

hi-fi news

THE HOME OF REAL HI-FI

& Record Review

Exclusive

POWER TRIO



E.L.P.
BRAIN SALAD SURGERY

VINYL ICON

Musical magnates ready to rock

Levinson's No52
Two-box preamp with a twist



GROUP TEST

Portable USB DACs
Upgrade your music on the move



Budget Esoterica
Cambridge Audio 651C
'You can't go to Garrard now!'
Vintage restorers, p14

Audio Research CD6
CD player/DAC - but no tubes!
Rega RP8 turntable
Brit deck has us in a spin



• **PLUS** 18 pages of music reviews & features • **VINYL RE-RELEASE** Little Feat's *Sailin' Shoes* on 180g
• **OPINION** 11 pages of letters and comment • **VINTAGE REVIEW** Cambridge Audio CD1 from 1984
• **SHOW BLOG** We report from Bristol Sound & Vision • **READERS' CLASSIFIEDS** Hi-fi bargains galore

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MUSICAL FIDELITY

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NEODYMIUM DRIVE UNITS

RIGHT: Top-of-the-range planar magnetic headphones from Audeze prove their worth. See p58



ABOVE: Trickle-down technology from TAD's super high-end DACs takes root in its new TAD-DA1000 outboard USB converter. First review on p32



VINYL: ELP's *Brain Salad Surgery* is this month's Vinyl Icon (p72) while Steve Sutherland remembers his first days in the hot seat as Little Feat's *Sailin' Shoes* is reissued as a 180g LP (p70)

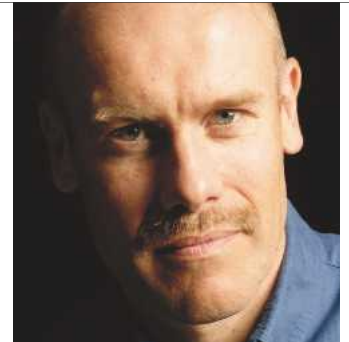
RIGHT: *Hi-Fi News & RR* is the exclusive UK representative of EISA's Audio and Home Theatre panels. Paul Miller is EISA's Audio and HT Panel Manager



Two significant trends are at work in today's audio world – increasing interest in high resolution music downloads matched by increasing sales of headphones, including high-end models from relative newcomers such as Audeze [see p58]. These two on-going events may seem symbiotic, but in fact they remain quite separate, the former driven by audiophiles wishing to access the raw digital masters beaten into shape by the recording studios, the latter a by-product of fashion – it's now 'cool' to wear large, over-ear headphones in public.

The trick, if we are ever to introduce a younger demographic to our wonderful world of high-end audio, is to expose the high quality headphone-wearing music lover to tracks rendered at rather greater than MP3 quality. And while we're at it, encouraging these budding mobile audiophiles to drive their headphones with something more capable than a mobile phone or laptop's built-in soundcard would be yet another step in the right direction.

Californian cable maven Audioquest kick-started this particular revolution with its original DragonFly USB DAC. We reviewed the latest (v1.2) version in our March issue but the



elegance of the concept remains undimmed. No bigger than a standard computer memory stick or 'pen drive', the hub-powered DragonFly plugs directly into the USB port of your MacBook or laptop, combining asynchronous audio streaming with a 96kHz DAC, onboard power supply smoothing, a custom headphone amp and variable output.

It's an instant upgrade for any portable computer device

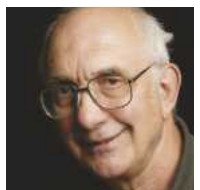
'It's now very "cool" to wear large, over-ear headphones in public'

equipped with a USB port and pre-loaded with hi-res music files. And it has inspired a host of similar hub and battery-powered USB DAC products (I hesitate to use the term 'imitators' as only Cambridge Audio is offering a product that's similarly demure).

If you've ever thought about stretching your hi-fi beyond the confines of the sofa, this month's Group Test is for you [see p39].

PAUL MILLER EDITOR

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



BARRY FOX
Investigative journalist supreme, Barry is the first with news of the latest developments in hi-fi and music technologies



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
Foremost collector and archivist of vintage hi-fi, famous for the UK's bi-annual Audio Jumble, John shares his experience with *HFN*



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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Midlands – Oxford Audio Consultants 01865 790879 / Midland Hifi Studio 01902 380083 / Art Audio Salon – 07878 566814.

South East - Guildford Audio 07979 515577 / Audio Venue W5 0208 567 8703 / Audio Venue Maidenhead 01628 633995 / Stereo Now 07870 192618.

Distributed by: Signature Audio Systems 07738 007776 ● www.psaudio.com

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ABOVE: For our Group Test of £100-£550 portable USB DACs, turn to page p39

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

PMC twenty.26

FLAGSHIP TWENTY-SERIES FLOORSTANDER WITH TRICKLE-DOWN FACT TECH

New from PMC and clearly inspired by its flagship fact series [see *HFN* Nov '13], the £5750 floorstanding twenty.26 is the first three-way speaker to be introduced into the well established twenty series. In common with the other models in this range the twenty.26 features the familiar sloping cabinet design which houses a refined version of the company's Advanced Transmission Line bass loading technology.

As the only three-way design in the twenty series, this floorstander is distinguished by its new 50mm soft dome midrange driver, married to PMC's existing treble unit and, here, the equally new 180mm bass driver with its low mass, natural-fibre cone. The midrange dome is inspired by research

conducted at the NPL (National Physical Laboratory) to develop the fact.12 mid unit and, PMC claims, features a similarly wide dispersion characteristic. The new bass driver has a cast alloy chassis and a 'power bulge' on the rear plate of the magnet assembly, allowing for greater linear travel of the voice coil and enabling good performance at high outputs.

The cabinet has 18-25mm thick Medite walls and extensive bracing, particularly at high-pressure areas on the top panel, to reduce cabinet induced coloration. The twenty.26 is available in oak, walnut, amarone and high gloss diamond black finishes and is rated at 86dB sensitivity.

PMC Ltd, 0870 4441044;
www.pmc-speakers.com



Cool running Krell

CLASS A KRELLS WITHOUT THE HEAT

Time was when 'Class A' automatically meant 'Krell' and now, some 34 years after those original power amps hit the high-end, the company has returned to its roots, albeit with a twist. Claiming to combine the 'musicality of Class A operation with vastly improved energy efficiency' its new 'iBias' amplifiers continuously monitor the power through their output transistors, instantly adjusting the standing current (or bias) to suit demands. This sliding bias technology minimises waste heat. The stereo range includes the 175W £7500 Krell Duo 175 and the 300W £9500 Duo 300 stereo power amp. Monoblocks are also available, comprising the £8750 Solo 375 and £11,250 Solo 575, rated at 375W and 575W.

Krell LLC, 0208 971 3909; www.krellonline.com, www.absolutesounds.com



HI-FI NEWS' NUGGETS

AN EVENING WITH DCS

On Sunday 13 April, dCS will host an open evening at London's prestigious Royal Academy of Music. Entitled 'An Evening with dCS and friends', the event will feature a wide range of tracks played on one of the world's very finest sound systems featuring the company's four-piece Vivaldi front end. The event begins at 6pm but only 100 places are available. Admission is free but tickets are allocated on a first-come, first-serve basis. To be one of the lucky 100 contact dCS at info@dcsLtd.co.uk

CHORD SIGNATURE

The Chord Company has launched a new version of its Signature speaker cable. Called Signature Reference, the new cable has been completely redesigned with 10AWG silver-plated OFC conductors, PTFE insulation, a braided shield and PVC outer jacket. Prices start at £600 for factory-terminated lengths of 1.5m or more. www.chord.co.uk

Signature hybrid

AESTHETIX ATLAS AMP IS REVAMPED



California-based Aesthetix's Atlas amplifier is now offered in 'Signature' guise with Peter Moncrief's StealthCaps for interstage coupling, increased PSU reservoir capacitance and low-inductance foil resistors in the output stage. The core design remains unchanged, the Atlas being a hybrid amplifier that incorporates a bipolar output stage (bridged), a bipolar driver stage and vacuum tube input gain stage. Rated at 200W/8ohm and 400W/4ohm the Atlas Stereo is priced £8000 while the new Signature version is offered at £10,000. Black and silver faceplates are available.

Aesthetix, 0800 043 6710 (Cool Gales), 0845 6019390 (Hi-Fi Sound); www.aesthetix.net

PS Audio embraces DSD

NEW DAC FEATURES CUSTOM DSD ENGINE

Designed from the ground-up to process all incoming digital inputs as a pure 1-bit DSD bitstream, PS Audio's new DirectStream DAC does not use any off-the-shelf converter ICs. Instead, digital inputs are upsampled and formatted into 56MHz DSD via a Xilinx Spartan 6 FPGA, the final DSD output at 5.6MHz prior to gentle analogue filtering. Price is £5250 and PS Audio will provide an upgrade path for all PerfectWave DAC MkI and MkII owners. **PS Audio Inc/Signature Audio Systems, 07738 007776; www.psaudio.com**



Quad goes wireless

NEW ALL-IN-ONE VENA SYSTEM ANNOUNCED BY QUAD

Available from May with an estimated price of £600, Quad's new Vena combines a 24-bit/192kHz DAC and Class D amp in a single chassis. Rated at 45W/8ohm, the Vena will be available in piano black, white and 'wood' finishes. Wireless Bluetooth connectivity is offered alongside a range of inputs and outputs. **IAG Ltd, 01480 447700; www.quad-hifi.co.uk**



Xtra carbon from Pro-Ject

'UK SPECIAL' VERSION OF XPRESSION CARBON TURNTABLE

No sooner had the ink dried on *Hi-Fi News'* review of the Pro-Ject Xpression Carbon turntable [Mar '14] than the importer, Henley

Designs, announced a 'UK exclusive' version. The Carbon UKX benefits from a new acrylic platter while retaining the pre-fitted Ortofon 2M Silver MM and one-piece carbon-fibre tonearm. The tonearm bearings and motor decoupling 'blobs' are 'hand-tuned' in this version. Price is still £575.

Pro-Ject AS, 01235 511166; www.project-audio.com; www.henleydesigns.co.uk



Acoustic Energy 1-Series

ACOUSTIC ENERGY EXPANDS INTO BUDGET SECTOR

With a design ethos and 'voicing' evidently inspired by the larger 3-Series range, Acoustic Energy's new 1-Series is aimed at enthusiasts with smaller listening rooms. All the 1-Series models feature AE's signature 110mm aluminium cone mid/bass driver, hard-anodised on both sides to create a stiff ceramic/aluminium sandwich. The £275 AE 101 standmount (pictured) marries this to a 28mm soft dome tweeter while the £550 floorstanding AE 103 has two bass/mid drivers in a 2.5-way configuration. Both designs are port/slot-loaded. **Acoustic Energy Ltd, 01235 511166; www.henleydesigns.co.uk**



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Upcoming Events

IMPORTANT DATES FOR YOUR HI-FI DIARY

- 10-13 APR** Hi-Fi & High End, Crocus Expo Centre, Moscow, Russia
- 15-18 MAY** High End Show, M.O.C, Munich, Germany; www.highendsociety.de
- 30-01 JUN** T.H.E. Show, Hilton Hotel, Newport Beach, CA, USA
- 05-10 SEP** IFA Berlin, The International Funkausstellung, Germany <http://b2c.ifa-berlin.de>
- 01-02 NOV** The Hi-Fi Show Live 2014, Beaumont Estate, Windsor; www.hifinews.co.uk/show

Bristol Hi-Fi Show 2014

Words & pictures: Paul Miller



As we've come to expect, the queues for what is now the UK's longest-running and most popular hi-fi show started very early on the Friday morning. So keen were many of the West Country's enthusiasts that the organisers even offered multi-day tickets for those wishing to return over the weekend. As ever, the Bristol Hi-Fi Show remains a vibrant meeting place for music-loving soulmates to audition some

very tasty equipment, browse racks of LPs and share in a choice of less tasty baguettes. Unlike some overseas shows we've reported on, many of the demos here were still driven by traditional physical media – CD and vinyl – although PC/Mac-based systems remained in the ascendant. As traditional brands rubbed shoulders with newbies, we celebrate the best that Bristol had to offer.

Flanked by a pair of white Spendor D7 floorstanders, this rack of Musical Fidelity components (a £2099 M6 CD, £3999 M8 PRE and £4499 M8 500) also has the new V90-BLU on show. Priced at just £199, this wireless aptX Bluetooth device offers a basic analogue output but also includes an S/PDIF out to facilitate upgrades with a top-end DAC. www.musicalfidelity.com



Painted steel cases (and a 600VA toroid inside the 120W Excalibur monoblocks) ensure these vdh separates are very weighty. Seen alongside the amps are the Grail SB phono stage (a coil-based RIAA network) and Emerald preamp. With no fascia controls, all are operated via IR remote. www.vandenhul.com

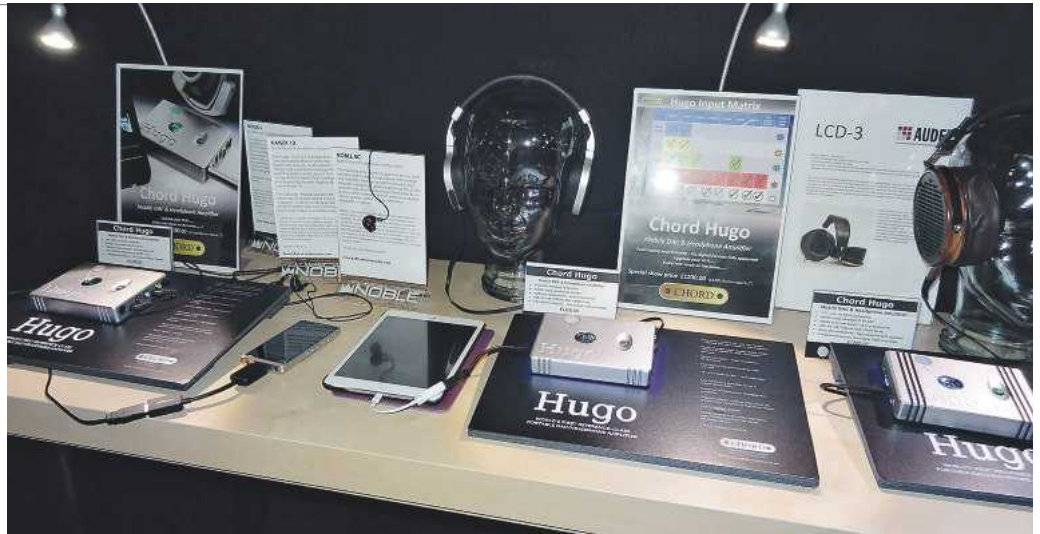


Dave Cawley of Timestep found that his refurbished Edison Cylinder player was often attracting more attention than his contemporary phono stages! With 2min cylinders being reissued by the Vulcan Cylinder Record Company, these Edison players are seeing a new lease of life. As part of the £100 service/refurb, Dave replaces the original leather drive belt with a synthetic O-ring to reduce wow and flutter. www.time-step.com



Inspired by 1960s contemporary design, Ruark Audio's R7 is a modern take on the classic radiogram. Priced at £2000 the R7 combines DAB/DAB+/FM/internet tuners, a slot-loading CD player and Bluetooth aptX decoding. A Class A/B amp, dual-concentric drivers and 8in 'sub' are built-in. www.ruarkaudio.com

Originally launched at CES 2014, Chord's palm-sized DAC and headphone preamp saw its UK outing at the Bristol show. The new £1200 Hugo offers five digital inputs including support for A2DP aptX Bluetooth, and provides both 3.5 (x2) and 6.35mm headphone outlets alongside a pair of RCA phonos. A USB 2.0 port handles 24-bit/384kHz DXD and DSD128 music files. The coaxial S/PDIF input is also good to 24-bit/384kHz thanks to the FPGA-based DAC technology developed for Chord by Robert Watts. www.chordelectronics.co.uk



This forest of Focals includes the £2798 Aria 948 (far right) in walnut, the Aria 936 (£2198 in walnut or £2498 in black), and the £899 Aria 906 standmount with its £199 pillar stand. The Aria range's bass/mid units have a glass fibre/flax sandwich cone material. Flax combines low mass and elasticity making it an ideal choice for this application. Coincidentally, France is the largest producer of flax in Europe! www.focal.com

Two flavours of the Lyric all-in-one streaming music player were demo'd on the Cyrus stand. It supports wired and wireless network streaming, Bluetooth connectivity, includes a CD drive and options for FM, DAB+ and internet radio. It's available as the £2250 Lyric 05 (80W with 24-bit/192kHz DAC) and £3000 Lyric 09 (170W and 32-bit DAC). www.cyrusaudio.com



One of the most welcome surprises of the show was the re-emergence of Nytech Audio – a real blast from the past! Seen to the right are the new CP132 'control centre' with four single-ended inputs and outboard PSU and (below) a pair of CPA401 monoblock power amplifiers. Rated at 45W/8ohm, they were sounding impressive with ARC speakers. www.nytechaudio.com



Here's Siemen Algra proudly displaying Primare's new 60-series with its two-tone styling. Top of the pile is the PRE60, a preamp with onboard DAC and streaming facilities and evidently based on a blend of the old P32 and DAC30 components with plenty of fine-tuning. The A60 power amp, beneath, is a fully balanced design rated at 2x250W/8ohm. Prices are €7500 each. www.primare.net





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Hi-Fi World, July 2013



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www.kef.com/LS50

KEF
INNOVATORS IN SOUND

Janszen's experience in the design and engineering of electrostatic loudspeakers stretches back 60 years. All this is reflected in the zA2.1 – a hybrid comprising two woofers and a 'static panel. Prices start at £12,695 in ash finish up to £13,695 for a black cherry version with 'airLayer' tweeter. www.soundsetup.co.uk



Illustrative of Tannoy's extensive GR (Gold Reference) range, this Kensington floorstander with its 10in dual concentric driver was effortlessly making music, in tandem with a stack of Rega electronics. Rated at a high 93dB sensitivity, the Kensington GR costs £9950. www.tannoy.com



The room may have been decked out in monochrome but the sound of Heed's £1300 Obelisk *dt* CD transport and £1500 *da* DAC with £1350 Obelisk *pre* (plus £880 *px* supply) and *pm* monoblocks was very colourful indeed. Seen here with Heed's Enigma 5 speakers. www.heedaudio.co.uk

German brand BMC Audio made a confident presentation with this combination of its BDCD1.1 belt-driven CD player, DAC1 preamp/USB DAC and pair of CS2 power amplifiers. There's a lot of proprietary technology in BMC's amplifiers, including its LEF (Load-Effect Free) concept that claims to avoid distortion rather than compensate for it. www.colabudio.com



I had seen Antelope Audio's Zodiac Platinum DSD DAC with its 2nd-generation Voltikus outboard PSU before, but not with the new 10M atomic (rubidium) clock. This is a 10MHz reference generator that can be paired directly with Antelope's DAC and is claimed to offer an accuracy of 0.03ppb (parts per billion)! www.antelopeaudio.com



Keith Tonge and Pete Thomas are seen here proudly unveiling the pinnacle of PMC's twenty series – the £5750 twenty.26. It's all-new except for the 25mm soft dome tweeter co-engineered with SEAS. The new 50mm vented/chambered mid dome crosses over at 380Hz to an equally fresh 180mm treated-pulp woofer. www.pmc-speakers.com





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BS 403



FS 407



FS 507



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Here's Kevin Kelly, MD of Atlas Cables, wielding a set of single-ended and balanced Asimi Ultra silver interconnects. Available at £2750 per terminated metre (XLR or RCA), the Asimi Ultra employs solid silver signal conductors, manufactured using the highest-quality technique for drawing pure silver (Ohno Continuous Casting or OCC). Symmetrical drain wires plus a foil and screen promise excellent RFI/EMI rejection characteristics. www.atlascables.com



The Cabasse Baltic can be mounted on an inclined stand (as seen here) or on a desktop base. The shell encloses a three-way coaxial driver as used in the company's Ocean flagship. The outer 230mm ring covers the lower midrange, the 130mm section the upper mid while a 25mm tweeter sits dead centre. The Baltic is typically used with an active Santorin 30 subwoofer, equipped with its own 1000W Class D amp. www.cabasse.com



The largest integrated amplifier ever produced by Arcam is this £3250 A49. A Class G design rated at a substantial 200W/8ohm, the A49 is a purely analogue in execution with no digital (USB etc) inputs. Evidently, Arcam would rather we chose from its burgeoning family of outboard DACs, including the £2200 FMJ D33 also seen here. www.arcam.co.uk

Proud father of the Spendor D1, Phil Swift, explains why this is the 'ultimate small speaker for music fans'. Its tweeter is the company's own LPZ (Linear Pressure Zone) polyamide dome while the EP77 bass/mid unit features a self-damping polymer cone. Used with Devialet amps they sounded quick and clean. Price is £1795 (£595 for the stands). www.spendoraudio.com



Another vision from the early '80s but this time accurately reverse-engineered in Germany by Nero Audio. The speakers are the ARC 050 and ARC 102 and while the custom bass/mid driver has been manufactured to ARC's original specification, the 30-year-old HF 2501 tweeter is replaced by the ScanSpeak D 2010. www.neroaudio.com; www.arc-loudspeakers.com



Pathos' proprietary NPOL circuit configuration is now available in its smallest-ever configuration as this InpolRemix tube/solid-state hybrid. £3850 buys you just 10W per channel with the bonus of a USB input and built-in Pathos Digit DAC. The InpolRemix is entirely hand-made at Pathos labs in Italy. www.pathosacoustics.com

Next month
A round-up of the shows from
Paris and San Francisco

Repairing the classics...

Steve Harris tracks down and talks to Britain's specialist vintage restorers

RIGHT: Valve amp specialist Mike Solomons of London Sound, famous for his work with Leak, Quad and Rogers classics. He recently celebrated 45 years in business as a repairer

You've fallen under the spell of vintage equipment, and your system is a perfect period piece. Your idler-drive turntable is spinning noiselessly, your valves are glowing discreetly and your speakers, which were born into one of hi-fi's most ancient and noble hi-fi families many generations ago, are filling the room with music just the way they should. But what if something goes wrong?

It's fairly easy to find repairers who will come and look at a dead television, but there aren't so many who are willing and able to do a good job on vintage audio. Yet they are to be found, if you look and ask the right questions.

Talking to a number of specialists around the country brought some revealing stories and a fund of good advice. To start with there is the question of safety, because valve amplifiers have internal voltages that can easily be lethal. Don't poke around inside one unless you know what you are doing.

