' even though there's no doubting the balance and composure offered by the cable. Complex classical works were easy to interpret, the cable assisting in the delivery of 'difficult' pieces without stress or strain. ☺

HI-FI NEWS VERDICT

Now in Reference guise, Chord's Signature is a highly developed cable which has evolved to complement similarly civilised systems. It necessarily faces stiff competition at this exalted price level but holds its own with a delivery of power and grace that can make lesser cables appear grainy or uncouth. The combination of low capacitance and resistance also bodes well for its consistent behaviour with a range of different amplifiers.

Sound Quality: 80%



PUNCHY PERFORMER

Thick, low-resistance cables typically retain the impact of the lustiest amplifiers and Chord's Signature Reference is no exception. The fruity kick-drum/bass line of Donald Fagen's *Morph The Cat* [96kHz/24-bit; Warner Music 9362499752] powered from my B&W 802Ds with a punch and purpose that belied the relaxed rhythm of the piece while the multi-tracked vocals sang as clear as day. By comparison, the

LEFT: The gentle twist of each cable's pair of conductors is maintained by an aluminium clamp, fixed 10in from each end

NAD D 3020

The NAD 3020 integrated is back with a radical design and a D for digital. With its high-res DAC and wireless connectivity, can it capture the magic of the original?

Review: **Tom Anderson** Lab: **Paul Miller**

With its modern looks, digital inputs and Class D power, you might justifiably ask why NAD's latest budget integrated takes its name from the iconic NAD 3020 launched in 1978. That original grey slab of analogue amplification was one of the first audio products to be designed in Europe, but built in the Far East to reduce cost. It established a new low price point and brought high-quality home audio to the masses. As the hi-fi industry took off in the '80s the 3020 went on to become the world's best-selling amplifier.

Fast forward 35 or so years... The D 3020 has a unique shape, designed to sit upright beside a PC or lie flat on a shelf. It has a raft of digital inputs including asynchronous USB; it's networked and its wireless connectivity allows music streaming from smart devices running AirPlay or Bluetooth.

IN TUNE WITH THE TIMES

Flexible, energy efficient, cool running and aimed squarely at 'new' audiophiles into computer audio and streaming, the new D 3020 is a product attuned to its time. And promising high-quality power, do-all functionality and a fine headphone amp all for under £400, suggests the same sort of value potential as the original integrated.

Out of the box the D 3020 is a small but weighty item with a slightly plasticky feel: a 440mm-wide metal unit it certainly isn't. At the heart of the design is an innovative Class D power amplifier, co-developed by NAD and Hypex [see boxout], which is both small and very cool-running, thus making any large metal casework redundant.

The unique shape and cosmetic styling runs across the brand's new 'Classic Digital' series that also includes the D 1050 DAC [HFN Jan '14] and the slightly larger Direct Digital integrated amplifier, the £800 D 7050. But is that look going to catch on?

RIGHT: The NAD/Hypex Class D amplifier module is screened off alongside a compact switchmode PSU. A Crystal CS42528 DSP supplies the ADC for the D 3020's digital ins

The mix of gloss plastic and rubberised textures looks stunning and contemporary. Well, at least for the first 30 seconds before you put it down and realise you have left finger-marks all over it.

There is a single front knob for volume, with the front panel showing illuminated source information and a scaling volume level. The latter is a subtle design cue taken from the original 3020 which (as many will fondly remember) had five red LEDs that lit in sequence as the gain went up.

Touch-sensitive buttons on the 'top' panel handle power on/standby and scrolling source select functions. These will be on the side if the unit is lying down and NAD supplies four little stick-on rubber feet for positioning according to how you want to orientate the device.

A small, rubberised remote control offers basic input and volume controls

with additional buttons to control a NAD tuner. One thing that the main unit's touch buttons and the remote control have in common is a mildly recalcitrant attitude to working as prescribed. You do need a firm press in precisely the right spot, with either control method, to get a response from

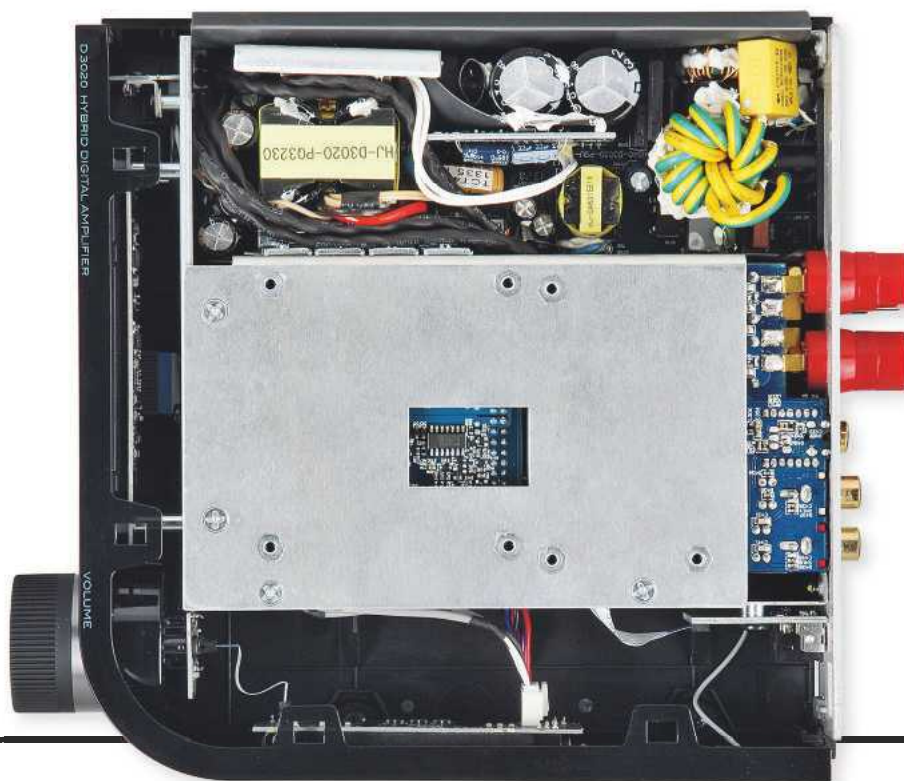
the amp – and that big plastic volume knob is a long way from feeling satisfyingly solid.

By traditional analogue amplifier standards the back panel looks virtually bereft of connections

too. Yet this amplifier offers no fewer than nine input options. You get Toslink optical and coaxial S/PDIF inputs, an asynchronous USB input, which is plug and play for material up to 192kHz/24-bit, and two digital connections you can't even see: Wi-Fi and Bluetooth.

The latter is enabled with the higher quality aptX codec, which has massively

'The little NAD delivers an infectious beat with great timing'





elevated the sound quality of Bluetooth streaming if you have a suitable aptX-enabled smart device. A second optical input is configured for a 3.5mm MacBook optical jack cable and NAD supplies an adapter to convert this to a second standard Toslink if required. The same port doubles as a 3.5mm stereo jack analogue input. Finally, there is one 'legacy' traditional stereo analogue input in the form of twin gold-plated RCAs.

The speaker binding posts are basic but solid and suitably plated. The 4mm sockets are somewhat shallow, so expect a typical banana plug to be secure but poke out a little. The back panel also hosts a 12V trigger connection and, rather uncommonly, a subwoofer output. Hook up an active subwoofer and you can get away with bijou front speakers for a discreet 2.1 system, ideal for desk-based PC audiophiles. The front panel also plays host to a headphone socket, which mutes the speaker output when a jack is inserted.

NAD is keen to publicise the work that went into developing the headphone

amplifier in the D 3020, which given the rise-and-rise of headphones is another strong nod to the modern pretensions of this new little box of tricks.

PUNCH AND SCALE

I hooked the D 3020 up to a MacBook Air via USB, an Oppo BDP-105 universal disc player [HFN Jan '13] via optical and a Parasound CD1 CD player [HFN Mar '14] direct into the analogue inputs. High-end speaker cables are likely to drag the little box clean off the shelf so Chord Rumour 2 seemed a good match, physically and financially. Similarly, a sample pair of Tannoy's Precision 6.1 standmounts (£900) made for a more appropriate pairing than my own KEF R900 floorstanders. With several inputs and speaker cables connected you do realise quite how compact that rear panel is. You would need fingers like precision tweezers to get another cable in there...

Then again you might question why you would need anything other than a PC connected to the D 3020 when it gets into

ABOVE: Placed either upright or on its side, the D 3020's design and feature-set make it equally at home on the equipment rack or sitting next to a PC on your desk top

its stride with a clean USB input. Belying its diminutive size it presses forth with a punch and scale that make something of a mockery of its humble 30W power rating. The sound is rich and robust, and blissfully free of the graininess at the top end that early Class D amps suffered.

Its character is very much an 'easy listen' over a more analytical presentation and – given that it has to handle anything from high-res audio to Bluetooth – that is probably apt. Yet the D 3020's real trick is in upping its game relative to the quality of the sound format being played. With cleanly ripped CDs or high-res audio tracks, it shines.

The Doors' *Waiting For The Sun*, [96kHz/24-bit FLAC from HDtracks], has seen some serious repeat play action on my MacBook of late. The opening (Spanish) guitar solo to 'Spanish Caravan' is frenetic and, balanced only on the left channel, easily reveals if an amp can convincingly recreate this instrument. The D 3020 loses nothing in terms of the energy and ambience of this solo, driving forward with excellent pace and good leading-edge attack to the notes. It nails the essential character and timbre of the instrument with ease and does so without breaking into a sweat.

As the bass and right channel kick in, the NAD delivers a big sound with warmth aplenty throughout the low frequencies. Morrison's vocal intro in the absolute centre of the soundstage is superb. The NAD renders his voice suitably smooth and laconic with the familiar Californian ➔

HYPER HYPEX

Bjorn Erik Edvardsen, the designer of the original NAD 3020, remains senior designer at NAD and identified Universal Class D power amplifier modules as ideal for the D 3020. He contacted UcD's inventor Bruno Putzeys with some ideas for improvement. Specifically Edvardsen wanted changes to increase the current capability driving low impedance speaker loads, and lower distortion by changing the output FETs and reconstruction filter. Soon NAD and Putzeys' company Hypex entered into a joint licensing agreement. The UcD design is self-oscillating (no clock) with high levels of feedback and Putzeys was in charge of the extremely critical PCB layout on the new modules to avoid any stray capacitance that could affect the modulation frequency. Edvardsen contributed the power supply design, precision clipping circuit and the DAC and buffer amp, ensuring compliance with NAD's very tight specification for signal-to-noise ratio and distortion, damping factor and overload behaviour.

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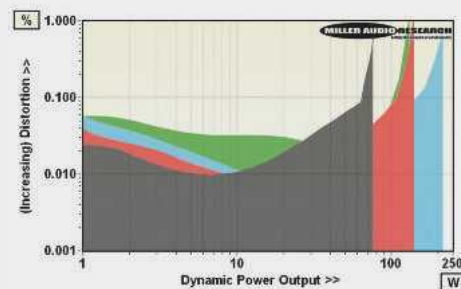
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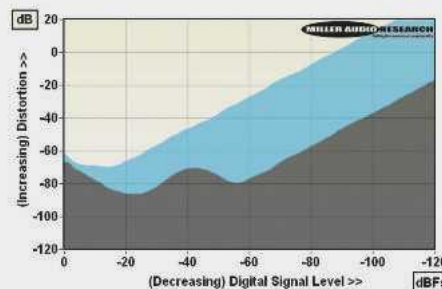
NAD D 3020

Dubbed a 'hybrid digital amplifier', in practice NAD's D 3020 behaves like a high quality single-ended analogue Class D amp (serving analogue inputs without conversion to digital) and serving S/PDIF and USB digital inputs via an intermediate 24-bit/192kHz DAC (jitter is 950psec re. 10W/8ohm). The D 3020 clips at full volume with digital signals above -9dBfs, so I'd not advise going beyond the illuminated '-20' on its fascia scale. Analogue inputs allow the volume to be used across its full range, but regardless of input source the D 3020 easily beats its 2x30W specification by delivering 2x60W/8ohm and a similar 2x65W/4ohm. Despite adopting a Class D architecture, there is significant headroom available under dynamic conditions to the tune of 140W, 215W and 130W into 4, 2 and 1ohm loads [see Graph 1, below]. So this diminutive box is considerably more capable, and load tolerant, than you might expect.

Via all inputs, distortion is tightly managed with a remarkably consistent 0.014-0.017% from 20Hz-20kHz (re. 10W/8ohm) and 0.006-0.027% over its rated 30W range. Like all quality Class D amps, its (analogue) response is unaffected by speaker load impedance, the 'gentle' treble reaching -0.7dB/20kHz and -8.7dB/100kHz from 8ohm down to 1ohm. Response via digital inputs mirrors this within the limits of the incoming sample rate. The A-wtd S/N is also fine at 89.1dB (analogue) and very good at 96.6dB (digital), both re. 0dBW. Readers are invited to download full QC Suite test reports for the analogue and digital performance of NAD's D 3020 'hybrid digital' amplifier by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Dynamic power versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (cyan) and 1ohm (green) speaker loads. Maximum current is 11.4A



ABOVE: THD vs digital signal level over a 120dB range (1kHz, black; 20kHz, blue; 0dB = 60W/8ohm)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	60W / 65W
Dynamic power (<1% THD, 8/4/2/1ohm)	76W / 140W / 215W / 130W
Output impedance (20Hz-20kHz)	0.073-0.079ohm
Frequency response (20Hz-100kHz)	-0.0dB to -8.7dB
Input sensitivity (for 0dBW/30W)	57mV / 313mV
A-wtd S/N ratio (re. 0dBW/30W)	89.1dB / 103.9dB
Distortion (20Hz-20kHz re. 10W/8ohm)	0.014-0.017%
Power consumption (Idle/Rated, o/p)	15W / 78W
Dimensions (WHD) / Weight	186x58x219mm / 1.38kg



ABOVE: Comprehensive digital input options include a MacBook optical jack; there are two analogue inputs – the second sharing the 3.5mm MacBook jack socket

drawl bordering on a drunken slur. The bottom registers of his voice are given real weight and authority. The D 3020 is one of those amplifiers that begs you to nudge the volume up a few more degrees with tracks like this, rewarding you with an ever bigger sound yet without adding any kind of harshness.

A BIG DELIVERY

The 2L recording of Haydn's String Quartet in D is a stunning 192kHz/24-bit recording with incredible depth and detail. The D 3020 delivers every bit of the energy of the work but it does fall a little shy of more costly DAC/amplifier combos in giving each instrument its own space in the soundstage. Its presentation is much more about delivering the music as a whole rather than analysing the individual components. Yet you do have to pinch yourself and remember this is a DAC, integrated amplifier, wireless networking device and headphone amplifier for less than the price of most audiophile DACs alone.

Using the Oppo Blu-ray as a high-quality disc transport to the NAD's optical connection reveals a very similar set of results. It loves to deliver the goods in a big and inherently musical way and the merest flirtation with Lorde's Grammy Award winning track 'Royals', from the CD *Pure Heroïn* [Universal], will have your feet tapping and head bobbing.

The little NAD manages to keep a tight rein on the recording's over-zealous bass production, delivering an infectious beat with great timing. The track's silences are suitably inky allowing Lorde's voice to expand into the room with real presence. The multi-track vocals, clearly benefiting from some form of spatial/Q-Sound processing, have

a wide, wide image that the D 3020 is happy to push right out into the room for a thoroughly entertaining and engaging listen.

If you haven't got London Grammar's CD *If You Wait* [Metal & Dust Recordings BEC5161711] irrevocably lodged in your CD player right now it is probably because you've got it on vinyl.

Played on the Parasond CD1 and fed into the analogue input of the D 3020, this infectious album of soulful pop and stunning female vocal was delivered with much the same rich sound and cohesive musicality that the NAD presents through its digital inputs. There was, however, a mild smoothing of detail and on the title track Hannah Reid's voice sounded a little set back in the mix – although it wasn't enough to flatten the soundstage.

The D 3020 might be pitched as the first 'proper' amp for new audiophiles but I can see plenty of us older audiophiles wanting a D 3020 for a second system sitting next to the PC. NAD's cute new little digital integrated can wear its '3020' moniker with pride. ☺

HI-FI NEWS VERDICT

The D 3020 is a do-it-all wonder at a remarkable price. Its energetic balance, backed with power that belies its 30W rating, and penchant for digital sources will find musical favour with all but the most critical of detail junkies. The features, headphone amp and comprehensive digital connectivity make it outstanding for value and the Hypex Class D amplifier modules make it a fine sounding performer too.

Sound Quality: 83%



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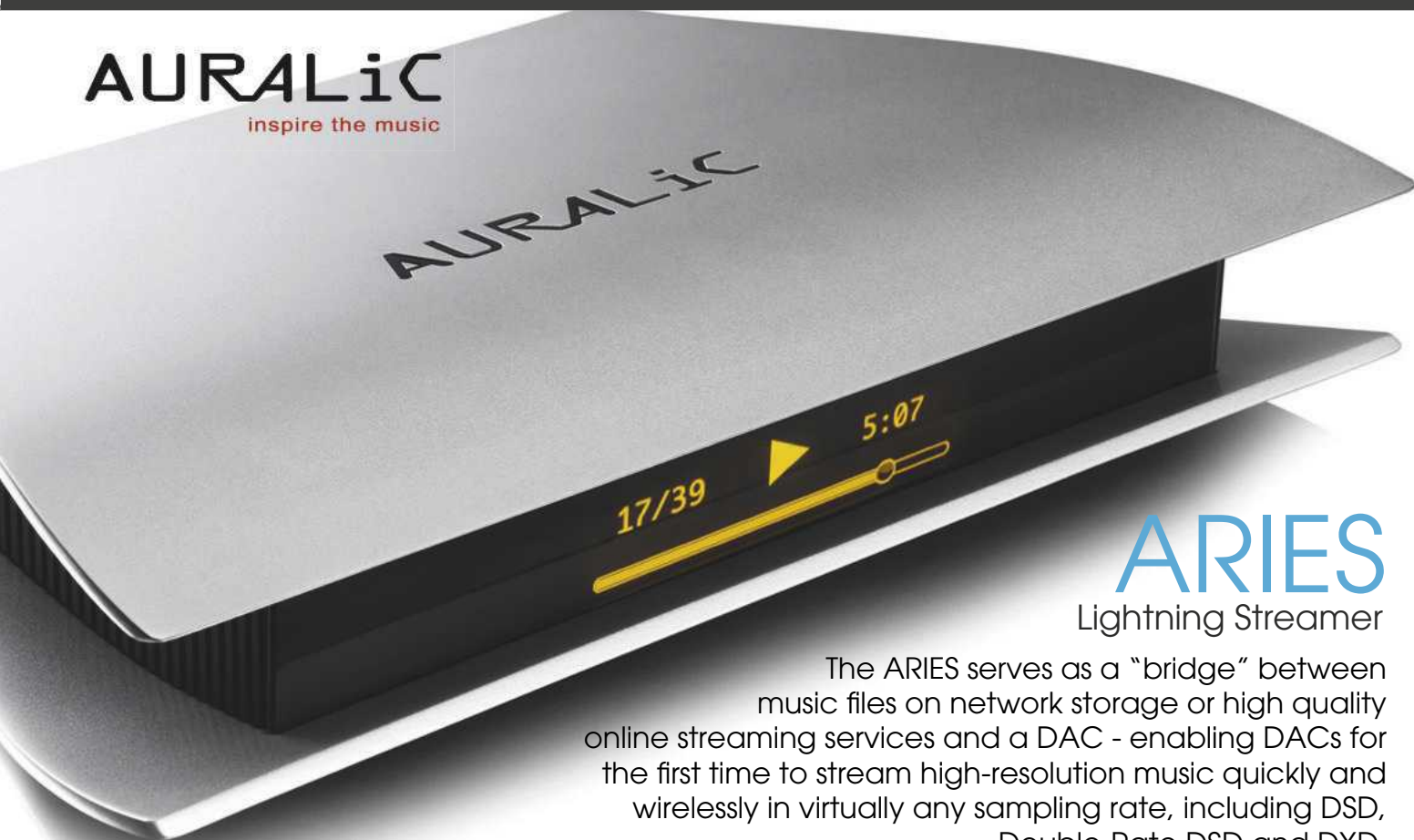
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BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

NEW SERIES

Andris Nelsons *A Rising Star*

The Latvian conductor takes over the Boston Symphony Orchestra this year, leaving the CBSO in 2015. **Christopher Breunig** discusses the ongoing discography and DVDs

Solti or Karajan might well have remained concert pianists, Maazel a violinist. More unusually, Andris Nelsons came to become a conductor after playing the trumpet (as did our own Elgar Howarth) – in the Latvian National Opera Orchestra. Born in Riga in 1978, he studied conducting in St Petersburg, later working with Mariss Jansons (they met when Nelsons played as a substitute trumpet during an Oslo Philharmonic orchestral tour), and at 25 Nelsons became music director of his old orchestra.

In 2006 he was in Germany at the Nordwestdeutsche Philharmonie before coming to this country, where, two years later, he was invited to take charge of the City of Birmingham Symphony Orchestra, as successor to Sakari Oramo.

When the CBSO was looking for its new conductor, and Nelsons was auditioned, a free Town Hall concert was programmed. At that

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← Andris Nelsons: one of a series of portraits by the photographer Marco Borggreve



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He leaves them next June with, he says, 'a certain element of sadness ... when we perform Mahler's Third Symphony in June 2015 it will mark the end of one of the happiest and most fulfilled chapters in my life'.

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Daniel Barenboim in the two Chopin piano concertos with the Berlin Staatskapelle [DG 477 9520 – a 2011 release]. More recently he's partnered the controversial pianist Hélène Grimaud in Brahms's B-flat Concerto with the VPO and the D-minor (live) with the Bavarian RSO [479 1058, two discs].

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PHOTO: ANDRISNELSONS.COM

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PHOTO: ANDRISNELSONS.COM

St Petersburg). In the *Largo* from the 'New World' on a BR Klassik CD he seems to tease the instrumental strands apart so the listener can appreciate every tonal detail – yet it doesn't appear at all mannered. It's certainly spacious, yet close to the 13m timing in the classic Kubelik/Berlin reading on DG.

A LOVE FOR THE MUSIC

'A delight to watch – like Carlos Kleiber', said one commentator. Very different of course. And there's none of Herbert von Karajan's internalised tensions, let alone the watchful rectitude of Sir Adrian Boult. Nelsons' face has an eagerness; he bends forward over the score, making huge circular gestures at times with both arms outstretched. Just watch him in Strauss' *Ein Heldenleben* with the Berlin Philharmonic! Or by contrast, tasked



PHOTO: ANDRISNELSONS.COM

with the onerous Mahler 3 finale in homage to the late Claudio Abbado, with palpable emotion as he tries to hold back any premature applause from the Lucerne audience [www.arte.tv; review by Fiona Maddocks at www.theguardian.com].