Here's another golden rule. If you have a piece of equipment that hasn't been used for many years, resist the temptation to connect it up and switch it on without having it checked out first. In the case of old valve equipment, it's best to re-form the capacitors gently by applying only a low voltage at first, using a Variac variable transformer.

That warning doesn't only apply to amps, as I found out from London-based repairer Michael Maurice [www.michaelmauricerepairs.co.uk]. He trained as a TV service engineer



BELOW: Still the archetypal classic, the Quad II power amp has also seen countless mods and aftermarket upgrades. But for non-engineer users, rebuilds are best avoided unless they come with a guarantee



back in the days when TV repair was big business, and has been working in the field for more than 30 years.

MOTOR PROBLEMS

'At the moment I've got a TEAC X10 reel-to-reel,' Michael said, 'where the belt had failed, because it had been in storage for a long time. The owner tried to power it up, but the belt just shredded and wrapped itself around the capstan. This put a lot of strain on the motor and the motor then burnt out.'

'I'm now waiting for a motor to come from America, and it's going to cost the owner a fortune. All because he switched it on without having it checked.'

In other cases though, Michael has been able to repair a motor that looked as if it needed replacing.

'Recently I had a Pioneer PL12D. Normally, where you have a turntable that's not rotating, it's going to be the belt. Not this time, though! The motor had seized. I had to dismantle the motor and in order to do that, I had to heat up the bearings enough to separate it, because the grease had actually hardened in it.'

'Once you've got it out, you can clean it with isopropyl alcohol or flux cleaner or something like that and then re-oil the bearings, leave the oil to soak into the bearings and put it back together, and it will run freely. Older AC motors like this can often be repaired, although DC motors usually can't.'

Another vintage turntable provided Michael with a rather fiddly job. This was a Garrard Zero 100SB,



designed round the speaker, not the other way round.

'What we try to do is save the cone if we can,' he says. 'If the cone is intact, we will put in a new coil, or suspension and foam surround, so that the speaker stays as close as possible to the original.'

'There are modern equivalents obviously, and some of the cones you get today are off the old tools and can still be used. Tannoy, of course, KEF – some of their cones have been going for 50-odd years.'

PRESSURE FIT

One speaker in which the cabinet itself presents particular problems is the Gale 401.

'The Gales had these big chrome end caps on the cabinet, which were a pressure fit. When you've got those off you have to remove the cloth which goes all the way round. An absolute bugger to get off.'

'We did two or three, taking the end caps off and so on. But one customer complained bitterly that there were one or two small scratches, and we decided that we weren't going to do that again.'

'We don't get involved in taking cabinets apart now, except for the KEF 104, 105 and 103, because they have the bass units inside linked by rods. We'd charge two hours labour for doing that. It's time consuming, but it doesn't involve mallets and bits of wood!'

'We don't touch Linn Isobariks, because the units are glued in. We had a couple over the years and we couldn't get the units out without damaging the wood, so we gave up.'

Wembley will service or repair almost any conventional speaker, up to and including the classics from ↻

where the cable had broken inside the articulated parallelogram arm.

'If that had happened in the 1970s, you would have gone to Garrard and got a complete arm assembly, complete with cable. No such luck today, because you can't exactly go to Garrard any more!

'So you have to dismantle the arm. What makes it very difficult is the fact that the parts are rivetted together at the headshell end so you can't get it apart.

You have to pull the old wire out and then put the new wire in, with very little space to spare. If you snag it, you'll snap the whole thing

and that's the end of it. Then you've got to solder these very fine wires onto the cartridge holder, making sure you don't melt anything other than the solder, and put it all back together. This took me hours.'

TIN WHISKERS

Returning to electronics, Michael offers another instance where ingenuity can overcome a seemingly intractable problem.

'I've recently had several Dynatron stereo radiograms, and one of the problems with those is that the germanium transistors tend to develop "tin whiskers", which cause the amplifier to distort.

'All the voltages go wrong, because the internals of the transistor are shorting to the case,

which is shorting to the heatsink and to earth. You can't replace the transistors because they're not available. But there is a way of getting round it. You can apply a small voltage to blow the whiskers, without damaging the transistor junction. I've done a few of those.'

Loudspeakers might seem intrinsically more reliable than other components, usually soldiering on for decades. But a common problem

with 1970s speakers is the disintegration of foam plastic cone surrounds. If your drive units have failed in this way, your first port

of call is likely to be Leicester-based Wilmslow Audio [www.wilmslow-audio.co.uk], the long-established supplier of everything to do with speakers. Wilmslow can repair drive units or substitute modern equivalents, and will also repair or upgrade crossovers with new capacitors, for example.

Another speaker specialist is Wembley Loudspeaker [www.wembleyloudspeaker.com]. The company was started in 1971 by Arthur Lampkin, who'd taken early retirement from his job as service manager at Goodmans. Managing director Paul MacCallum says that Wembley will always try to preserve the qualities of the original design.

'We try to explain to customers, don't forget that the cabinet was

ABOVE: Web pages for experienced London-based repairer Michael Maurice and for speaker specialists Wilmslow Audio and Wembley Loudspeaker

BELOW: Some products are surprisingly tricky to fix, says Michael Maurice. The rivetted joints in Garrard's Zero 100 tonearm turned replacing the internal arm cable into a nightmare task





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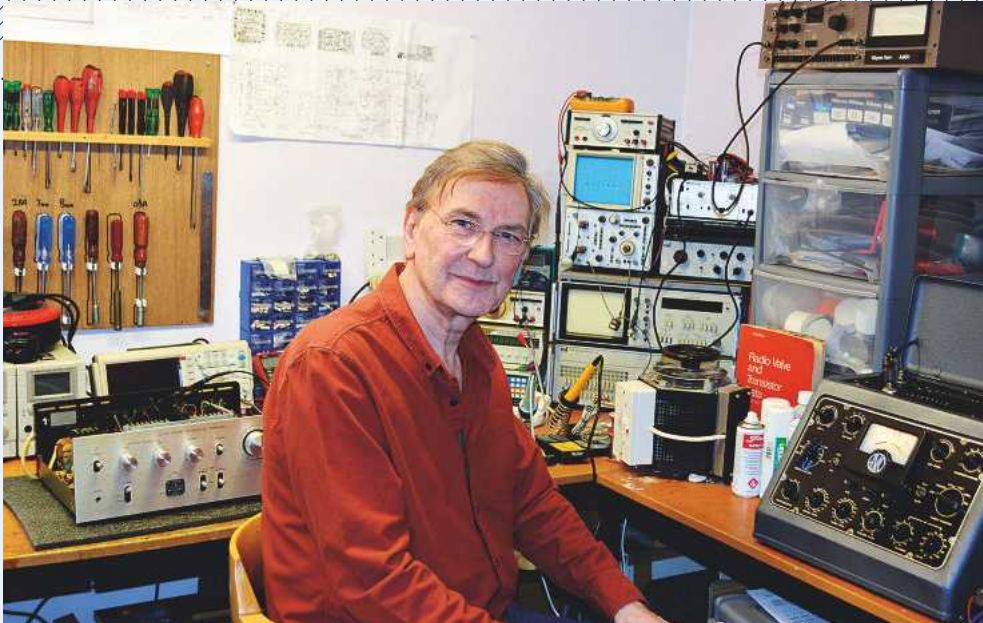
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to get some ex-military homotaxial power transistors, so bought the lot, a couple of hundred of them. That's all that's left as far as I can see.

When they've gone, they've gone.' Currently, like other repairers, Rob has more work than he can handle. Wouldn't he like to pass on his knowledge to others?

'I keep thinking it would be nice to set up a little thing at the college, to encourage people to bring their old equipment in and have a go at repairing it themselves, just pass on a little bit of knowledge. Because there's nobody else around. The reason I've got so much work is because we're few and far between.'

CAUTIONARY TALES

But today, undoubtedly, the doyen of vintage repairers is Mike Solomons of London Sound [www.londonsound.org], who has clocked up more than 45 years in the business. Mike is a never-failing fund of advice and cautionary tales. For example, when I talked to him about the sound of different valves, he had

this to say.

'The biggest difference I find between valves from different manufacturers concerns their ability to accept abuse. If you

have a good-quality amplifier that is in good working order, then you won't hear a significant difference between different valves. If you have an amplifier that is rubbish and abuses the valves or, which is more usual, you have a good-quality amplifier that is faulty and is abusing

“You get a lot of youngsters bringing in valve equipment”

Tannoy, and big theatre speakers from Vitavox, for example. But they won't deal with electrostatics because 'We don't know anything about them, or ribbon tweeters!'

Of course, the servicing and repair of Quad's original electrostatics is a subject in itself. But for most vintage enthusiasts, I think the need for professional help will usually arise when it comes to amplifier repairs. A quick internet search will lead you to the website of AmpLabs [www.amplabs.com], based in Worcester.

SO MUCH QUAD

AmpLabs proprietor, Rob Beales, has spent a lifetime in electronics, at one time working in television at the BBC before becoming a college lecturer in electronics. But he'd always loved audio, and started AmpLabs in 2009.

'I do specialise in the vintage stuff. I started off with valves, obviously, way, way back. I remember when I was nine or ten, I was so keen on electronics I used to get valves and put them in a chassis and pretend I'd made something that worked.

'I saw it all happen. Valves declining, transistors taking over and then ICs taking over. The mounting technology changed from hand-wired to printed circuit boards, single-sided then double-sided, then multi-layer, and then surface-mount technology. I've been lucky enough to go through that whole era.

'When you get a modern amplifier with surface-mount technology, there's not a lot you can do. Sometimes you can attempt

ABOVE: After a career as a college lecturer in electronics, Rob Beales set up AmpLabs as an enjoyable retirement business. He's now got more work than he can handle and would like to pass on his skills to others

component-level replacement, but it's very fiddly and you need a microscope. Then you see a valve amplifier come in, with nice hard-wired components and you think, what a difference!

'There's a wide range of people that bring amplifiers to me. You get a lot of youngsters absolutely sold on valve equipment. Young guys who've inherited dad's old kit, or grandad's. They love it! It hasn't died, there's been a revival.

'And I get so much Quad stuff in. People dig up a Quad 303 covered in rust. I try to use the original homotaxial devices that Quad used, just to try and keep the sound as close to original as possible. And they sound absolutely amazing still.

'A lot of these things are no longer made. But I was lucky enough

RIGHT: A Quad 303 power amp on the bench at AmpLabs. It's important to replace output transistors with the correct type, rather than more modern equivalents, says Rob Beales





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LEFT: 'Think what could happen if this fell into dishonest hands!' grins Mike Solomons. Back in the '70s, Quad sent him a roll of official box-sealing tape when he needed to re-pack some new 44 tuners

guarantee or with a short guarantee, take that as a warning. If the seller doesn't expect it to last 12 months, why should you?

'Factor in the cost of an overhaul. Buy something that looks good, because we can't do much about the cosmetics, and if possible buy from the original owner.'

WORK GUARANTEED

Having more work coming in than he can handle, Mike passes on much of the non-valve equipment to two other engineers.

'Both of them match my policy of a free estimate and a 12-month guarantee. I speak quite regularly to both people I pass work to. And from time time to time, I teach them things. Because I've been doing it longer than they have. On the occasion that they come unstuck, I may have come across it before, so I say, this is how we do that.'

'But it would be very difficult to teach in the conventional sense. You know what teachers are paid! If I went to a college

to teach a class of 25 potential electronics students, I'd be paid less per hour than I get paid working on the bench.'

'Which is a shame. Because it means that what I've learned, and I suspect what a lot of other skilled people have learned, doesn't get passed on.'

'I'm not brilliant. I get things wrong sometimes. Everybody does. But the 12-month guarantee means that if I get something wrong, my customer still gets what he wanted. If I can persuade other engineers to work to this standard, I will have achieved something in life!' ☺



ABOVE: A Quad 303 in pristine condition. 'Buy one that looks good, preferably from the original owner,' advises Mike

BELOW: NOS valves at London Sound. Valves should have a long life if the amp is working properly, says Mike Solomons

the valves by making them draw excess current, then some valves will give better performance, in what you might call the fault condition, than other valves.

'A very good example of the use of different brands of valves is the Quad II amplifier. Quad used capacitors to couple the signal to the output valves that after many years became leaky, and as a result have to be replaced in most cases. There was a time when we used to say, "Let's check to see if they are leaky", but in the end we had to change all of them.'

'I had one customer who told me that his Quad amp was absolutely brilliant, but it was very expensive on valves. He had to buy a new set of output valves every year. Finally the amp packed up and he couldn't replace his very expensive GEC KT66 valves any more, and he got me to carry out repairs.'

'He had these old capacitors. He had thought he was being clever buying new valves and fitting them ever year, but it would have been cheaper if he'd come to me in the 1970s, and I'd changed his coupling capacitors. Then the next set of valves would have probably lasted 20 or 30 years.'

'If he'd taken that same amplifier and used modern output valves instead of the original KT66s, he'd have probably had to change them every three or four months.'

'Because the modern KT66 valves are less able to cope with abuse than the 1970s GECs. But if the

amplifier is in good order, they'll work equally well.'

So the lesson here is that old equipment does need regular checking.

'Most valve amps deliver excellent sound or are audibly poor, because when they go wrong they tend to go from perfect to poor to unacceptable to don't work at all, in a short period of time. Transistor amps will often go decades delivering not quite the sound quality that you want, and appearing to be reliable.'

'The answer is of course that transistor amplifiers should be checked every now and then. I used to say, service the equipment every five years. But I think that is unnecessary. If you take equipment

that has been in use for five years and put it on a bench and check it, you will often find defects, and adjustment will make it better.'

'But once you've got it right, it's not unusual for it to go a further 15 or 20 years with negligible deterioration.'

PIECE OF ADVICE

Unlike that long-term Quad owner, many of Mike's customers today will be bringing in pieces of equipment that they've just bought.

'Piece of advice, if you see an advertisement for a piece of equipment on eBay that has been rebuilt, renovated or any similar word, and is sold without a

'Even transistor amps should be checked every now and then'



Audio Research CD6

Audio Research replaces the solid-state CD5 CD player/DAC with the CD6, and it just may be the company's most unlikely digital bargain – especially if you use USB
 Review: **Ken Kessler** Lab: **Paul Miller**

Having reviewed the Audio Research REF9 CD player/DAC [*HFN* May '13], assessing the new CD6 was, as the line goes, 'déjà vu all over again'. Aside from the word 'Reference' on the CD9's fascia, and the addition of an IR input on the back of the CD6, the latter is externally identical to its £4000-dearer forebear. The other, crucial, difference is an absence of valves.

Producing a solid-state version of a valve CD player is nothing new for the Minnesota-based company. I will admit that my initial reaction was 'Why bother?', the £4000 savings notwithstanding, because for many, 'Audio Research' means valves. But one mustn't ignore non-sonic niceties including brand loyalty, and that someone with an all-ARC system might prefer matching components, right down to the handles. There's another bonus that hadn't occurred to me: the CD6 can be sited in a cabinet or other enclosure with doors, whereas the CD9 needs ventilation.

Whatever your motivation for considering – or ARC's for manufacturing – a solid-state player/DAC, the not-inconsiderable price difference, allied to the distinct sonic nature of the CD6 ensure that the two are not quite mutually exclusive. So, while this could have been a boilerplate review in which I just changed 'CD9' to 'CD6' throughout my earlier article, that would apply mainly to its physical description. From there on, they are subtly different, like two vintages of the same wine. (Anyway, my notes from last year's review of the REFCD9 were not totally applicable because then I was using Sophia 3s. The Alexias add a lot more down below, so the bass is not comparable, and the soundstage is bigger.)

Both players confront the current need for a plethora of digital inputs and sampling rates with a full complement. In some ways, it seems as if the CD playing

element is a public service, because downloads, streaming, *et al*, are improving, as 'high res' starts to mean something: the use of this appended to a computer is not as 'shock! horror!' an intrusion as it once might have seemed to purists.

SELECTABLE FILTERS

CD6's four digital inputs comprise asynchronous USB 2.0 (ARC supplies a CD with the drivers for Windows and Mac), coaxial RCA, and Toslink – I tried the latter with transports from Marantz and Musical Fidelity. Although all inputs offer 192kHz/24-bit resolution, certain settings are proscribed, yet there is ample freedom in what rates you opt to use with each source, for fine-tuning the sound.

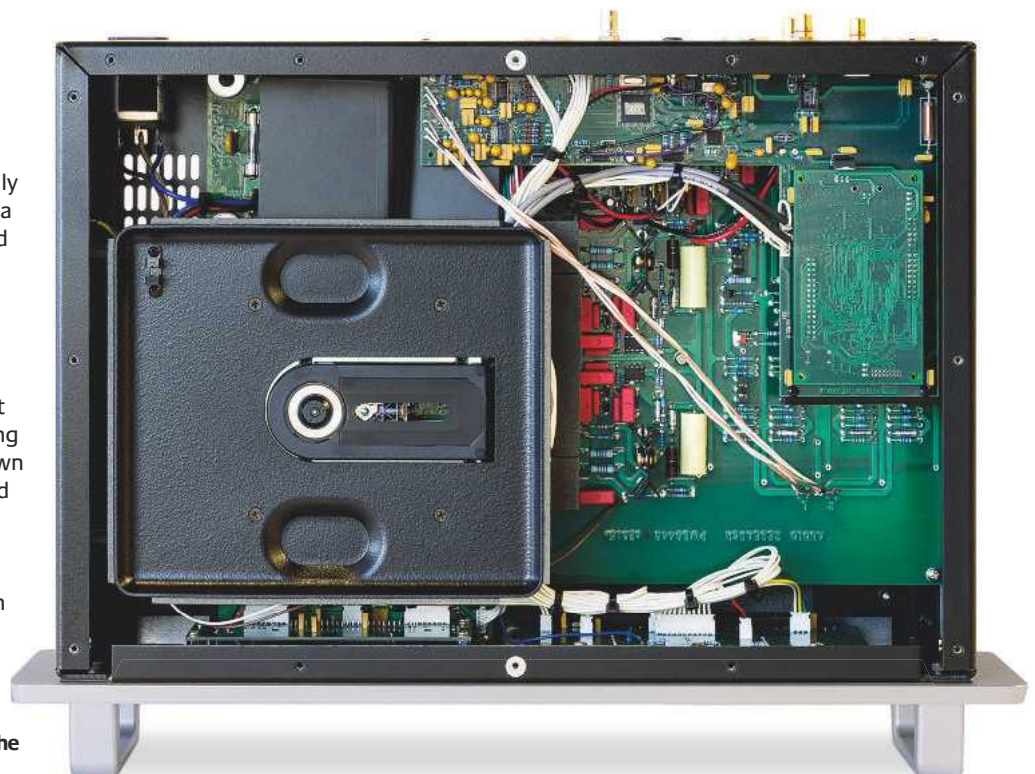
Another boon, for those who feel somehow 'helpless' with digital playback systems that do not allow fine-tuning, are selectable 'Fast' and 'Slow' digital filters, the former being a standard brickwall type.

Selecting 'Slow' accesses 'a low-order filter with reduced ringing (lower time domain distortion) but higher conventional and aliasing distortions', according to editor PM, who also proffered that, 'this option is better suited to 96kHz+ digital inputs'.

For CD playback, ARC has fitted the Philips PRO2R transport, which they say is 'still the best dedicated CD mechanism available'. Access is through a sliding door on the top, and the CD is held in place by a magnetic puck. The player won't operate if this door is open, so no fears of flying CDs.

Enjoying trickle-down technology from the REF DAC and REF CD9, the CD6 employs quad 24-bit DACs running in mono mode, with dual master oscillators. One DAC handles 44.1/88.2/176.4kHz sample rates, the other 48/96/192kHz, indicated by green LEDs on the front panel – as are the inputs and the selected digital filters.

As noted, the front panel is identical to the REF CD9's fascia, with a dimmable



RIGHT: Philips' CD mechanism is configured here as a top-loader. The digital processing is handled via daughter board (far right) while the DAC PCB is hard up against the rear panel



display on the left side; the display is just for the CD. It shows time in track elapsed, CD elapsed and CD remaining. On the right side there are three vertical LED displays indicating the aforementioned sample rates, the middle column for input chosen, with CD at the top, and a column extreme right for Fast-Slow-Upsample-Power.

COMPARISONS VIA THE REMOTE

Below the LEDs are seven buttons for Power, Previous, Play, Next, Pause, Stop and Input. More extensive control can be found on the all-metal remote, which takes care of all the button functions as well as scrolling through sources and sample rates, filter selection, numeric entry for programming and display dimming. Thanks to the remote, you can A/B settings from the listening seat. As the filter and sampling rate differences are audible but subtle, this facility is useful.

Aside from the IR input, the back, too, is a direct lift from the REF CD9. The four digital inputs are accompanied by AES/EBU and BNC digital outputs; I would have liked Toslink, too. ARC supplies a BNC-to-RCA adapter for use with coaxial 75ohm cables. Analogue outputs are RCA phono and

balanced XLR. Also at the back is an IEC connector for the mains.

Paul Miller explained that 44.1kHz (as in 'red book' CDs) and 88.2kHz are upsampled to 174.6kHz while 48kHz and 96kHz are upsampled to 192kHz. When 'Upsample' is switched off, the incoming rate is maintained, so a CD stays at 44.1kHz, 96kHz sources stay at 96kHz. What this does for the user is allow one to hear the differences rather than hear only a default value, eg, machines that upsample regardless.

I have my reference system set up with two amplifiers of differing character: the Audio Research REF75 and the D'Agostino Momentum Stereo, both fed by the Audio Research REF5SE preamplifier, and taking turns driving Wilson Alexias. What was revealed with no uncertainty was that the CD6's purported ability to tame a lush system proved to be a boon. With the D'Agostino, the sound errs toward the clinical; with the REF75, it's almost old-school tube. I experimented with the settings and found

ABOVE: Top-loading allows plenty of real estate for a conventional display and row of transport controls. A full 15 LEDs show sampling rate, chosen input and digital filter choices (as CD9)

that they even had their use with different CDs, and certainly with the music fed by computer. *She & Him, Volume One*

[Domino DS009CDs] is a sweet-sounding, gentle set featuring the characterful voice of Zooey Deschanel: going from CD to download, and varying the upsampling could rob her voice of a

certain liquid character, or turn it sibilant. Tweakers will have a field day with the various settings.

'Tweakers will have a field day with the various settings options'

MAKES YOUR HAIR STAND UP

What we have here are two components in one, and I dealt with the CD6 first as a CD player. While obviously not quite as rich-sounding (in the tube sense) as the REF CD9, neither was it screechy solid-state in its overall behaviour. But then, what is, circa 2014? It was my first indication that this is closer to the CD9 than just missing valves might suggest.