THE LENINGRAD SYMPHONY

Written partly in Leningrad itself – and started *before* the German invasion – Shostakovich's Seventh Symphony, dedicated to its people, elevated the composer to heroic status. It became a 1942 propaganda asset in the West, when the micro-filmed score was sent via Teheran and premiered here (Sir Henry Wood) and in the States (Toscanini – whose recording Shostakovich deplored), with the famous episode in the first movement seen as depicting Nazi forces *en route* to cut off the Soviet city. Or was that a *tour de force*

➔ On CD: taken from two live performances given at the end of 2011, Shostakovich's Symphony 7 with the CBSO

➔ Nelson's website has links to the Berliner Philharmoniker Concert Hall: he's seen here conducting Strauss's *Ein Heldenleben*



parody of Ravel's *Bolero*? Was the 'War Symphony' more a requiem for his people, suffering equally under Stalin, or 'Perhaps it is a mother's tears', as the composer later said?

The complexities surrounding this 70m+ graphic score – which became denigrated postwar (Ernest Newman placed it at 'seventy degrees of longitude and the last degree of platitude') – are elucidated in the excellent note by Andreas Wehrmeyer for the Orfeo CD edited from 2011 performances by CBSO/Nelsons [C852121A].

When I wrote my 'album choice' review [HFN Feb '13] there must somehow have been a gremlin in the works: I now hear no traces of the claimed 'slight congestion'.

Indeed, the Symphony Hall recording is perfectly clean as it encompasses the wide dynamic range deployed by Andris Nelsons.

The wonderful thing about this disc is that you are completely drawn into admiring the music itself by the sheer beauty of the playing: eg, solo flute in (i), his pastoral song later discoloured by bassoon; the excellent oboe in (ii) before Shostakovich introduces his rowdy dance passage; the lovely soft strings in the coda of (iii).

There are current CD alternatives with almost every Russian conductor you can think of, not to mention the three Bernstein recordings (one with rehearsals: WHRA 6048), but surely none more fulfilling than Nelsons'. ♪

ESSENTIAL RECORDINGS

Berg's Violin Concerto

Orfeo C778091A (CD)

Coupled with the Beethoven Concerto, this is played by Arabella Steinbacher, Nelsons conducting the WDR SO. You can see an alternative with Baiba Skride at the Berliner Philharmoniker Concert Hall. He also conducted the Lucerne Orchestra with Isabelle Faust, in the Apr '14 Abbado Memorial Concert: see www.arte.tv.

Dvorak's 'New World' Symphony

BR Klassik 900116 (CD)

A live performance with the Bavarian RSO from the Herkulesaal, Oct 2010, notable for the spacious calm of the *Largo*. There's an alternative filmed concert version with other music on C Major 713504 (Blu-ray).

And a 2010 CBSO Prom version can be seen on YouTube (complete but in five chunks).

Tchaikovsky's Francesca da Rimini

Orfeo C860111A (CD)

Nelsons with his CBSO: a meticulously detailed account of the doomladen 'Francesca' prefaces the Fourth Symphony in a reading of great individuality (in some respects like the Markevitch/LSO).

Britten's War Requiem

Arthaus Music 108070 (Blu-ray); 101659 (DVD)

Filmed live at Coventry Cathedral on 30th May 2012 – with Erin Wall, Mark Padmore, Hanno Muller-Brachmann and CBSO choruses and orchestra – this was a 50th anniversary performance. Nelsons brings the work to the Proms on 21st of August.

Vinyl Release

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

Muddy Waters *Hard Again*

When the king of Chicago blues returned to the studio in 1977 it was to be his finest hour. **Steve Sutherland** revisits the nine-track set, now to be had on 180g vinyl

Our story begins, strangely enough, with barbecued spaghetti. Chris Robinson, singer with The Black Crowes, is talking about life on the road and saying that one of the things he misses most about being back home down South in Atlanta is barbecued spaghetti.

Being Brits, of course, we say we've never heard of it. Chris is aghast and launches into an epicurean eulogy something along the lines of 'God's own food', etc. Anyway, one thing leads to another and we're invited to this blues festival being held on the banks of the Mississippi in Memphis where, Chris says, the crew will be grilling some pasta that we are welcome to try.

THE MUDDYWOOD

Sounds like a plan but first we head off to Las Cruces, New Mexico, to interview ZZ Top. Backstage, the Top chat away, the highlight of our conversation being the finer details of the business they run on the side, importing classic cars across the Tex-Mex border. We also get to hold

the Muddywood, a guitar that the Top's Billy Gibbons has had fashioned out of one of the cypress beams salvaged from the Stovall Plantation cabin in Clarksdale, Mississippi, where the late, great Muddy Waters was raised.

The guitar, Billy explains, is part homage, part spiritual connection and, once it goes up for auction, part fundraiser for the Delta Blues Museum they're setting up down thataways. The Muddywood is awesome. Anyway, we eventually rock up to the blues festival and sure enough, there's the spag which consists of part-boiled pasta lobbed onto the grill then smothered in Bar-B-Que sauce and smoked, shredded pork. Delicious washed down with a cold Corona.

The Crowes are dead excited about the fest because other artists playing include Leon Russell – Joe Cocker sidekick and key pianist of the legendary session squad, The Wrecking Crew (Phil Spector, The Byrds'

'Muddy found himself, at the age of 62, written off as an historic relic'

STEVE SUTHERLAND

Steve edited NME from 1992-2000, the Britpop years, launching NME.com and reviving the NME Awards. Previously he was Assistant Editor on Melody Maker. Among his many adventures he has been physically threatened by Axl Rose, hung out awhile with Jerry Garcia and had a drink or two with Keith Richards...



'Mr Tambourine Man' et al) – who, it turns out, looks a shadow of his former self and performs a wan, laid-back set.

Then there's Gregg Allman, flanked by a gang of Hell's Angels, who guests with The Black Crowes on a terrific version of The Allman Brothers' 'Dreams'. But the performer who aces them all is a bloke I've barely even heard of; a harmonica player called James Cotton.

Playing in a small marquee, admirably backed by an incongruous looking band of long-haired 1970s throwbacks who look like they've just walked off the

set of Cameron Crowe's *Almost Famous*, Cotton is not so much a man as a *force*.

He's massive, stage front dressed in cotton-pickin' dungarees, and when he blows we are instantly time-warped back to places he's been and we've only ever dreamed about – '50s sessions in Chicago's Chess studios with the magnificent Howlin' Wolf, solo stuff emanating from Sam Phillips' Memphis Sun Studios from where Elvis emerged, and stints swapping in and out with rival harpist Little Walter putting the soul into some of Muddy Waters' greatest recordings.

BLESSED AMAZING

Cotton's show is riveting and rooted in something so deep that, to our amazement, we find we are crying. And looking around, so are The Crowes.

One of the albums James Cotton adorned is the one we're here to talk about now, Muddy Waters' unbelievable *Hard Again*: a record that had no right whatsoever to be anywhere near good, let alone so blessed amazing.

The story goes something like this. In August of 1975, the famous Chess label was pretty much washed up as a going concern and was sold off to another label called All Platinum who intended to use it solely as a repository for reissues. One of



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➔ Muddy Waters at the Capital Radio Jazz Festival, Knebworth July 1981. He died in his sleep from heart failure on April the 30th 1983, at his home in Westmont, Illinois

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➔ Priced £17.99, the 180g vinyl release of Muddy Waters' *Hard Again* can be ordered online from www.rockbox.co.uk

the artists let go was Muddy Waters, once a giant of the roster, but now assumed to be redundant.

Waters – real name McKinley Morganfield – was considered one of the founding fathers of the blues, especially famous for electrifying the genre and upping its machismo via such joyously boastful classics as 'Hoochie Coochie Man', 'I Just Want To Make Love To You', 'Mannish Boy' and 'I'm Ready'. The primary influence on the British R&B boom which exploded out of the UK in the '60s, he was a revered figure but words of praise don't pay the bills and Muddy found himself, at the age of 62, written off as all but an historic relic.

Enter one Johnny Winter to the rescue. Johnny was a white blues man, born albino, who was largely instrumental in segueing blues into heavy rock in the 1970s until he discovered a liking for heroin and went off the rails. He fessed up, cleaned up, got back on track and by 1976, was helping his manager run a label called Blue Sky to



JEAN LUC COURLIN

➔ Waters onstage with James Cotton in June 1978, at Ontario Place in Toronto

MUDDY WATERS

HARD AGAIN



which he was thrilled to sign the homeless Muddy, one of his absolute heroes.

Johnny knew Muddy had been mistreated and it made him mad. His solution? Johnny got Muddy in a room with his longtime touring band, sat in on guitar and just let 'em wail together, live and kickin'. The band, of course, were incredible. Pinetop Perkins on piano, who'd been with Muddy on and off since 1968. Willie 'Big Eyes' Smith was on gutbucket drums, the best in the business, he'd been with Muddy 16 years. Bob Margolin, Muddy's regular guitar sidekick, was onboard as usual, with a top mate of Johnny's, Charles Calmese, on bass. James Cotton, the man himself, stomped and blew harp while Johnny riffed along.

GRANITE TOUGH

The session was a breeze. Three days and it was cut, Muddy soaking up the backing like Viagra, was strutting like a man half his age, a twinkle in his eye and a rocket in his pocket. Stand-out tracks were the revamped 'Mannish Boy', so granite tough that it even surpasses its esteemed original. Willie Dixon's 'I Want To be Loved' is pure testosterone and 'I Can't Be Satisfied' cocky downhome country blues at its slinkiest, Johnny's slide steel string the most playful ever committed to vinyl.

The session is punctuated with whoops and hollers as the players encourage

each other to even greater feats of showmanship and get caught up in the heady blast, surprising themselves that they've still got what it takes.

Hard Again won a Grammy, which was all well and good but what really tells it like it is was *NME* giving it an ecstatic review in the week it came out, in January 1977, at the very height of punk. That recognised what we recognise today: *Hard Again* wasn't just one of the greatest blues albums ever laid down, it was and still is one of the greatest albums ever made. No cool collection is complete without one. ☺

RE-RELEASE VERDICT

This Music On Vinyl reissue (not to be confused with the limited edition 180g release on Friday Music) comes in a 3mm card sleeve and, like all the company's 180g LPs, is pressed in the Netherlands.

While a little raw sounding – as was the original release – greater dynamics give the music a groovier feel while snappier bass and thunderously deep drums make for a high-octane, yet still emotional, experience. Not a full-on audiophile extravaganza then, but easy to recommend, nonetheless. HFN

Sound Quality: 79%

0 - - - - - - - - - 100



Beefheart *Trout Mask Replica*

Few albums divide opinion like this 28-track collection of clashing rhythms, discordant sounds and lyrical skits. Yet one's thing's for certain: Captain Beefheart's third studio album is a landmark in experimental music and was a breakthrough record for the band

Words: **Mike Barnes**

For many, *Trout Mask Replica* is the ultimate example of an LP that critics applaud, is frequently found in 'Best Of' lists, but which is rarely listened to. And even when played it's an album often approached with trepidation – at best 'a difficult listen', at worst an incomprehensible racket, worth persevering with only because it might help broaden one's musical knowledge.

Yet this 28-track double LP, the most avant-garde of rock albums, actually reached No 21 in the UK charts following its release in 1969, when interest in the new and the groundbreaking was unusually high.

SONIC PILE-UP

The music that makes up *Trout Mask Replica* is convulsive and angular, a sonic pile-up involving the freewheeling lines of country blues, the blurred abstractions of free jazz and the sheer drive of rock 'n' roll.

Lyrically it offers a panoramic view of America, both ancient and modern, and also of one set in a parallel universe peopled by hobos riding the rails, old sea dogs, weird women like Pachuco Cadaver, and references to popular mainstream culture – all seen from a surreal, neo-beat poet viewpoint.

It's a vital, hugely rewarding album, but to enter its peculiar world one must cross a hurdle at which many fall. Indeed, Don Van Vliet – aka Captain Beehearts – had wanted his music to shake people



ALASTAIR THOMPSON

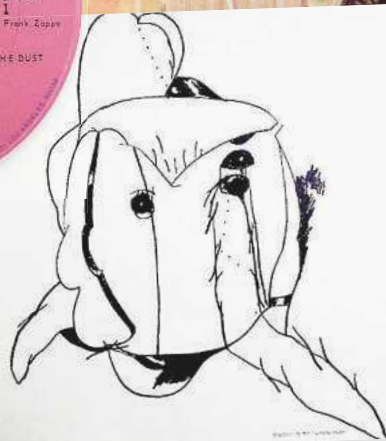


➔ Van Vliet, Cotton, Harkleroad, and Boston. The label from the original 1969 vinyl release is shown above

➔ Artwork by Van Vliet's cousin 'The Mascara Snake', from the lyric sheet that accompanied the US release of the original double LP

➔ Van Vliet performs in 1974 at the Convocation Hall, Toronto

➔ Zoot Horn Rollo on stage with The Magic Band at Leeds University in 1973



JEAN-LUC OURLIN

up, to be an 'irritant', to stray away from 'the mama heartbeat', which he felt was the lowest common denominator of rock 'n' roll.

Speaking to the BBC in 1993, *The Simpsons*' creator Matt Groening recalled buying the album in his mid teens: 'It was the worst dreck I had ever heard. I thought: "They're not even trying; they're just playing randomly". Then I played it again and thought, "It sounds horrible, but they mean it to sound this way". By the seventh or eighth time I thought it was the greatest album ever made and I still do.'

PSYCHEDELIC BLUES

There is a good reason why *Trout Mask* sounds so different from anything else. Don Van Vliet was the vocalist in the Magic Band, which since 1965 had purveyed a potent and exploratory form of psychedelic blues and had performed in some

of the big clubs in San Francisco and LA. But he couldn't really play an instrument other than the harmonica and was tired of being told that his more *outré* ideas wouldn't work. So he gradually assumed control of the band, drafting in young musicians before deciding, in a move of supreme

self-confidence, that he would teach them what to play.

To this end he bought a piano, which technically he couldn't play,

and began creating lines for the instruments, often in different keys and metres. Drummer John French notated these lines on manuscript paper then taught them to guitarists Zoot Horn Rollo (Bill Harkleroad) and Antennae Jimmy Semens (Jeff Cotton), and bass guitarist Rockette Morton (Mark Boston), arranging them into playable form.

French then tried to square the circle by coming up with suitable ➔

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PRODUCTION NOTES

'Veteran's Day Poppy' and 'Moonlight On Vermont' were recorded in August 1968 at Sunset Sound, Hollywood, with Frank Zappa producing and Gary Marker, from The Rising Sons, on bass prior to Boston's arrival. From then on, things became a little less conventional.

Zappa, who was bankrolling the recording, decided to record the band in their Woodland Hills house as an 'ethnic field recording', with a Uher two-track recorder which, according to engineer Dick Kunc, made 'spectacular recordings' either with its stereo mic, or four separate mics fed through Shure mixers. The only Uher recording that made it onto the album was of Van Vliet and his cousin Victor Hayden, aka The Masacara Snake, playing a cacophonous duet on saxophones, recorded in the garden, after which Van Vliet can be heard talking to two children who had come to check out the noise. This was later superimposed on the band performance of 'Hair Pie: Bake One'.

'The Blimp' finds Jeff Cotton reciting the poem down the phone – 'This is recorded through uh flies [sic] ear', he exclaims cartoonishly – to Zappa who captured it on tape. 'China Pig', with guitar from former band member Doug Moon, was recorded on cassette as were the *a cappella* songs, 'Orange Claw Hammer' and 'The Dust Blows Forward 'N The Dust Blows Back', with the pause button being audibly pressed down between lines.

Van Vliet then accused Zappa of being a cheapskate by recording it at home and so they decamped to the nearby Whitney Studios in Glendale in March 1969, where the formidably well-drilled band recorded their backing tracks in eight hours. Zappa kept a low profile, while Kunc wasn't really sure of the difference between a good and a bad take.

When Van Vliet added the vocals later. He refused to wear headphones, hearing only the studio leakage and the tinny sound of some headphones that had been deliberately left out. The correspondence of his voice with the music he had barely rehearsed and could barely hear still sounds astonishing. In total, recording and mixing at Whitney took four days.



← The band in 1977: (l-r) Eric Drew Feldman, Richard Redus, Bruce Fowler, Don Van Vliet, Robert Williams, Jeff Moris Tepper. The group's final studio album was *Ice Cream For Crow*, released in September 2012. It was the last Don Van Vliet recorded before abruptly retiring from music to devote himself to a career as a painter

drum parts to unify these elements. This gave rise to rapidly changing compositions made up of a series of short episodes. Van Vliet would also whistle lines from tunes he liked to the musicians and one can discern, for example, a figure from Rodrigo's 'Concerto De Aranjuez' from Miles Davis and Gil Evans' *Sketches Of Spain*, singing cowboy Gene Autry's 'El Rancho Grande', and even the childrens' song 'Mama's Little Baby Love's Shortnin' Bread'.

SOME KIND OF GENIUS

This approach to composition sounds like it should have produced chaos, but Van Vliet was possessed of some kind of genius. He left The Magic Band to get on with it, coming into rehearsals only to fine tune or, just as likely, disrupt proceedings. If there was a missing part he might run his hands over the piano, crash them down into a

ten-note chord and insist that they find a way of playing it. Or simply say, 'You guys know what to do'.

'I'd call him a control freak,' said Mark Boston later. 'We'd be in there working hot and heavy on trying to get these songs formulated in our minds, and he'd come in and just start a whole new song.'

'It was a challenge to keep up with him and it made him more in control to disrupt everything.'

'Frownland' is one of the most dramatic openings to any rock album. The guitars begin playing across each other and just as things seems likely to cohere, Van Vliet's

mighty bellow announces 'My smile is stuck/I cannot go back to your Frownland'. The bass then enters playing in a different

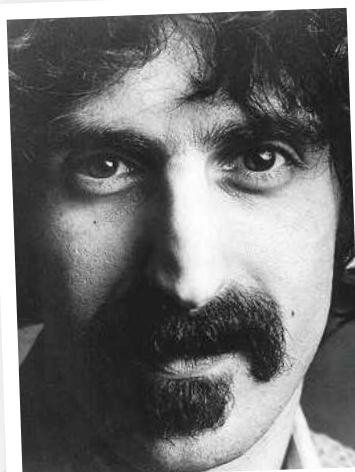
'At one point French was thrown down the stairs into the garden by Van Vliet'

time signature and suddenly everything careers off in a different direction with galloping drums and odd guitar hooks darting in and out of the tumult.

FURS AND FEATHERS

It's not all so extreme. Despite some thoroughly unpredictable instrumental sections, 'Ella Guru' actually has verses and choruses. The song is inspired by a woman the band knew who eccentrically dressed in furs and feathers. 'Now here she comes walking, lookin' like uh zoo,' Van Vliet observes.

The austere dual guitar instrumental that is 'Dali's Car' is clearly derived from a rudimentary piano player's technique of working over one particular patch of the



← Trout Mask producer Frank Zappa was Van Vliet's friend and former school buddy, but Vliet became suspicious that Zappa was trying to record the LP on the cheap. There would later be tension between the pair as Vliet became upset by the name of Zappa's record label

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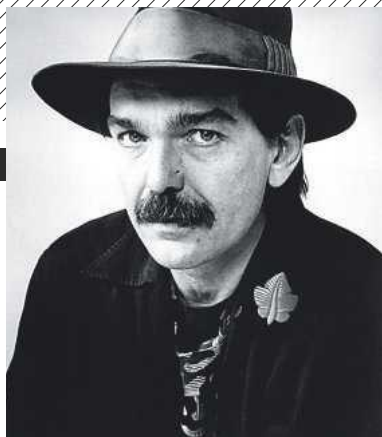
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Alternate Format Discography



➔ Vliet in a Virgin press shot. He died in December 2010

keyboard, but sounds like nothing one would hear in a guitarist's typical repertoire. Similarly, Van Vliet's technique-free sax playing is effective in bolstering the ominous environmental warnings of 'Ant Man Bee'. And of the three *a cappella* songs on the album, 'Well' sounds like a field-holler or work song, but startles with its nocturnal images.

There was little privacy during the recording, with Van Vliet sleeping in a bedroom with his girlfriend and the rest of the group in another bedroom and lounge. Fist fights broke out and Jeff Cotton had some ribs broken by roadie Jeff Burchell and was taken to hospital. French was thrown down the stairs into the garden by Van Vliet and on one occasion escaped, but returned. Boston also quit, but only got as far as the local market before he was apprehended by the group and persuaded to come back.

CAUGHT STEALING

If all that wasn't bad enough the band lived in grinding poverty, existing on welfare and food stamps. French recalls that for a period his daily diet was a cup of soya beans. The situation got so desperate that the conspicuously attired group went down to the local Safeway and were caught shoplifting, their trousers stuffed with cheese and bologna. It was Frank Zappa who put up their bail money.

Group members have variously described the conditions in which they lived as nightmarish and like being part of a cult, but thankfully they stuck to their Herculean task.

'I think we all sensed that there was something going on that had never been done before and was artistically sound,' said French.

'Sometimes I really wanted to be somewhere else, but that's what motivated me to stay.' ☺



ORIGINAL LP

Trout Mask Replica was released in April 1969 in the US [Straight STS 1053] where it failed to chart, and November 1969 in the UK, where it charted at number 21 in January 1970. Captain Beefheart & His Magic Band were a high profile group, but even in those heady days it's unlikely that anyone other than Don Van Vliet's friend, Frank Zappa, would have taken a risk on such an experimental album. But problems soon arose, kickstarting what would become a very public rivalry. Van Vliet was, to put it mildly, sensitive to nuance and soon became upset by the name of the record label.

In fact, Zappa had two labels, Straight and Bizarre, which he ran with his and Van Vliet's manager, Herb Cohen. Both names were tongue in cheek, with 'straight' meaning a conformist character in the hip vernacular of the time.

The original *Trout Mask Replica* came out on Straight in a gatefold sleeve with an insert featuring lyrics, a poem and drawings by Victor Hayden, aka The Mascara Snake. The exact chronology is unclear, but in early 1970 some copies were released on Bizarre [Bizarre/Reprise 2MS 2027]. Around this time Zappa gathered together the Straight/Bizarre roster on a compilation album, *Zappéd* [Bizarre/Reprise PRO 368]. Two songs from *Trout Mask Replica* were featured, 'The Blimp' and 'Old Fart At Play'.