It is important from the outset to appreciate this, because it is all too easy to fall into the bad-old-days contretemps of tube-vs-tranny absolutes, of the extremism of the two 'camps' when it was necessary because valves were facing extinction. I think we can all agree that we're way beyond the era that had Naim at one extreme and vintage Quad IIs at the other.

I've been working my way through *Elvis – The Movie Soundtracks* [RCA/Sony Music 88430 16642], a 20CD box containing all of the songs from his feature films. Admittedly, they turn risible after *Roustabout*, as Col Parker ensured that ➤

SUBTLE CHANGES

If you still need a convincing demo of the sound of tubes vs transistors, this does the trick. I was reminded of Tim De Paravicini's first-ever Yoshino amplifiers, offered in valve and transistor editions of the same fundamental circuit, and Musical Fidelity's DM25 Transport/DAC with selectable solid-state and valve output stages. I'm surprised that we still engage in such debates, the two technologies living side-by-side, often within the same system. Wise heads always opt for the best sound and if it means mixing the two, so be it. What this player does is offer the opportunity in an Audio Research dealer's showroom, if there's a CD9 in stock, to hear the two side-by-side. Pedro, Absolute Sounds' expert installer, has confirmed that the CD6 can be used to change the character of a system's overall sound if it errs too far on the side of the warm, lush or romantic. To suggest, however, that this is cold water poured to dampen one's ardour, is abuse of the analogy: the differences are audible – but subtle.



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ABOVE: Balanced (XLR) and single-ended (RCA) analogue outputs are joined by USB, optical and coaxial S/PDIF and one AES/EBU digital input. Digital outs are offered too

his charge was never allowed to flourish musically, all but inflicting career suicide after The Beatles became his biggest-ever threat. That aside, there are fine moments even from Presley's daftest appearances.

It was the 'redneck' slap bass on 'Return To Sender' from *Girls! Girls! Girls!* that made the hairs stand up, and which decreed that, tranny or tube, ARC's CD players are just gorgeous. The snap was precise, authentic, just what I'd heard at a live gig the week before. It didn't even need all the extension that the Alexias provided, because C&W-style electric bass ain't hip-hop bass. What it did do was flow, and maintain a level of substance and mass that proved irresistible.

STICKING WITH THE CD

It is, of course, a perfect production regardless, with instrumentation courtesy of the finest studio denizens of the era, with stunning background vocals, peerless production and Elvis in top form. His voice, via the CD6, was rich, mellifluous and with every nuance easily appreciated. The CD6 swings, lilt and lopes like a double-jointed hipster. And when the track goes briefly *a cappella* at 1m 33s, you sense air, space and, well, Elvis.

I then played the same through the USB input via two different levels of download. I hope the audio gods forgive me for saying this – and Editor Miller's learned discourse on 'truncated low-level resolution with USB in the CD6' doesn't quite trigger a light bulb of realisation over my head – the playback was 'OK' but nothing that would make me give up physical music carriers. CD simply sounded more visceral and convincing, USB a bit indistinct and grainy.

Because some of those early 1960s Elvis recordings were so clean and lean as to now merit 'audiophile' status, and because their origins are gloriously analogue, I turned to Caravan's latest, the just-released *Paradise Filter* [Caravan Records CPGJM1] for its complexity and modernity. The title track is a wash of ethereal textures that will charm the faithful, as prog-rocky as one would anticipate. If ever a band created 'soundscapes', it is Caravan. The CD6 does its Capability Brown schtick with aplomb.

'The Paradise Filter' elicits analogies of a fabric-like nature, gentle vocals, sweeping keyboards – then an interlude of tearing guitar, wispy flute and solid percussion. It's a challenge that the CD6 resolves in (can I really be saying this?) a most analogue fashion. The spread is seamless from side to side, nothing jars, it all coalesces. In fact, I was reminded of the CD9, which remains one of the finest-sounding CD players I've ever used. But here's a four-grand price cut – and all you lose is a hint of warmth. ☺

HI-FI NEWS VERDICT

Whatever internal changes exist beside the removal of the valves, this really is a 'poor man's REF CD9' – 'poor' being a relative term. The main sonic differences are a sharper top-end, which can be used to tighten the sound of a soft system (eg, one using all tubes, or vintage kit), followed by a slight hygienic thinness that continues through the mid-band. That aside, I could live with this honey forever.

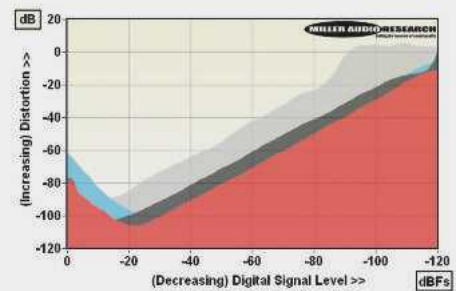
Sound Quality: 88%



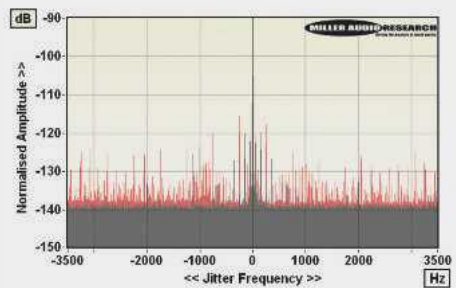
AUDIO RESEARCH CD6

Once ARC's upsampling mode is engaged it over-rides the 'Fast' and 'Slow' filter modes (unless the input is already at 192kHz) and generally improves performance. The responses stretch out to -0.6dB/20kHz, -3.1dB/45kHz (96kHz media) and -6dB/90kHz (Fast filter) or -9.8dB/90kHz (Slow filter) with 192kHz media. Distortion is slightly lower in upsampled mode (0.075% vs. 0.093% at 20kHz/0dBfs) although there's little effect on jitter (165psec with CD, 180psec with 24-bit/48kHz data over S/PDIF and a far cleaner 40psec over USB – see Graph 2 below). The peak 6.4V balanced output is higher than the typical 4V but the 110-111dB A-wtd S/N ratio is no wider. In fact our CD6 exhibited rather more PSU noise on its right channel, regardless of input, limiting its S/N to 105dB here.

Possibly due to the high output levels stressing its analogue stage, distortion is higher than might be expected from the PCM1792 DACs at 0.022-0.0035% over the top 10dB of the player's dynamic range, but this falls to a minimum of 0.0004% at -20dBfs (1kHz) and 0.0007% (20kHz). This trend is clear enough from Graph 1, below, as is the +15dB increase in distortion at 20kHz via the USB input [grey trace, Graph 1]. We've seen this before with ARC's USB mode [REF CD9, *HFN* May '13] and the CD6 follows the same trend right down to -90dBfs whereupon the signal is truncated (a limitation of the USB driver), squeezing its resolution to about 15-bits. This may also explain why the jitter spectrum looks so much cleaner... Readers may download full QC Suite test reports for the ARC CD6's CD, S/PDIF and USB performance by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: THD vs decreasing digital level at 24-bit/48kHz (1kHz, S/PDIF = red; 20kHz, USB = grey) vs 16-bit CD (1kHz = black, 20kHz = blue)



ABOVE: High resolution jitter plots, 24-bit/48kHz inputs (red = S/PDIF, 180psec; black = USB, 40psec)

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	6.42Vrms at 242ohm
A-wtd S/N Ratio (CD / S/PDIF in / USB in)	109.5dB/110.2dB/110.9dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.022% / 0.00036%
Distortion & Noise (20kHz, 0dBfs/-30dBfs)	0.074% / 0.00077%
Freq. resp. (20Hz-20kHz Fast/Slow filter)	+0.0dB to -0.65dB
Digital jitter (CD / S/PDIF in / USB in)	165psec / 180psec / 40psec
Resolution @ -100dB (CD / S/PDIF input)	±0.1dB / ±0.1dB
Power consumption	20W
Dimensions (WHD)	480x134x310mm

Rega RP8/RB808

Along with its striking skeletal chassis, this model combines several other innovations in pursuit of long-held design ideals. Is this the start of a new chapter for Rega?...

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

To begin with, Roy Gandy of Rega made a turntable that looked rather special. For the original Planet of 1973, he used a platter that consisted of three small circular pods, because this was cheap to make, and it looked interesting. Among those who were inspired by the idea was Amstrad, whose TP12D was as grotesque as the Planet was neat and elegant.

After the Planet, Gandy focused on designing products that sounded good, rather than looking good. And yet, 40 years on, Rega's new RP8 turntable has been feted as a style icon, being selected by designers Jony Ive and Marc Newson for their RED charity auction, which took place in November last year [see *HFN* Mar '14].

Of course, the RP8 hasn't been designed just to look pretty. It's a great example of form following function. But the story of this product goes back a few years, to the time when CD player sales really slowed down while turntable sales began to grow spectacularly. One year, says Gandy, Rega's turntable sales actually doubled.

Looking to the future, he knew that it made sense to invest in developing new turntables. So Rega has worked on producing a cost-no-object 'ultimate' turntable, which would take the tried-and-tested Rega design precepts to an extreme.

Among other things, this meant making the lightest and stiffest possible chassis. In the concept prototype, the chassis was a carbon fibre moulding, developed with the help of a Formula 1 supplier, with ceramic brace pieces. The research also involved commissioning some other extremely expensive one-off parts, such as ceramic bearings and spindles.

The benefits, though, were soon seen not just in some ultra-exotic product that no normal person could afford, but in a complete new range, using what Rega named Double Brace

Technology. In this system, stiffening braces above and below the plinth provide the greatest rigidity just where it is needed, between the turntable main bearing and the arm mounting.

DOUBLE BRACE, DOUBLE BELT

The first model to introduce the double brace feature was the RP3 [*HFN* Oct '11], the braces being of phenolic material rather than ceramic. Because the bracing technique provided the required stiffness, the plinth itself could now be made economically from standard furniture board. But the RP3 was followed by the RP6 [*HFN* Apr '12], which has a much more luxurious high-gloss paint finish.

There was a further plinth development on the way, though. Thanks to the double brace, Gandy was able to envisage a plinth construction that would be much, much lighter than even that of the Planar 9 or its successor the P9. In the RP8, and with the

RP10 sister model, the plinth has given way to a very light skeletal chassis [see below].

From a functional point of view, the RP8 on its skeletal chassis is complete in itself. But Rega has added a separate outer frame, using the same foam-sandwich construction, to support the dustcover. The only points of contact are three small rubber-ring location devices, which enable the outer frame to sit on the feet of the turntable proper.

In both RP6 and RP8, the two brace pieces are of two different materials, to further reduce any resonant properties in the 'stressed beam' that's created by the braces and the metal pillars that connect them together. This further reduces pickup of airborne vibrations. For the RP8, the lower brace is phenolic while the one on top is magnesium.

Although it's the chassis design that makes the RP8 look different, there are other innovations, most notably in the



RIGHT: Here's the RP8 with platter off, showing the skeletal chassis and the magnesium upper brace piece between main bearing and arm mount



platter. Rega's flat glass platters had been sourced from the same supplier for about 30 years, until the owner of the business retired, but the need to find a new supplier opened up new possibilities.

Working with a young glass engineering company using the very latest CNC equipment, Gandy found that it was now possible to machine glass accurately enough to make a two-part glass platter. For the RP6, a 10mm-thick outer rim is bonded on to the 6mm-thick main disc give extra flywheel mass.

A logical next step was the three-part stepped platter used here. Between main disc and outer ring there is now an additional, wider, 6mm-thick middle ring.

Under the platter of the RP6, the traditional Rega moulded subplatter is topped by an aluminium disc, machined with the six raised nibs that actually contact the glass. In the RP8, these two components are replaced by a single metal part, with a steel spindle. Also, the usual single standard drive belt is replaced by two of Rega's higher-grade belts.

Like the RP6, the RP8 comes with the Rega TTPSU power supply, which is fed in turn from a small plug-top transformer. It

produces a 24V AC signal with a claimed less than 0.1% distortion, unaffected by mains fluctuations or noise, to drive the motor, and provides switching for 33.3 and 45rpm. Each RP8 motor is hand-tuned and matched to its TTPSU, to minimise noise and vibration, using the anti-vibration circuit built in under the deck.

As with all Rega turntables, the tonearm is a major part of the package. Outwardly identifiable by its gloss paint finish, the new RB808 is based on the newly-retooled casting introduced with the RB303, but with improved bearings and a tightened spindle-fit tolerance.

Reducing the mass of the turntable meant that the mass of the arm had to be reduced too, to avoid any ill-effects due to vibration travelling through the structure suddenly reaching a large mass. So a new and lighter vertical bearing assembly was designed.

As usual with Rega, after balancing by adjusting the counterweight, cartridge tracking force is applied by a spring, controlled by a calibrated dial. A simple pull-out button applies bias compensation.

Finally, the audio signal emerges via new low capacitance phono cables. These come

ABOVE: An outer frame surrounds the skeletal chassis and supports a hinged dustcover. The Rega Apheta cartridge seen here [not reviewed] is available as a £600 factory-fit option

fitted with chunky phono plugs that have a twist-and-clip action.

EVERY DETAIL REGISTERS

I'd really looked forward to getting my hands on the RP8, and I have to say immediately that I wasn't disappointed. I tried it with several cartridges, including an Ortofon Cadenza Black, the Rega Exact moving-magnet and the Rega Apheta moving-coil. But I started listening with the trusty Benz Micro Glider SL.

When it came to conveying depth or space in a recording, whether wholly natural or cunningly enhanced, the RP8 was very impressive indeed. The perennial *Muddy Waters: Folk Singer* [Discovery HDR 1001] demonstrated this very well, with Muddy's voice sounding both intimate and tremendously powerful in the seemingly cavernous acoustic.

On Waters' incredible, emotive guitar, you could hear every detail as the bottleneck rasped on the wound strings. Buddy Guy's clean-and-clear single-note obbligatos, on the second acoustic guitar that I used mistakenly to think was electric, could be heard to come from his seated position to the rear right of the singer, just as you see in the original session photos. Willie Dixon's bass was full and weighty, again seeming firmly placed in space.

I also felt that the bass was outstandingly good on the classic direct-cut, *The King James Version* [Sheffield Lab LAB 3] with the Harry James band. The bass line had real precision and urgency, the ability to stop and start, combining with a tight drum sound in a way that was both natural and also got your feet tapping.

The fine sense of musical flow and rhythm wasn't confined to certain types ➔

'I was impressed at what Rega had managed to pull out of the hat'

THE LIGHTEST YET

In pursuit of minimum mass and maximum stiffness, even the earliest Rega Planar turntables had a plinth where phenolic skins sandwiched a core of fairly lightweight particle or fibre board. In flagship models like the Planar 9 the concept was refined by removing as much as possible of the core material between the skins, leaving just a skeletal shape connecting the main parts. But the RP8 carries this much further. Instead of board, the core of the sandwich is a nitrogen-expanded closed-cell polyolefin foam which, of course, is extremely light; it's also self-coloured black. Initially, glue had to be hand-rolled onto the foam before the parts were assembled and stacked in a press, and it's taken a lot of work with the supplier to get the desired result in quantity production. But Rega says that the RP8 plinth is seven times lighter than the original Planar 3's.



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REGA RP8/RB808

Rega's RP6 [HFN Apr '12] was the first turntable in its range to employ a laminated glass ring platter while the newer RP8 takes it one step further by laminating three rings together to produce an enhanced flywheel effect. The TTPSU, with its crystal-locked sine generator, and Rega's 24V twin-phase synchronous motor with hand-tuned 'anti-vibration circuit' look unchanged from the RP6 and yet the RP8's ~4sec start-up time is no slower. There's certainly an improvement in low-rate wow, however, as this RP8 offers the 'sharpest' W&F spectrum we've seen from the marque and a peak figure of just 0.03% [see Graph 1, below]. Through-groove rumble is comparable to that of the RP6 at -69.4dB with the felt mat in place as is the through-bearing rumble of -70.8dB.

However, the real star of the show is the RB808 tonearm, its mass redistributed (over earlier Rega arms) with varying tapers. The overall effective mass is slightly reduced at 10g (from 11g) and friction minimal at <10mg in both planes, but instead of one principal beam mode, the resonant behaviour of Rega's new tapered tonearm resolves into two distinct and separate frequencies - 160Hz and 215Hz [Graph 2]. In practice there's probably little difference in the energy released along the structure but by distributing this as a broader, lower-Q resonance its effect is likely to be more benign. The higher frequency modes at 550Hz, 680Hz and 1.02kHz are quickly damped and related to the fingerlift, bias mechanism and other appendages. Readers may view full QC Suite reports for Rega's RP8 turntable and RB808 tonearm by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Rear view shows the strong metal mounting parts of the new RB808 tonearm (not seen here are Rega's new higher-quality signal cables and phono plugs)

of music, and I put on a late 1960s recording by István Kertész and the LSO in Brahms's *Serenade* No 1 [Decca SXL 6340]. With the RP8, the music immediately came over with a great sense of flow, sweeping all before it.

Then I moved up to a rather more expensive cartridge, the excellent and beautifully-made Ortofon Cadenza Black. Staying with Eric Clapton, the RP8/Ortofon combination gave a different view of the music. Here was a sound that was more analytical, giving an impression of precision rather than warmth. The Ortofon has a stronger, solid-sounding bass, and yet the result was really just as foot-tapping, but (if this makes sense) in a slightly statelier, measured kind of way. Yet on a track like 'I'll Make Love To You Anytime' the Ortofon's super-detailing paid off.

TURNTABLES COMPARED

Looking back to the RP6, I remembered how I'd found it pretty easy to quantify the gains over the base model RP3, which, it must be said, is an astonishing turntable for the money. Yet the RP6 was more sophisticated in every way, in the best sense of that word, because this didn't mean that it was ever too restrained or polite sounding.

On the contrary, it could sound every bit as urgent and foot-tapping as you'd hope, while in terms of detail, clarity and texture, it improved on the RP3 in every department from top to bottom of the spectrum. Little details in the treble became cleaner and clearer, the midrange was more open and airy, giving a truly excellent portrayal of vocals, for example, allowing the lyrics to convey emotion effortlessly.

And in fact on good recordings the effortless, flowing quality of the RP6 seems to reveal the proper dynamics of every instrument, in

a sound that had a convincing, coherent wholeness about it.

So what about the RP8? For this review I was able to compare the RP8 directly with the RP6, using Rega's own Exact cartridge. And, not for the first time with a Rega product, I was really impressed at what the company had managed to pull out of the hat.

There were some pretty obvious gains. Returning to the Brahms *Serenade*, the sound of the orchestra's double-basses was evidently clearer while having no loss of impact, and now enjoyed a greater sense of clarity than when heard via the RP6.

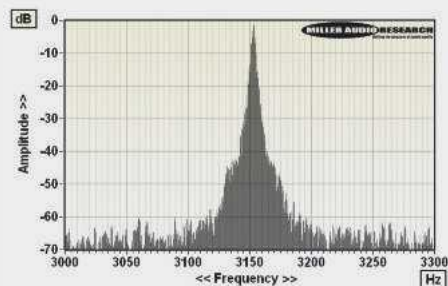
Another major feature of the RP8 was an increased ability to portray really low-level detail, digging previously-unnoticed minutiae from even the most familiar recordings.

For example, on the track 'Fast Car' from the album *Tracy Chapman* [Elektra EKT 44] there's a credit for Ed Black on steel guitar, but this instrument is mixed so far back you could probably listen to the song 100 times without really noticing it, or recognising it. With the RP8, though, I found myself picking up on it straight away. ☺

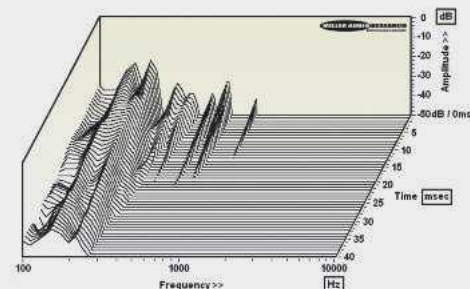
HI-FI NEWS VERDICT

A claim that the RP8 is 'probably the biggest step forward' in the evolution of Roy Gandy's turntable design philosophies isn't just hype, because this model embodies the fullest realisation of Gandy's ideas yet. It rewards the listener with a sound that has confidence, depth, purity and realism that belies its moderate price. If it's also Rega's most stylish turntable ever, that's just the icing on the cake.

Sound Quality: 87%



ABOVE: Wow and flutter re. 3150Hz tone at 5cm/sec (plotted ±150Hz, 5Hz per minor division). Some flutter but wow is lower than with RP6



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	33.45rpm (+0.34%)
Time to audible stabilisation	4sec
Peak Wow/Flutter	0.03% / 0.03%
Rumble (silent groove, DIN B wtd)	-69.4dB
Rumble (through bearing, DIN B wtd)	-70.8dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-62.3dB
Power Consumption	7W
Dimensions (WHD)	446x105x363mm

Mark Levinson No52

Five years in the making after its No32, ML's No52 Reference offers unprecedented configurability and lays claim to being one of the finest preamps money can buy
 Review: **John Bamford** Lab: **Paul Miller**

It's not every day that Harman International introduces a new Mark Levinson component, especially a flagship product with Reference nomenclature. The previous two-box No32 Reference preamp, dating back to 1998, ceased manufacture some years ago due to discontinuation of some components and, critically, RoHS legislation.

The £28,000 No52 Reference has been years in the making. At last, Levinson's flagship No53 amplifiers, those whopping 500W monoblocks employing 'Interleaved Power Technology' [see *HFN* Jan '11], now have a Reference-status preamplifier with which they may be rightly partnered. The No52 is a two-chassis component designed with meticulous attention to detail both in its topology and in features that offer comprehensive system configurability.

TRUE ISOLATION

You might assume from our main photograph that the uppermost chassis houses the preamp section proper, with the lower box a separate power supply. But this is not the case. As with the long-lamented No32, the rationale of the No52's two-box approach is to isolate the pure analogue audio circuitry from any possible source of pollution. Consequently the dual chassis construction physically separates the power supply and microprocessor-driven controls (top unit) from the audio circuitry contained in the larger of the two chassis. The controller/power supply unit connects to the preamp's audio chassis via three umbilical cables sporting multi-pin locking connectors. Two are for DC power, the third cable carrying control data.

Volume control is via a precision ladder resistor network which allows fine gain adjustment in 0.1dB steps. This sits in the No52's audio stage chassis and is shielded in a central chamber, while the rotary encoder that governs it is in the control

box. A MM/MC phono stage is included too (this was optional in the No32).

The controller chassis contains four universal-input power supplies, one for low-current standby, one each for the two audio channels, and an independent supply driving the front panel, power management and external control triggers, RS232 and Ethernet. The unit generates its own 'secondary' AC power, employing regeneration circuitry and a custom-built toroidal transformer to provide 'clean' DC to control relays and audio circuits.

The user interface is simply wonderful – enhanced in this No52 by a new hardware platform developed specifically to add Ethernet capabilities, firmware access, and configuration backup on a USB thumb drive. Not only can inputs be named and individually configured for level and offset, but now there are three user-selectable tapers for the volume control.

The setup menu for the RIAA stage features multiple loading and gain options to allow compatibility with most high and

low-output cartridges. Custom input loads, should one be required, can be configured using internal solder-less connections by your dealer. The setup menu also provides a switchable 20Hz high-pass filter and allows correction for a cartridge's channel imbalance in 0.1dB increments. This is independent of the preamp's global balance control. Mono settings are included for vinyl purists – including L+R and L-R, the latter to assist in accurately aligning cartridge azimuth.

CONFIGURABLE OPTIONS

All audio input and output sockets reside on the rear panel of the audio chassis in a symmetrical dual mono layout. Being a fully balanced design – including the phono gain stage – single-ended inputs are converted to balanced signals and processed as such throughout. A pertinent example of attention to detail is the manner by which unused inputs are deactivated to prevent interference. In a regime dubbed 'virtually unplugged switching topology', signal and



RIGHT: Local relay switching in the preamp proper connects to and from line and MM/MC phono amplifier cards (right channel enclosure opened for clarity in this picture)



ground of unselected inputs are physically disconnected from the preamplifier by the relays, while a mid-stream point of the signal path is shunted to isolate inputs from each other and from downstream circuitry. Says ML: 'This results in greater than 120dB isolation between inputs on the same channel and effectively immeasurable isolation between unselected inputs on separate channels, while also eliminating the influence of differing ground potentials in source components.'

All active circuits in the No52 preamplifier are on Nelco circuit boards with gold-plated contacts and pads, and each channel's PCBs are effectively shielded from one another in separate compartments.

There are three outputs available: two Main and one Auxiliary, with each available on balanced (XLR) and single-ended (RCA) connectors. Moreover, each output

"Has my system ever sounded quite as good as this?" I wondered'

circuit is independent to avoid the load connected to one output affecting the performance of another. The Aux output is a more flexible adaptation of what we would normally expect from a fixed-level 'record' output, since it can alternatively be configured to track the main outputs. And get this: via the setup menu it can be

configured differently for each input. So you *might* be using the Aux output to drive a subwoofer with some inputs, while with others it could be feeding a secondary system, either at fixed or variable level! Which

inputs are available to be routed to Aux is also configurable – to avoid any chance of feedback in a 'tape-loop' application.

BEWITCHING IN CHARACTER

How to describe the sonic character of a preamplifier designed to sound of nothing at all? What I *can* say is that the No52

ABOVE: Brushed aluminium black and silver faceplates are accented by red illumination behind the units' glass centre panels. Inputs can be named and configured via a setup menu

transformed the overall performance of my system whatever amplifier I partnered it with, its transparency allowing forensic inspection of fine detail buried in recordings. And with appropriate audiophile-quality recordings it helps serves up an expansive and enveloping soundstage that draws you in to a musical performance in a manner which is dangerously addictive.

Playing host to the No52 was of course a perfect reason to enjoy hearing those top-of-the-line Mark Levinson No53 Reference monoblocks again. My system sounded pretty amazing when the No53s were in residence for a few weeks back in 2011, at that time driven by the single-chassis No326S preamp. The pre/power combo sounded beautifully integrated, I recall, its performance fast, tight, tuneful and with exceptional bass control and intelligibility. But I don't remember it being quite as bewitching as what I was experiencing now. Where I'd found the combo to appear a little 'dry' and matter-of-fact at times, with the new No52 driving the No53s the sound was more 'beautiful', brimming with deeply saturated and vibrant tone colours, and always inviting.

The source feeding the No52 was my carefully configured computer audio rig running JRiver Media Center file management and playback software, connected via USB to T+A Elektroakustik's DAC 8 [*HFN* Oct '12], allowing playback of PCM files up to 192kHz/24-bit resolution. ↪

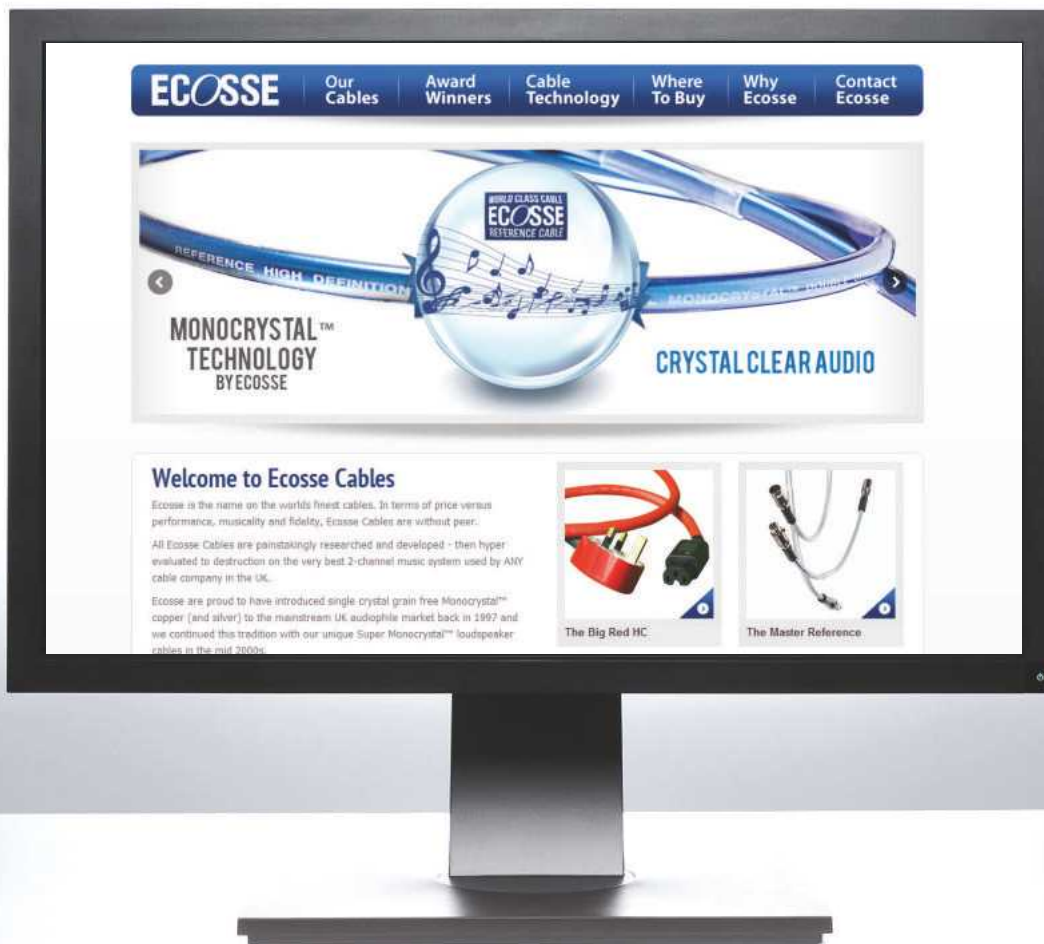
THE LEVINSON LEGACY

Ever since Jazz musician Mark Levinson founded Mark Levinson Audio Systems in 1971 the ML brand has been synonymous with 'luxury', representing the epitome of high-end audio even before the term was coined. Levinson's company was first acquired by Madrigal Audio Labs in the early '80s (after which Levinson formed Cello Film and Music Systems and, subsequently, Red Rose Music in New York), but since the turn of the century it's been owned by Harman International Industries, headquartered in Northridge, Los Angeles. Doyen of Harman's Luxury Audio Group (formerly the High Performance AV 'speciality group'), Mark Levinson today is a sibling of Revel loudspeakers, Lexicon electronics and JBL's high-end Project lines such as its awesome Synthesis systems which often incorporate ML electronics. As ever, the marque created in the 1970s still signifies meticulous design methodology and no-expense-spared engineering.

ECOSSE REFERENCE CABLES

Brand new website launch on March 28th 2014

www.ecossecables.co.uk



The new site is simple to navigate, user-friendly and packed with information not only on all Ecosse Cables but also valuable research including how 'noise' pollution affects your music and av system and why choosing the right cable for your system Monocrystal™ is crucial. There is detailed explanation on why certain cables work best together, with clarification on cable and system synergy.



Our superior non-compressing RCA plugs -ensuring the very best connections available at real world prices- are discussed in detail, as is our breakthrough Monocrystal™ and Super-Monocrystal™ conductor technologies.



A 'factory tour' and MD interview gives you and an insight into why Ecosse are, and have been, one of the UK's leading cable brands for over 17yrs and how the genuine music lovers behind Ecosse painstakingly research and develop, then hyper evaluate to destruction, all new Ecosse Cables on the THE VERY BEST 2-CHANNEL MUSIC SYSTEM used by any cable company in the UK.



Our philosophy and 'mission statement' which proudly states: Ecosse Reference is a specialist company engaged in the design and manufacture of low voltage signal analogue and digital interconnects, loudspeaker cables and mains A.C. Powerchords. The commitment of its principals, everyone committed music and hi-fi /audio-visual enthusiasts, is to provide the highest quality products at prices which reflect today's value for money zeitgeist' - ensures our ongoing commitment to bettering the sound from your music and av system, bringing you ever closer to the music, as the artist who performed it intended it to be heard.

That's the Ecosse Guarantee.

MARK LEVINSON No52



ABOVE: Three balanced (XLR), four unbalanced (RCA) plus phono inputs are joined by dual pre-outs plus an auxiliary for tri-amp, bi-amp/sub, record and monitoring applications. Ethernet, ML Net, 12V trigger, IR and USB are all for system control

I revisited the 96kHz/24-bit recording of the jazz/rock combo Vantage Point on the DVD-Audio album *Resolution* produced by Mark Waldrep [AIX 80040]. Waldrep's hi-res productions are uncompromisingly explicit, and the immense dynamic capabilities of this Reference ML amplifier combo put me right in the action, the band seemingly transported to the far end of my listening room to perform.

THE MAGIC OF MUSIC

The No52 opened the window to the space so that the texture and resonance of each instrument was portrayed with fabulous clarity and precision. All the while the sound was luscious and relaxed: smooth and sweet but without being too creamy and mellow; vivid and ultra-detailed without it appearing antiseptically squeaky-clean and with instruments' transients sharply spotlighted; light-footed while simultaneously meaty and powerful.

As I picked recordings used regularly for assessing a component's character I wondered time after time: 'Has my system ever sounded quite as good as this?' Such is the No52's transparency it was easy to observe the dexterous plucking by guest bassist Alphonso Johnson and his subtle phrasing, where too often the clarity of the bass is masked by the wallops of Simon Phillips' kick drum in the *au naturel* recording of Vantage Point. Similarly I was enthralled by

the gloriously natural sound of the Hoff Ensemble's *Quiet Winter Night* album [2L 087]. The clarity took my breath away, as did the holographic nature of the sound image.

There's a lot of humanity transferred from a guitarist's fingers to fretboard and strings, a drummer's hands and sticks to heads and cymbals. That's the magic of music. The clarity and precision of the No52's delivery made this startlingly obvious with tracks from *Roadhouses & Automobiles* by Chris Jones [Stockfisch SFR 357 6027 2].

On the infectious 'No Sanctuary Here' the pumping electric bass loaded my listening room to the max on my thrill-factor gauge, while the shimmering tambourine hovering stage left suspended disbelief with its lifelike, sparkling transients. The cheesy voicing of the Hammond was clear despite it being wa-ay back in the track's stereo mix, while the resonance of the African bow harp added delicacy and colour. Regardless of what I played the Mark Levinson No52 kept everything focused and in clear perspective. ⬇

HI-FI NEWS VERDICT

In pursuing outright excellence Mark Levinson's development engineers have certainly designed a most glamorous preamplifier. If I could contemplate spending £28k... well, I'd be elbowing my way to the front of the queue for a ML No52 in a heartbeat! Not only does it get out of the way of the music, its flexible configurability and pleasing user interface makes it a delight to operate. In a word: fabulous...

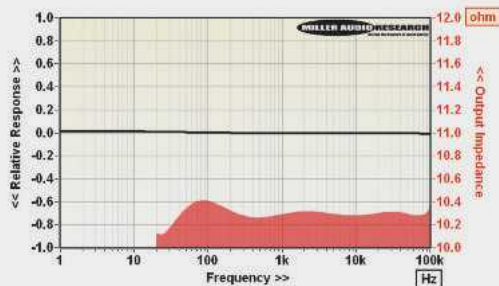
Sound Quality: 88%



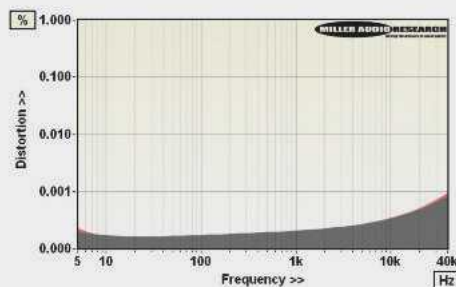
With a combined weight of 27.3kg and with its digital control logic and analogue preamplifier stages separated into two heavily screened enclosures, the No52 from Mark Levinson is arguably the most sophisticated but basic preamp we've tested in *HFN* for many years. For all its complexity this is, after all, a traditional line/phono preamp devoid of any *digital* inputs (USB, S/PDIF, networking etc). Overall gain is programmable from 0dB (unity) to +6dB, +12dB and +18dB, the +6dB option being tested here (actually +5.97dB for our review sample, balanced in/balanced out). The S/N ratio at this gain setting is impressively wide at 102.5dB (re. 0dBV, A-wtd).

The logic-governed volume control is the most precise I have measured, offering exact 0.1dB increments from position '80' (maximum volume) down to '23' (a total of 570 steps representing a 57.0dB range with a cumulative error of just ±0.1dB) and then 1.0dB steps from '23' down to '1' (a total of 22 steps offering a 22.4dB range). The miniscule 0.4dB error is also picked-up cumulatively over the final 22dB volume range, with -0.06dB at the -10dB point (-67dB overall), for example. Volume position '0' ('Off' or 'Mute') cuts the preamp's output to a residual noise of just -100.5dBV (9.4µV, unweighted).

Frequency response is almost perfectly flat from 1Hz-100kHz with a mere +0.02dB shelf below 20Hz and the output impedance is equally uniform at just 10ohm across the audioband [see Graph 1]. Distortion is incredibly low at 0.00007% through bass and midrange (1V-16V output), increasing to a microscopic 0.0003% at 20kHz [see Graph 2]. Readers are invited to view a comprehensive QC Suite test report for Levinson No52 preamplifier by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Extended frequency response (1Hz-100kHz, black) versus output impedance (20Hz-100kHz, red)



ABOVE: Distortion versus extended frequency from 5Hz-40kHz at 0dBV (left, black; right, red)

HI-FI NEWS SPECIFICATIONS

Maximum output (<1% THD, 47kohm)	>16Vrms (Balanced)
Maximum input level (<1% THD)	>10Vrms (Balanced)
Output impedance (20Hz-20kHz)	10.1-10.3ohm (Balanced)
Frequency response (20Hz-100kHz)	+0.02dB to -0.01dB
Input sensitivity	500mV (+6dB gain setting)
A-wtd S/N ratio (re. 0dBV)	102.5dB
Distortion (20Hz-20kHz re. 0dBV)	0.00007-0.0003%
Power consumption	31W (1W standby)
Dimensions (WHD) / Weight	438x219x330mm / 27.3kg

TAD TAD-DA1000

Following its imposing Reference series with a new range, 'Evolution', TAD has come up with this versatile high-end DAC, seemingly fully-equipped for the hi-res enthusiast
 Review: **Steve Harris** Lab: **Paul Miller**

Known originally for professional studio speakers, Pioneer's Technical Audio Devices brand is now firmly established in high-end consumer audio. The £11,995 TAD-DA1000 DAC reviewed here is one of the newest introductions in a range that has truly international ingredients.

TAD is headquartered in Long Beach, California, where its director of engineering is expatriate Yorkshireman Andrew Jones. He began his career at KEF under Laurie Fincham, working on the development of Uni-Q drive units, and became chief engineer in 1989. After 11 years at KEF he followed Fincham across the Atlantic to Infinity, before joining Pioneer in 1998.

TAD'S ELECTRONIC RANGE

Several major speaker designs later, Jones would become responsible for a complete new high-end product range. The TAD electronics line started in 2008 [see boxout] with the M600 monoblock [see *HFN* Apr '13] and D600 disc player [*HFN* May '12], which, with the C600 preamp [*HFN* Apr '13], form the TAD Reference Series. These statement products come at prices out of reach to all but a few, but they've been joined by the Evolution series, best described as 'less unaffordable'.

Launched in 2011, the C2000 DAC/preamp, M2500 two-channel amp and M3400 four-channel amp provide more system options for less stratospheric budgets. We teamed the C2000 and M2500 with the D600 in a world-first exclusive system review [*HFN* May '12].

Late last year, TAD announced the D1000 disc player/DAC, roughly half the price of the D600 at £13,995, and the DA1000 as a DAC-only alternative. Both offer the same DAC input options, but the DA1000 also includes a linear volume control, for direct connection to a power

amp, and a separate headphone amplifier. These models share the technology of the D600. Digital conversion strategy is the same, with two Burr-Brown 1794A DACs, one for each channel, the two channels of each DAC chip being connected in parallel.

For the D600, TAD's literature described a new ultra-high clock/noise ratio master-clock UPCG (Universal Programmable Clock Generator) and 'a new proprietary crystal oscillator that improves noise by more than 50dB compared with conventional players'. This time, it's said that both new models 'integrate a newly developed, ultra-high C/N master clock UPCG equivalent to that in the higher-level TAD D600'.

Physically, though it lacks the dramatic V-fronted 'bow' of the D600, the DA1000 is still a true battleship, housed in an 8mm-thick pure aluminium chassis.

Heavier components are placed in the lower section, lowering the centre of external vibrations, while power supply vibrations are minimised by mounting the supply on a thick-walled brass base.

ALMOST TOO DISCREET

Front-panel controls are discreet, to say the least, almost hidden between the upper and lower bulwarks of the massive casing. An input selector button cycles through the USB input and four other digital inputs, while Vol ± buttons control the line output level. The factory default setting is for a fixed (maximum) output, but to enable the volume control, you just hold the '-' button down for a few seconds.

On the far right is a ¼in headphone socket, with an adjacent pair of buttons



RIGHT: A single Burr-Brown PCM1794 DAC is visible on this top PCB which also carries a deal of PSU regulation for the various digital and analogue circuits. Note the unused, but ready-screened sections of the PCB



providing a headphone volume control independent of the line output level.

Once up and running, the small display indicates U1 or U2 for the USB input, D1 for balanced XLR, D2 or D3 for one of the two coaxial digital outputs or D4 for optical. If using the fixed output level, the display will also give the sampling rate of an incoming signal in round numbers, eg, '44' for CD. When the line-output volume control is activated, the level defaults sensibly to a moderate initial value of 30, and the display will subsequently show the volume setting (between 0 and 78) instead of the sample rate. In either case, the Disp button, to the right, will cycle between this and the other two display modes: input-plus-headphone-volume and display-off.

As delivered, the USB input comes ready to play in its default mode, indicated on the display as U1. This supports USB Audio Class 1.0 and USB 2.0 high-speed and allows sample rates up to 96kHz. To explore the full potential of the DA1000,

'The DA-1000 always produced an "effortless" sound quality'

you need to switch to USB AudioClass 2.0 DoP mode, seen as U2 on the display.

This can handle 24-bit/192kHz and even 32-bit/384kHz data, and supports the DoP format for 'DSD over PCM', a standardised way of transferring DSD audio via USB.

However, as PM's Lab Report confirms, the DA1000 always downsamples higher-rate audio inputs to 96kHz.

Remote commands are received by a sensor near the centre of the fascia, with a range of around 7m, enough for most people's listening rooms. The slim metal-cased handset duplicates all the front panel controls, including headphone/line output volume.

If you're setting up the TAD-DA1000 with a PC, you need to download an appropriate driver from the TAD website. This means choosing the 64-bit driver for Windows 8 or Windows 7 64-bit, or the 32-bit driver for Windows 7 32-bit, XP SP3 or Vista SP2, and following the installation guide. At the end of this you will be instructed to switch to the AudioClass 2

ABOVE: Controls include volume buttons for line output and, far right, for the headphone output. Display shows input sample rate but can also display line or headphone level

input mode, U2, by putting the unit in Standby, then pressing the Standby button while holding down the Input selector.


If you're a Mac user, you won't have to do any of that, whether you are running OS X 10.6, 10.7, 10.8, or 10.9 Mavericks. Just turn on, connect the USB cable and the driver will be installed automatically. The only setting-up you need to do is to select the U2 input from Standby by pressing the input and power buttons together.

One of the many nice features of the TAD-DA1000 is that it's designed to have your laptop sitting, as it were, on its lap. The flat top panel is also designed to provide effective screening between computer and DAC.

COMING ALIVE

Using a Mac and Pure Music in conjunction with iTunes, I spent a lot of time enjoying downloaded 24-bit/96kHz material, mainly courtesy of HDtracks. Here the DA1000 seemed airy, transparent and simply able to let the music through in an unforced and natural way that just kept you listening.

It certainly brought orchestral music to life in a sometimes awe-inspiring way. One of the great classical excerpts on Chesky's 2013 sampler, actually supplied by Reference Recordings, is 'The Dance Of The Tumblers' from *The Snow Maiden* by Rimsky-Korsakov. On this track, the DA1000 was able to give a fabulous depth and scale of image, with a really effortless sound from the big orchestra, and an impressive display of air-moving sound from the timps.

Moving on to jazz and popular music sounds, I was captivated by the 24-bit/96kHz presentation of Patricia Barber in 'The Wind Song,' which comes from her 2013 Concord Jazz album *Smash*. It was 

A START WITH SPEAKERS

Although TAD has always been part of Pioneer, the story starts not in Japan but in the USA. In 1975, Bart Locanthi, former vice president of engineering at JBL since 1960, moved over to join Pioneer North America to be in charge of product development. The result was the HPM-100 loudspeaker, Pioneer's answer to the all-conquering JBL L100 Century. With Locanthi leading a US design team and with its own advanced speaker technology, including, for example, beryllium diaphragms, Pioneer was ready to make serious inroads into the pro audio speaker market. But it couldn't do this under a brand that was associated with mass-market hi-fi. The answer was to name the pro speakers 'Technical Audio Devices'. For the next 20 years or so, TAD continued as a pro department within Pioneer, its name unknown to audio consumers. But in 1997, Pioneer set up a new facility in California, recruiting Englishman Andrew Jones to head the team that would come up with a high-end audiophile speaker range. At the Las Vegas CES in 2008, Pioneer announced the creation of Technical Audio Devices Laboratories, Inc, as a subsidiary, and launched the first TAD electronics.