In 1969, 'weird' and 'freaky' meant that you were different from the 'straights'. But Van Vliet started to feel uncomfortable in the company of acts like groupie band the GTOs – with their sub-Bananarama vocal skills – and worse than that, Wild Man Fischer, an artist working in the Outsider genre who clearly had mental health issues. 'It was treated as some kind of freak show by Zappa

and Cohen,' said Van Vliet, looking back on *Trout Mask* in *Sounds* in 1972. 'All that Straight/Bizarre... Bizarre, what the f**k, man?'

FIRST CD RELEASE

After the Bizarre/Reprise issue that caused all the fuss, the album saw its first release on CD in 1989 – on Reprise [Reprise 2027-2]. In the US this was available in long-box form. Although reissued in different territories a number of times over the years, there have been no special anniversary editions of the original or extra tracks and no outtakes are known to exist.

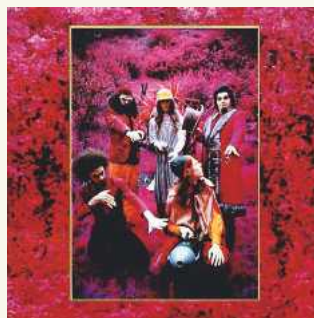


ASSOCIATED RARITIES

The real scoop in terms of *Trout Mask*-related rarities was on *Grow Fins: Rarities (1965-1982)*, a five-CD box set with a 112-page book released on John Fahey's Revenant Records in 1999 [Revenant 210].

It was released simultaneously on three separate double vinyl albums on the Xeric/Table Of The Elements label with a poster and a 24-page libretto in each set. (Vols I-III are XER-LP98 to XER-LP96, the catalogue numbers being in descending order, confusingly.)

The main point of interest is a disc of Dick Kunc's two-track recordings of backing tracks made with the Uher tape recorder in the group's house, which were ultimately abandoned for recordings made in Whitney Studios. The excitement in these



cuts is tangible and they have more energy than those on the official album release, with John French characteristically cueing in his band mates with a single shout of 'And'. As Van Vliet never added his vocals to these versions it's possible to experience the full intricacies of the group's amazing interplay without his huge voice, which was mixed high on the album.

An enhanced CD has content from a video of 'She's Too Much For My Mirror' and 'My Human Gets Me Blues' from the Amougies Festival, Belgium, in 1969. It features the *Trout Mask* line-up including Victor Hayden, but without Jeff Cotton who, by this time, had had enough and John French, who had also left, albeit temporarily. Roadie Jeff Burchell manages to muddle through quite effectively on drums.

Additional content includes a 1971 TV studio performance from the Detroit TV show *Tubeworks* featuring one *Trout Mask* song, 'When Big Joan Sets Up'. Of further interest is a single, 'Pachuco Cadaver' [pictured below], released in March 1970 [Straight 2C 006-91200], but only available in France. Super-rare, copies now fetch hundreds of pounds.



RECENT REISSUES & REMASTERS

In 2009, the album was reissued on red vinyl as a limited edition LP by Rhino Records [2MS 2027] with replica Straight labels. The most significant CD reissue is the most recent, from 2013, which appeared on Zappa Records [ZR 20014]. The master tapes stored in the Warner Brothers archive were found to have suffered from oxide loss, but luckily Zappa had had the foresight to get Dick Kunc to run off some safety masters – bar two songs – which were found in the Zappa vaults and are in excellent condition. A vinyl version is said to be awaiting release.

Shoreline Amphitheatre, CA

Purpose built to host major rock acts from around the globe, this outdoor venue has now become home to many music festivals – some far more successful than others. **Steve Sutherland** brings you the story of the Shoreline Amphitheatre in California

The chap sitting in front of us is David. And that's his friend, Glenn. I know this because they introduced themselves when you went to get the beers. They were intrigued by our accents. Thought we were Australian. I put 'em right on that point. David and Glenn are junior partners in a law firm, working out of Palo Alto. Pretty smart guys. And right now they're gently stoned late-1980's Deadheads, sharing a spliff and goofily grooving along to the Grateful Dead's late afternoon, first set, the one that customarily features some acoustic stuff from *American Beauty* and *Workingman's Dead* – the lull before the psychedelic storm.

BEAR NECESSITIES

Fast forward an hour. It's starting to get dark now and in a few moments the Dead will return to the stage to do their cosmic electric thing. And look at David? What's he doing? He's rooting around in a carrier bag under his chair, pulling out something, like, big, brown and hairy. What's he doing now? He's putting it on. It's a bear suit, head and all! And now he's rooting around in another bag and pulling out some Christmas tree lights which he's wrapping himself up in and – wowsah! – he's connecting them to a car battery he's just pulled out of the bag.

➔ View of the Shoreline Amphitheatre from ground level. Located in Mountain View, California, it was built between 1985 and 1986 and has a capacity of 22,500. Inset picture shows main entrance and ticket booths



The Dead stroll on stage. Bear David goes nuts! Howling! Growling! Whooping! The loony's on fire! Welcome to Shoreline.

Shoreline was conceived and built in the Bay Area, an hour outside San Francisco if the traffic's not too snarled, between 1985 and '86 in a deal between the local council and Bill Graham, the infamous pioneer rock promoter who ran the Fillmore Ballrooms West and East in the late '60s, briefly managed Jefferson Airplane, and was tragically killed in a helicopter crash on the way back from a Huey Lewis show in 1991.

Purpose built outdoors to serve the rocking community, Shoreline was constructed on a tier basis, seating down front for 6500 with a further 16,000 accommodated on the lawn area further back, the gig experience hosted festival-style. And from the air, it was shaped like the Grateful Dead's Steal Your Face logo, just for good vibes I guess.

The Dead were booked as the opening act in July 1986 but Jerry Garcia went and slipped into an eight day drug-induced diabetic

⬅ Aerial view of the venue shows how it was constructed to mirror the Grateful Dead's Steal Your Face logo (left)



coma so the first time the band graced the stage was on the 2nd of October 1987, the first of 39 shows the Dead performed there. I was lucky enough to see two of the shows, hence the Bear David recollection. Then Jerry checked out for good in August 1995 and a very good thing came to a sad end.

TOURING FESTIVALS

The Dead apart, Shoreline soon found its niche as the home of many of the new-fangled touring festivals that were starting to spring up in the States. The first was The Gathering Of The Tribes, a benefit staged to raise money and awareness for Native American causes dreamed up by Bill Graham in cahoots with, of all people, The Cult's Ian 'Wolf Child' Astbury.

Staged over two days between Shoreline and the Pacific Amphitheater in Costa Mesa in

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Staged over two days between Shoreline and the Pacific Amphitheatre in Costa Mesa in





October 1990, The Gathering boasted a catholic line-up of Soundgarden, Ice-T, The Charlatans, The Mission and The Cramps.

The event didn't make that much, but Perry Farrell of Jane's Addiction was impressed enough by the ethos to use the template in creating his Lollapalooza, a touring Festival of independently-minded artists which was conceived as a farewell tour for his own band as well as a counter-cultural franchise.

BAND EXTRAVAGANZA

The first Lolla rolled out around the USA in 1991, two July dates at Shoreline featuring Jane's Addiction, Siouxsie & The Banshees, Nine Inch Nails, Ice-T, Living Colour and the Jim Rose Circus which involved lots of tattooed and pierced weirdos doing nasty things with weights.

Two more Lolla dates arrived the next year featuring Red Hot Chili Peppers, Ministry, Ice Cube, Soundgarden and The Jesus & Mary Chain, and in '93 Rage Against The Machine, Tool and Alice In Chains brought Lolla to town.

Nineteen-ninety-four boasted Smashing Pumpkins, Beastie Boys, The Breeders and George Clinton with his P Funk All Stars, and the following year Sonic Youth, Hole and Cypress Hill came by. Lolla, though, was losing its way. The crowds simply weren't turning out for these multi-band extravaganzas the way they used to so '96 was a hiatus year and, even though '97 changed tack and brought the UK dance revolution to Shoreline in the shape of Orbital, Prodigy and The Orb, the game was pretty much up.

Poster for the 1997 Lilith Fair and organiser Canadian singer Sarah McLachlan

The Dead on stage in 1994 – they performed 39 shows at the Shoreline

In 1991 Jane's Addiction played two dates as part of their farewell tour

Ian 'Wolf Child' Astbury of The Cult



Farrell reformed Jane's Addiction to headline the 2003 jaunt, which included one Shoreline show also featuring Audioslave, Queens Of The Stone Age and Incubus, but 2004's Lolla didn't make it out of the traps. Ticket sales were so poor for the 30-date tour featuring Morrissey, PJ Harvey, Sonic Youth, The Killers and Flaming Lips that the whole thing was pulled, including the Shoreline date. Since then Lollapalooza has had to satisfy itself with a weekend every year at Chicago's Grant Park.

BRIDGE SCHOOL

Another touring Festival which dropped by Shoreline was Lilith Fair, the all-female, empowerment gig created by Canadian singer Sarah McLachlan. Lilith – colloquially known as Girlapalooza

or, rather disparagingly, as Breastfest – swung by Shoreline in July 1997 starring McLaughlin and Suzanne Vega, but again ticket sales weren't up to expectation and the Fair petered out.

The Anger Management Tour was another high profile visitor to Shoreline, arriving in August 2002 with Eminem



and Papa Roach on board, while Moby held his own mini-festival called Area 1 in July 2001 featuring himself, Outkast and New Order.

He returned the following year with Area 2 and David Bowie on board. Motley Crüe brought their Crüe Fest in 2008 and 2009 but the most enduring and heartening of the big shows to regularly rock

at Shoreline are surely the Bridge School Benefits arranged and hosted annually every October by San Fran local Neil Young and his wife Pegi.

Two of Neil Young's children had been born with life-long severe physical impairments and complex communication needs and the Bridge School was set up to help just such children cope in the world around them. From 1986 until the present day (with the exception of 1987) the Youngs have commandeered Shoreline over an Autumn weekend to raise funds

'Tattooed and pierced weirdos did nasty things with weights'

CLASSIC VENUES

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW



RADIOEDIT



JOE SEER/SHUTTERSTOCK.COM

for the school. The first gig featured Young with his old sparring partners Crosby, Stills & Nash, plus Tom Petty, Bruce Springsteen and king of comedy Robin Williams. The opening year set the tone and Young has appeared every year thereafter, often jamming with some of his other illustrious guests.

In 1988, CS&N and Petty were back, joined by old pal Bob Dylan, the Dead's Bob Weir and Garbage. Other highlights over the decades include a long-awaited Simon & Garfunkel reunion (1993), David Bowie ('96), Metallica ('93 and 2007) and REM ('98).

Twenty-ten saw an unlikely reformation of Neil's first legendary Los Angelean tour-de-force Buffalo Springfield

alongside T Bone Burnett's Speaking Clock Review (that's Elton John, Leon Russell, Elvis Costello, Bluegrass legend Ralph Stanley, Neko Case

and *Big Lebowski* actor Jeff Bridges in case you were wondering).

Canadian band Arcade Fire joined a bill with cool throwback crooner Tony Bennett in 2011 and Axel Rose's weird and occasionally wonderful new Guns N' Roses played in 2012 alongside Neil's new recording buddy Jack White.

I've been lucky enough to attend two Bridge School shows. The first was in 1994 when Tom Petty showed up again. I recall industrial

monsters Ministry stripped it all down and did a wonderful version of the Dead's 'Friend Of The Devil', and Neil was hanging out with Pearl Jam at the time, the band having just inducted him as the Godfather Of Grunge by doing the Mirrorball album with him.

NERVOUS BUT ACE

My second show was in 2002, when I remember the awesome James Taylor delivered a tear-jerking 'Sweet Baby James'. Ryan Adams was nervous but ace, Thom Yorke played one of his first solo shows without Radiohead (he did a spine-tingling version of Young's 'After The Goldrush' on an old stand-up tack piano), Jack Black's Tenacious D freaked

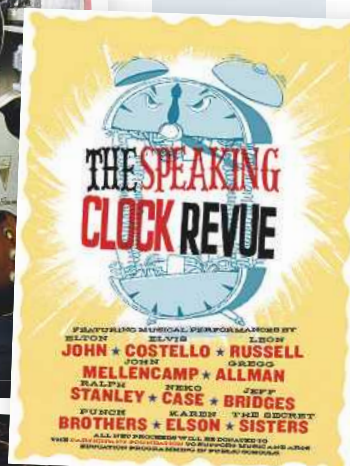
everyone out by covering pretty much the whole second side of The Beatles' *Abbey Road*, and something happened which

I never thought possible – the remaining members of the Grateful Dead performed as The Other Ones, did a set of songs that history will tell you were the deceased Jerry Garcia through-and-through and they were absolutely brilliant.

You'd be hard-pushed to think of any continual musical force more philanthropic than the Bridge School Benefits. Superstar acts donate their services for free and often indulge in sets they

would rarely, if ever, otherwise play, while the audience gets to enjoy the experience in an environment specifically created for them rather than some venue converted as best it can be from an old cinema or such or stuck out in the middle of a muddy field somewhere.

And that's Shoreline for you – a unique venue tailor-made for the magic of rock 'n' roll. ☺



MOSES NAMKING

← Thom Yorke played one of his earliest solo shows at the venue, in 2002

← Poster for the 1999 Bridge School Benefit. It takes place every year, in October

← Neil and Pegi Young who set up The Bridge School event in 1986

← T Bone Burnett and a poster for The Speaking Clock Revue

↓ Jack Black of Tenacious D

'Jack Black freaked everyone out by covering The Beatles'

"...we've found we can really rely on them."
- Craig Potter



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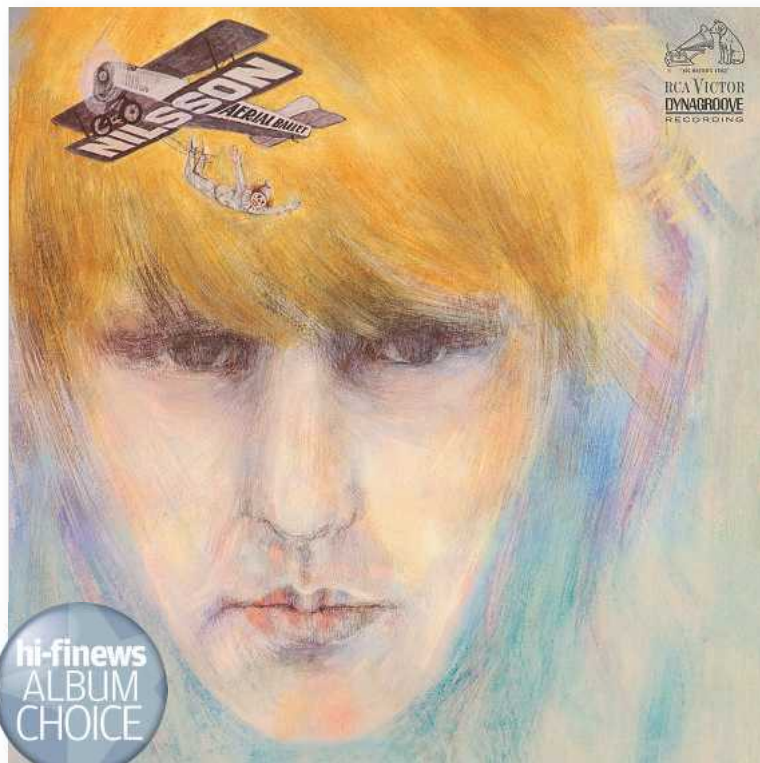
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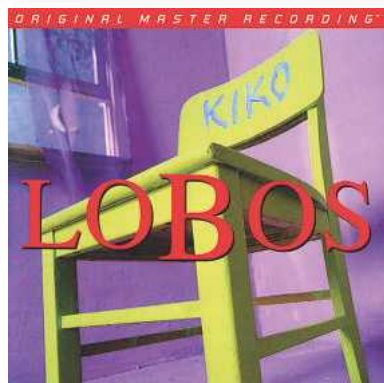
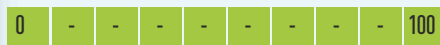
NILSSON

Aerial Ballet

Sundazed LP4568 180g vinyl mono

A rare, 'late mono' LP issued in 1968, Nilsson's second solo (or third, depending on what you think of his earliest, 'primordial' releases) was a masterpiece praised by no less than The Beatles. It contained the sublime, Grammy-winning take of Fred Neil's 'Everybody's Talkin'', immortalised in *Midnight Cowboy*, as well as the achingly tragic 'One'. Nilsson was never easy to describe, let alone shoehorn into a genre – among his achievements was producing one of the first LPs of standards by someone from the rock world. This set ranges from the whimsical to the intense, ever rich with charm and invention, if now sounding twee in places. There's also a covetable edition of 1967's *Pandemonium Shadow Show*. **KK**

Sound Quality: 91%



LOS LOBOS

Kiko

Mobile Fidelity MFSL 1-371 (180g vinyl)

Having redefined what constituted a band with So-Cal/Mexican origins, Los Lobos both created a sub-genre of Latino rock decades on from Ritchie Valens and played a crucial role in the development of the world music/roots music with 1984's, *How Will The Wolf Survive?*. Eight years later, and *Kiko* kicked it up a few notches. It was co-produced by Mitchell Froom, and it won for him a 'Producer of the Year' Grammy. Although experimental when contrasted to their more obviously ethnic works, it's still identifiable as Los Lobos: guitar-driven but harder, cleaner, more aggressive. A milestone in their canon, it's even been issued in a live, song-by-song version. **KK**

Sound Quality: 90%



PAUL RODGERS

The Royal Sessions

429 Records FTM17976 (200g vinyl plus free digital download)

This hasn't set the world alight, perhaps because we expect more of Rodgers – one of the greatest hard-rock voices ever. Or perhaps it's because albums of covers of a singer's personal faves (a genre including Rod Stewart's lame, interminable series of the Great American Songbook) can seem self-indulgent? That consideration aside, Rodgers' interpretations of 1960s soul/R&B classics like Sam & Dave's 'I Thank You' and Albert King's 'Born Under A Bad Sign' suit his voice, exhibit sincerity and – having been recorded in Memphis with veteran musicians – authenticity. Not essential, but a must-have if you rate the Free/Bad Co/Queen vocalist as highly as he deserves. **KK**

Sound Quality: 86%



SANTANA

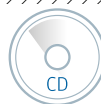
Santana III

Mobile Fidelity MOFI 1-039

How tough must it have been following a stellar debut and the even more searing sequel, *Abraxas*? 1971's *Santana* (called *Santana III* to prevent confusion with the eponymous first LP) oozed confidence, and heralded a future guitar hero in Neal Schon, then only 17. The resultant LP reached No 1 in the *Billboard* charts, continuing in the vein of its predecessors by blending genres, from rock to jazz to Hispanic. Strong dependence on percussion further reinforced the drums as defining the band's sound as much as do the guitars. The group would turn jazzier after this set, which was also the last to feature the bulk of the band that performed at Woodstock. **KK**

Sound Quality: 91%





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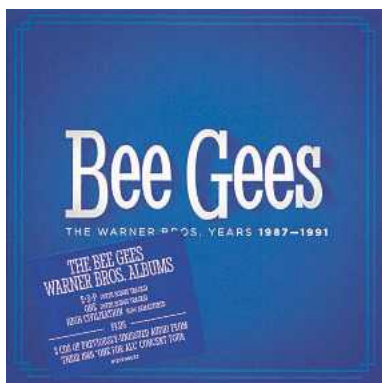
BLU-RAY



VINYL



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BEE GEES

The Warner Bros. Years 1987-1991

Rhino 8122796037 (five discs)

As rich and long as was the Bee Gees' career, this is a complete representation of the less-adored post-disco period. It is not as spectacular as the 1960s pop, nor the music that preceded or accompanied *Saturday Night Fever*; but neither is it mere filler. This classy box contains all three studio albums, *E-S-P* and *One* with rare demos and outtakes, a remastered *High Civilization* and a 2CD set of live concert material from 1989 recorded at the National Tennis Centre, in Melbourne, Australia, called '*One For All*' and released for the first time in its entirety. Whatever you may think of this period, it did give us the utterly magnificent 'You Win Again'. **KK**

Sound Quality: 88%



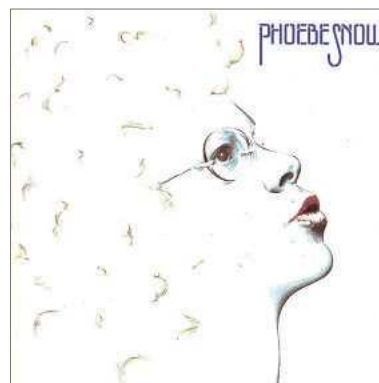
FRANK SINATRA

Point Of No Return

Mobile Fidelity UDSACD2112 (stereo SACD)

Sinatra could have completed his obligations to Capitol Records with a so-so quickie. Instead, he delivered a stunning quickie, working with arranger/conductor Axel Stordahl, who had performed the same duties in the 1940s and at Sinatra's first Capitol session in 1953. They created this gem in two days in '61. Despite sitting on better material for his own label, Reprise, Sinatra's Capitol farewell included 'September Song', 'There Will Never Be Another You', 'These Foolish Things' and 'As Time Goes By'. It is smart, sophisticated, gorgeous and polished. And if this is what he could issue in a hurry, it goes to prove he was the true master of his craft. **KK**

Sound Quality: 90%



PHOEBE SNOW

Phoebe Snow

Analogue Productions CAPP2109SA (stereo SACD)

Reviewed last November as a 2x45rpm LP set, this is so of its era that a digital version will sound cooler and less intimate than that vinyl statement. Do not, however, feel that you must 'go without' – play this over a worthy SACD-based system and you will still enjoy the full measure of an ear-opening debut from 1974. The late Snow was eclectic, literate and expressive, so it is only fitting that it was part of the first wave of the singer-songwriter phenomenon. Though less familiar than Carole King, she'll appeal to her followers, as well as those who appreciate the more cerebral Joni Mitchell. The SACD offers a touch more detail, if at the expense of warmth. **KK**

Sound Quality: 90%



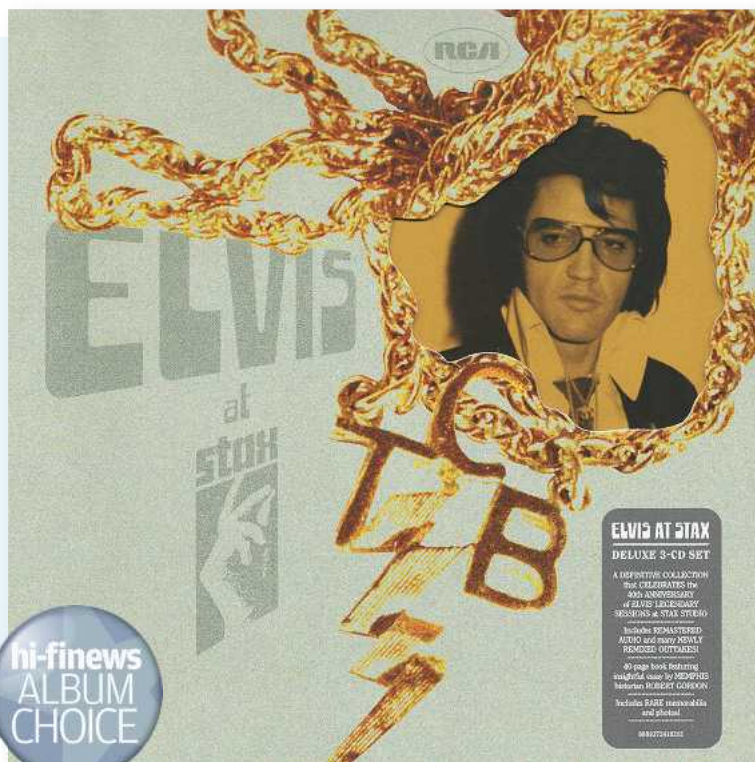
ELVIS PRESLEY

Elvis At Stax

RCA/Sony Legacy 88883724182 (three discs)

No, not a lost 'Elvis Does Soul' package: while he certainly admired the musicians of Stax, pundits suggest he chose the studio as much for its proximity to his home. A study of an almost-forgotten detour in his career, the sub-titles are self-explanatory: CD1 contains 'The R&B and Country Sessions' plus outtakes, CD2 'The Pop Sessions', outtakes and 'The July 1973 Masters', and CD3 'The December 1973 Masters', explained in Robert Gordon's liner notes. Originally issued on 45s and LPs, *Raised On Rock* (1973), *Good Times* (1974) and *Promised Land* (1975) with its eponymous hit, this set reveals one thing: Colonel Parker and RCA were foolish for not releasing it cohesively 40 years ago. Aah, what might have been. **KK**

Sound Quality: 91%



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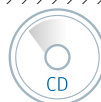
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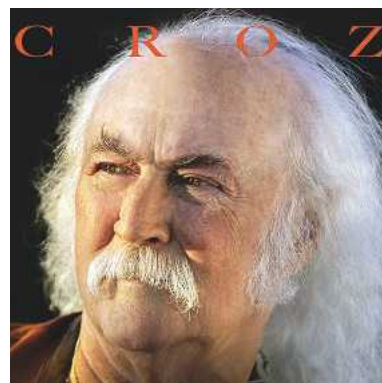
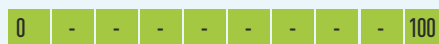
Symphonies 4, 'Inextinguishable', and 5; Royal Stockholm PO/Sakari Oramo (96kHz/24-bit; FLAC)

www.ecclassical.com; BIS-2028

David Fanning sets out composer and public responses to these two complex and interrelated works from 1916/22 in a fine booklet note. These are symphonies I've struggled with over the years, in recordings by Jascha Horenstein, Neeme Järvi, Colin Davis, Leonard Bernstein, *et al*, and at last a superb new coupling where the conductor and his Stockholm orchestra hand me a key, opening the door *at last*... This is because the sound is so beautiful, the strings

often heard *ppp*, and clarinetist Hermann Stefánsson well deserving his booklet credit for his playing in No.5, yet Oramo still captures the rawness, the abruptness of the symphonic argument. It was all spaciouly recorded in the orchestra's concert hall, and produced by Jens Braun (his name cropping up frequently now – *eg*, recent Hyperion releases). Outstanding! **CB**

Sound Quality: 95%



DAVID CROSBY

Croz (192kHz & 96kHz/24-bit; FLAC)

www.hiresaudio.com; Warner Music Group

His first monikered material for two decades is 'solo' though created over several years with adopted-out son James Raymond and accentuated by guests – a Mark Knopfler solo for opener 'What's Broken', Chet Baker soft trumpet solo from Wynton Marsalis on 'Holding On To Nothing', and underpinned almost throughout by fine beat-skipping rhythms from Steve DiStanislao. Unlike his 1993 album *A Thousand Roads*, however, those visiting don't overstay their welcome – this is Crosby to its core, traditionally presented and thoughtfully constructed on a span from jazzy folk to quite dark rock, and slathered in those signature stacked vocals, staking a claim to the West Coast soft-rock sound of Eagles and Toto in his choruses on 'Dangerous Night', and layering harmonies over a four-bar bridge of 'What's Broken' like some manually-made Mellotron. A delight. **JF**

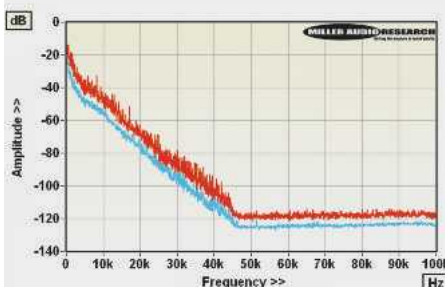
Sound Quality: 85%



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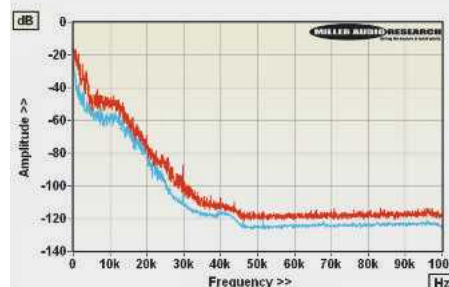
Following our Investigation feature [*HFN*, Jun '11] where we examined the claimed quality of high-resolution downloads, *Hi-Fi News & Record Review* is now measuring the true sample rate and bit-depth of the HD music downloads reviewed on these pages. These unique reviews will be a regular source of information for those seeking new and re-mastered recordings offered at high sample rates and with the promise of delivering the very best sound quality. (Note: asterisk in headings denotes technical reservation explained below.) **PM**

LAB REPORT

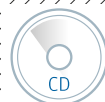


Our analysis of this genuine 24-bit/96kHz file [Graph; No. 5, *Tempo giusto – Adagio*] reveals much of the ultrasonic energy as orchestral percussion right out to the ~45kHz cut-off. A 192kHz recording would have captured even more! **PM**

LAB REPORT



Though close-miked, compression is held in check by Croz's engineers resisting the temptation to hit the 0dBfs limit, most peaks ending at a sensible -6dBfs to -3dBfs. Some low-level tones are present at 30kHz/40kHz on this 96kHz file. **PM**



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CHOPIN

Piano Concertos 1 and 2; Ingrid Fliter, SCO/Jun Märkl (192kHz/24-bit; FLAC/ALAC)

www.linnrecords.com; Linn Records CKD 455

Silver medallist in the 2000 Warsaw Chopin Competition, Argentinian pianist Ingrid Fliter has made two Chopin CDs for EMI and on Vai Audio there's an earlier live recital. This is her first recording for Linn where she's partnered by Munich born Jun Märkl, who skilfully animates Chopin's not always persuasive orchestral scoring – those slow-movement cantabiles for bassoon! The piano is boldly upfront, as the mic placements seen in the Usher Hall session photos (in the booklet PDF) would imply. Fliter's interpretations can easily withstand the scrutiny: her runs are a joy to hear; and I don't know a more expressive recorded account of the *Larghetto* from Concerto No 2 (the better of the two works but in fact completed a year earlier). 'In the great tradition, rich-toned and generous...' said the *Guardian* review; a fine coupling. *CB*

Sound Quality: 85%



MELPHI

Through The Looking Glass (96kHz/24-bit; FLAC)

www.hiresaudio.com; SnipRecords

Melphi is a Dutch quartet, formed by pianist Rogier Telderman in 2010 and curiously named after the psychiatrist in *The Sopranos*. *Through The Looking Glass* is the band's debut outing, comprising mostly Telderman compositions, with lyrics by the group's singer Lotte van Drunen. Bassist Jurriaan Dekker and drummer Willem van der Krabben complete the combo, their virtuosity shining through the set's collection of enchanting tracks. It's a nice recording too, the electric bass underpinning the combo's moody, melodic, jazz-inspired songs to great effect. It's not a purist production – each musician was in a separate studio booth rather than performing in 'natural' space but they were still playing together. Lotte van Drunen's voice is fabulously emotive, ranging from sensually smooth to downright rockin'. *JB*

Sound Quality: 80%



HELGE LIEN TRIO

Badgers And Other Beings (192kHz/24-bit; FLAC)*

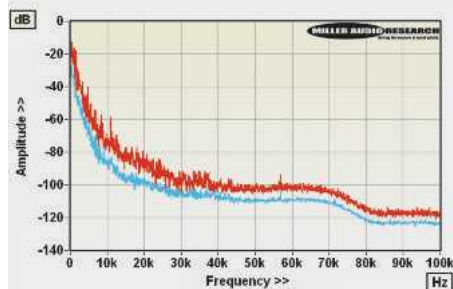
www.hiresaudio.com; Ozella OZ 055 CD

This fourth album on the German label introduces a new drummer to the jazz trio: Per Oddvar Johansen, who replaces Knut Aalefjær after 13 years with classically-trained (Norwegian Music Academy) pianist Helge Lien and bassist Frode Berg. Recorded at RainbStudio in Oslo, the ten tracks are all by Lien – whose cited influences are Bill Evans, Keith Jarrett and Brad Mehldau. Some of them I find a bit rambling, then suddenly it all makes sense. The last track, 'Badger's Lullaby', is the most enjoyable with a final slowing into silence. It also allows Johansen's percussion a few moments spread across the whole soundstage, whereas he's mostly confined to the rear left. There's a lot of post-production work here as part of the sonic concept, so although the 192kHz resolution allows vivid tonal representation, perspectives are constantly in flux. *CB*

Sound Quality: 75%

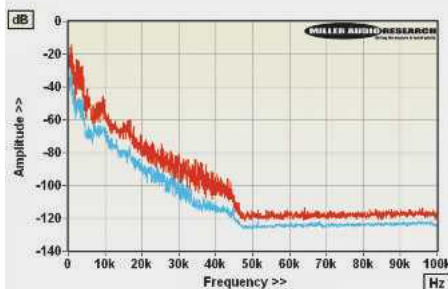


LAB REPORT



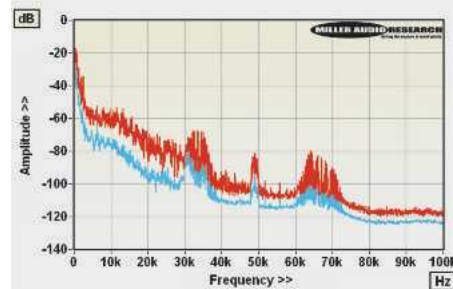
Downloaded from Linn's Studio Master store, this 192kHz rendering is just what it says on the tin. Of course, the natural bandwidth of the piano means that most of the musical energy resides in the first 10kHz of its ~80kHz bandwidth. *PM*

LAB REPORT



This native 96kHz recording shows a very extended ultrasonic output even through the simplest piano and vocal sections, these peaks more likely a product of downstream electronics (amps, mixers, compressors) than natural harmonics. *PM*

LAB REPORT



Spectral analysis [above] suggests something has gone awry here, possibly during post-production. There's a clear 48kHz sample tone, modulated by the audio, but the spurious 'clumps' at ~33kHz and ~66kHz are unvarying. *PM*



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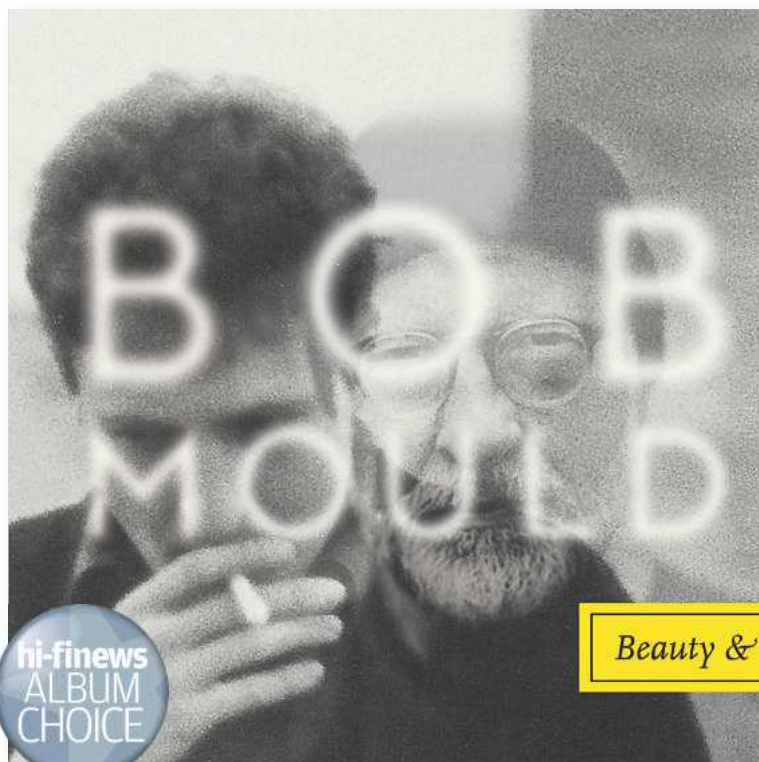
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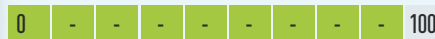
BOB MOULD

Beauty And Ruin

Merge MRG 520

After redefining the power trio in the '80s and '90s with the massively influential bands Hüsker Dü and Sugar, latterly Bob Mould was drawn to DJing and dance music, but he's back working in that format, purveying finely crafted pop songs bolstered by a formidable rhythm section. Jon Wurster's drums and Jason Narducy's bass have a live, organic feel, and overall it's an exciting group sound. But Mould's guitar remains the most thrilling component, a vast overdriven roar full of drones and overtones. The album's dynamic range is wide, from the breezy 'Let The Beauty Be' to the high velocity guitar firestorms of 'Hey Mr Grey' and 'Little Glass Pill', and the album stands up with his best work. **MB**

Sound Quality: 90%



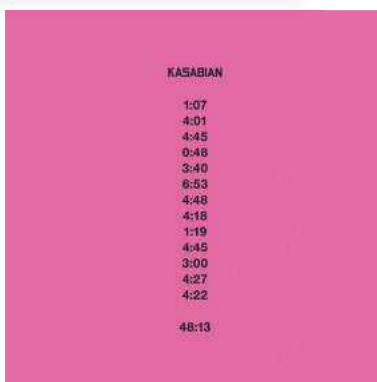
THE ANTLERS

Familiars

Transgressive TRANS 176

The New York trio's fourth album is a typically serious affair, which vocalist Peter Silberman explains as a sort of musical 'rescue mission' from the pains of the past. *Familiars* is principally based on simple guitar chords, with decelerated, swinging drum rhythms, bass, keyboards and electronics, while studio reverb gives a gauzy sound to proceedings. These typically lengthy, rather meandering songs are nonetheless meticulously arranged, with bittersweet trumpet lines complementing Silberman's gorgeous, soaring voice. He takes the music onto another level, at times sounding uncannily like Jeff Buckley. The animated 'Parade' is a stand-out. **MB**

Sound Quality: 80%



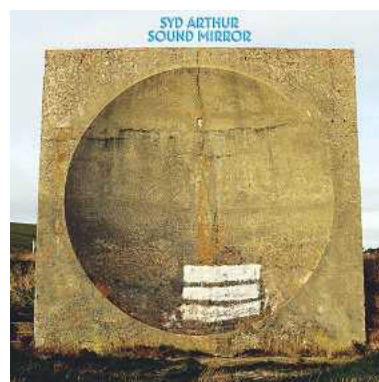
KASABIAN

48.13

Sony 88843063752

Kasabian's lead singer Sergio Pizzorno has said that, when making their fourth album, they 'had the confidence to be more direct, more honest'. Musical layers were apparently stripped away, but with the exception of 'SPS', with its acoustic strum, slide guitar and a flourish of strings, it's still a helluva big sound. 'Bumblebee', a brash, in-your-face rock racket, is superficially impressive, but Kasabian are more potent when they're more inventive and eclectic, riding on groovier drum beats and integrating old school techno siren sounds, buzzing synths, psychedelic guitars and swooning vocal melodies. 'Eez-Eh' also comes out as a single. **MB**

Sound Quality: 85%



SYD ARTHUR

Sound Mirror

Harvest 3770664

Syd Arthur are part of a new breed of psychedelic progressive rock. The fact that they hail from Canterbury, that their name is a pun on Herman Hesse's novel *Siddharta* – a staple of the hippy era – and that they record on Harvest, initially EMI's 1970s 'progressive' imprint, might suggest they are revivalists. One can discern traces of Caravan, Pentangle, and American groups like Spirit and Love, *et al*, in their sound, but the result is resolutely 21st century. This young band's music is concise and melodic, its instrumental flourishes pithy and serving the song, and *Sound Mirror* finds them developing a characteristic style that's both fresh and original. **MB**

Sound Quality: 85%





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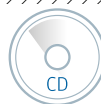
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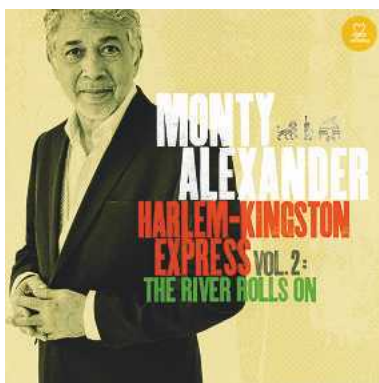
ORAN ETKIN

Gathering Light

Motéma 233833

Saxophonist and clarinetist Etkin is known at home in New York for his Timbalooloo music classes, introducing small children to real music instead of just feeding them nursery rhymes. But a decade ago, absorbed in the music of Mali, he formed a band with West African musicians that's heard on his 2009 album, *Kelenia*. More recently he's gathered influences when travelling Indonesia, China, Japan and Europe as well as his native Israel. This time, his deep, woody-toned bass clarinet combines arrestingly with Curtis Fowlkes' trombone and Lionel Loueke's guitar, not to mention the excellent Ben Allison on bass and Nasheet Waits on drums. *SH*

Sound Quality: 85%



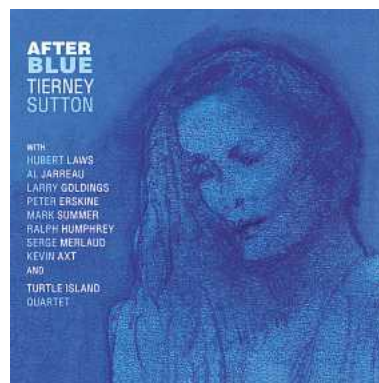
MONTY ALEXANDER

Harlem-Kingston Express Vol 2: The River Rolls On

Motéma 233828

Though he's lived in the USA since 1961, Alexander has always celebrated his roots in Jamaica where, as a teenager, he'd played sessions for the top producers. His Harlem-Kingston Express combines the jazz piano trio with a Jamaican rhythm section, and when their 2011 New York concert recording (originally made for Sirius XM radio) was released on Motéma, it was a huge hit. *Vol 2*'s ten studio tracks still have the gutsy, real-thing feel of the live album, and there's an all-star interlude as George Benson, Ramsey Lewis and Joe Sample join the band on Alexander's catchy 'Love Notes'. Finally, three tracks from the original live sessions make an enjoyable bonus. *SH*

Sound Quality: 90%



TIERNEY SUTTON BAND

After Blue

BFM Jazz BFM77056

Out in the USA last year but now officially released in Europe, this has already won the singer her fifth Grammy nomination. Sutton was performing 'Big Yellow Taxi' before a 2011 tour collaboration with crossover string group The Turtle Island Quartet brought arrangements of 'All I Want' and 'Green,' and the time was right for a Joni album. The songs aren't only from *Blue*, though. Drummer Peter Erskine, who played on the original *Mingus* suggested 'Dry Cleaner From Des Moines,' while 'Cool' is a duet with guest Al Jarreau. Sutton isn't Joni, but with her technique and musicianship she really gets inside Mitchell's songs. This is a fine and sincere tribute. *SH*

Sound Quality: 85%



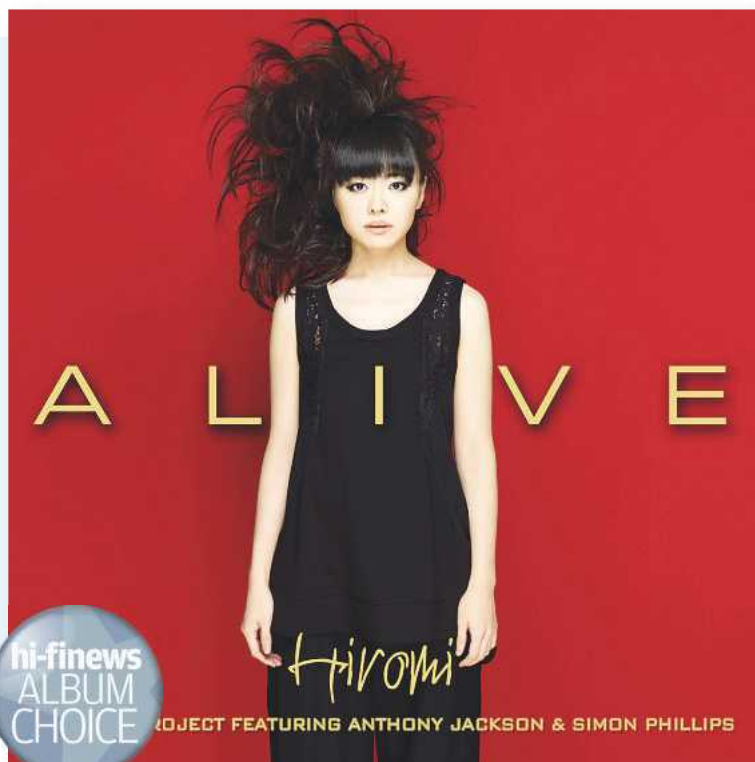
HIROMI

Alive

Telarc TEL-5307-02 (also available as Limited Edition SHM-CD + DVD)

Hiromi's nine albums to date include a couple with her electric group Sonicbloom, one of duets with Chick Corea and one with the Stanley Clarke Band. But this is her third release with The Trio Project, featuring the astonishing playing of bassist Anthony Jackson and drummer Simon Phillips. Hiromi says 'The more I play with them, the more ideas I have for songwriting' – and her compositions this time are themed on different aspects of 'being alive'. So 'Wanderer' opens with a vision of new horizons and then explores restlessly, while 'Seeker' is a gospel-hued tune that builds in inimitable Hiromi fashion. With The Trio Project the pianist has created an enduring supergroup, and this is their best work yet. *SH*

Sound Quality: 90%



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Philharmonia Orchestra
Otto Klemperer

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HIQLP041
Music Of Spain: Turina / Albéniz / Falla
Paris Conservatoire Orchestra
Rafael Frühbeck de Burgos

This is a timely reminder of the many recordings made by the great Spanish conductor Rafael Frühbeck de Burgos, who, aged 80, announced his retirement from conducting, on health grounds, in June 2014. A champion of Spanish music, de Burgos captured these favourites in atmospheric recordings made in the Salle Wagram, Paris in 1963, with the legendary Victor Olof producing.