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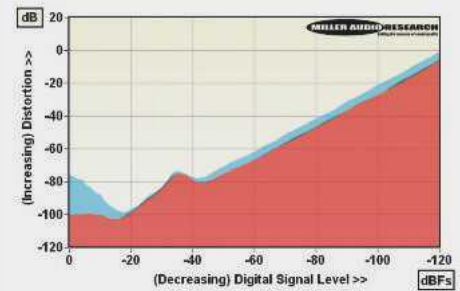
"STACKS EASILY - GOES ANYWHERE - SUPERB SOUND"

TAD TAD-DA1000

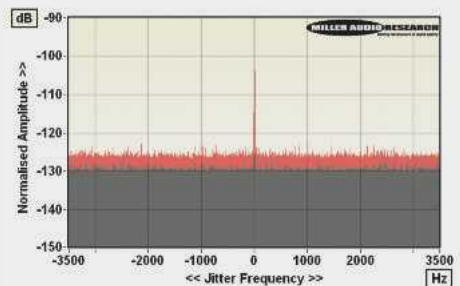
Equipped with an improved DoP-ready USB 2.0 input, the digital and analogue performance of this TAD-DA1000 still bears a strong resemblance to that of the older D600 player/DAC [HFN May '12]. TAD's specification talks of 'compatible sampling frequencies' of 44.1 to 192kHz (S/PDIF) and to 384kHz LPCM/5.6MHz DSD (USB) but, further down the sheet, mentions 'frequency characteristics' of 10Hz-40kHz. This is because the TAD-DA1000, like the D600, downsamples all high rate material to 24-bit/96kHz resulting in a practical response limit of -0.5dB/41kHz and -3dB/42kHz (a very steep cut-off thereafter gives -21.3dB/45kHz). Also in common with the D600, the DAC's 4.2V output is phase inverting and the output impedance rises alarmingly to nearly 3kohm at 20Hz, possibly affecting subjective bass performance.

Distortion also mirrors the D600 with odd-orders prominent at high levels (0.0008-0.017%, 20Hz-20kHz/0dBfs) and a more consistent even-order pattern at lower levels (~0.05%, 20Hz-20kHz/-30dBfs). [The 'bump' in THD vs. level attributable to the PCM1794 DAC is visible in Graph 1, below.] The A-wtd S/N is still admirably wide at 113.7dB but would be higher still but for a smooth carpet of white noise at higher frequencies, artfully concealing any low-level jitter sidebands, or digital granulation noise [see Graph 2, below]. Once again, there's plenty of discussion about TAD Labs' 'Ultra-high C/N Master Clock UPGC' and its jitter reduction, illustrated in practice by figures as low as 30psec via S/PDIF and USB at all sample rates.

Readers can view comprehensive QC Suite test reports for the TAD-DA1000'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)	4.10Vrms at 307ohm-2.79kohm
A-wtd S/N ratio (S/PDIF / USB)	113.7dB / 113.6dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.0008% / 0.005%
Dist. & Noise (20kHz, 0dBfs/-30dBfs)	0.017% / 0.0046%
Freq. resp. (20Hz-20kHz/45kHz)	-0.13dB to -0.0dB/-21.3dB
Digital jitter (48kHz/96kHz/USB)	30psec / 50psec / 30psec
Resolution @ -100dB (S/PDIF / USB)	±0.1dB / ±0.2dB
Power consumption	25W
Dimensions (WHD) / Weight	440x150x406mm / 16.5kg



ABOVE: USB and coaxial/Toslink S/PDIF and AES/EBU digital ins are offered plus coaxial and XLR digital outs. There are also balanced and single-ended analogue outs

great to appreciate the real subtlety of the singing 'wind' sounds she somehow coaxes from the piano, starting off as a kind of soft breeze before bassist Larry Kohut and drummer Jon Deitemyer join in to build up the momentum, with an almost ridiculously big bass sound from Kohut that seems to leap up and over the soundstage. But nothing overpowered or diminished the sheer intensity of Barber's vocal delivery in this powerful song.

RIPS AND CD

Playing music ripped from CDs, the DA1000 displayed what I would call a creamy, smooth and full-bodied sound. In the tremendously atmospheric album *O Que Sera* by Stefano Bollani and Hamilton de Holanda [ECM 2332], the live, reverberant sound was truly invigorating, with Bollani's piano on the left and de Holanda's bandolim (a ten-string mandolin) on the right as this virtuoso duo engaged in their most fantastic flights. With the DA1000, these players made music so organically and excitingly that you wondered why there aren't more piano/mandolin duos around.

Not unexpectedly, the DA1000 was pretty superlative when playing CD directly. It could always produce a big and open soundstage, with a relaxed quality that again had me coming back to the word 'effortless'. On female vocals it would sound particularly sweet and unstrained, as for example when I put on my old favourite *Entre Cada Palabra* by Marta Gomez [Chesky JD301].

This album, though, was one that allowed me to compare the sound of CD and 24-bit/96kHz audio from Chesky, which was an ear-opener. Listening to Gomez and 'Lucia' in the hi-res version, the soundstage was much bigger and more real, with a sensation of height, and Marta's

voice had more texture and beauty, the bass more gently resonant in what was now like a real acoustic.

Guitar sounds were full-bodied and realistically stringy, so that on one particular hand-noise scrape as the guitarist's hand changed position, you could hear what the sound really was and almost see his fingers. The breathy accordion had greater air around it, while the conga sound, which on the CD by comparison had almost a 'plopping' quality rather than a real drum attack, now had the real rapping impact of something hit.

Listening to material recorded at the higher sampling rates, I got enjoyable results, despite the fact that the DA1000 was downsampling them to 96kHz. On a 192kHz recording by Tony Faulkner of Rachmaninov's *Symphonic Dances*, it was still impossible not to be impressed by the huge sound of the orchestra, combined with fine detail.

Similarly, on a Faulkner recording of Dvořák's 'New World' symphony made at a sample rate of 176.4kHz, the DA1000, though downsampling, still conveyed tremendous dynamics in the orchestra, with bottom-end power and extension giving realism to the basses and providing a great foundation for the music. ⤴

HI-FI NEWS VERDICT

Matching a commanding physical presence with impeccable sonics, the DA1000 sounds inviting and unruffled across any media you throw at it, although in fact it downsamples 192kHz sample-rate audio to 96kHz. The D1000 player/DAC has the same input options. But a valuable extra with the DA1000 is its genuinely usable volume control, meaning you only need a power amp to complete the system.

Sound Quality: 85%



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Hi-Fi News



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hi-finews GROUP TEST

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TESTED THIS MONTH

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The rise of computer audio has been remarkable. Even as recently as five years ago we were all buying special hardware and software (CDs, mainly) to play music on, but suddenly this has all changed as so many people now use their PCs and Macs to do the job instead.

This is all well and good, except that they were never built to play music to audiophile standards. There's a degree of compromise, and it's particularly marked here because computers break pretty much every audiophile rule in the book. They're highly electrically noisy inside and often run on very average power supplies, and there are various other internal obstacles for the delicate digital datastream to negotiate before it gets to the outside world.

That's why we've recently seen an explosion in specialist USB audio devices – from full size DACs to the small hub/battery-powered headphone amplifiers tested here. By taking the digital to analogue conversion out of the computer box, they're far less susceptible to interference. They also offer

the chance to use higher quality DAC chips (specified by the device manufacturer and not the computer supplier). Unlike the computers which drive them, these claim some semblance of audiophile credibility.

Their higher quality amplifiers are also far better able to drive a decent set of hi-fi headphones than the analogue output stages built-in to computers, so for any serious personal audio fan USB headphone DACs do make a lot of sense. This month's test covers five such devices, but they're all quite different. Some are minimalist, others dripping with features; some are truly portable and others rather a chore to travel with, even though it can be done. Read on to see which best suits your needs.

SYSTEM AND SOUNDS

Each USB DAC was run for several days to get thoroughly warmed through. Rechargeable batteries are fitted to the Furutech and CEntrance, and these were fully topped up. Both Jays v-Jays portable and Philips Fidelio X1 domestic headphones were used, with minijack adapters where needed,

and the music source was a recent Apple MacBook Pro running Audirvana Plus 1.5.12 music player software, switched to priority mode.

A wide range of CD rips and hi-res music files were tried, including Jon and Vangelis's 'I Hear You Now' from *The Best Of Jon And Vangelis* [Polydor 821 929-2], and David Bowie's 'Modern Love' from *Let's Dance* [EMI Bowie 1]. The former has an extremely clean and dry sound, while the latter is cut hot with very punchy bass. A richer, sweeter noise came courtesy of Isaac Hayes' 'Bumpy's Lament' from *Shaft, OST* [Stax SCD-88002-2], while Kate Bush's 'Snowflake' from *50 Words For Snow* [Fish People 87 186-2] is a state-of-the-art modern recording with a wonderfully intricate sound – the 96kHz/24-bit download version was used. Other test tracks included a 192kHz/24-bit rendering of REM's 'Texarkana' from *Out Of Time* [Warner 8 122-7395 1-2] and a 320kbps MP3 of Daft Punk's 'Get Lucky' [Columbia G010003011881D]. ☞

REVIEWS BY NICK TATE
LAB TESTS BY PAUL MILLER

• AMPLIFIERS • TURNTABLES • CARTRIDGES • AM/FM TUNERS • USB DACS • HEADPHONES • SPEAKERS •

Arcam rPAC



This company was early to the portable headphone DAC market, and hasn't looked back since. The rPAC is an impressive product at the price, as it is beautifully styled, packaged and built. It makes some of the others here look slightly slapdash, and feels more expensive. It is one of two truly portable designs in the group, the other being from Cambridge Audio, but the Arcam is rather heavier and bulkier, which marks it down. Operationally it is wonderfully easy to use with just two buttons (volume up and down).

With no third-party (PC) USB drivers required, media files are limited to 96kHz. Regardless of sample rate, the unit's central LED goes from red to green when it locks onto a signal. A Texas Instruments PCM5102 DAC is fitted inside the thick aluminium case, and there's an integral rubber mat for stability. At the back, the unit has RCA stereo line outputs to complement the front mounted 3.5mm mini headphone socket. As with the other 'non-battery' DACs here, it is powered via the USB lead/hub.

CLASSIC ARCAM

Considering its modest price, the rPAC is absolutely fabulous. An obvious improvement on the internal sound system on even a high-end laptop computer, it brings a spacious, smooth and enjoyable performance to whatever type of music you care to play. There's lots of detail and depth, but the Arcam doesn't throw it out at you. Instead it manages to pull you into the music, never wearing you down.

For example, the Jon and Vangelis track separated everything out beautifully, giving a very detailed

RIGHT: The beautifully styled Arcam shows that sometimes less can be more, with only 3.5mm headphone socket and +/- volume buttons visible

soundstage where all elements in the mix could play without being subsumed by others. Although not as enthralling as the Cambridge Audio, the Arcam offered a slightly more detailed and spacious rendition.

Tonally the rPAC is 'classic Arcam', which is to say bright and spry without ever getting harsh. Treble has a lovely sparkle, giving a realistic feel to Isaac Hayes' 'Bumpy's Lament' – the recording came over as rich and atmospheric, with a good strong bass and a lovely sheen to the track's soaring strings. It shares the pricier Fostex's light, bright, punchy nature, but doesn't quite ram it into your face in the same way, the result being that the rPAC is an easier listen. This was most obvious on the highly EQ'd, seriously compressed David Bowie track, where the Arcam was less tiring and all the more enjoyable for it.

Kate Bush's 'Snowflake' showed the Arcam to be unable to excavate deep into the texture of vocals or instruments, but most of the others here were too – with the exception of the ADL and the CEntrance. It was still a lovely listen though!

Sound Quality: 75%

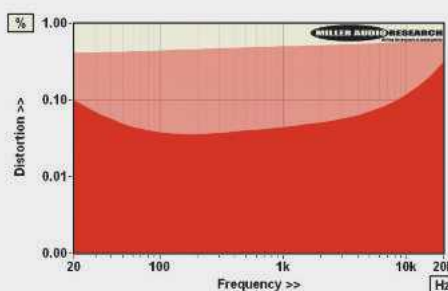


RIGHT: Set in a recess in the back of the neat casework of the Arcam rPAC, a USB type B socket sits alongside RCA phono outputs (a basic RCA lead is provided with the rPAC)



HI-FI NEWS LAB REPORT

Arcam's specification for the headphone output of its rPAC USB DAC is mildly inferior to that of the accompanying RCA line outputs. For example, the RCA's 2.15V maximum output and 106dB A-wtd S/N ratio drops to 1.67V/94dB when measured via the headphone socket (unloaded). Distortion is also higher via the headphone output and uniformly so at 0.04% over the top 30dB of its dynamic range. Distortion increases with reducing (headphone) load impedance from 0.04-0.31% (unloaded) to 0.41-0.62% (10mW into 25ohm) from 20Hz-20kHz [see Graph, below]. Arcam rates the rPAC's 'headphone power output' at 138mW into an unspecified load, but with a full scale digital input the power output was 88mW at 3% distortion into 25ohm. A figure of 75mW/25ohm is achieved at the point of clipping (0.5% THD). The response shows a slight loss in bass (-0.2dB/20Hz) allied to an extended treble (-0.1dB/20kHz and -0.4dB/40kHz), its uniformity almost guaranteed by the low 1ohm source impedance. Stereo separation is unusually unvarying with frequency – just 63dB from 20Hz-20kHz. PM



ABOVE: Distortion versus frequency from 20Hz-20kHz (solid red, 1V unloaded; shaded red, 10mW into 25ohm load)

Maximum output (re. 1% THD into 47kohm)	1.67V
Max. power output (re. 1% THD into 25ohm)	75mW
Output Impedance (20Hz-20kHz)	0.96-4.0ohm
A-wtd S/N ratio (re. 0dBFS)	94.3dB
Distortion (20Hz-20kHz, re. 10mW)	0.41-0.62%
Freq. resp. (20Hz-20kHz/40kHz)	-0.2 to -0.1/-0.4dB
Stereo separation (20Hz-20kHz)	62dB to 63dB
Digital jitter (unloaded/loaded at 25ohm)	98psec / 85psec
Dimensions (WHD)	110x25x62mm

Cambridge Audio DacMagic XS



LEFT: The unit is seriously compact, feeling more like an in-line volume control than a DAC. Volume up/down is all you get – and all you need

The smallest unit here by a good margin, this is the ideal travel companion if you regularly need high quality music on the move. The DacMagic XS (eXtra Small?) has the most important functions for mobile music makers – namely an up/down (analogue) volume control and an LED that glows blue for 44.1kHz/16-bit inputs, green for up to 96kHz/24-bit and purple for 192kHz/24-bit, for which USB 2.0 drivers are needed if you run a PC.

Its built-in ESS9023 24-bit DAC does digital conversion duties, and there's also a beefy headphone amplifier chip driving the 3.5mm socket. Between them, the unit gets surprisingly hot, despite having a sleek, brushed aluminium case to cool it. The unit comes supplied with a short USB-to-micro USB lead for connection to your computer, and a single 3.5mm headphone socket; no 6.3mm facility is offered, although one could always use an adapter.

SPACE AND GRACE

Despite being the smallest and cheapest here by a fair way, the wee Cambridge Audio did surprisingly well. Its sonics cannot match the more expensive products in the group, but you would never say it sounded poor. Indeed, it punched way above its weight in terms of musicality, and didn't appear to be lacking in power either.

The DacMagic XS has an upfront, engaging and punchy sound, but this never descends into hardness or sounds unpleasant. It is a dramatic improvement over the internal sound system of an Apple MacBook

Pro, for example, establishing its *raison d'être* at a stroke.

This little widget brings a good deal of clarity and focus to the proceedings, plus a little more sophistication at the frequency extremes. For example, David Bowie's 'Modern Love' gained an enjoyably solid bass, which never sounded leaden or slow. Indeed, it pushed the song along with real zeal, and this followed through up into the midband where there was a wealth of detail and fine dynamics.

The beautiful strings in Isaac Hayes' 'Bumpy's Lament' were carried superbly, with space and grace; they were also positioned well in the soundstage, giving a less upfront sound but no less impactful. At the same time, the XS showed a reasonable finesse in the treble, although hi-hats weren't quite as silky as with others here. Most important was its fine sense of rhythmic flow; this really is a natural music maker and makes anything you play a pleasure.

Kate Bush's 'Snowflake' saw a rich, sonorous piano sound, plus a satisfyingly accurate and intimate rendition of lead vocals. In absolute terms, there's a fraction more grain than the substantially pricier ADL and CEntrance, and a little less space and silkiness up top, but still the Cambridge Audio managed to be one of the musically believable devices in the group, with dynamics and detail to spare. At this price, you can't say fairer than that.

Sound Quality: 75%

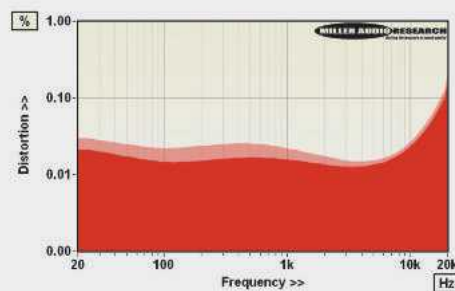


RIGHT: Round the back of this DAC there's only a USB socket to keep you company, but mobile music fans wouldn't want any more clutter



HI-FI NEWS LAB REPORT

Diminutive in stature it may be, but the DacMagic XS still packs a punch. The sub-1ohm output impedance is a real bonus when driving low impedance 'phones just as it minimises variations in the system response regardless of swings in the headphone's impedance. The native response shows a very gentle treble roll-off (-0.2dB/20kHz and -0.9dB/45kHz with 96kHz media) with a mere 0.15dB loss into our 25ohm test load. Stereo separation is fixed at around 62dB from 20Hz-20kHz (see Arcam's rPAC, p40) but the channel *balance* is almost perfect with errors of <0.01dB over the same audio band. The maximum voltage output is 1.9V, yielding a 92.4dB A-wtd S/N ratio, but the DacMagic XS is still plunged into clipping over the top 1-2dB of its (digital) dynamic range where 125mW is possible albeit at 4% distortion. A figure of 100mW/25ohm is more realistic at <0.5% THD. However, thanks to the rugged output stage distortion is not only impressively unaffected by loading [see Graph below] but it is also very 'flat' with frequency at ~0.025% from 20Hz-10kHz. Jitter is also very low at ~100psec, loaded or unloaded. PM



ABOVE: Distortion versus frequency from 20Hz-20kHz (solid red, 1V unloaded; shaded red, 10mW into 25ohm load)

Maximum output (re. 1% THD into 47kohm)	1.90V
Max. power output (re. 1% THD into 25ohm)	100mW
Output Impedance (20Hz-20kHz)	0.68-0.95ohm
A-wtd S/N ratio (re. 0dBfs)	92.4dB
Distortion (20Hz-20kHz, re. 10mW)	0.016-0.20%
Freq. resp. (20Hz-20kHz/40kHz)	+0.0 to -0.17/-0.34dB
Stereo separation (20Hz-20kHz)	60dB to 61dB
Digital jitter (unloaded/loaded at 25ohm)	105psec / 100psec
Dimensions (WHD)	30x10x54mm



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CEntrance HiFi-M8



Although it can never match the tiny Cambridge Audio in its portability, the HiFi-M8 is one of the better units here for music on the move. It has an internal rechargeable battery offering six hours of playing time from a full charge, and the controls can't easily be upset when out and about. The unit is well made in a contoured aluminium box, and charging is via USB or the supplied universal power adapter.

Despite diminutive dimensions, it is the best equipped device of the group. The front panel has the volume control, plus a choice of headphone outputs, while the back has two USBs and a mini power socket; there's also a power level display plus a charging beacon.

It's unique here for having three-position bass and treble boost controls as well as variable gain and loading switches, so should be able to get the best from most headphones around. CEntrance describes it as a full Class A design with 'clean rail' power supplies and battery isolation.

A GOOD BALANCE

Tone controls set to flat, the HiFi-M8 strikes a nice balance, sitting in the middle of the group between the silky ADL and the up-and-at-'em Fostex. Bass isn't quite as seismic as with the Fostex or ADL, but is still strong and you'll not want for lack of dynamics either. The difference is that up in the midband, the CEntrance proves fractionally more spacious and better able to carry musical nuances. In this respect it's similar to the ADL, but has a marginally brighter and more

RIGHT: The front panel of the HiFi-M8 takes care of the headphones, with 3.5mm, 6.3mm and XLR sockets, plus a neat little rotary volume control



searching tonality that peps drums and cymbals up.

Still, you couldn't call it harsh; those soaring strings on Isaac Hayes never grate, nor do the cymbals spit. The other feather in its cap is the way it lets the music flow: it's grippy but doesn't ram the song out.

This makes 'Modern Love' just that wee bit less intense than via the Fostex, say, but it seems to have more room to breathe and the listener is drawn to the song's crashing piano chords and less to the snare drums, which reinforces the sense of melodiousness.

Overall, this headphone DAC seems just a little more balanced in the round than its cheaper Fostex rival, while obviously well ahead of the Cambridge Audio and the Arcam. Its only worry is the Furutech, which makes a better job of 'Snowflake'. There is little to criticise here, everything is well balanced, detailed and smooth yet with plenty of power, it's just that the track's haunting, brooding quality doesn't quite come over as well.