The original December 1963 review in GRAMOPHONE remarked "...these are distinguished performances adding further to the excellent impression that Rafael Frühbeck has been making recently... the Paris Conservatoire Orchestra plays well for this conductor..."

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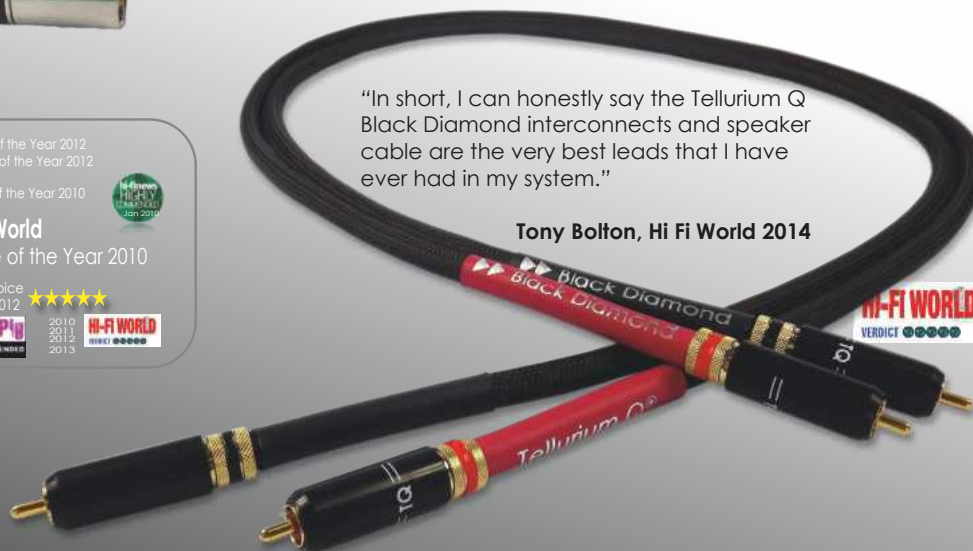
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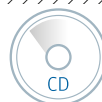
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BRAHMS

Violin Sonatas 1-3; (FAE) Scherzo; Wiegenlied
Leonidas Kavakos/Yuja Wang

Decca 478 6442; downloads up to 96kHz/24-bit

These young soloists first played the Brahms violin sonatas at last year's Verbier Festival, then later in Europe, before recording them in the Hamburg Friedrich-Ebert-Halle in December. It's a partnership that works well (as with Szeryng/Rubinstein or Suk/Katchen), with give and take – although I still find the sound Yuja Wang makes a little shallow for this composer. 'She's too loud' a friend complained at one point, when listening to the CD. But the 96kHz/24-bit download [highresaudio.com] tells a different story: tonal qualities are enhanced and you can hear it's a well balanced studio mix from close mic sources. The transcribed lullaby makes a restful bonus. **CB**

Sound Quality: 90%



CHOPIN

5 Nocturnes; Impromptus; Piano Sonata 3
Louis Lortie

Chandos CHAN 10813; downloads up to 96kHz/24-bit

In this magnificent recital, Vol.3 in his Chandos series, Louis Lortie alternates the Impromptus with Nocturnes in a key-related sequence, then we have the B minor Sonata (not the 'Funeral March' one). His Chopin is direct, strong but sensitive – it put me in mind of Solomon's [Testament SBT1030] – with none of the mannered playing found with some of today's younger pianists. You only have to listen to that most popular of the Nocturnes, Op.9 No.3, to appreciate Lortie's thoughtful approach. Additionally, at least in 96kHz/24-bit resolution, the sound from Potton Hall is exceptionally fine – Lortie plays a Fazioli grand. **CB**

Sound Quality: 90%



ELGAR

Symphony 2
Berlin Staatskapelle/Daniel Barenboim

Decca 478 6677

It was Barbirolli who encouraged the young Daniel Barenboim to explore Elgar's music, and he first recorded this symphony with the LPO in 1972 for CBS, along with much else. Timings haven't changed markedly but this live recording is of a matured reading, quite bristly in the scherzo, and full of energy from the start. Now an 'elder statesman' (politically as well as musically) Barenboim gives us the public face of Elgar and the counterbalancing withdrawal and sadness. The orchestral balance is telling – solo oboe clearly focused in the slow movement, for example. A different view from Boult's but equally unmissable. **CB**

Sound Quality: 85%



TCHAIKOVSKY/FRANCK

Piano Concerto 1/Symphonic Variations
John Ogdon, Philharmonia Orchestra/Sir John Barbirolli

Hi-Q Records HIQLP037

The Manchester-trained pianist John Ogdon won the 1962 Moscow Competition with Vladimir Ashkenazy – both, inevitably, were then asked to record the Tchaikovsky Concerto, Ashkenazy's, with LSO/Maazel, taking a whole LP [Decca SXL6058]. Ogdon's, from Abbey Road's Studio 1 and engineered by Robert Gooch, also has the Franck *Variations* – rarely encountered nowadays. (The turnover is after the Tchaikovsky slow movement.) Barbirolli, of course, had made a famous 78rpm set with Rubinstein in 1932 and he provides a muscular backdrop for Ogdon's formidable artistry – wonderful dexterity in (ii). **CB**

Sound Quality: 80%



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Paul Miller Editor

Technician and writer on all things audio for some 30 years, Paul Miller took over the editor's chair in 2006. He invented the QC Suite, used across the audio industry

Riding the Pono

With more portable USB DACs on the market than ever, **Paul Miller** asks whether it'll be Neil Young's PonoPlayer or the partnering PonoMusic download store that really fires our imagination

A couple of years ago I discussed the prospect of the ageless rocker, Neil Young, teaming up with Apple to offer a new generation of high-res music downloads. There was talk of an 'HD iPod' too. But the passing of Apple's Steve Jobs looked to put the project on the back-burner, until Young took up the reins solo. He's now the frontman for a new venture, Pono, that's attracting a lot of attention in the mainstream press. So what, if any, are the implications for the computer-savvy audiophile hungry for genuinely hi-res tunes?

PONO'S MISSION

The PonoPlayer and partnering PonoMusic webstore have given form to Young's vision, achieving one of the swiftest uptakes on Kickstarter, the creative funding platform. With nearly \$6.25 million already pledged towards a mere \$800k target, samples of the PonoPlayer will start shipping this autumn to those fans who invested \$200 or more via the website.

The Toblerone-inspired player will be manufactured by PCH International at its production facility in Shenzhen, China after what appears to be a very lengthy period of design and beta-testing. This is no me-too Far Eastern clone. The core digital electronics, the apodising digital filter and DAC, were implemented by none other than Charles Hansen, Ayre's co-founder and Research Director.

HI-RES DAC WITH STORAGE

The PonoPlayer will ship with 64GB of built-in storage and another 64GB of memory on a removable microSD card. This expansion slot is designed to allow quick access to personal music libraries on different cards. How much music

RIGHT: Neil Young's forthcoming PonoPlayer as seen on <http://ponomusic.com>. It's a DAC with storage and line and headphone outs – plus plenty of audiophile cred thanks to the digital pen of Ayre's Charlie Hansen



rather depends on its resolution because the PonoPlayer's specification includes most common file types up to 192kHz/24-bit. Free desktop software (for Mac and PC) will include a built-in music store to browse, purchase, manage and sync Pono-certified tracks 'as well as others'. There's every suggestion the PonoPlayer will be

DRM-free, allowing enthusiasts to play music they've already downloaded from other sources, whether high or low-res.

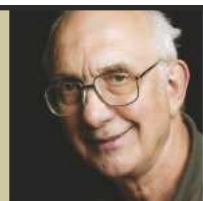
PONOMUSIC

Naturally, *Hi-Fi News* will carry a full technical review of this portable USB DAC from the first shipment to the UK, so we'll soon know if the likes of Astell & Kern *et al* need to start planning for sleepless nights. But the commercial juggernaut is already rolling, for there is a raft of 'limited edition' PonoPlayers in a variety of colours, including chrome, signed off by the likes of Kenny Rogers, Lenny Kravitz, Herbie Hancock as well as the man himself. Pledge up to \$5000 and you'll not only get a PonoPlayer but also receive it at a VIP dinner and listening party hosted by, you guessed it, Neil Young.

There's more than a little razzmatazz here. Fanning the flames of expectation, Pono has a host of video testimonials on its website from the great and good (and a few more besides) of the music biz. Many are seen emerging from Young's Buick Eldorado proclaiming they've 'never heard music like this before'.

If this is all you need to make a critical comparison then perhaps we audiophiles should decamp from our listening rooms, switch off our high-end amps and USB DACs and go sit in the garage with some in-car entertainment instead. But I digress, because in practice this is Young's attempt at convincing fellow performers to return to the studio, dust off their master tapes and re-release old and new material at the highest resolution possible. And the PonoMusic webstore will be their vendor of choice.

I'm all in favour of hi-res audio getting more exposure. Indeed, we're the only monthly that tests new 96/192kHz downloads in an effort to verify their worth. But here's the point – every month we still discover errant files, mangled music that's upsampled or downsampled from something else. If PonoMusic is the first hi-res music store to convincingly demonstrate the provenance of its wares then it'll sweep all before it. And the PonoPlayer will be a mere sideshow. ☺



Barry Fox Technology journalist

Barry Fox trained in electronics with the RAF and worked as a patent agent, but he gave that up to enter journalism. He is one of the world's top technology writers

A question of numbers

Linn is offering a new kind of system optimisation which sees your speakers measured at its factory then tailored to suit your room. **Barry Fox** wonders if the maths used by Linn beats mic calibration

Since the 1970s I have had all manner of multichannel systems, from Hafler-derived rear ambience, through SQ, QS, CD-4, UD-4 and Ambisonics surround rigs, to 5.1 and 7.1 Dolby/DTS with big subwoofers. Getting all the physical connections right, and then balancing the channel levels and equalisation with test tones and a microphone is a pain.

My ageing Denon system always tries to tell me the surrounds are out of phase, when the colour-coded wiring tells me they aren't. I would like to change it for a modern Onkyo rig but can't face the hassle of re-wiring everything. Why bother, because I have always kept most of the surround and woofer channels switched off most of the time. Listening in stereo with full range speakers is so much easier and sounds better anyway.

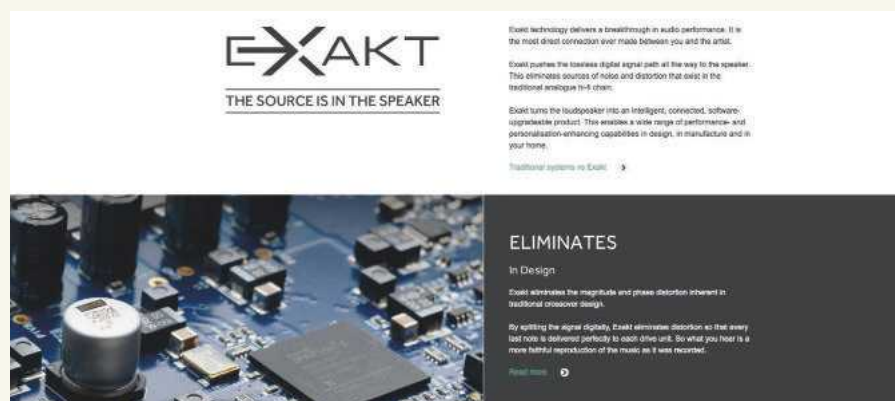
DIRECT DIGITAL LINK

I thought of this recently while Linn demonstrated its new stereo 'Source Is In The Speaker' Exakt system. The £25,500 idea is to provide a 'direct digital link from studio to speaker' by using downloaded

hi-res studio master digital source material, usually coded at 24-bit/96kHz, and decoding to analogue only in the active speakers. All connections are by

basic, inexpensive Cat 5 Ethernet cable, albeit with a proprietary digital protocol called Exakt Link which differs from standard Ethernet. This, Linn claims, gives better control of left/right channel synchronisation and eliminates jitter.

What particularly interested me is the way Linn optimises the system. One optimisation corrects for the fact that no two loudspeaker drive units can ever



ABOVE: For more on Linn's 'The Source Is In The Speaker' system see www.linn.co.uk

be exactly the same. The drivers for each speaker are measured at the factory and the digital processing factory-tweaked to compensate for any differences. The amplifiers and speaker crossovers are then optimised on site for the room where the system is installed. But Linn has moved away from the traditional test tone and mic technique and relies solely on measurements and maths.

The Linn installer physically measures the room, notes the furnishings, and keys the measurements into a laptop running Linn's setup program. The results are then downloaded into the speakers. If the owner moves rooms or homes, or re-positions the speakers, the system

must be re-calibrated by a Linn installer.

Linn's Product Manager Mark Hanson robustly rejects the suggestion that this approach creates works for Linn installers.

'It is very easy to measure erroneously with a microphone, and skew the results,' he said when challenged. 'We use pure maths. And we are only correcting for frequencies below 80Hz, which is where the effect is greatest.'

'A demonstration of the system showed clear improvements in bass tightness'

A demonstration of how the system sounded with and without measure-and-maths room optimisation showed clear improvements in bass tightness after the maths had been applied.

I have known Linn long enough to know that it always likes to do things differently. The company also has enough massed brainpower to justify whatever it is doing differently. I am just passing on the facts as presented, to trigger some thought and debate on whether measure and maths really is better than automated tone and mic calibration.

TWENTY-TWO CHANNELS

This comes at a time when the electronics industry is trying to set a standard for Ultra HD TV, known as 4K TV. The new picture standard will specify 22.2 channel audio, with 22 channels of horizontal and vertical surround and two subwoofer channels.

The idea of setting up a 22.2 home system, and optimising it for the room, gives me nightmares. Most people will surely be listening to UHD audio in stereo, perhaps with a single subwoofer.

Let's hope that the standard-setters are giving some serious thought to the issue of down-conversion from 22.2 to two channels. ☹



Barry Willis

Journalist for top American audio-video publications

While his main interest is high-end audio, Barry Willis also writes about the culinary industry, visual art and theatre for a huge variety of US newspapers and magazines

And the Beats go on

In May Apple announced plans to acquire headphone maker Beats and its music streaming service. Will the wider audio industry benefit, wonders **Barry Willis**, and what of the high-end in general?

In May, the financial press was abuzz with Apple's announcement of its intention to buy Beats Electronics LLC for a reported \$3 billion. Apple forked out a staggering fee for the headphone brand and its startup Beats Music subscription service. The deal was Apple's largest acquisition ever, one that dwarfed the \$400 million purchase of NeXT Software Inc in 1997, a move that brought the autocratic but uniquely creative Steve Jobs back to the company he had co-founded.

BRAND RECOGNITION

News features were unanimous in depicting Beats as a 'maker of high-end headphones', a description readers of journals like *HFN* might disagree with. Even the most casual audio fan can rattle off a dozen headphones that at least rival if not better Beats in every department save brand recognition. Executives at headphone makers as varied as AKG, Audio-Technica, Sennheiser, and Sony must wonder where they went wrong when an upstart competitor can come out of nowhere then find itself in a very flattering light on the auction block.

And the entire audio industry may be wondering if this acquisition will have any beneficial spillover – will

the current rage for headphones and headphone accessories ultimately lead to mass interest in other audio products, such as loudspeakers, components, and specialty cabling?

This observer's guess: if such a spillover occurs at all, it won't be very big nor very long-lasting – unless other related products carry the Apple/Beats imprimatur. Now there's a marketing opportunity! Audio execs may also be baffled by what sort of secret handshake

RIGHT: Dr Dre, Lady Gaga and Jimmy Iovine pictured at the Best Buy store in Los Angeles, California. Best Buy carries products by both Beats and Apple



Beats principals Jimmy Iovine and Dr Dre knew to get inside Apple, a company notoriously difficult to deal with, according to some who've tried. The answer is that music producer Iovine was a long-time friend of Jobs – a legacy that swung plenty of weight at Apple's Cupertino HQ.

Financial analysts gushed over the corporate beneficiaries of the deal, including the Carlyle Group, Access Industries LLC, and Vivendi SA, all investors

in Beats – and over the incomprehensibly large payouts to Iovine and Dr Dre, rumoured as of May to be taking board positions at Apple.

Some reports speculated about the retail implications for

big-box stores such as Best Buy and Target, which carry products by both Apple and Beats. You can be sure the rumour mills of the business world will continue to churn for months to come.

It's a rare occurrence when a bit of front-page news has any relevance for the almost invisible world of high-performance audio. The importance of the Apple/Beats hook-up isn't about the well-documented sales decline of recorded music and the increasing value of subscription music

services, nor about the numbers of headphones and accessories likely to be sold in the coming five years. The real significance is that the deal represents a new chapter for Apple. Under Jobs, the company made breakthrough products – the iPod, iPhone, and iPad – that were exemplars not only of sleek design but of entirely new technological categories. Apple products were cool because coolness was inherent in Apple's identity.

EDGE OF POP

With the demise of the visionary Jobs went the single-minded fanatic originality that made the company a leader at the edge of pop technology. In acquiring Beats, Apple is making a play for the youth market – a niche chased after by many companies in the often mistaken belief that brand loyalty established at an impressionable age will endure as consumers drift into maturity.

It's public admission that Apple's days as an originator are over. Unthinkable as it may seem, Apple's in danger of becoming as stodgy as IBM. The Beats acquisition is clear evidence that Apple's corporate faith in cultivating homegrown loyalty is gone. Expect more deals like this over the years to come. Apple's deep resources will be spent extravagantly in the quest for further legitimacy. ☹

'Unthinkable as it may seem, Apple's in danger of becoming as stodgy as IBM'



Jim Lesurf Science Journalist

Jim Lesurf has spent a lifetime in audio, both as an engineer at UK hi-fi company Armstrong and reader in Physics and Electronics at St Andrew's University

Secondhand treasure

Pleased with his charity-shop vinyl buys, **Jim Lesurf** ventures into a secondhand record shop only to be dismayed at crates of unsorted records. Until he starts to dig in and finds the hunt addictive

For years I've been in denial. No, I'm not a collector! I don't buy 'special issues' simply to keep them in shrink-wrap. And I don't aim to buy every version of every release by my favourite artists. Yet gradually I find that more and more of my home is occupied by things I've kept because they are 'interesting'.

When I was a teenager one of my main interests was Science Fiction. Back then the genre was almost never featured on TV in the UK and rarely on films shown at a local cinema. Most Science Fiction was American. If you recognise names like Heinlein, Asimov, or *Analog* magazine, then you'll know exactly what I mean.

A GOOD READ

I used to buy secondhand copies of Science Fiction paperbacks via the post from a dealer who specialised in getting both books and magazines from the US. I bought them secondhand because I couldn't afford new copies and didn't care about their condition so long as they were readable.

I still recall the brown-paper parcels arriving at my home, wrapped up in string. And the excitement of opening them to find which books I'd managed to buy before someone else had taken them!

When I started buying LPs I got them from a local record shop. For these, good condition was vital as even a few clicks or an off-centre pressing spoiled my enjoyment. Since I didn't have much money, buying a new LP was a real event. As with the books, I kept them to enjoy again, but with no real thought of building a 'collection'.

Through the CD years I had more disposable income, so I bought much



ABOVE: Secondhand vinyl can be a fun way to add music to your collection for mere pounds

more music. But somehow each new disc was less of an event. I largely stopped buying LPs for many years, as they vanished from the high street, followed by the shops that had sold them.

A few weeks ago I spotted a small shop opening in town, selling secondhand LPs.

Since I'd recently tried some LPs from a charity shop and been pleasantly surprised by their good condition I decided to give it a try. My first visit yielded four LPs. Two 'pop/rock', two jazz.

The pop LPs were a disappointment. One was badly scratched on one side. And even after careful DIY cleaning the other had clearly been worn and damaged. However the two jazz LPs were in superb condition.

So I've been back a few times since. The result is a number of new-to-me jazz LPs for just three or four pounds each – sometimes double LPs for three pounds! Most seem to be in almost unplayed, clean condition. Many are German or pressings meant for markets outside the UK.

'It's fun not knowing what I'll find. Like looking for – and finding – treasure'

I guess one advantage I have here is that I'm happy to buy what most people would regard as ancient or unfashionable material. How many trendy music fans will want an LP of Bix Beiderbecke or Artie Shaw, or even know what they sound like? The LPs in the shop are all fairly tightly packed into boxes. Most of them are labelled as "70s Pop/£5" or similar. With just a few 'Jazz/£3' boxes near the back of the shop or under a table, surrounded by boxes of rock/pop.

MUSIC FIRST

When I first went into the shop I was disappointed that nothing was in alphabetical order by artists or genre beyond being in the boxes. No real displays. It made things hard to find. However having now been back a few times I realised I'm enjoying searching though the boxes. It's fun not knowing what I'll find. Like looking for – and finding – hidden treasure.

Oh dear, maybe I am a collector after all. If so, at least the music sounds good. And I don't care that many of the LP sleeves are tatty. After all, it's the music I'm interested in! ☺

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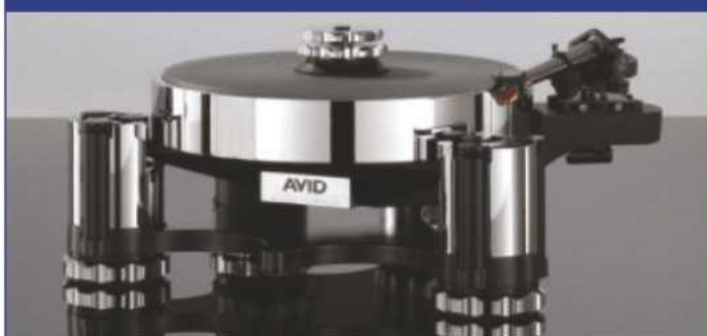
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Steve Harris Contributing Editor

Steve Harris edited *Hi-Fi News* between 1986 and 2005. He loves jazz, blues music, vinyl and vintage hi-fi and anything that makes good music come to life

A walk on the live side

An old copy of *Vogue* sparks memories for **Steve Harris** of Ronnie Scott's as it was in the 1980s. Its upstairs bar is now another great place to enjoy live music, whether electronics are used or not

Is it live or is it recorded? If you hear the sound of mellow brass instruments playing a hymn tune, you just know immediately that there's a Salvation Army band playing live around the next corner. It seems that those brass instruments played in the open air have a quality that you've never heard reproduced electronically. You shake your head and think, well, perhaps hi-fi has still got a long way to go.

But even in the street, it's not often that you'll hear anything played without amplification. In London recently, my ear was caught by some wonderfully contrapuntal but slightly strange-sounding classical guitar. As I got closer I saw a truly accomplished busker playing Bach on a Les Paul.

It turned out that he also played in a rock band, and when busking he just used his rock instrument and a practice amp to make himself heard.

RARE CHANCE

When I started listening to jazz records, the great temple of live music for me was Ronnie Scott's.

Before the refurbishment of the mid-2000s, the club's PA system left something to be desired. But this didn't seem to matter too much when you were

getting a rare chance to see American jazz legends, close up and in the flesh.

Quite by chance, I recently saw Ronnie Scott's face staring out at me from the pages of an ancient magazine. It was *Vogue*, February 1966. Under the evocative title 'Happenings', Polly Devlin described the opening of Ronnie Scott's new club in Frith Street.

'Inside,' she wrote, 'it's very dark and serious, low orange lights on each table add to the air of acute dedication rather

'Whatever kind
of music you like,
hearing it live
refreshes the soul'



ABOVE: American artist Vera Kelle's painting of the upstairs bar at Ronnie Scott's Jazz Club

than illuminate it... Scott's club is the best, indeed the only jazz club in London, and there is always a hard core of listeners who know the breed, seed and generation of each player and their respective merits... Ronnie Scott moves equably through the scene, battling against difficulties with Unions and Rules and still managing to get

the best performers on both sides of the Atlantic to perform for him.'

I'm not old enough to have ever visited the original club in Gerrard Street, but Devlin's description certainly

reawakened memories of what the 'new place' was like in the 1980s. In those days, when the pubs closed at 11pm, it did seem that a proportion of the clientele were there, not to hear the music, but because this was one of the few places where you could get a drink after midnight.

After Ronnie Scott passed away in 1996, the club eventually came under new ownership, changing with the times yet maintaining its pre-eminence. It's clearly still a great discovery for new generations.

Also, the upstairs bar, once just a disco, provides another great place to enjoy live music: smaller, scruffier but far less expensive than the now sleek and glossy main room. You can see it through the eyes of American artist Vera Kelle in her painting, inspired by saxophonist Renato D'Aiello in his Monday night residency.

MAGICAL PEOPLE

'Jazz is a painting of those moments when ambience and musical performance coexist in aesthetic bliss,' she says. 'While I lived in London, Ronnie Scott's was my favourite place. In the dark-lit room, world-class live jazz played along the sound of dinner forks clicking on thin glossy wood tables with red velvet benches. Upstairs is just as aesthetically pleasing and with magical people. Renato played and I returned to take photos of his performance. From there the painting grew...'

Whatever kind of music you like, hearing it live refreshes the soul. And of course, it's better to hear the natural sound of acoustic instruments, but in the end, perhaps it's not the presence or absence of electronics that matters. It's the presence of the performer. ☺



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Sound Off!

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A SOURCE OF CONCERN DO DIGITAL-ONLY REVIEWS FAIL READERS?

I was disappointed with some of the reviews in recent issues of *HFN*. The first was that of the Mark Levinson No52 preamp in the May issue and then the June review of the Wilson Sasha Series-2 speakers. The reviews themselves were very well written, but the way in which sound quality was assessed left a lot to be desired. Why? Because the music used was either downloaded from the internet or from CD.

This would be perfect if you listened solely to computer-derived music or CDs but in my

case this is not the case. Most of my listening is via my turntable so I could not imagine how my music would sound if heard through the products reviewed.

In the April issue Ken Kessler wrote an interesting piece in which he said that no-one would buy hi-fi equipment via the internet without having heard it. He then went on to eloquently state the case for the hi-fi magazine as a guide to what components sound like and, by inference, the art of the reviewer.

While I realise that the use of downloads makes things more convenient for reviewers, not all of your readers have gone down this route. Are we seeing the slow demise of reviewers who use all modes of playing music when testing speakers and amplifiers?

I still think *HFN* is an excellent magazine, especially as it carries articles on subjects like hearing aids, which are more pertinent to older readers who started in this great passion a long time ago (is 1968 that long ago?).

John Fearon, via email

Paul Miller replies: You raise an interesting observation John as, in practice, there are few professional scribes who lend equivalent weight to LPs and/or digital players. Typically, they use whatever they feel is the best 'tool' for the task at hand. Crucially all our reviewers, whether they prefer analogue or digital sources, have one goal in mind – to engage the reader with a clear impression of the sound of the product under test. Frankly, whether they use a top-notch turntable or high-res server for the purpose should not fundamentally affect the subjective description or final verdict. Our review of the Wilson Sasha 2 was just that and not how it dealt with the sound of a particular source.



ABOVE: Wilson Sasha Series-2 – what does it sound like with a vinyl source?

Send in your views to:
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PO Box 718, Orpington, BR6 1AP or
email your views to: letters@hifinews.com –
please use 'Sound Off' in your subject field

SAM software and crossovers

WILL DEVIALET SYSTEM ACCOUNT FOR UPGRADED SPEAKERS?

I was most interested to read in the June issue about Devialet's new SAM (Speaker Active Matching) system. I now have more reasons to upgrade my D-Premier amp to a 240 (250 with the new 7.1 software). Can I still take advantage of SAM even if I have upgraded the crossovers of my speakers? The original crossover components were replaced with high quality ones of the same, or close to the same, value.

Leigh Hibbins, Australia

Paul Miller replies: Leigh, the simple answer is 'yes'. Provided the LF filter shape(s) are unaltered then it's the electromechanical characteristics of the bass driver(s), the internal volume and loading of the cabinet that SAM will 'model' via its spare SHARC processor. You do not mention what speakers you have but Devialet's repertoire of SAM-compatible models is increasing by the week. Currently there are various models from KEF, B&W, Focal and Wilson whose parameters are available as SAM downloads but many more are promised. Other Devialet owners who want to see their loudspeakers included on the SAM catalogue should visit <http://votehorsam.devialet.com> and vote!



ABOVE: Original Devialet D-Premier is ripe for upgrading

Ken hits the spot

REVIEW RECOMMENDATIONS WORTH PURSUING

Ken Kessler strikes again! I've just finished listening to the Wendy & Bonnie album *Genesis* that he reviewed in the June issue. When Ken raves over this sort of thing, he never fails me and this recommendation is spot-on as usual. It's a wonderful album.

Genesis comes after the re-issue of the *Honey Ltd* album by the '60s group of the same name (more fabulous female harmonies). How many more treasures like these are out there waiting to be rediscovered?

Daniel Emerson, via email

Ken Kessler replies: Sundazed, Rhino, Hip-O and other reissue labels do us a great service by unearthing such gems. The only problem they have is gaining access to the vaults of the major (and indie) labels. I suspect that forgotten albums run to the thousands, so it may be some time before they run out of surprises.

On headphone headbands

APPLAUSE FOR HFN INVESTIGATION, BUT ARE SOME EFFECTS OF HEADBANDS ON SOUND BENEFICIAL?

Congratulations to the indefatigable Keith Howard for quantifying what is obviously a significant variable in headphones: the headband [see *HFN* June '14]. Clearly the band which is connected mechanically to both earpieces must potentially have some effect on the performance of each? Although the measuring process is quite complex and time-consuming it would be good to see it included in Keith's future reviews.

However, as ever, the subjective effect of something that has an objective existence is problematic. As it happens Keith mentions two headphones where his measurement would suggest superiority for one – the Sony MDR-MA900 – over the other, which is the PSB M4U 2. Unfortunately I find that subjectively I much prefer the PSB, with its amplifier in play (another variable), to the Sony. For me the PSB seems to create an acoustic and spatial realism which the dry and slightly sharp Sony does not. Could this 'acoustic' I hear from the PSBs be a function of headband-mediated leakage from one capsule to the other?

It wouldn't be the first time in audio that resonances and harmonics which are strictly 'incorrect' enhance the subjective experience of the sound. However, my little theory is immediately contradicted by the Focal Spirit Classic, which scores on both Keith's measurement and my subjective assessment of musicality. Of course, the latter depends on more

than any impressions of acoustic and spatial information. I am, however, left with my strong view, shared I note by most reviewers, that the PSBs are a great headphone. Could Keith's impressions be influenced by his objective findings on headphone headband effects and phase discrepancies? Sometimes, maybe it's better not to know!

By the way, it's great to see the constant attention you are now giving to headphones in the magazine, the major growth point in the market. Could you perhaps have a named section for this area covering phones and phone amplifiers?

Professor Roger Ellis, via email

Keith Howard replies: Exactly what the ramifications for sound quality are of headband resonance remains to be clarified. It must be undesirable but it is certainly possible, as Prof Ellis suggests, that it might have effects that are perceived as in some respect beneficial by some listeners. I have ideas for tackling this subject, which I hope will result in a follow-up Investigation in due course. It has also been suggested to me, from a different quarter, that another factor may be at work in the crosstalk from one capsule to the other, which I will also be investigating soon.

While it is true that I perform the headphone measurements prior to long-term listening, in case there should be a fault, I always do some initial listening before measurement and don't process the measurements until the main listening is almost complete. This doesn't guarantee that I'm immune to 'measurement suggestion', of course, but I have recommended sufficient headphones down the years which measure less than wonderfully to be confident that my suggestibility is low.

In the case of the PSB M4U 2, it was the first headphone I'd heard that accords with one of the newly minted target responses involving shelved-up bass. (Heaven knows there are plenty of headphones with excess bass around – but not all of them justify it on the basis of research.) I am no more enamoured of this idea now than when I first listened to the M4U 2 – and that was before measuring it.



ABOVE: PSB M4U 2 with folding headband

8

Lanes On Your Entertainment Superhighway



RJ/E Forest



RJ/E Cinnamon



RJ/E Vodka



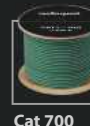
RJ/E Diamond



Cat 600 Pearl



Cat 700 Pearl



Cat 700 Forest



Cat 700 Carbon

Since its origins in the early 1980's, Ethernet, and the Local Area Network (LAN) systems it enables, has become the copper plumbing of the digital age. Originally deployed only over coaxial cable, the Ethernet protocols (IEEE 802.3) now also apply to fibre-optic and "Category" (Cat 5, 5e, 6, 6e, 7) cables. These 8-conductor (4 twisted pairs) Cat cables are the 8 lanes which stream or transport your digital entertainment to equipment a foot away or several rooms away.

AudioQuest refers to its pre-terminated leading-edge Cat 7 cables as the RJ/E Series ... RJ for the RJ45 connector standard to the application, and E for Ethernet. For AudioQuest, the highest Cat 7 standard (with all 4 pairs using correctly differentiated twist rates and individually shielded) is only the solid foundation to which AQ then adds better materials and unique-to-AQ additional technologies.

The particulars of the RJ45 connectors have also received extreme attention. The plugs used on the Vodka and Diamond models (and available for use with bulk Cat 700 models), feature a unique patented transition-compensating system which reduces reflections caused by the impedance mismatch where 4 twisted pairs meet a straight line of 8 plug contacts.

What does this all mean? Simple ... better sound!

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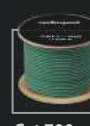
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Ayre Acoustic C5 ce CD/SACD	£2,750	Dynaudio C1 & stands	£1,950	BMC Audio CS2 Integrated/ Power Amplifier	£4,800	Luxman C800f	£8,990
Bel Canto Dac3	£2,199	Eclipse TD512, A502 + Stands	£2,000	Bryston 2BSBST-2	£12,750	Mark Levinson 326S + Phono	£6,750
Bel Canto USB Link 24/96	£349	Eggleson Works SAVOY	£15,000	Conrad Johnson Prem 8A monoblocks	£4,950	Mark Levinson No 326s Reference Dual Mono Pre	£8,170
Bluenote Stibbert valve improved	£1,800	Focal JM Lab Diablo Utopia III & Stands	£8,100	Crimson Electronics 640 E3 Monoblocks	£3,399	Musical Fidelity Kw Phono	£1,450
BMC Audio PureDAC	£1,290	Focal JM Lab Electra 1028Be	£2,695	Edge G6	£2,250	Nakamichi 410	£198
BMC Audio BDCC1.1 Belt Drive CD Player	£3,360	Focal JM Lab Grande Utopia III EM	£121,999	Edge NL Reference Monoblocks	£34,900	Nosae TAE 000	£2,990
CEC TL0X	£9,990	Focal JM Lab Scala Utopia 3	£18,999	Edge NL12.1	£8,900	Tom Evans The Vibe pre & Pulse power supply	£2,750
Classe Audio CDP102	£1,290	Focal JM Lab Stella Utopia III EM	£47,990	Gryphon Antileon	£5,990	Vitus SL 101	£13,995
Cyrus cd6 se2	£400	Genesis Technologies 5.3	£7,500	Halcro DM 88 Monoblocks	£24,950	VTL TL 6.5 Signature Line Pre	£9,990
Cyrus CD8X	£400	Goodmans Maxim	£400	Halcro DM38 with 220/110 V transformer	£8,500	Turntables/Arms/Cartridges & Phonostages	
Esoteric P05 D05	£5,500	Hansen Audio Emperor	£32,500	Jadis ja-250	£15,000	Air Tight PC-1 Cartridge	£3,495
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Meridian Audio 508	£600	Mission 753	£6,495	Mark Levinson No 532H Reference		Jan Allaerts MC1B mk1	£1,495
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Bitten by the upgrade bug

ONE READER'S JOURNEY FROM A MUSIC CENTRE TO A MONOBLOCK-DRIVEN KEF RIG

It all started back in the mid '80s when I decided to replace my tired old Garrard music centre with separates. So my first real hi-fi system was a Marantz CD-84, an Audiolab 8000A and a pair of Arcam Two loudspeakers mounted on Heybrook stands. I was then bitten by the upgrade bug. By 1990 the Arcam speakers had been replaced by KEF Reference Series Model 104/2s. These turned out to be the mainstay of my system. Little did I know how good they would turn out to be.

Somewhere around the mid '90s I got into cables. This didn't go down well with my partner who wasn't impressed by the sight of wires hanging on bits of string attached to the ceiling. A few years on and the Audiolab integrated was replaced by a Quad 66 preamp partnered with a secondhand Quad 606 power amp.

Skip forward quite a few years and I read a review of the Quad 99 CDP-2. This was the answer to all my dreams. A transport, DAC and preamp all in one box. It would simplify my system considerably. I liked the shop demonstration model so much that I had to have it.

Then about a year ago I replaced the Quad 606 power amplifier with a pair of Audiolab 8200MB monoblocks. My main objectives were a good signal-to-noise ratio, low distortion, good sound, and designs that would



ABOVE: Miniature gems – Wharfedale's Diamond 10.1s were released in 2009

be extremely load tolerant and have shed-loads of power. I had always thought that the KEF loudspeakers were a bit power hungry, even though the manufacturer claims that an amp delivering 25 to 200W would be ample. But what these monoblocks have done to reveal low-level detail is simply fantastic.

Sadly, one of the KEFs has now gone a little bit quiet. Too many parties, perhaps? I'm presently weighing up the pros and the cons of having them refurbished or buying new loudspeakers. In the meantime I'm using a pair of Wharfedale Diamond 10.1s.

These little speakers are making sounds they have no right to at the price, instruments like viola and piano sounding particularly beautiful. Only with large-scale material do they not quite cut it, which is where a decent floorstander comes in. Maybe I'll try a pair of Elac FS 197s?

Watch this space!

Bob Twaits, via email

Paul Miller replies: I'm sure that many *HFN* readers will agree that Bob's upgrade story has a familiar ring to it. I mean, how many of us have *not* been bitten by the 'cable bug' at one time or another? Meanwhile, when we tested the Audiolab 8200MB monoblocks [*HFN* Sep '12] they proved their mettle by delivering a massive 335W, 620W, 1080W and 1600W into 8, 4, 2 and 1ohm loads under dynamic, music-like conditions. This is more than sufficient to drive the 4ohm KEFs, should you have them refurbished, or a new pair of Elacs. Coincidentally we have the new FS409 floorstanders in the lab for review next month...



ABOVE: One of Bob's KEF 104/2 speakers with an Audiolab 8200MB amp beside it

WIRELESS FRONTIER?



Not only are wires still very much the lowest-distortion highest-performance way to send both analog and digital audio information, but when it comes to sending power, "wireless" is just a nifty science project, not part of a home entertainment rig.

The challenge of not adding distortion as AC power goes from the wall to the electronics, and the challenge of not adding distortion as audio power is sent to a loudspeaker, are almost the same. The amount of energy transferred through these cables, and the size of the associated magnetic fields, puts them in a different class from all other audio and video cables.

Speaker cables need to maintain perfect integrity across the audio band and then some, while AC cables only have to try to be perfect in a narrower band. AC cable design is therefore a subset of speaker cable design because AC cables are subject to almost all the same distortion mechanisms, and benefit from almost all the same damage minimizing techniques.

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PC music, a Raspberry Pi and I scream...

READER SHARES FRUSTRATIONS AS HE ENDEAVOURS TO CONFIGURE A PI-BASED MUSIC SYSTEM USING A WOLFSON AUDIO CARD

Guess what I've discovered? There's a whole new way of approaching digital sound and it raises the question of whether the current batch of 'media players' are decked with more features and functions than they need to be. I'm playing with a tiny printed circuitboard the size of a playing card, clipped into a cute plastic case. You may have heard of it. It's called a Raspberry Pi.

The good news is that it cost me less than £80 to buy the motherboard (the Pi itself), a 24-bit/192kHz Wolfson Audio Card and a wireless keyboard and pad the size of a large remote control. In my house, that whirring hulk of a black box, ironically called a 'hush PC', has now been replaced by my Pi, which you are able to put just anywhere.

The bad news is that achieving the joys of high-definition audio via a Pi is akin to climbing Everest – and I'm not talking about windows. It's the Linux operating system that has been the cause of my frustration as I had not realised it was a 'get out and get under' OS that requires you to address it via typed-in commands. This means that in order to setup an HD soundcard one must 'talk to' the Pi using the command line. There is no plug and play or 'wizard' to help you here.

This has taken me the best part of a week and, as I write, I still haven't had a bleep out of the thing. It's into it's sixth hour of '....' on the screen and

```
'net/ipv4/tcp_minisox.o
net/ipv4/tcp_cong.o
net/ipv4/tcp_metrics.o...'
```

You get the picture.

It's a bit like the shipping forecast. Meanwhile, you imagine what these expressions might mean, but dare not put your theories to the test for fear of losing your self-esteem.

At each failed install, I scanned the internet forums in despair. One contributor poured lavish praise on the soundcard I was trying to setup. I wondered why it seemed to have gone so easily for him and not for me.

As I read his posting it became clear that he, too, had not yet heard a toot from the card and was writing, just as I am doing now, to fill in the time while endless lines of code scrolled up his screen like the credits to a ludicrously over-manned blockbuster.



ABOVE: The Raspberry Pi was first released in 2012 as the Model-B Rev1, shown above

I am now writing a few days later and the good news is that it is working up to 192kHz FLAC. This is a victory lessened by days of unnecessary frustration. I only managed it finally with the help of my son, who is an IT professional. And even then it still took some extra lines of command to deal with a required update, reboot and so on.

In short, so much promise but impossible to realise until a computer programmer comes along who actually lives on the planet Earth. Wolfson cards on raspberry Pis are not for those inexperienced in Linux. All for the want of a pre-prepared SD card.

Paul Williamson, via email

Jim Lesurf replies: Unfortunately, the sheer success of the Raspberry Pi (I'll call it 'RPi' from now on) means that many people do not realise that its intended purpose was to be a cheap platform for those wanting to 'get out and get under' in order to learn how computers work. So the command line is actually what the device is supposed to be all about! It is also small and cheap so the buyer isn't deterred from experimenting out of a fear he or she might 'break' it.

Its size and cost also mean that the RPi has less in the way of hardware resources than a full-size desktop machine. In turn this means that the versions of Linux that have been developed to run on it have had to be adapted and 'cut down' compared with the

versions aimed at conventional desktops and laptops. Unlike most PCs and Macs, which run on 'stock' versions of either Windows or OS X, there are many different Linux distributions (versions). Paul's comments seem to be about just one developmental version for the RPi. So far as Linux itself is concerned, there are many distributions for users who want to avoid the mysteries of computing, but these aren't aimed at the RPi.

The Wolfson Audio Card is a very interesting development, though. For me, its appeal lies in that it could be the basis for a good audio recorder rather than a player. One point to bear in mind is that it has only been available for a short time so enthusiasts are yet to develop useful programs for it. These will eventually make it easier to use.

Meanwhile, if you want a desktop-style operating system that fits more easily onto the RPi then take a look at the RISC OS [see www.riscosopen.org]. This, by its very nature, is pre-designed to work well on it. For a light and easy-to-use desktop you may find it a better choice than the Linux distributions.

And if you want good audio output with less hassle, you may find a USB audio DAC a better choice. Indeed, with a modern desktop version of Linux you should find that conventional hardware will essentially be plug-and-play. All that said, I suspect it won't be long before the RPi will become the basis of some easier-to-use audio devices, even if hidden inside a box with some other name on the outside!

A polished sound

READERS SEEK THOUGHTS ON ANTI-STATIC PISTOLS, BRUSHES AND SPRAYS

I have for many years enjoyed the enhanced sound that comes from using an anti-static spray on my CD collection (Mr Sheen with anti-static formula, to be exact) ensuring, of course, that the spray solution has dried before putting a disc into the player's disc-drawer.

I recently purchased what I imagine will be my last CD player: a Cyrus CD8SE with attendant power supply. Worried that the Mr Sheen spray might upset this player's letter-box mechanism, I bought a Zerostat anti-static pistol to use instead.

I tried the pistol out for the first time on a copy of *Genesis Revisited* by Steve Hackett, which my brother had brought round. We had a quick listen without zapping the disc and I asked him if the bass was supposed to sound lumpy and monotoned. He nodded, saying that was also how the recording sounded on his own system at home.

I then gave the disc a zap and pushed it back into the player. We were amazed that the bass was now tuneful and rhythmic and the cymbals sounded more, well, cymbally. Have you experienced such improvements using a Zerostat?

Ray Spink, via email

Should you dry clean records more than using a wet-cleaning method? Should new records be cleaned before you play them?

I have seen a brush that looks like it should be used with a dustpan and is fitted with grounding cable. Do you know what it is and whether or not it is effective? And are carbon fibre brushes all the same or are some superior to others. Oh, and where do you buy them in the UK?