Sound Quality: 79%

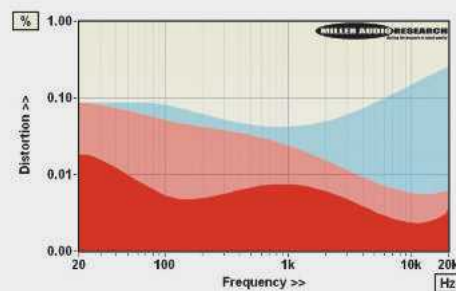


RIGHT: At the back of the CEntrance you find two USB ins (type A for iDevice, type B computer), power socket, plus bass, treble, gain and load and source switches



HI-FI NEWS LAB REPORT

Maximum output varies from -5.3dBV (543mV) to +7.8dBV (2.46V) to +13.8dBV (4.9V) depending on the position of the gain switch and also offers 11ohm, 3ohm and 2ohm output impedance selections to suit all headphone types. Unlike other USB headphone preamps here, the HiFi-M8 does not clip at high gain with a full scale (0dBFS) digital input but delivers a full 460mW/25ohm at 0.023% THD (0.012% unloaded). The trend of distortion versus frequency does alter depending on the gain setting however. In the maximum setting distortion increases to 0.26%/20kHz, loaded or unloaded at -6dBFS, while in the minimum gain mode distortion falls with frequency to achieve just 0.0065% at 20kHz [both tests at full volume position - see Graph]. With the CEntrance ASIO drivers installed and the sample rate set to 192kHz, the maximum *realisable* sample rate is still only 96kHz with an analogue frequency response up to -0.4dB/40kHz and -2dB/45kHz (also, linearity is good to only 16-bits). There is also a bass roll-off of -0.6dB/20Hz but jitter is very low at 124psec and the A-wtd S/N impressive at 98dB. PM



ABOVE: Distortion vs. frequency from 20Hz-20kHz (red, 1V unloaded; shaded, max gain 10mW/25ohm; blue mid-gain)

Maximum output (re. 1% THD into 47kohm)	4.90V
Max. power output (re. 1% THD into 25ohm)	460mW
Output Impedance (20Hz-20kHz)	11, 3 & 2ohm (selectable)
A-wtd S/N ratio (re. 0dBFS)	98.4dB
Distortion (20Hz-20kHz, re. 10mW)	0.060-0.0065%
Freq. resp. (20Hz-20kHz/40kHz)	+0.0 to -0.05/-0.4dB
Stereo separation (20Hz-20kHz)	100dB to 56dB
Digital jitter (unloaded/loaded at 25ohm)	124psec / 124psec
Dimensions (WHD)	113x34x155mm

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Fostex HP-A4

This highly specified product offers DSD 5.6 compatibility as well as up to 192kHz/24-bit LPCM, and a switchable digital filter, variable gain and digital and analogue outputs. Indeed it's more of a mini digital preamplifier than a headphone DAC. Impressive stuff, but sadly the Fostex isn't ideal for taking out and about: its largish satin black aluminium box is heavy enough to preclude it from serious portable use.

Build quality is excellent at the price, with a precision feel to its knobs and switches, plus an easy-to-read display of sampling frequencies, which is what every DAC should have but some sadly don't. Other front panel buttons toggle between USB and optical digital in, digital filter settings, gain and output (RCA line-outs or headphones). Round the back there are the associated sockets, plus a MicroSD card slot for future software firmware updates. It feels excellent value then, providing you expect to use it mostly at home.

EDGE OF THE SEAT

Fostex is a Japanese brand that's made its name in pro audio circles, and frankly it shows. Its presentation is upfront and edge-of-the-seat, with oodles of detail and dynamics, although you'd never call it raucous.

The unit throws out vast amounts of detail, life and energy, making the Isaac Hayes track sound breathtaking, bristling with subtle musical cues set against the backdrop of an extremely powerful bass guitar and soaring strings.

In outright terms, it was less finely textured than the ADL, but still seemed to let the music come

RIGHT: Very Japanese, the crowded fascia has LED sample rate indicators, offers input and output selection and filter and gain switching



across with more poignancy. David Bowie was a riot of thumping, closely-miked rock drums, driving bass guitar and big, crashing power chords – the Fostex was in its element here. Wonderfully impactful, the bass came across as throbbing with harmonics, with a great rasp to the saxophones and a biting snare drum sound.

It's more of a propulsive performer any of the others here, even if lacks some much needed subtlety and tonal light and shade. A switch from filter 1 to 2 made for a more spacious extended sound, at the expense of a little smoothness.

The Kate Bush track proved an emotional experience. The Fostex lent real poignancy to the subtly accented piano playing, giving the song an epic sense from the opening few bars. It lacked the ADL's wonderful, zen-like contemplative mood – indeed, the HP-A4 almost seemed as if it wanted to race through the song rather than become lost in the music: this was its one major downside.

Sound Quality: 77%

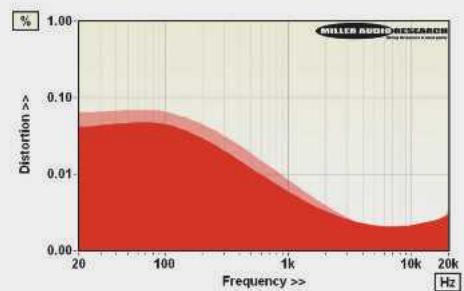


ABOVE: The provision of Toslink digital ins and outs confers real flexibility, while RCA line outs give preamp functionality. USB in is for computer, MicroSD for upgrades

HI-FI NEWS LAB REPORT

The headphone output is plunged into clipping with a 0dBFS digital input at full (analogue) volume in high gain mode but delivers up to 55mW/25ohm in low gain mode. The HP-A4 is capable of higher output still – achieving 130mW/25ohm for 0.01% THD in high gain mode with a –6dBFS digital input (Fostex rates the HP-A4 at 100mW/32ohm) – but leaving it in low gain mode is simply 'safer'. With Class 2 USB drivers installed (PC only), the USB DAC handles 24-bit/192kHz files natively, yielding a response that stretches out to –0.8dB/90kHz (or –0.3dB/60kHz to –4.6dB/90kHz with Filter 2 engaged).

Distortion increases slightly at low frequencies with loading, so 0.045% at 20Hz becomes 0.065%/20Hz at 10mW/25ohm while 0.0055% at 1kHz increases less obviously to 0.0077% into 25ohm [see Graph]. The HP-A4 offers a moderate 10-11ohm output impedance, representing a loss of 2.9dB into 25ohm, and a slightly reduced 82dB A-wtd S/N ratio. Jitter is low and only mildly influenced by headphone loading, increasing from 35psec to 95psec into 25ohm. PM



ABOVE: Distortion versus frequency from 20Hz-20kHz (solid red, 1V unloaded; shaded red, 10mW into 25ohm load)

Maximum output (re. 1% THD into 47kohm)	1.66V
Max. power output (re. 1% THD into 25ohm)	130mW
Output Impedance (20Hz-20kHz)	10.5-10.7ohm
A-wtd S/N ratio (re. 0dBFS)	81.7dB
Distortion (20Hz-20kHz, re. 10mW)	0.068-0.002%
Freq. resp. (20Hz-20kHz/40kHz/90kHz)	+0.0 to -0.1/-0.2dB/-0.8dB
Stereo separation (20Hz-20kHz)	73dB to 99dB
Digital jitter (unloaded/loaded at 25ohm)	95psec / 36psec
Dimensions (WHD)	113x34x155mm

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noun

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Furutech ADL X1



This appears to be a portable miniature music centre, offering USB and iDevice functionality, plus a built-in rechargeable battery giving around five hours of operation. Six top-mounted LEDs display sampling frequency, and there's a front fascia volume control – which sadly proved just a little too easy to accidentally move when out and about. Those on the Number 41 bus will doubtless prefer the ergonomic simplicity of the Arcam or Cambridge Audio: these are the only *truly* portable devices in this group.

Build quality is superb, as you'd expect from a premium priced Japanese product. The X1 is basically a brushed aluminium case enclosed in a rubberised plastic shell. It sports an additional 3.5mm line input, the only one in the group to offer this. A 3.5mm headphone socket is fitted, plus Toslink TRRS switch. Like the Cambridge Audio, it sports an ESS ES9023 DAC inside. Overall, it feels like a well presented, luxury product.

OPEN WINDOW

The ADL gives a wonderfully clean and open window into any recording, with better insight into the texture of instruments and vocals than any of the other units here. And it does this without sounding bright or harsh in any sense; indeed if anything it is the deepest and 'darkest', contrasting strongly with the very well lit Fostex. Nor does it have a thumpingly powerful nature, yet it still comes over as wonderfully engaging.

This was very obvious on Kate Bush's 'Snowflake', which was rendered with a very believable

RIGHT: The ADL X1 is similar in size and style to an iPhone 4. There's a choice of line-in or USB; the fascia also has a volume control and ground switch



tonality. The piano was deep and powerful, showing the ADL's strong but not over-prominent bass. Vocals were smooth and velvety – less glassy than with any others in the group, and the phrasing is wonderfully subtle. The song gained a whole new level of emotional impact as a result.

David Bowie's 'Modern Love' was beautifully delivered, albeit not quite as 'impressive' in a hi-fi sense as with the ultra-punchy Fostex. Still, drums sounded less splashy and carried more dynamic contrast. Vocals were smoother yet more believable, and the ADL separated out the multiple elements of the mix in a more cohesive way, making it easier to hear the piano throughout.

The Isaac Hayes track took on wonderful warmth and fullness, and the Jon and Vangelis track was also beautifully rendered, managing to convey the melody of the lead keyboards most convincingly. It's not a showy performer, but the ADL is nevertheless blessed with a wonderful subtlety that makes you want to keep on listening.

Sound Quality: 82%

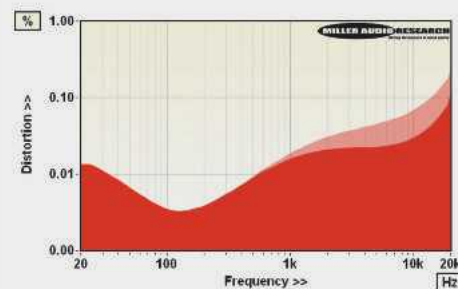


RIGHT: The rear panel of the Furutech ADL X1 offers USB or iDevice connectivity, plus a combined optical digital and line output socket for good measure



HI-FI NEWS LAB REPORT

With a proven XMOS USB 2.0 front-end married to a 24-bit/192kHz ES9023 DAC, the Furutech ADL X1 is certainly not short on technology. It is just a little short on power though, full volume plunging the X1 into overload (loaded or unloaded) over the top 5dB of its (digital) dynamic range. So a full scale digital output realises 140mW/25ohm, albeit at 14% THD, but at -6dBfs it delivers 60mW/25ohm at a preferable 0.025% distortion. A figure of 100mW/25ohm represents the point of clipping. Within its 'comfort zone' distortion falls to a low 0.005% (unloaded) with a steady increase in THD with frequency when driving 25ohm/10mW – 0.015%/1kHz to 0.25%/20kHz [see Graph, below]. The X1's low ~1ohm output impedance minimises response variations with different headphones although its native response shows an obvious low bass roll-off of -1.7dB/20Hz (not a bad thing bearing in mind the excessive bass output of many designs). The high treble response is good to -1dB/50kHz but rolls off thereafter to -9.1dB/90kHz with 192kHz media. The A-wtd S/N is a little disappointing at just 81dB. PM



ABOVE: Distortion versus frequency from 20Hz-20kHz (solid red, 1V unloaded; shaded red, 10mW into 25ohm load)

Maximum output (re. 1% THD into 47kohm)	1.61V
Max. power output (re. 1% THD into 25ohm)	100mW
Output Impedance (20Hz-20kHz)	0.84-1.11ohm
A-wtd S/N ratio (re. 0dBfs)	81.3dB
Distortion (20Hz-20kHz, re. 10mW)	0.015-0.24%
Freq. resp. (20Hz-20kHz/40kHz/90kHz)	-1.7 to -0.2/-0.6dB/-9.1dB
Stereo separation (20Hz-20kHz)	73dB to 86dB
Digital jitter (unloaded/loaded at 25ohm)	745psec / 670psec
Dimensions (WHD)	68x17x118mm

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GROUP TEST VERDICT

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This group encompasses a diverse range of designs but there are two basic types – the sort you'd happily put in your pocket for use on the move, and those you wouldn't. The Arcam and Cambridge Audio fall into the former category, and the others into the latter, to varying degrees. Overall rankings have to be qualified by how you'd intend to use such a product. Another issue is one of functionality; if the unit is to sit next to your desktop PC hooked up to a hi-fi system, you may want lots of features, but if it is to be used out and about you almost certainly won't.

The Cambridge Audio DacMagic XS is super-compact. Those wanting simple, easy music on the move will rate it the best here bar none, because it sounds very good and is wonderfully small to stow away. Sonically, it is enjoyable but it does lack that last few percent of detail and refinement of the others here. Still, it's an excellent portable USB DAC at a great price.

The Fostex HP-A4 is also a fine product in its way: a first choice for those who have a sizeable collection of DSD files they wish to play. It is dripping with facilities and it sounds strong and punchy, making

everything vivid and engaging. Some may wish to have a little more subtlety though, as the Fostex is certainly 'in your face'. One major downside is its size: it is emphatically not the traveller's choice.

A GREAT ALL-ROUNDER

In third place comes the Arcam rPAC. This is a great all-rounder which wins outright in build quality, style, packaging and finish. It's a little heavier than the Cambridge Audio but still just about useable out and about. The price is another

attraction too – it is excellent value for money considering its fine sound. But compared to the pricier designs here it lacks a little insight, some

bass and treble extension, and has a slightly 'well lit' upper midband.

Ranked second is the CEntrance HiFi-M8. Like the Arcam it's a very good all-rounder, but is bolstered by greater functionality and considerably improved sound. You may find the need for all of its myriad features or you may simply want to enjoy its very smooth, open and dynamic character, one which really gets the best out of a good pair of headphones. It adds focus, grip and insight to the Arcam, while being a good deal smoother and

more polished than the Fostex and Cambridge Audio. True, it's a bit bulky, but you can just about take it with you on the train all the same. And the CEntrance is loaded with facilities – it's a serious bit of kit.

PORTABLE PERFECTION

The CEntrance is a lovely package, but try the Furutech ADL X1 and you find almost everything that the former does very well, the latter does even better, making a great product that's pretty much got the lot. Aside from that slightly fiddly volume knob, it's easy to move around and works as effectively as a portable as when it's sitting next to your home computer. The rechargeable battery system works well, and it's not lacking in features.

However, the real ace in its hand is the sound, which is not just excellent, but special in a way that none of the others are here. It's not massively powerful, but at sensible levels you get the sort of subtlety you only normally expect from high-end digital; it digs right down into a piece of music and brings every last bit to life, without ever sounding harsh or artificial.

Partnered with a good pair of headphones and some decent source material, the X1 really takes you to a higher level than you'd expect. Factor in that fine build and sober styling and its top-end price suddenly seems very agreeable. ☺

'The ADL X1 is a package that's pretty much got the lot'

BELOW: The stylish Arcam [right] is just surpassed by the CEntrance but the Furutech [left] leap-frogs the lot with its all-round performance



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Sonus faber Olympica III

Another all-new range from Italy's leading speaker maker, Olympica's top model is the commanding III floorstander
 Review: Ken Kessler Lab: Keith Howard

With so many families in the Sonus faber catalogue, it's hard to figure where Olympica fits. The top of the range III sells for £9400 per pair in natural walnut or anthracite, while the range starts with the small two-way Olympica I at £4398, and there's the II in the middle at £6998, so they overlap with Cremona and Homage. That said, they boast interesting details to separate them from their older siblings while they also exhibit a return to, and refine, the design language that made Sonus faber the most influential speaker brand of the past three decades.

The Olympica range is named after one of the greatest works designed by the legendary architect Andrea Palladio, and constructed in 1580-85 as a gift to the city of Vicenza, the Teatro Olimpico. Sonus faber's tribute is a line of speakers conceived to reflect the Palladian virtues of 'planning, harmony, proportions', and a 'search for beauty [and] wonder'. Tempering the aesthetic concerns, of course, are audio considerations: accessing the listener's emotions through a lifelike portrayal of the music.

In citing Palladio, Sonus faber specifically calls our attention to his theatre's *sonic* qualities, the company long practicing the use of accurate reference models of acoustic enhancement and the concomitant environments in which they'll be used. This is a tradition started by the late founder, Franco Serblin, who was unafraid to insist on, for example, extreme toe-in to create what he described as a 'proscenium effect' around the speakers.

In addition to the lofty aims of using Palladio as a muse, Sonus faber has played to its own strengths, expressed in the company's mission statement, citing a desire to offer its clients, 'a range of models so that everyone can find the right solution in terms of use and in terms of space'. To realise this, the Italians had to

make something that, by any definition, was utterly stunning to gaze upon.

WOOD AND LEATHER LUXURY

Standing 1114mm in height and weighing a thought-provoking 88kg, the Olympica III is imposing without being a room-dominator. As expected, the speaker suggests fine furniture, the review example arriving in natural walnut, with the top and bottom in solid walnut and joints in clear maple. Accenting this, and adding a sense of the atmosphere within a limousine, are leather inlays with highlighted stitching and a branded Sonus faber logo; the front baffle is covered in the same natural hide. The back is also covered in leather, with countersunk serial number tags, followed by the beautifully-appointed terminals.

The construction comprises 'progressive thickness' triple curvature cabinet walls, with solid walnut clamps reinforcing the structure. For treble duties, Sonus faber has fitted its now-familiar 29mm 'Arrow Point' Damped Apex Dome, described as 'a synthesis of the classic dome and ring transducer', with neodymium magnet. The technology is derived from the much dearer Aida [see *HFN* Apr '12].

Mids are handled by a 150mm midwoofer, designed by Sonus faber, with a special custom-made diaphragm employing a 'real-time, air-dried non-pressed blend of traditional cellulose pulp, kapok, kenaf and other natural fibres'. The cone is then treated with a transparent viscous surface damping coating.

Among the most impressive of the Olympica III's virtues is bass with a richness, a fullness and a sense of scale that warrants special mention. The lower octaves are delivered by a brace of Sonus faber

RIGHT: Gorgeous wood, with metal and leather accents embracing the company's signature 'lyre' cross-section. Pairs are supplied mirror-imaged





A RETURN TO FORM

Spotting the Olympicas at a hi-fi show, one seasoned pro said, 'Finally, some Italian-made Sonus fabers.' While this ignored the massive flagship The Sonus faber, Aida and Homage models, it was a barb about the hugely successful, but cheaper models in the (award-winning) Venere range. But I understood his remark, because the Italian brand has been pumping out product like the world is about to end. Olympica heralds a return to the days when Sonus faber wasn't just a pretty face: it was a hot and sexy siren that delivered what its curves promised. Two hours after setting them up, my listening room smelled like I was in Stefano Berner's ordering bespoke shoes. They oozed 'Italy', 'craftsmanship', 'luxury'. Far be it for me to whine because Sonus faber is now a thrusting company in the manner of 21st century commerce. But as one who has championed the marque since I first laid eyes on a pair of Minimas, hearing Olympica IIIs was like a school reunion – only nobody had turned grey or put on weight.

W18XTR woofers, said to descend from 9in units found in the Aida. Their construction includes sandwich cones using a rigid syntactic foam and treated cellulose pulp.

While these are instantly recognisable as Sonus fabers thanks to the oft-copied 'lyre' shape, the eagle-eyed will note the unusual side-firing 'Stealth Ultraflex' reflex port running the height of the speaker, trimmed with a perforated metal sheet. The speakers are supplied in mirror-image pairs, but neither is specifically 'left' or 'right'.

Depending on tastes, room size and other considerations, you might opt for these side-firing ports to fire inwards or, as in my room, firing outwards towards the side walls.

SOUND COHERENCE

Driven by an Audio Research REF75 power amplifier [*HFN* Nov '12], REF5SE preamplifier, SME Model 30/12 turntable/arm and Kiseki Blue feeding an EAT E-Glo phono stage, with a Marantz CD-12/DA-12 handling digital duties, these new Sonus fabers proved instantly inviting. No, make that 'irresistibly welcoming'.

In more ways than one, it was like running into an old friend. I must have used 20 or so pairs of Sonus fabers during my career, following their evolution to what I consider the high point: the Stradivarius Homage. But that was some time ago, and the latest sonic iteration of that speaker is more likely to

be found in a Serblin Ktema. Instead, the Olympica III takes the merits of a Cremona or Amati and adds greater precision, cavernous, almost limitless bass and a sense of freedom to models that were, in any case, hardly lacking in those areas.

If I had to use a single term to describe the overall sensation, it would be 'coherence'. However much you can pick apart the sound and isolate specific areas, not least being the natural, convincing bass, you will always return to the notion

'The Sonus faber Olympica IIIs proved irresistibly welcoming.'

that the speaker remains perfectly balanced. I could discuss the exquisitely sharp and fast treble in isolation, bang on further about the bass, talk about the vista-like quality of the

soundstage, but that would be a pointillist approach that does a disservice to the masterly cohesion. The sound through the Olympica III truly merits the description of 'as a whole'.

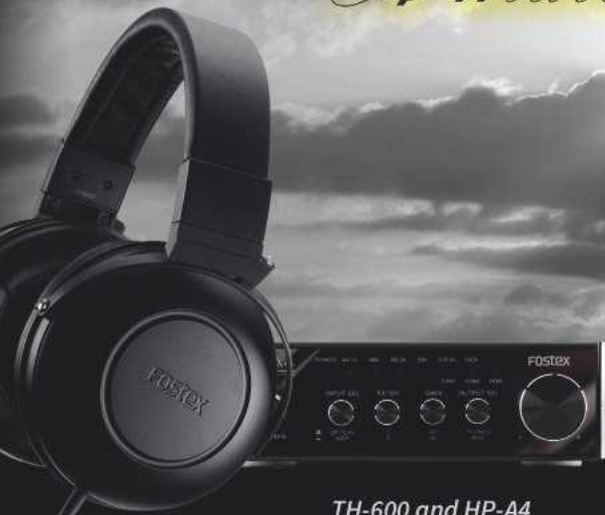
My first test for the speaker was easy: the gorgeous, silky, inviting 'My Baby Just Cares For Me,' from Nina Simone's phenomenal debut, *Little Girl Blue* [Verse Music Group BCP 6028]. Impressively, it was recorded in 1958 but it sounds as good as anything of a younger vintage you may care to compare it to.

That signature song features her sublime piano playing and a lean-but-purposeful backing of drums and bass. The sense of a small club suddenly popping up in one's listening room is exactly the effect desired of a high-end system fed by this CD. With the piano rolling under her smoky vocals, the percussion to the right and at the back, piano occupying the centre of the listening area, and the bass creating a perfect foundation, the results were enthralling. ➔

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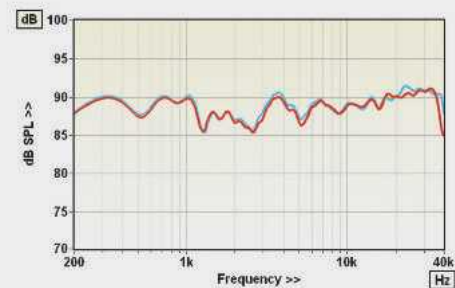
*if you aren't satisfied with the exceptional audio quality, return the items in as new condition for a full refund.