Peter Scott, via email



ABOVE: Parastat record cleaning brush and chrome case, as used by Jim Lesurf



ABOVE: The Milty Zerostat 3 anti-static gun aims to remove static from vinyl

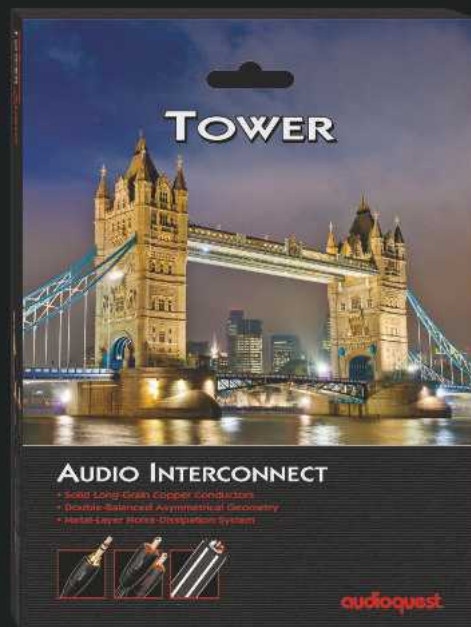
Jim Lesurf replies: I'm afraid I've never bothered to Zerostat any of my CDs. Nor have I ever polished any of them so far as I recall so I have no idea why Ray heard a difference. I just use a soft (blusher) brush bought from Boots to brush away any stray dust or fluff from CDs before putting them into a player.

I've seen adverts for various carbon fibre brushes over the years but I've not personally tried any of them. I recall one report of an example where the fibres tended to break off and lie in the groove!

For most of the LPs I own I just use a Zerostat or Parastat when needed, then use a dust bug with just its plush pad as the LP is being played.

Neither do I especially advocate wet-cleaning new or secondhand LPs. Only in rare cases where they seem very dirty, or produce a lot of crackle when I start playing them I do give them a wash. I have an effective if low-tech method for this. I lay the LP flat on a fresh sheet of cooking foil then use a clean washing-up sponge to wipe around the disc with lukewarm water to which I've added a tiny drop of washing liquid. I do this for a while, then do the other side. I then rinse the LP under the tap, and leave it to dry for a few hours.

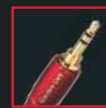
Yes I know that this is horribly less than clinical. No gloves or facemask. No de-ionised water or expensive liquids. But it seems to work fine! I'm fortunate to live in a soft water area, so perhaps distilled water might be a safer bet otherwise. Finally, I try to avoid getting the edges of the labels wet, but when they do they typically recover if carefully air-dried.



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Philips CD450 CD player

With the launch of the CD450 in 1986, Philips joined the Japanese and equipped its full-size CD players with 16-bit processing. How does the CD450 measure up today? Review: **Tim Jarman** Lab: **Paul Miller**

During CD's formative years, different ideas on the optimum method of playback had become established in Europe and Japan. The European approach was to use a 14-bit DAC for each channel, a digital filter and fourfold oversampling. This arrangement simplified the design of the analogue sections of the machine.

By contrast, early Japanese players typically had no digital filter or oversampling and used a single 16-bit DAC that was timeshared between the left and right channels. This was followed by an often elaborate analogue filter.

It was clear these two methods would have to converge eventually, Europe moving towards full 16-bit processing and Japan adopting oversampling. This, of course, is exactly what happened.

MASS APPEAL

We left the Philips story with the highly popular CD104 [see *HFN* Apr '14] released in 1984. Despite the fact that the company had cleaned up the styling of its players to the point where the CD104 now looked like a smaller, prettier Sony CDP-101 [*HFN* Jan '12], the internal architecture used had hardly changed since the days of Philips' first ever CD player, the CD100 [*HFN* Oct '11]. This meant 14-bit processing with lumps of die-cast aluminium holding everything together. If CD players were to appeal to everyday consumers as well as to audiophiles, things had to change.

Philips' next move was therefore to produce a version of the CD104



ABOVE: A launch picture of the CD450, first of the 'New Generation' 16-bit players from Philips. Impressive though the technology was, the machines were not as heavily built as their predecessors

engineered so as to bring down its cost. The result was the CD150. This retained the 14-bit DAC arrangement with its 4x oversampling filter but introduced a simpler all-digital servo system and the new CDM2 mechanism, which used a glass-filled polymer rather than aluminium to form the bulk of its structure.

The circuit of the whole player could now easily fit onto two small printed circuit boards (one integral with the CDM2), which could in turn be mounted into a chassis formed by a single plastic moulding. Selling in the UK for just £230, the CD150

helped put the CD format on the map. Then, a year later, the 'New Generation' of 16-bit/4x oversampling players arrived. Philips had already released a portable, the CD10, which used 16-bit Sony decoder, but 1986 saw the company bring 16-bit processing to its full-size players with the introduction of the CD650 and CD450.

NEW CHIPS

Unlike the CD10 portable, both full-sized machines were full in-house jobs based on new chips designed and made by Philips. Most notable of these was the DAC, the still highly regarded TDA1541. This saw two high performance 16-bit DACs combined in one package no larger than a single DAC of the previous generation – a major engineering achievement in itself.

Aside from the colour of the fascia and a few minor pieces of trim, the CD150 and CD450 looked almost identical and during 1986 would be sold alongside each other,



PHILIPS CD160 Midi Sized CD player, front loading, programmable to 20 tracks. Reproduces the sound as it was recorded, quickly finds the next track you want to hear, perfect sound, latest technology all at a very competitive price.
PRICE: £179.95.

INSTANT CREDIT AVAILABLE. DEPOSIT £18.00. MONTHLY PAYMENT £8.00. APR 32.9% VARIABLE. ASK FOR WRITTEN DETAILS.



PHILIPS CD450 Midi Sized Remote Controlled CD Player. Fully programmable, infra red remote control, signal to noise ratio 100 dB. This system is compatible with most hi-fi systems.
PRICE: £274.95.

INSTANT CREDIT AVAILABLE. DEPOSIT £27.50. MONTHLY PAYMENT £11.00. APR 32.9% VARIABLE. ASK FOR WRITTEN DETAILS.

LEFT: Dealer's brochure shows the CD450 and CD160. Remote control and fascia styling aside, the two models were pretty much identical yet the CD450 cost around a third more!



although at around £275 the CD450 was quite a bit more expensive.

Inside, too, it would take a sharp eye to spot the revised CDM2 transport (the servo sections had been moved back to the main board) and the single 16-bit TDA1541 DAC that now took the place of the previous twin 14-bit TDA1540s. In fact, more marketing effort was paid to the fact that remote control was now a standard feature – it had been an optional extra requiring an external unit in the case of the CD150.

The CD650 was the top model and featured a hinge-down panel with a numerical keypad inside for rapid programming. It also offered two sets of outputs. One was identical to that of the CD450 while the other saw the signal processed by extra analogue filters mounted on a separate PCB. This layout would become popular as Philips started to sell the 16-bit/4x package of CDM drive, electronics and chassis to other manufacturers. Soon these components

could be found everywhere, from basic Saisho players in Dixons to B&O's upmarket 9000 series CD music centres.

SWEET-SPOT

At the same time, the Japanese quietly fitted the 16-bit TDA1541 DACs into some of their very best machines, an example being the Sony CDP-555ESD while Marantz produced a CD450 derivative, the CD-273. 'Special Edition' versions of this model

came with higher specification electrolytic capacitors in some key circuit positions, but while this was warmly received at the time, as the years passed sound quality was found to deteriorate considerably

due to the operating conditions in which some of these new components were asked to work. Reversion to Philips specification is the most obvious cure.

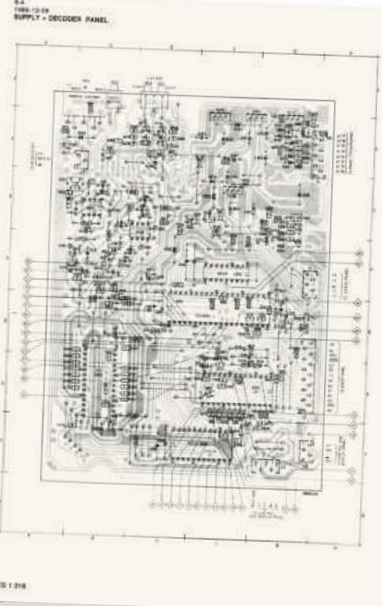
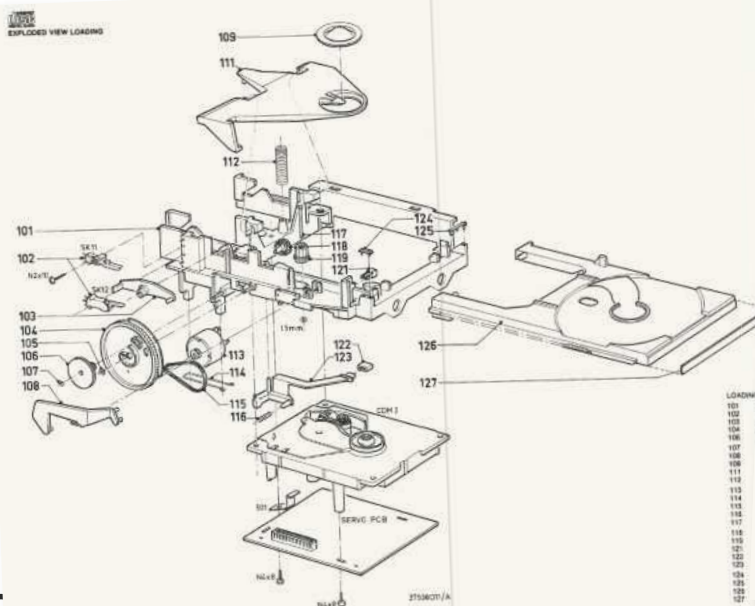
To begin with Philips kept quiet about exactly what made the New Generation models special, but this all changed in 1987 with the arrival of the CD160, the

ABOVE: Still gleaming after all these years, our test CD450 has led a charmed life. The high gloss plastics on the front panel always looked good when new, but easily became marked

replacement for the CD150 and, in simple terms, a re-styled CD450 with the remote control receiver removed. This player came with the words '16 Bit – Fourfold Oversampling' emblazoned across its front panel in a large, garish font. In fact, 16-bit/4x turned out to be a sweet-spot as far as CD was concerned, further advances featuring 8x oversampling, 18 and 20-bit DACs failing to catch the interest of regular consumers. Europe and Japan aligned and produced 16-bit/4x players of various designs in huge quantities; this was an era in which the design of CD players reached the point of international consensus.

If, like me, you are a long term CD104 user, your first encounter with a CD450 is likely to be a disappointing one. The CD104 is a solid machine which is most definitely a two-handed lift. The CD450, despite being almost exactly the same size, can be picked up with one hand and easily held in the palm at arms length, so

'It is the player's sharp sense of focus which is its real strength'



LEFT: Service sheet extracts for the CD450. Note the relatively small number of parts in the mechanical assembly – far fewer than were necessary previously. Also visible at the bottom of this exploded view is the CDM2 optical/mechanical block, an integrated high precision unit that was normally replaced complete, if faulty

VINTAGE HI-FI

RIGHT: The CD450's internal layout is simple and uncluttered compared to that of previous Philips' models. The TDA1541 DAC is just visible beneath the red upturned PCB in the centre

lightweight is its construction. There is no correlation between mass and sound quality, of course, but it is difficult not to make prejudgements. The high gloss finishes and polished metal trims help enliven things, but the creaky plastic buttons used do little to boost first impressions favourably.

On the other hand, the remote control unit is a weighty thing, if a bit oddly proportioned. The weight comes from its unusual construction where standard-sized components are fixed directly to the steel back plate with only a gossamer film of insulating material in between.

TIM LISTENS

Unlike the CD104, the CD450 uses detachable cables for both signals and power so out came my Chord Calypso interconnects and a carefully chosen figure-of-eight mains lead – not all types will fit since the socket is deeply recessed. As well as analogue outputs, the CD450 also offers a standard S/PDIF digital output, but this was intended for data storage and video purposes rather than for use with external audio DACs. It *will* work with them, but with a TDA1541 on board why bother? The rest of the system comprised a Cyrus 6A amp and Monitor Audio PL100 loudspeakers.

Those expecting the CD450 to sound luxurious, romantic and vinyl-like in the

manner of the older 14-bit machines will be in for a surprise. The CD450 is tight and dry, having a lean bass and prominent treble. Percussion retains the familiar

Philips character, sounding highly polished yet slightly diffuse. This is a good compromise and for me preferable to the harsh metallic clang delivered by some early Japanese models.

This effect was easily demonstrated using Dire Straits' 'So Far Away', the opening track to the band's *Brothers In Arms* album [Vertigo 824499-20] whose first few bars have only ever

sounded convincing to my ears when reproduced by a Philips player of the pre-Bitstream era.

Of course, the bass guitar lines on this track lack the warmth that a CD104 would give them, but this can be mitigated in part by loudspeaker choice, or by moving the speakers you already own closer to the rear wall to increase bass reinforcement.

Still, with the bottom end kept so well in check, it's easy to appreciate how well this player images.

REAL STRENGTH

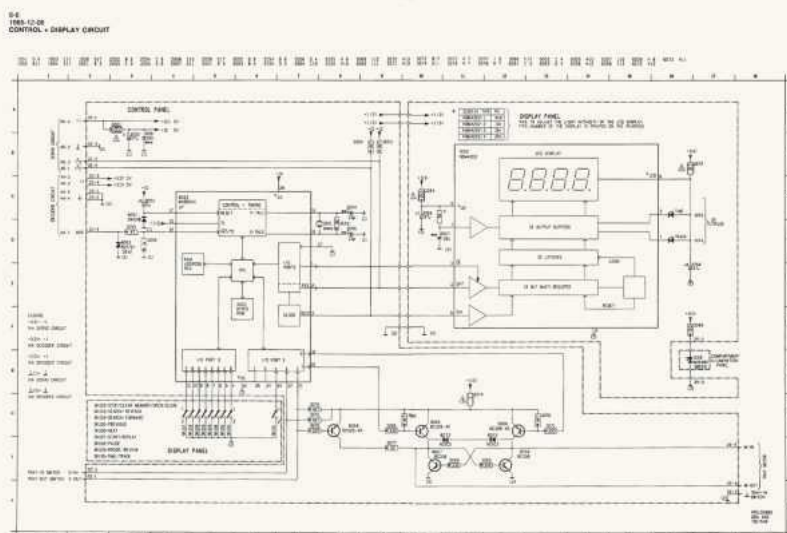
Soundstaging has a solidity with a range of musical styles and at all times a sharp sense of focus is retained. Indeed, this is the CD450's real strength. It was a pleasurable distraction to allow my mind's eye to wander around the performers of Svendsen's *Romance* in G major, with the solo violin solidly placed at pinpoint centre and the rest of the instruments arching behind. Repeated listening, concentrating on a different sound each time, proved to be an education.

It is just such a shame, then, that the player's overall tonality is a little bleak. It's a great machine for transcribing CDs to cassette and for musical study but when it comes to pure entertainment and long, indulgent listening sessions I can think of others I would prefer. My observations in this area are mirrored ➞

LEFT: The circuit for the display unit, which is a sealed assembly and cannot be repaired. Most Philips machines of this generation now have a segment or two missing from the track time



'Its honesty elevates it to the highest rank of hi-fi equipment'



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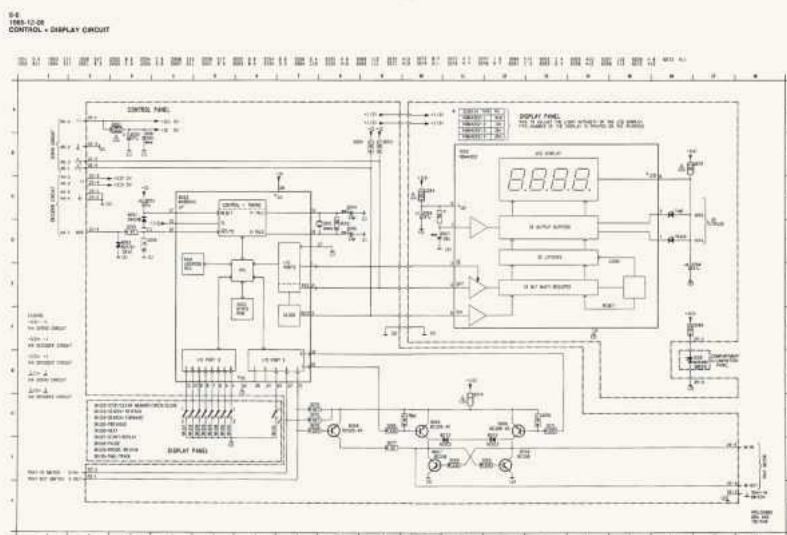
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VINTAGE HI-FI

LAB REPORT

PHILIPS CD450 (Vintage)



ABOVE: The rear panel, showing the analogue and S/PDIF outputs. The DIN socket is for a remote control receiver, though the player comes with one already built in

by some contemporary reviews, which deemed the early 16-bit Philips players to be a bit sterile and clinical-sounding in character. This may be true (or simply an artefact of the comparisons between the new models and the old 14-bit ones, or vinyl) but there is still a charm to perceived accuracy and detail, which the CD450 gets across.

If years from now I was asked the question 'what did CDs really sound like?' then I would pick a machine like the CD450 for my demonstration because its presentation is so honest. That, in a curious way, elevates the player to the highest rank of hi-fi equipment: the 'reference'.

BUYING SECONDHAND

The CD450 is based on a technical package that was ubiquitous in the late 1980s, so its habits are very well known. The CDM2 laser unit is not as durable as the earlier CDM0 and CDM1, so failed units are frequently encountered, evidenced by a wildly spinning disc followed by an error indication on the display.

In some instances these symptoms can be caused by a defective capacitor in the control circuit for the laser. This capacitor is easy to spot due to it having the odd value of 33µF and it's well worth replacing it with a 47µF, Matsushita M type to see if this fixes the issue before the machine is sidelined. From experience, about a third of defective CDM2 units can be recovered this way.

The rest of the machine is essentially reliable bar cracked

soldering around the voltage regulators and the sockets at the back. The PCB is double-sided but the 'through connection' faults, which dogged the CD104, are not present in this design.

The belt that powers the drawer becomes slack with age and makes for a stubborn mechanism, but replacement is easy since the clever design of the chassis means the whole machine can be stripped to its component parts in minutes.

A minor 'nuisance' fault is that segments of the display seem to fail with age, this is almost universal but difficult to do anything about since parts of the driving circuit are integral with the display unit.

The standard DAC fitment is the original TDA1541, but there is no reason not to experiment with the more exotic grades of this device (the TDA1541A, S1, S2, etc) if the fancy takes you as they all fit straight in with no further modifications needed. Be aware, though, that the TDA1541A R1 version has a lower ('relaxed') specification and so would not represent an improvement and that a TDA1541A S1 or S2 will certainly cost a lot more than even the best complete CD450! ☹

HI-FI NEWS VERDICT

While it may be a relative lightweight in terms of build quality and its sound may not be as rich as that of the early 14-bit/4x oversampling CD players, the CD450 is a historically important machine, second only to Philips' own inaugural CD100. For those who enjoy a taut, lean sound, the player has much to recommend it, while its sheer transparency means it can be considered a reference machine.

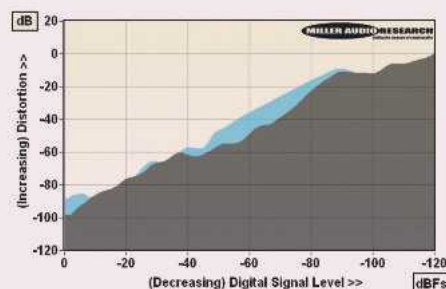
Sound Quality: 75%



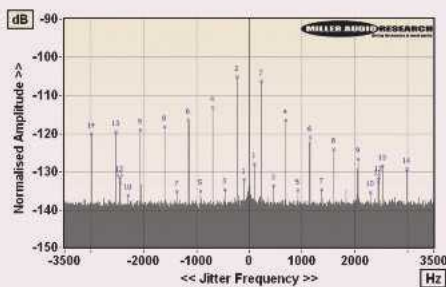
ABOVE: The unusually styled but sturdy and weighty remote control handset

Comparisons with Philips' 4x oversampled 14-bit players, the CD100 [HFN Oct '11], CD104 [HFN Apr '14] and CD303 [HFN Nov '13] are very interesting, because the CD450 featured here is the first exponent of the company's next-generation 16-bit/4x architecture. The SAA7220 oversampling filter offers a slightly poorer 40dB rejection of stopband images than the 51.6dB enjoyed by those earlier players but its suppression of higher-order sampling artefacts is superior. Furthermore, the SAA7220 is a higher-tap filter and the passband response ripple is markedly reduced – down from ±0.25dB to just ±0.03dB. By modern standards this is still a high figure, but in 1986 was state-of-the-art for 4x oversampling at a 16-bit wordlength! The extra 2-bits also garner a wider S/N ratio, even if the CD450's 108dB does not offer the theoretical 12-13dB uplift over the 104dB enjoyed by those inaugural 14-bit players.