SONUS FABER OLYMPICA III

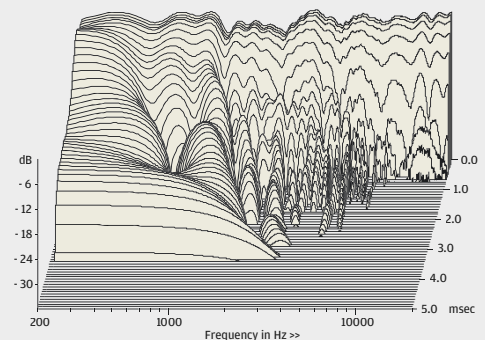
Sonus faber claims a 90dB 'nominal' sensitivity for the Olympia III but our pink noise figure of 88.8dB suggests that this is a little, but only a little optimistic. Low impedance is used to help achieve this – the nominal 4ohm specification should imply a minimum modulus of 3.2ohm (80% of nominal) but we recorded a dip down to 2.6ohm at 103Hz, so this is really a 3ohm design. Given that EPDR (equivalent peak dissipation resistance) is typically half the minimum modulus figure, the Olympia III might have proved to be a tough load to drive but well controlled phase angles result in a minimum EPDR of 1.7ohm at 81Hz, so its partnering amplifier will be no more stressed than with many of today's floorstanders.

Measured at 1m on the tweeter axis the frequency response [Graph 1, below] has a slight presence band dip but departures from flat are constrained to ± 2.5 dB and ± 2.6 dB respectively, 200Hz-20kHz, for the review pair – excellent for a passive loudspeaker – and pair matching error over the same frequency range is also first-class at ± 0.8 dB. The long, thin 'paralaminar stealth flow' reflex port at the back of the cabinet adds some uncertainty to summing the driver and port contributions in the near-field bass measurement which may partly explain why the measured -6dB point (re. 200Hz) was at a relatively high 67Hz – a figure to be regarded with some caution.

At the other frequency extreme, ultrasonic output from the damped apex dome tweeter reaches to beyond 40kHz. The cumulative spectral decay waterfall [Graph 2] evinces fast initially energy decay across the spectrum but some low-level resonant hash is visible in the treble. KH



ABOVE: The Olympia III has a slight presence band dip but is essentially flat. Pair matching is excellent



ABOVE: Fast decay and no obvious bold resonance modes, but some 'hash' persists through the treble

LEFT: Ported down its length, with a quartet of multi-way binding posts at the bottom to allow for bi-wiring if so desired. Terminals are Sonus faber's proprietary type – easy to tighten properly

you can hear the pads hitting strings. You can isolate her accompanists. But never do they suffer a sonic disconnect. It was important, then, that more layered studio creations had to be tasted.

RETRIEVAL PROWESS

Matthew Sweet and Susannah Hoffs' latest duet set, *Under The Covers 3* [Floating World FEEM5037] comprises more of their favourites, a stand-out being their rendition of the Dave Edmunds classic, composed by one E Costello, 'Girls Talk'. All jangly guitars and chiming tones and two contrasting voices: the Olympia III demonstrated a prowess with detail retrieval that I associate most closely with Wilsons, eg, the Alexias.

Their respective character traits are almost clichés, reflecting the designers' personalities. Dave Wilson is the most analytical individual I have ever met; he is discreet, understated. Italians, though impeccable arbiters of taste, tend toward the more flamboyant. Playing the speakers side by side, you could picture Ralph Lauren vs Brioni. The sound says it all.

And yet neither the Wilsons nor the Sonus fabers are so susceptible to such cheap and easy descriptions as to warrant a return to the days of 'British vs American vs German vs Japanese sound'. They differ chiefly as follows: The Wilsons convince. The Sonus fabers seduce. ☺

HI-FI NEWS VERDICT

No doubt about it: Sonus faber has rediscovered its mojo, with the best speaker I've heard from it since the Stradivari – a reminder of the era of the founder, the late, lamented Franco Serblin. The sound is commanding yet capable of great delicacy, the soundstage huge, yet the imagery specific and precise. They represent to my ears an achievement to rank with the Sonus faber Amati. And yes, they're just as gorgeous.

Sound Quality: 86%



Impact? The percussion – both the more energetic moments at the keyboard and the actual drum kicks – were rendered in a wholly lifelike, convincing manner, the magic coming in the form of intimacy. Think about it: the walls of the listening room disappear to be replaced with the sound of the venue, the openness complete, yet there's Ms Simone almost close enough to touch.

Those single notes picked out at the beginning of 'Good Bait'? I tapped a few of them on the upright next to my desk just to gauge the resonance of a real piano. Damn, the Olympia IIIs have it nailed. Yes,

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	89.0dB/88.8dB/88.5dB
Impedance modulus min/max (20Hz–20kHz)	2.6ohm @ 103Hz 22.5ohm @ 2.3kHz
Impedance phase min/max (20Hz–20kHz)	-37° @ 2.9kHz 46° @ 1.5kHz
Pair matching (200Hz–20kHz)	± 0.8 dB
LF/HF extension (-6dB ref 200Hz/10kHz)	67Hz / >40kHz/>40kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.6% / 1.8% / 0.5%
Dimensions (HWD)	1114x403x508mm

Xindak A600E

With acres of aluminium and a massive PSU, Xindak's A600E amplifier is as substantial as any high-end behemoth. But it's an *integrated* and it costs less than £3000...

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

Until comparatively recently, there had been no culture of hi-fi in China. Thanks to the country's tumultuous modern history, there was relatively little consumerism until the late 1980s. But since then a number of Chinese electronic component manufacturers have diversified into full-blown audio separates, and now China's hi-fi industry is coming of age.

We saw the same pattern with Japan some 40 years earlier of course: at first its hi-fi was derided, then bought in large numbers, then revered. There's no reason why this can't happen with China too.

At the moment, companies like Xindak – which is now nearly a quarter of a century old [see boxout] – still lack the prestigious branding to pull prospective purchasers in. So the approach is to offer products which instead appear to offer exceptional value for money. The A600E is precisely this.

The phrase 'never mind the quality, feel the width' springs to mind, as there is no denying the immense physical size and weight of this behemoth. It's so vast that, had it arrived with a prestigious American name on its fascia plate, you would expect there to be an additional '1' at the head of the price tag.

TAKE A LOOK UNDER THE LID

Size isn't everything though, as many of us like to believe. And whereas many Chinese products win on the weighing scales, they can become less successful when a forensic eye is trained upon them. But in the case of the A600E external finish is actually very good, with no visual flaws of the kind that would embarrass Salisbury or Glasgow. Nor would the smoothly painted satin black aluminium casework make Quad owners feel ill at ease. In short, it's an extremely impressive beast in the flesh, even if you wouldn't say that it deserved first prize in the styling department.

RIGHT: A pair of toroidal transformers and 240,000µF of reservoir capacitance supports this mammoth dual-mono amplifier with four pairs of power transistors per side

Some might suspect it's all show and no go. But look under the lid and be amazed. That vast casework is crammed inside with smoothing capacitors, power transformers (set inside their own discrete box) and four pairs of output transistors bolted to the heatsinking each side, while an input stage PCB sits just behind the fascia panel.

It seems very well put together, and you can see why Xindak has built up a strong reputation in its home market for beefy solid-state amplification over the past 20+ years. The spec sheet claims 160W per channel into 8ohm and twice that into 4ohm [see PM's Lab Report, p57].

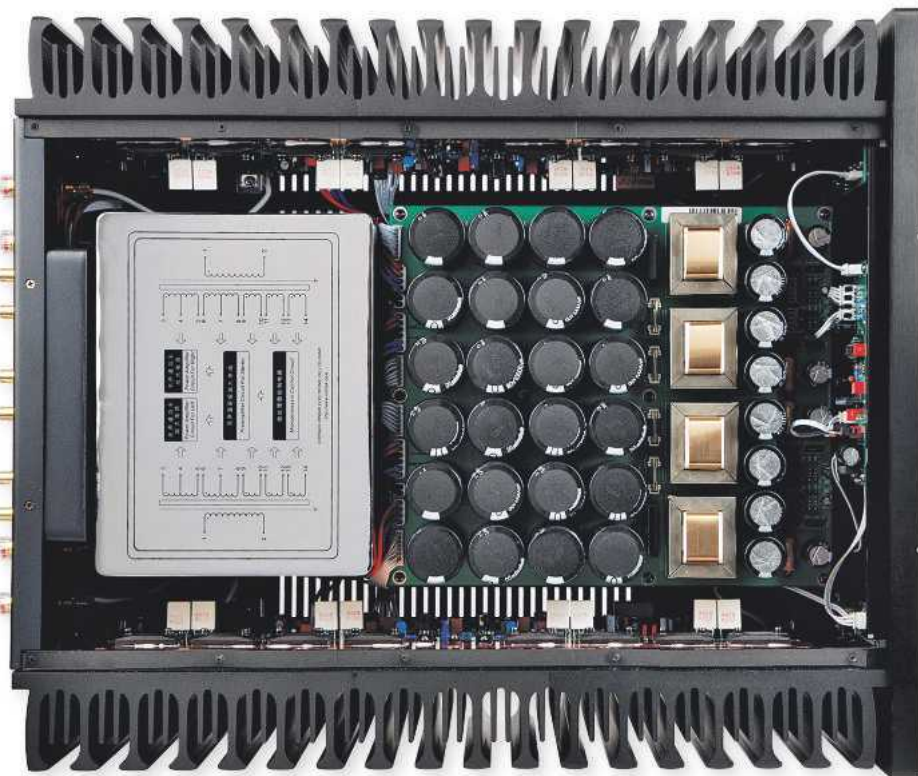
Thankfully, the fascia panel is tastefully minimalist for a Chinese amplifier, with no bright blue power meters or garish displays. The thick aluminium front panel holds just a power switch, input selector – one balanced, two RCA line inputs and one RCA direct in – with associated LED indicators and a volume control. Around

the back, you get two pairs of chunky speaker binding posts per channel, and a choice of RCA phono or balanced XLR inputs, plus an IEC mains input. A decent quality remote is included.

Prospective purchasers should be aware that the main issue with using this amplifier is its immense physical bulk and weight (great care should be taken lifting, as this is a two-man job). It's not exactly something you can slot in and out of your existing hi-fi rack – unless you don't want your existing hi-fi rack anymore. That means many will simply put it on the floor, which is less than ideal given that this is rife with vibrations from loudspeakers. So I would suggest a very sturdy purpose-designed sub-table, positioned in a place that doesn't require it to be moved ever again!

SHAKING THE ROOM

This amplifier sounds like it looks, which is to say large, powerful and heavy.





(Incidentally, it comes in a black finish only.) Indeed it's a true force of nature, with an immensely strong and unflappable sound, making similarly priced rivals appear endowed with all the stability of an autumn leaf in a storm.

The Xindak tells you that it isn't going anywhere, that absolutely nothing that can budge it from its commanding position, and that all else must give way – especially the loudspeakers. This aspect of its performance is wonderful, but there are other sides to it which do need further qualification. Tonally, the A600E mixes a fulsome, warm bass with an explicit upper midband and treble. As you might expect from an amplifier with more power reserves than your average electricity substation, the Xindak has a strong bottom end. Indeed, it treats loudspeakers rather like a cat does a mouse – it toys with them, and has absolutely no fear.

This means the amp seems able to power practically anything you'll find in a domestic environment, regardless of how troublesome a load it may be; bass is duly served up in great quantities, devoid

of any sense of strain. This links up to a clean and open midband, but one that will appear a little too 'etched' for some tastes; it illuminates the soundstage like a bright halogen beam has been shone on it. This gives a rather 'matter-of-fact' tonality to the midrange which is at odds with its sumptuous bass, and the brightness extends up to the treble regions. Again, this makes for lovely filigree detailing, but it may come over as a little too forceful with less refined loudspeakers.

Feed the big Xindak with a thumping drum'n'bass track like Alex Reece's 'Feel the Sunshine' [Island Records 854-468-2] and you soon find yourself pinned to the seat. The song's powerful low frequencies are pounded out by the A600E, as it takes whatever loudspeakers it happens to be driving by the scruff of the neck and shakes them.

However, the rather forward balance of the song and the explicit upper midband

ABOVE: The A600E integrated comes in black only (with silver volume control and fascia switches); indicator LEDs for input choice and power status are symmetrically disposed

didn't prove as good a match as I had hoped. Despite being wonderfully visceral and muscular sounding, the amplifier didn't quite engage with the music in the way that, say, the new Naim SuperNait would.

This combination of an amazing bass and a well lit midband makes it more sensitive to the type of music being played than some more tonally balanced rivals.

'The A600E treats loudspeakers rather like a cat does a mouse'

A STEP BACK

Stay away from head-banging rock or crashing dance music, and the Xindak's talents are better utilised. Smooth dinner jazz in the shape of John Coltrane and Johnny Hartmann's *Lush Life* [Impulse MCA 05661] sees it taking a step back, and proving a faithful companion that offers a detailed sound together with a huge stereo soundstage. It is particularly impressive from left to right – as you might imagine the A600E never feels a prisoner of the speakers it is being asked to drive. The result is a large recorded acoustic, full of air and space.

On smoother recordings, this amplifier's detailed midband picks out nuances in the mix brilliantly, offering up an engaging sound delivered on a vast scale. Indeed, there is a sense that the Xindak has been voiced for this sort of source material, as it sounds completely in its element here.

With all that power and punch, you'd think rock music would be a riot. Certainly you couldn't call it boring, as The Cult's 'She Sells Sanctuary' from the 1985 ➔

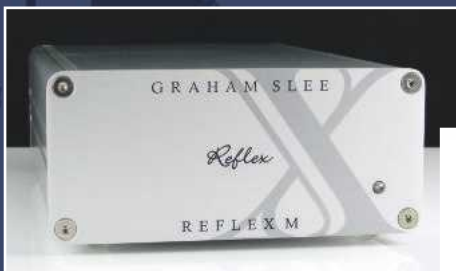
WINNING PLAUDITS

Xindak started out as the Chengdu Xindak Electronics Company back in 1988. Based in central south west China, it was founded by audio engineer Ling Junyan and got its first hi-fi dealership in 1992. Soon after, the company created the Xindak brand for domestic hi-fi products. From its early days, it showed serious interest in manufacturing special audio-grade passive components, specifically capacitors, and these found their way into a popular range of power amplifiers. In 1994 Xindak produced its first loudspeaker, and by the mid-'90s it was winning plaudits for its demonstrations at the annual Wuhan hi-fi show. By 1998 it was exporting out into the Asia-Pacific area, and producing OEM products for Canadian companies. Soon after it went into multichannel home cinema systems, further consolidating its reputation for building powerful solid-state amplifiers. These have won many home-market awards, as has its burgeoning range of loudspeakers. We'll hear much more from Xindak in years to come.

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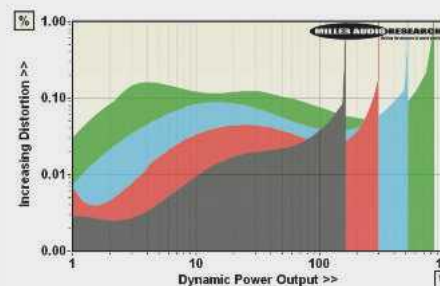
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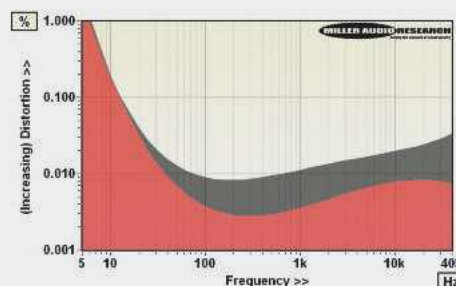
XINDAK A600E

This massive amplifier is very powerful but not, perhaps, as monumentally speaker-bruising as you'd expect. Rated at 160W/320W into 8/4ohm, the output is closer to 160W/295W as the amplifier reaches clipping and, thanks to its supremely tight PSU regulation, offers little or no dynamic headroom at 165W, 300W, 525W and 850W under transient conditions into 8, 4, 2 and 1ohm loads [see Graph 1, below]. 'Peak current of each channel can reach 68A' says Xindak but at a figure of 29A for 10msec at <1% THD is the realistic, measured proposition. It is still more than capable of wrestling with difficult or insensitive speakers, however! Distortion increases with warm-up (0.006% to 0.01% at 1kHz/10W over a 30min period) and with output beyond 2-3W (0.0015%), to 10W (0.01%) to 100W (0.02%). Distortion is largely unvarying with frequency at 0.007-0.012% from 50Hz-10kHz but does increase quite markedly at subsonic bass frequencies – up to 2.1% at 5Hz/10W. Is this a reflection of the A600E's bass heavy sound quality [see Graph 2, below]?

Moreover, the amplifier's S/N ratio is some 6dB under par at 80dB (A-wtd, re. 0dBW) and crosstalk seems to be 'engineered' at a flat and relatively weak 48dB across the audio range, but the output impedance is solid at 0.045-0.07ohm from 20Hz-10kHz, rising thereafter to 0.12ohm at 20kHz and 0.79ohm at 100kHz. This is partially reflected in its response, the mildly rolled-off treble hitting -0.15dB/20kHz and -2.9dB/100kHz, a trend that becomes more marked into lower impedance loads. Overall gain is high for a line amplifier at +44dB (balanced input). Readers may view an in-depth QC Suite report for Xindak's A600E 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 29A



ABOVE: Distortion vs. frequency from 5Hz-40kHz at 10W/8ohm (left = black; right = red)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	160W / 295W
Dynamic power (<1% THD, 8/4/2/1ohm)	165W / 300W / 525W / 850W
Output impedance (20Hz-20kHz)	0.046-0.115ohm
Frequency response (20Hz-100kHz)	-0.04dB to -2.85dB
Input sensitivity (for 0dBW/160W)	17mV / 225mV (Balanced in)
A-wtd S/N ratio (re. 0dBW/160W)	80.4dB / 102.4dB
Distortion (20Hz-20kHz re. 10W/8ohm)	0.012-0.0085%
Power consumption (Idle/Rated o/p)	222W/555W
Dimensions (WHD) / Weight	450x220x596mm / 53kg



ABOVE: Physically robust, two-position 4mm speaker cable posts are joined by three single-ended RCA inputs (one a direct input) plus a set of balanced XLR inputs

album *Love* [Sire 9 25359-2] delighted with an immensely large soundstage, giving cathedral-like scale to the proceedings. The pounding bassline proved absolutely immune to interruption, and kept on thumping through the track regardless of what the other musicians were doing. Such physicality is an absolute joy: surely no other integrated amplifier at this price can provide such a visceral experience of towering, pile-driving rock music.

But across the midband, Ian Astbury's vocals did sound slightly thinner than anticipated; admittedly he's no Robert Plant, but the A600E didn't quite dig down to capture the grain of his voice, or convey what little warmth it actually has. The result was a slightly opaque and uninvolved feel on this particular track; the Xindak made an impressive 'hi-fi' sound but didn't impart the full emotional impact.

JACK OF ALL TRADES?

The title track from Madonna's *Frozen* [Warner Bros 9362-43990-2] proved an interesting listen. The song is underpinned by William Orbit's great bass synthesiser line, which the Xindak delivered beautifully in all its fat, squelchy glory. So many amplifiers at this price are struggling to make it work, but the A600E had no such trouble. Even run at very high volume levels, it tracked the dynamics of the song convincingly, going ever louder when called upon to do so.

However, rhythmically the song meanders a little and it is a tricky test of any amplifier's ability to keep the listener engaged. This behemoth did well up to a point, delighting on dynamic crescendos and the sheer grunt from the bass, but didn't quite get to grips with the nuances of the drum programming. I have heard

better accounts of the relationship between the snare and cymbals elsewhere. Bass was muscular and the midband detailed, but again the A600E never quite reached the heart and soul of the matter. Lead vocals also sounded slightly metal-plated, but then again, Madonna's icy voice is hard for any amplifier to get right at the best of times.

Sonically, the Xindak is something quite unusual. It has strengths which go far beyond what is expected of a sub-£3000 integrated amplifier, and these are all related in some way or another to its vast power and scale, allied to a good amount of detail.

However, it isn't the most lithe sounding of devices, and this means it tends to suit some types of music and not others – rather than being a jack of all trades and master of none. The A600E works best with relatively relaxed acoustic music – including more polished jazz or large-scale classical pieces – but is less adept at capturing the 'swing' of music with a more propulsive beat. I think that prospective purchasers should go to a dealer's and listen to one at their leisure, and try out music examples of their own choosing. ☺

HI-FI NEWS VERDICT

Those seeking an exceptionally fast and engrossing sound won't single this amplifier out for particular praise, but what it does do is deliver vast amounts of power in a relatively relaxed and controlled manner. It doesn't show signs of strain or break into a sweat, even at really high volumes and/or into awkward loudspeaker loads. That isn't something that can be said about most integrateds at its price.

Sound Quality: 75%



Audeze LCD-3

If the planar magnetic drive principle really is superior to moving-coil alternatives, the LCD-3 – top model in the Audeze range – ought to be the best headphone available
 Review & Lab: **Keith Howard**

If you are of the mindset that consumption should be conspicuous and material wealth flaunted, the LCD-3 – top model in Audeze's four-headphone range – will frustrate the hell out of you. It's a bit like a Savile Row suit with its designer label on the inside: you can tell the LCD-3 apart from the 'lowly' LCD-2 [HFN Mar '13] only by being close enough to read the small lettering along the top edge of the capsule back plate. Otherwise the two models look identical, although this LCD-3 came fitted with brown earpads and headband rather than the black items of the previous LCD-2.

PLANAR DRIVE UNIT

And it's not only appearance that they share. Both are open-back designs (Audeze does also have a closed-back model in its range, the LCD-XC, priced nearer to the LCD-3 than the LCD-2) and both feature the Audeze planar magnetic drive unit: a modern realisation of the driver geometry first seen in the Wharfedale Isodynamic headphone of 1972, wherein a flat 'voice coil' is etched from a thin layer of copper or aluminium deposited on a thin plastic film. It's in the details of the drive unit's design that the LCD-2 and LCD-3 are differentiated: the costlier model has a thinner diaphragm, slightly lower impedance and a 'more efficient magnet structure'. Beyond that Audeze declines to elaborate, other than confirming that the lowering of impedance was done to improve sensitivity a little.