We'll have to wait to test some other first-generation 16-bit/4x players but it looks as if they were no more linear than their 14-bit/4x cousins, the errors at -90dB and -100dB of a similar (3dB) magnitude but negative rather than the compressive (positive error) values returned by the CD104/303. Similarly, our distortion versus digital level trends [see Graph 1, below] clearly illustrate that the SAA7220/TDA1541 chipset still also lacks the uniformity of modern DAC solutions while its data-related jitter is modestly high at 350psec [Graph 2]. The 'spot' distortion values look impressive though with 0.0009% at 1kHz/0dBfs and 0.003% at 20kHz/0dBfs. Readers may compare the QC Suite test report for Philips' CD450 with our samples of the CD100, CD104 and CD303 by navigating to www.hifinews.co.uk and clicking on the red 'Download' button. PM



ABOVE: THD versus digital level over a 120dB range (dithered 16-bit data; 1kHz, black and 20kHz, blue)



ABOVE: High resolution jitter spectrum showing sidebands and digital noise (16-bit/44.1kHz data)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	2.01Vrms at 195ohm
A-wtd S/N ratio	107.8dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.0009% / 0.0020%
Distortion & Noise (20kHz, 0dBfs/-30dBfs)	0.0028% / 0.055%
Frequency response (20Hz-20kHz)	+0.03dB to -0.03dB
Digital jitter	350psec
Resolution @ -90dB/-100dB	-3.3dB / -2.3dB
Power consumption	12W
Dimensions (WHD)	320x86x300mm

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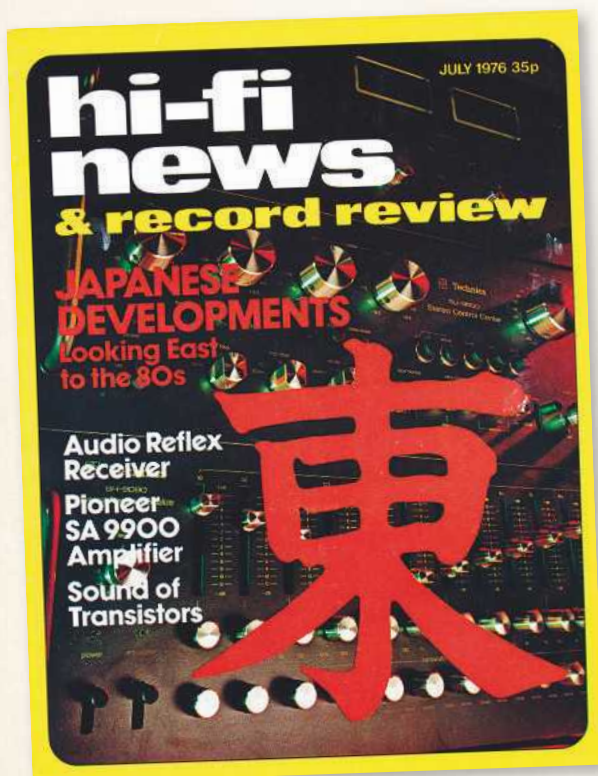
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Japanese developments: Looking East to the '80s

Adrian Hope returns from Japan with a warning for the UK hi-fi industry



BELOW: The Matsushita Electrical Industrial Co Ltd HQ, in Kadoma, Osaka, Japan

Hi-Fi News July 1976

Each month **HFN** will bring you an article from our vast archive of features and reviews from yesteryear

Japanese-sponsored trips are legendary among journalists, not only for the lavish hospitality and attention to detail shown by the organising host company, but also for the bottomless pit of new things to write about and bore friends with back home.

To clear confusion, Matsushita Electrical Industrial Co Ltd, based mainly in the Osaka area of Japan, produces a wide range of products, including Technics upper price range hi-fi gear. The 1976 Technics seminar, which brought journalists from all over Europe, was ostensibly motivated by Matsushita's wish to spread the already well established Technics gospel even further throughout the Western world.

It was also, without doubt, intended to gather potentially valuable views and comments as a guide to further development.

On a more specific level, it coincided, doubtless not by

coincidence, with the launch in Japan of the new Elcaset. When Philips launched the compact cassette on the continent in October 1963 and in the UK in February 1964 it was intended only as a convenient dictation medium. Subsequently it was found that even quite cheap recorders could produce reasonable quality live recordings, and the rest is history.

ENTHUSIASTS' DREAM

Yet all along, hi-fi enthusiasts have dreamed of a modified version of the Philips cassette, which houses 6.35mm (1/4in) tape instead of 3.81mm cassette tape and which does not itself comprise the pressure pad for guiding the tape against the machine playback and record heads.

It has also been argued that the tape playing speed of 4.8cm per second (1 7/8in per second) should ideally be doubled.

Two years ago BASF launched the Unisetette, which fitted the bill in all respects, and although no US manufacturers have shown interest in producing the necessary

hardware, at least two European firms (including Studer) have shown active interest in producing professional machines. Now comes the Elcaset, which in tape width, speed and overall appearance, matches the Unisetette.

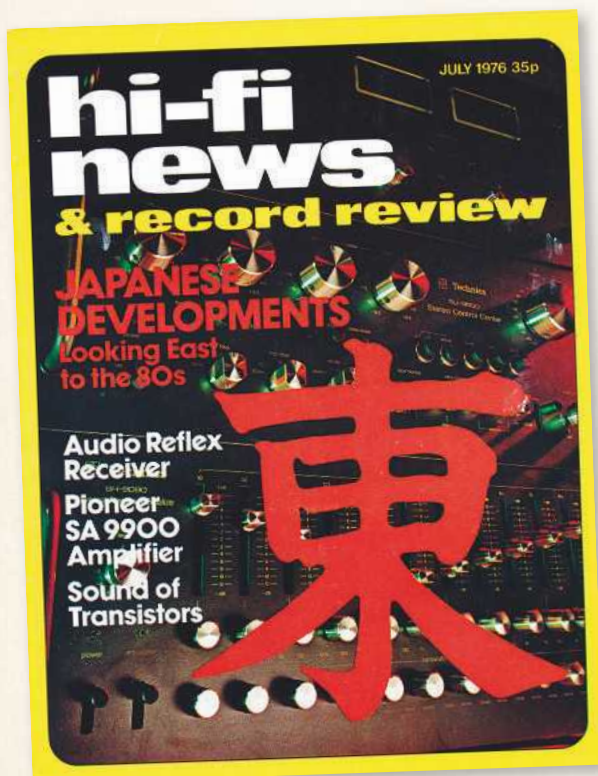
Like the Unisetette, the Elcaset plays no part in guiding the tape round the machine heads, protective flaps on the Elcaset front hingeing away (somewhat in the manner of a videocassette) when it is loaded into a machine for automatic lacing. But unlike the Unisetette, the Elcaset system is predominantly domestically orientated and has provision for a cue track in association with each of the two stereo pairs.

The cue tracks are narrow and intended only to carry pulse tones which can be used to control the player machine operation, for instance for auto-searching.

The Elcaset was jointly developed by Matsushita, Sony and Teac with the Aiwa and Victor companies of Japan pledging to adopt the standard. The launch was widely

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and generally enthusiastically reported in the Japanese press, and at a round table discussion with Tokyo dealers organised by Matsushita guarded interest was shown. A demonstration proved that the self-searching facility can work well, the machine's fast rewind and fast forward functions being readily controlled by the cue pulses to select and play specific pre-cued passages from a pre-recorded tape.

Although the audio quality at the demonstration was not impressive, this was almost certainly a problem with the individual prototype rather than an indication of any inadequacy in the system as a whole. More important, the Elcaset launch confuses the current standard situation by providing not only an alternative to the Philips compact cassette but also a rival for the BASF Unisette. Reading between the lines, it seems likely that the Japanese were largely unaware of the Unisette's existence.

SUPER CASSETTE DECK

It was in some respects ironic that the Elcaset should be launched shortly after a demonstration of the new Technics compact cassette deck, the RS-9900US. This super-quality deck (not yet available in the UK) comes in two rack-mounted halves, with battleship grey finish matching the other new Technics top-end equipment: the ST-9600 tuner, SU-9600 amplifier control unit, SE-9600 power amp and SH-9090 graphic equaliser.

The cassette deck, which proved itself in an AB demonstration to be capable of indistinguishably matching a high quality disc source,

has a wide range of user-accessible pre-sets, whereby in accordance with modern thinking its bias, record equalisation and Dolby level can all be matched to whatever particular tape-type is used with the machine.

The tape drive mechanism and the preamplifier control circuitry are housed in separate rack-mounted units, the meters are peak reading and the performance figures on paper would shame many high quality open reel machines.

In some respects one senses technological overkill, the tape indicator working by sensing the back-EMF on the take-off spool!

The price of the RS-9900US is likely to be slightly above that of the Nakamichi 1000, and there is no point in starting a queue at your local shop till early next year.

Technics' top-end tuner has similarly mind-boggling specifications on paper with circuitry sophistication including an eight-gang tuning capacitor. Particularly interesting (and potentially controversial) is the facility for direct off-air broadcast-to-tape recording with bypass of the de-emphasis circuitry, so that the received FM radio signal is sent direct to tape with the HF pre-emphasis still intact. The signal is then de-emphasised on playback, with obviously greatly reduced tape hiss.

Apart from the question of whether we need yet another 'standard' recording

LEFT: Sony stereo Elcaset machine. The format was jointly developed by Panasonic, Sony and Teac and promised the performance of reel-to-reel tape with the convenience of compact cassette by using larger cassettes housing 1/4in tape

ABOVE RIGHT: Original ad for Sony Elcaset deck showing the difference in size between the new format and a traditional compact cassette

BELOW: A prototype Elcaset as shown to HFN journalist Adrian Hope on his visit to the Technics Seminar in 1976 along with a standard Sony C60 compact cassette

All sounds are created equal. But all sound recorders are not.



format, many machines and tapes may well have problems handling the extra HF content loaded onto them in this way. A demonstration compared a master-tape with an off-air recording of a broadcast of the tape made using a reel-to-reel machine and the Technics tuner. The assembled crowd preferred the transmission recording to the original master tape, apparently because of reduced hiss on the transmission recording.

QUESTIONABLE TEST

Realistically, however, this test must surely be regarded as questionable because the bandwidth available for FM transmission is less than that available from the master tape, and transmission thus acts as a band pass filter on the master tape; hence more HF noise will be audible from direct reproduction of a master tape than from a recorded transmission of that tape, irrespective of the recording technique adopted.

The tuner also has a built-in pink noise generator which derives

pink noise by filtering the white noise available from tuning between FM stations without muting.

The graphic equaliser (mono only, so a pair is needed for stereo use) is intended mainly to compensate for room acoustics and to doctor inadequate



FROM THE VAULT

recordings in studio fashion. The frequency spectrum is divided into 12 bands controlled by sliders, providing up to 12dB of cut or 12dB of lift on each band. Also, each band control can have its centre frequency shifted by an octave either way, and its Q varied to sharpen or blunt its response.

The combined use of all these features enables unwanted frequencies to be taken out very tightly or whole ranges to be bluntly attenuated or boosted, even where the frequency to be handled does not fall directly in the centre of the 12 main control bands. As one enthusiastic Technics engineer demonstrated, anyone so inclined can spend many happy hours feeding pink noise from the tuner through the equaliser and jiggling the controls to produce thunder, rainfall or steam-train effects to his heart's delight.

TURNTABLE CHIPS

On the gramophone front, Technics has now produced a single-chip IC for its SL range of direct-drive turntables. A bipolar linear IC of 3x2.7mm size contains the equivalent of 321 individual components, including 200 transistors, among them the power semiconductors which cope with the substantial drain which arises as the turntable starts rotation.

The SP-10 MkII direct-drive turntable is intended mainly for professional use and uses a quartz-controlled phase lock servo motor drive to stabilise its three switchable speeds to within $\pm 0.002\%$. It has the quite remarkable starting torque of



ABOVE: Technics' ST-9600 AM/FM tuner boasted an eight-gang tuning capacitor and, controversial at the time, allowed off-air broadcast-to-tape recording that could bypass the internal de-emphasis circuitry

BELOW LEFT: Ad for the Technics RS-9900US cassette deck trumpeting the fact that the tape drive mechanism and preamp control circuitry are housed in separate units

BELOW RIGHT: Controls on the RS-9900US allowed bias, record equalisation and Dolby level to be matched to the tape-type being used 'in accordance with modern thinking'

6kg/cm, which can bring the platter up to 33.3rpm within a quarter of a second. When switched between speeds during rotation, the new speed is obtained within a similar period of time.

The other effect of providing such massive starting torque is to make the platter virtually immune to any mechanical obstruction or interference encountered during normal use. For instance, a stylus pressure of 1kg would not affect the speed; put another way, 500 tonearms, each with a 2g tracking force, could be used simultaneously without affecting the speed.

The SP-10 circuitry is so far only partially integrated, but clearly the next step will be full-scale integration of its three large printed circuit boards.

We were continually asked our opinion of linear phase techniques in general, and the Technics SB linear phase range in particular. Clearly an immense amount of research and development effort is being devoted to the task of cracking the European loudspeaker market. Anechoic and echoic chambers are used, along with computer analysis of speaker

performance, phase, and frequency characteristics of the human ear.

A complicated live-vs-recorded test was laid on, with a range of different loudspeakers behind a gauze curtain and an engineer playing a tambourine, both live and on tape. The assembled audience was provided with push-button hand units linked to a computer which could instantly evaluate our overall reaction to any particular sound source. Unfortunately the test was so complicated – or the European audience so dim (or both) – that we defeated the computer and no result was forthcoming.

TWINGE OF TERROR

A demonstration in another room of a new electret tweeter, although hurried, suggested that these units can produce exceptionally clean HF response even at high levels. All this should add up to a twinge of terror for European loudspeaker manufacturers, who so far

have felt secure, even smugly complacent, in the knowledge that mass-produced competition from the East is inferior and no serious threat. But it can only now be a question of time before one, and then most, large Japanese manufacturers find the secret of manufacturing loudspeakers to suit Western ears, and it could then be partial curtains for the European speaker industry.

Japanese production statistics are as mind-boggling as some of the performance traces for the equipment that rolls off the production line. In Matsushita alone, there are six tape recorder factories, producing 500,000 sets per month, of which 70% are exported. Production lines for the

'It could then be partial curtains for the European speaker industry'



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FROM THE VAULT

Universal tonearm for the SL range currently disgorge 50,000 arms per month, but by the time this article appears in print will be producing double that figure. Perhaps the most sobering thought is that here, at a time when the rest of the world is slowing down, is a factory that is speeding up production.

QUALITY CONTROL

Although each worker works at his or her individual speed, there is no room for fumbling or idle fingers, because they would inevitably slow down the whole production line. With all this obsession for speed of production, one would imagine that quality control would suffer, yet there is as great, if not a greater, obsession with quality control as there is for production speed.

There are weekly meetings of groups from each production line to discuss quality control, with thorough checking of each item rolling off the line and even more extensive checking of a 10% sample, for instance. Although the wiring of each tonearm will be checked for phase and left-right identity, a few units will be soak-tested in soundproof booths for a hundred hours, rattled, shaken, dropped, frozen and brutally overheated.

Even the few production lines shown us not only speak volumes about the likely future of the UK audio industry, but sum up differences in attitudes, both at management and shop floor level, between the two countries.

It is hard to imagine any British manufacturer currently taking the risk of gearing up to increase production by such an extent in the current economic climate, and it is equally hard to imagine any British worker on the shop floor submitting to such a workload.



Technics clearly has no intention of sitting back on any current laurels and relaxing. There is, for instance, a definite ambition in the loudspeaker department to produce a mounted unit that will accurately transduce a square wave electrical signal into square wave sound. It may sound impossible, it may sound pointless, but I, for one, am left with the conviction that if that is what the aim is, it will be achieved.

PERPETUAL WARNING

Perhaps that, best of all, sums up the attitude, not just of Matsushita, but of Japanese industry as a whole. If a problem presents itself to be solved then, one way or the other, it will be solved. As one engineer told me when I commented on the extraordinary speed and zeal with which the flat-pay-rate production line worked, 'We have no natural resources other than industry'.

If any manufacturer in the UK has hopes of retaining, or perhaps regaining, success in the audio market place, they would be well advised to bear that comment in mind, as a perpetual warning. ☺

ABOVE: Pages from the July 1976 issue of *Hi-Fi News* carrying Adrian Hope's account of his visit to the Technics facilities in Japan

BELOW: A Technics SP-10 MkII [see *HFN*, Nov '10]. Unlike the MkI deck, which had a built-in power supply, the MkII has an off-board speed control and power supply connected to the deck via a four-pin XLR-style cable. The arm is an Audio-Technica AT1503/II



Also in *HFN* this month in 1976

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HFN reports from Hi-Fi '76.

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Audio Engineer James Moir takes an objective look at how transistors perform.

THE SHAPE OF AMPLIFIERS TO COME: PART 3

Electronics engineer and regular *HFN* contributor John Linsley-Hood concludes his series on amplifier design.

QUALITY MONITOR

HFN staff assess the last quarter's top recordings from the technical angle.

BAYREUTH TRIPLE SET

Charles Osborne listens critically to the three Wagner operas.

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Adrian Hope investigates.

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MUSIC ON RECORD

John Davis takes an in-depth look at the work of Spanish composer Manuel de Falla.

AUDIO REFLEX AGS-150 RECEIVER

Gordon J King hears this solid-state model made in Japan for Canadian brand AGS.

PIONEER SA-9900 AMPLIFIER

Hefty transistor integrated assessed by Gordon J King.

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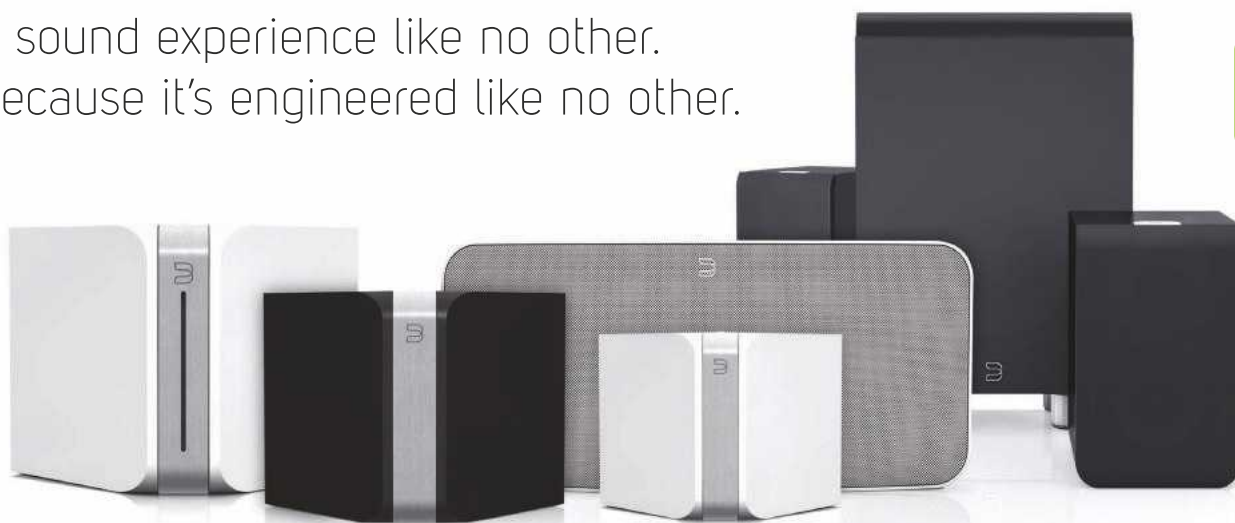
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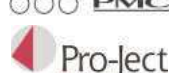
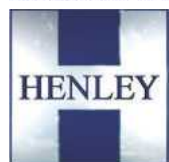
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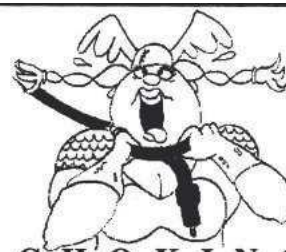
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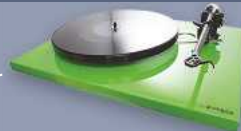


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LAST WORD

OFF THE LEASH!

KEN KESSLER TELLS IT LIKE IT IS...

Have speakers had their day? **Ken Kessler** thinks not, but it's curtains for mediocre headphones...



Yeah, I'm shocked, too: this *farbissener* is actually in an optimistic mood, glass half full, sun shining, yadayadayada. Why? Because I've just returned from Munich's High End 2014 [see p8], a show so buzzing and so joyous that I had a brief flash of *déjà vu*, wondering if I'd suddenly been transported back to 1989.

Undoubtedly, the show differed in so many ways from the '80s/early '90s heyday of hi-fi events that my discombobulation was brief. But the single most telling element was the presence of more headphones and headphone-related accessories than I can recall ever seeing, surpassing even the recent headphone-only halls of the Rocky Mountain Audio Fest and Paris' Festival Son & Image.

A DIFFERENT TAKE

Any previous observations about the headphone juggernaut must be revised because the trend isn't merely global, it also ignores age, gender, genre and price points. We are looking at a paradigm shift in the way society 'accesses' music, and full-sized loudspeakers could become the minority means of playback.

Although Munich was rich with new speakers, like KEF's Blade 2 and the revived Reference Series, a new Sonus

faber, Martin Logan's Neolith, a bunch of outrageous horns, Graham's BBC-approved monitor, an anniversary model from Diapason and countless others, there's a feeling of 'The Parade's Gone By'.

Just consider Carot One's Nik-58. This is an actual valve headphone amp with a lithium rechargeable battery and dimensions of a minuscule 82x55x20mm. It's at the opposite end of the spectrum that includes the sublime Hugo from Chord, as it has no

DAC nor a price tag of £1400, though its €699 cost places it firmly among the premium offerings. Truly pocketable and great-sounding, it's an audiophile delight for road warriors who

might find the Hugo too hefty.

For indoor usage, there's the McIntosh MHA100 headphone amp – more like a full-blown integrated [see p56] – complete with blue meters and a mate for the company's new headphones. And I fell for the Obravo headphone with Heil AMT driver like the old Jecklin Float. Even Stax was exhibiting again.

What's changed – despite the fact that Apple is about to blow \$3bn on Beats and appoint Dr Dre to its board – is that sound quality has become an issue, even though fashion still motivates the majority of newbies. Serious listening was a given, every headphone vendor setting up decent demos so visitors could get a taste of what quality

cans can offer. The implications are already manifesting themselves.

For instance: ear-buds, though present, have certainly been vanquished. There were plenty on show, but I got the impression that on-ear and over-ear types now dominate. A handful of new digital portable players were present, suggesting that the iPod is 'so last decade', while smartphones continue their ascent into hi-fi status. The current dominant brand – Astell & Kern – showed revised versions of its seriously audiophilic players in sleek new shells, with the kind of tech you'd normally associate with makers of £5000-plus DACs.

Should you have any concerns about a rise in portability, one should also note that the attitude demonstrated by the new wave of headphone advocates is not exclusionary in any sense that they're catering only to listeners on the go. Astell & Kern, for example, also showed classy docks, and its players can double as DACs or feed external DACs. More than one stand showed balanced headphones, with Musical Fidelity mooted the possibility. Planar headphones are on the ascent.

SOLUTION OF CHOICE

Should this worry traditionalists? Probably not: speakers won't die. I remember when I first got into hi-fi that my budget also included headphones because I was a teenager living at home and had to respect the privacy of others. For me, headphones were an alternative to not listening to music when my father was home. The paradigm shift? People now listen to headphones by choice, not just when they're on trains or planes, or in other situations when they mustn't disturb others.

It is this elevation of the headphone from domestic quarrel avoidance to preferred listening mode that has powered the growth in better headphones, headphone amps, combo DAC/amps, USB DACs and even upscale replacement cables.

Certainly, the traditional high-end user is a part of it. The backlash against mere adequate-sounding headphones advances inexorably. Dr Dre may be making most of the money at present, but he's got a challenge on his hands. ☺

'We are looking at a paradigm shift in the way society "accesses" music'

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