Even so the LCD-3 is still 5-12dB less sensitive than many of its moving-coil competitors. But it couldn't be called notably insensitive, nor is it an awkward load to drive, given that its impedance is almost

purely resistive and, at about 48ohm, a little higher than typical. In other words, any pukka headphone amplifier ought to be able to drive it without difficulty, an output voltage of 3.4V being sufficient to achieve a peak acoustic level of 120dB SPL. Which is not to say, of course, that any old headphone amplifier will do. Quite the contrary, the LCD-3 merits partnering with the best ancillaries – and headphone amplifiers vary in sound quality just as much as do amplifiers for driving loudspeakers.

There's no escaping the fact that this is a large and (because of all those bar magnets in the drive units) heavy headphone, even for an audiophile over-head model. Although the deep earpads, well-padded headband and modest head clamping force all help maximise comfort, swapping the LCD-3 for, say, Sony's bantam-weight MDR-MA900 is a bit like putting on running spikes after gumshoes. It's part of the Audeze experience you just have to accept.

Suggesting that the LCD-3 is suitable for use on the hoof would clearly be fatuous, so Audeze makes no such pretence: the capsules don't rotate flat or fold up into the headband and there is no provision

for connection to mini-jack sockets. Two flat Y-cables are supplied which attach to each capsule separately via 3-pin mini XLRs: the standard single-ended option is terminated in a chunky metal-bodied ¼in jack; the balanced cable, for those few who have a headphone amplifier equipped with balanced outputs, is terminated in a single 4-pin XLR. An adapter is available as an accessory for converting the 4-pin XLR to twin 3-pin XLRs if required.

I was initially disappointed to see that the LCD-3 was supplied packaged in

a smart but ultimately effete 'show case', as Audeze calls it, when I was much more impressed by the rugged plastic travel case in which our LCD-2 review sample arrived, which looked like it could survive a small thermonuclear explosion. It turns out, though, that you can specify either. Likewise you can select between the lambskin earpad covering shown in the photos or a suede alternative.

A word regarding structural resonances. In common with many of the headphones I've reviewed recently the LCD-3 has a headband resonance, clearly heard as a 'boing' if you wear the headphones and tap the headband with a finger. On the pink noise impedance test there was less obvious coloration or shifting of the image towards the silent channel than in the worst cases but still it's audible. In their quest for the ultimate headphone Audeze's designers would do well to eliminate this.

As already stated, a headphone with the aspiration of the LCD-3 to be one of the world's very best merits being partnered with a headphone amplifier of the highest quality. So the fact that the LCD-3 was with me at the same

'It was an object lesson in how good headphone bass can be'



RIGHT: LCD-3 is optionally supplied either in this swish show case or in an impressively rugged plastic protective case that looks fit for service with the SAS

RIGHT: Planar magnetic (isodynamic) drivers are of the same general design as in the lowlier LCD-2 but boast a thinner, lighter diaphragm and revised magnet assembly



telling bit more intimate via the LCD-3. Elvis's voice, and those of the backing singers, were more believable and the studio reverb a touch more apparent. Nat King Cole's voice in 'Welcome To The Club', ripped from the Audio Fidelity SACD of the same name, benefited likewise and here there was also a little more snap to the accompaniment of the Count Basie Orchestra to give a more toe-tapping overall delivery.

That said, let's be clear that the LCD-3, like the LCD-2, is not the headphone for listeners who regard information as the mother lode. It has excellently extended and controlled bass – perhaps the best there is from a headphone for listeners who understand the difference between quality and quantity (not that I mean to imply the LCD-3 is at all lacking in the latter) – but at higher frequencies, no two ways about it, it remains reticent.

If you like a sound that's dark-hued in its timbres and errs on the side of a soft portrayal that banishes glare, the LCD-3 could be right up your boulevard. Whereas if you prefer a delivery that majors on resolution, on delivering transparency but not over-etching detail, then the LCD-3 will almost certainly disappoint, even though it is more hear-through than the LCD-2. No headphone can deny its inherent tonal balance to that extent.

For me this means that the LCD-3 works best on relatively simple music, particularly vocals – but it helps if those vocals are close-miked and borderline fierce. A good example was 'Songbird', ripped from Eva Cassidy's *Simply Eva*. It's a great voice but an overly manipulated recording to which the LCD-3 applied a welcome soothing balm, turning the sometimes strident into the mellifluous.

What the LCD-3 won't do is burnish old recordings all but buried in ooze, which makes it a less than obvious choice for aficionados of classic rock recordings. ➔

time as the Teac HA-501 [HFN Apr '14] was a piece of serendipity. In crude economic terms they may seem mismatched given that the headphone is getting on for three times the price of the amplifier, but in terms of what *really* matters – the ability to make reproduced music live and breathe – the HA-501 is an ideal partner.

job than the LCD-2 of cutting to the heart of a performance and, more objectively, of unpicking the features of a recording.

Elvis Presley's 'Love Me Tender' from *24 Karat Elvis*, for instance (ripped from the SACD and converted to 24-bit/88.2kHz PCM using AudioGate), was that little but

A DIFFERENT SOUND

The burning question for any potential LCD-3 owner, of course, is whether it justifies its premium over the LCD-2. To which the answer is yes. Although the lab report confirms that the LCD-3 has a tonal balance much like the LCD-2, nevertheless the two models sound appreciably different. Although – thanks primarily to that easy-going tonal balance with its relative lack of presence band content – the LCD-3 is never going to be top of the list for most explicit, most transparent headphone available, still it does a better

LIGHTNESS OF BEING

Audeze says one of the benefits of its headphones' planar magnetic drivers is that 'the extremely lightweight diaphragm is able to respond with more immediacy than in conventional drive units', a claim commonly repeated – if phrased in different ways – for electrostatic and true ribbon drive units also, in both headphones and loudspeakers. It's lighter so it can move quicker, right? Wrong, as we can easily see if we are more precise and recast the claim as 'light diaphragms can accelerate faster'. In simplified form, Newton's second law of motion states that force equals mass times acceleration ($F=ma$) from which we see that whatever the mass we can accelerate it as fast as we wish provided that we apply sufficient force. As sound pressure level is proportional to diaphragm acceleration, if a drive unit can achieve the desired output level then it must be able to apply sufficient force to its diaphragm, however heavy. It's that simple.

v i t u s **VA** a u d i o



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"The RI-100 is capable of extracting the highest highs and most dynamic lows and pretty much everything in between"

The Absolute Sound Editor's Choice 2014

"The RI-100 is without compromise from any possible perspective or listening criteria."

Positive Feedback December 2013

"When Neil Gader's review of the Vitus Audio RI-100 integrated was originally published this 300Wpc mega-amp was characterized as "the sledgehammer with a heart." After months of using the RI-100, NG hasn't changed his opinion. The RI-100 is still capable of extracting the highest highs and most dynamic lows and pretty much everything in between. In most respects it gives away little to its pure Class A Signature Series siblings. Oh, it may not offer quite the same warmth, fluidity, and harmonic ripeness of the superb and costly Vitus SIA-025, but the brawny RI-100 is virtually unrivalled in its breathtakingly tightfisted grip on the bottom octaves."

The Absolute Sound Products of the Year 2013



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AUDEZE LCD-3

Although much has been made of the low sensitivity of the LCD-2, we measured 106dB SPL for 1 volt input at 1kHz when we tested it [*HFN* Mar '13] – better than some high impedance moving-coil designs and a world removed from first-generation planar magnetic headphones like the Wharfedale Isodynamic. But the fact that the LCD-3, due to its lighter diaphragm and reduced impedance, proved to be over 3dB more sensitive at 109.4dB (averaged for the two capsules) is welcome nonetheless. No headphone amplifier worthy of partnering with it should have difficulty driving it to peak sound pressure levels the far side of 120dB. The drop in impedance that helps achieve this is small – only around 10ohm – and still leaves the LCD-3, with a minimum measured modulus of 47.2ohm, a little easier to drive than many medium impedance headphones.

It's a feature of isodynamic designs that they have almost constant impedance across the audible range, the difference between lowest and highest modulus being just 0.9ohm in our testing over the range 20Hz-20kHz. So you can safely use the LCD-3 almost regardless of source impedance as it will make negligible difference to the overall frequency response.

The uncorrected frequency response [Graph 1, below] is characterised by virtually flat output below 1kHz, less rise than would be expected at 2-3kHz and declining output thereafter so it's no surprise to find that the diffuse-field-corrected response [Graph 2, below] shows a falling perceived output beyond 1kHz, consistent with the LCD-3's relaxed tonal balance. Capsule matching was unusually tight for a headphone, though, at ± 4.9 dB (40Hz-10kHz) and Audeze's finest has exceptional bass extension, with its -6dB point (re. 200Hz) occurring at a frequency well below 20Hz. As with the LCD-2, total harmonic distortion was vanishingly small (<0.1%) at 90dB SPL at both 100Hz and 1kHz. KH



ABOVE: Two cables are supplied – unbalanced with a ¼in jack plug and balanced terminated in a four-pin XLR

Even 'Black Sabbath' from *Black Sabbath*, one of the better examples of early-'70s rock recording quality in my collection, could have done with a little more energy although the thunderclaps were awesome.

LACKS SOME SPARKLE

Descend the quality ladder to the depths of Yes's 'Roundabout' (ripped at 24-bit/96kHz from the DVD-A of *Fragile*), where dynamic range is largely abandoned after the guitar intro, and the LCD-3 just doesn't provide sufficient elucidation to make as silky a purse as can be had from the sow's ear on offer.

It was a similar story with 'Levon' from the 24-bit/96kHz download of Elton John's *Madman Across The Water* (a better recording but short on precision via the LCD-3) and – really digging down to the soundtrack of my youth – the 24-bit/96kHz download of The Moody Blues' 'Nights In White Satin' (whose sound is more like 'Nightmare In Brown Syrup'). The LCD-3 did a good job of flattering Justin Hayward's voice but the trademark Mellotron sound just wasn't ready enough.

Modern recordings more worthy of their hi-res credentials fared better but the LCD-3 doesn't possess the sparkle necessary to convey the full benefits of life beyond 16-bit/44.1kHz. The trumpet in Jimmy Cobb's 'I Had the Craziest Dream' from *In The Key Of Blue* (24-bit/

96kHz download) never crossed the line from raspy to harsh, as it so easily can, but the percussion was recessed, as if the drum kit had been moved a few metres back.

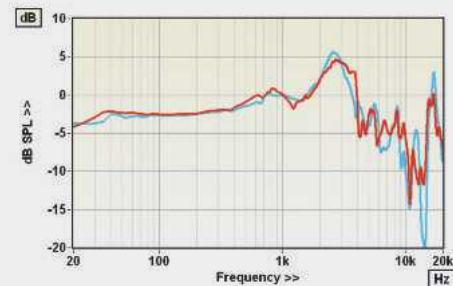
To end on a positive note I turned to a track that thrives on extended and powerful but well controlled and not over-egged bass, The Beatles' 'Come Together' from the *Love* CD. I've lost count of the number of occasions when playing this track over modern headphones that I've switched off in disgust at flabby, excessive LF. But not with the LCD-3, which is an object lesson in how good headphone bass can be when the response is flat to below audibility and the distortion vanishingly small.

If Audeze could coax similar quality from the opposite end of the spectrum in an 'LCD-4' then it would be on to a definite winner. ☺

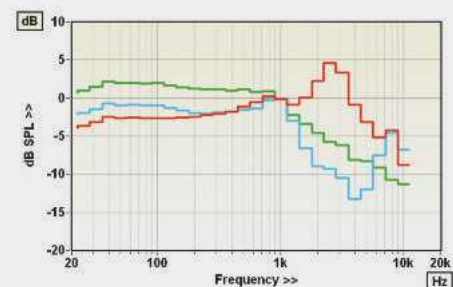
HI-FI NEWS VERDICT

Job done, in that the LCD-3 is indeed an improvement on the less costly LCD-2. But in sharing the LCD-2's laid-back, low-glare tonal balance the LCD-3 still answers to a particular taste in musical presentation rather than to audiophile imperatives in general. Like its lesser sibling it will appeal most to those whose priority is smoothness of sound, less to those who place a premium on warts'n'all clarity.

Sound Quality: 85%



ABOVE: Very flat frequency response below 1kHz is unusual but the declining output above 3kHz is consistent with its relaxed sound quality



ABOVE: Third-octave freq. resp. (red = uncorrected; cyan = FF corrected; green = DF corrected)

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL at 1kHz for 1Vrms input)	109.4dB
Impedance modulus min/max (20Hz-20kHz)	47.2ohm @ 6.8kHz 48.1ohm @ 3.8kHz
Capsule matching (40Hz-10kHz)	± 4.9 dB
LF extension (-6dB ref. 200Hz)	<20Hz
Distortion 100Hz/1kHz (for 90dB SPL)	<0.1% / <0.1%
Weight (inc cable and 0.25in connector)	645g

Cambridge Audio Azur 651C

There's no shortage of budget CD players, but finding one for which excuses aren't necessary is another matter. Here's one whose price tag doesn't show...

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

Sometimes, objects through the looking glass are not quite as they appear. Talk to any electronics engineer in the hi-fi business, and they'll tell you that it's tricky to design a decent high-end CD player, but really hard to do a good cheap one.

The thing is, if you throw enough fancy components at the problem, and follow basic sound design practice, you're likely to get a reasonable result. But work on something that requires component costs of one-tenth of that flagship silver disc spinner, and you're into a new world of pain. It's where real skill comes in, and not everyone has it. Even though standards have recently risen, you need only listen to the average entry-level compact disc player to realise that the ability to make great products at this end of the market remains in short supply.

AFFORDABLE CLASS LEADER

For this reason, Cambridge Audio should be accorded at least as much respect as the high-end brands that populate this magazine's pages. It has delivered extremely strong sounding products for two or more decades now, since it changed ownership and its mission in life in 1994 [see boxout]. Once it too was a high-end brand, responsible for the superb, innovative and class-leading CD1 of the mid-'80s [see p120]. But by the '90s it was doing what it does today, purveying fine sounding separates at knock-down prices.

Cambridge Audio has a habit of making great entry-level CD players, as anyone who ever had the classic CD4SE will attest. The Azur 651C is the spiritual successor, a £350 machine that's just affordable enough to persuade hi-fi unbelievers that it's worth investing in separates rather than that lovely looking one-box system their spouses already have their eye on. It's part of the company's Azur range, which got a

RIGHT: The player has a substantial pressed steel base, which houses the main audio, power supply and CD servo boards and toroidal transformer; a custom disc mech sits centrally

major revamp a couple of years ago, with attention given to the overall look and feel of the machine.

It's just about attractive enough too; you'd never call it the height of fashion but the fascia is cleanly styled and the unit itself doesn't look cheap. The company has really raised its game in this respect, although this has probably had to with machines like Marantz's CD6005 setting such high standards.

The casing itself is pressed steel – expected in a product at this price – but it resonates less than some £1000 machines, so a decent job has been done here. The fascia is neat-looking brushed aluminium, and comes in a choice of black or silver finishes. The central display is described as 'Double Film Super Twisted Nematic', which to all intents and purposes looks like a backlit inverted LCD. It offers full CD Text support which is nice to have, but it isn't

the most legible in bright light. Mounted immediately above is a fairly smooth acting disc tray, but its plasticky feel reminds you that the 651C isn't a high-end product.

REPLAY FILTER CHOICES

This player's finish doesn't quite give away its lowly status in life then, but still other

machines are available which do better – like the Marantz CD6005 costing some £70 less.

Inside, there's Cambridge Audio's S3 Custom CD Servo drive, which is an in-house design with bespoke

chipset which dynamically adjusts focusing, tracking and output level of the laser in real-time for optimum tracking. Developed jointly with Philips, it is not just simply a repurposed computer drive. It uses an ARM7 processor working in conjunction with a master clock oscillator; Cambridge Audio says it specified 'a physically large'

'With the Azur 651C you're into a whole new world of dynamics'





crystal to minimise the effects of heat and vibration. A special impedance-matched clock buffering scheme is employed here. Beside the drive, tidy double-sided surface mount circuitboards are used, with WIMA capacitors and MELF resistors fitted.

Two Wolfson WM8742 DACs are used in a dual-differential configuration, with one stereo chip per channel. These were chosen for their 'clean and neutral sound'. Cambridge Audio also claims they're an improvement on the '8740s in the 650C predecessor, with a 'more open sound due to the better noise performance'.

The two-pole dual-differential 'virtual earth balanced Bessel analogue filter' is claimed to cancel a significant proportion of the distortion present in the DACs, which also feature three-way selectable digital filters. The steep roll-off filter attenuates aliasing images outside the audio band, at the expense of a little pre- and post-ringing in the time domain.

The linear phase filter has 'constant group delay' which ensures that all audio is fully time-coherent at the output, and the minimum phase filter has its coefficients optimised without feed-forward.

The company further says real care had been taken to ensure the power supplies are up to the task. 'We separate out everything we can and use cascaded low noise regulators, since each regulation

stage filters out power supply noise.' Juice is delivered by a surprisingly large toroidal transformer that's kept well away from the audio circuitry.

The CD transport has special damping built into it, and the unit has dual layer damped feet to further minimise the ingress of vibrations; there's also an 'eco-friendly' standby mode. The 651C has the usual optical and coaxial digital rear outputs, plus remote control socketry.

LIGHT AND SHADE

The genius of this machine is that its sound is way better than expected from something this inexpensive. Spending £250-£300 gets you some prettily presented Denons, Marantz, Teacs and Yamahas, but go for the £350 Cambridge Audio and it significantly ratchets up the performance on offer.

All the aforementioned Japanese machines sound 'nice', with levels of smoothness and warmth that would never have been possible in this market sector a decade ago. But switch to the Azur 651C and suddenly you're into a whole new world of detail and dynamics, one that these cheaper players are unable to access. Indeed, the Cambridge gives a sound closer to machines in the £750 category.

The key to its performance is the machine's ability to reveal a whole new

ABOVE: No prizes for styling, but the 651C is purposeful and refreshingly fuss-free with simple transport controls. The dot-matrix alphanumeric display isn't easy to read, though

level of detail compared to cheaper players. It makes the already very nice Marantz CD6005, for example, sound opaque and dynamically flat.

There's a sense that the 651C is able to get one step closer to those ones and noughts held deep in the disc, giving a sound that is at once more complex and more engaging. It's able to fill in gaps that the listener's brain hadn't previously been doing, furnishing the recording with far more information.

For example, the backing percussion on Heidi Berry's 'Washington Square', from *Love* [4AD CAD 1012], comes over in a enjoyably lilting manner on the Marantz, but suddenly on the Cambridge there's air and space around the tom-toms, and their playing is invested with real dynamic light and shade. The song feels more propulsive, and immediately becomes more like music, rather than muzak.

Even the first few bars of the song show the 651C's talents, but as Berry's beautiful, silky vocal cuts in there's another epiphany: it is big, breathy and expressive rather than banal or uninterested. The voice has more texture and timbre – whereas similarly priced CD players seem to focus on tuning out any rough edges to make the sound more bland.

Another major facet of this machine is its wonderfully well resolved stereo soundstaging; it sets the vocals boldly centre stage and hangs the backing instruments far behind. By contrast, its rivals come over as far flatter and more homogenous. In other words, the 651C goes into battle attempting to control the whole of the field rather than holding back, simpering at the sidelines. For its price it is a bold and confident performer.

This is the sort of thing you'd expect from a good mid-market machine, such as Roksan's Kandy K2 for example, rather

MARK THIS MARQUE

By coincidence, this month's Vintage Review [page 120] is the Cambridge Audio CD1 compact disc player – the world's first two-box design. A British brand that was founded in 1968 by recent graduates of the city's famous university, it first specialised in premium priced amplifiers and tuners, many of which featured novel technical design and an unusually slim physical profile. The name was then relaunched in the mid-1980s with the CD1. More CD players, a cassette deck and a tuner followed. In 1994 it was acquired by Audio Partnership with James Johnson-Flint and Julian Richer as joint shareholders. It duly began to focus on more affordable products, with the CD4SE CD player and DACMagic digital converter winning many friends. Recently the company's Azur range – in which the 651C is the entry-level CD player – has impressed price-conscious audiophiles the world over. Cambridge Audio products are distributed by Richer Sounds in the UK, but the company is not a Richer Sounds brand in itself.

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CD PLAYER



ABOVE: Rear panel is basic, although the choice of coaxial and optical digital outputs is handy. RCA line outs, remote sockets and IEC mains seal the deal

than something at half its price. It's way ahead of other budget players in sheer transparency. But great as the 651C is, you don't get all the goodness of, say, a £1000 machine. Where it falters slightly is in its tonal colour: this machine has a slightly 'grey' nature that doesn't impart the full palette of sounds.

ENGROSSING SOUNDS

For example, the rather dry character of the Heidi Berry recording isn't contrasted as markedly as it should be with the warmth of Portishead's first album *Dummy* [London Records 422-828 553-2]. 'Roads' isn't as sumptuous via the Cambridge as either higher end players like the aforementioned Roksan, or even cheaper machines like the Marantz. It's as if the 651C's designer has thrown all his resources at getting the player to do the important, headline stuff like excavating detail and tracking the song's dynamics correctly, and everything else beyond that is secondary to the big picture.

But you wouldn't call the Cambridge stark, it's just that it lacks a certain tonal warmth. You notice this mostly on jazz, eg, Herbie Hancock's *Speak Like A Child* [Blue Note ST-84279], which doesn't have the prerequisite lushness for a 1968 Rudy Van Gelder recording.

Still, when you focus less on the surface and dig deeper, you're in for a treat. Hancock's piano is a joy, dripping with harmonics, and his playing is mesmeric. At the same time, the percussion floats around his wonderfully louche keyboard work, and the brass gently runs behind this.

The 651C is able to impart a wonderful sense of occasion, making the music engrossing in a way that no other player of its price can be. At its best, this machine seems able to dissolve itself out of the system. All of a sudden, you find yourself

forgetting you're listening to a beam of light firing into a little metal-coated plastic disc, with computer chips crunching away the numbers. This is the mark of a serious CD player – and such are in very short supply at the £350 price point.

However, this ever-so-slightly lean tonality never quite leaves the player, no matter what music you play, and it's a trait that cannot be tuned out by playing with the three switchable digital filters options. They make an interesting but only very subtle difference to the sound.

The Linear phase filter gave the cleanest result, although it will be a little too matter of fact for some tastes: accuracy improves at the expense of musicality. The Minimum phase goes the other way, with a more organic feel to the way it makes music, and it seems to imbue the music with a warmer feel at the expense of a sense of precision.

The Steep roll-off filter is slightly smoother still, but more vague on complex music where you miss the Linear phase filter's tidiness. Overall, the Linear phase was used for the bulk of the listening, but it's nice to have the option of experimenting. Tastes vary, so this is a worthwhile feature and not a gimmick. ☺

HI-FI NEWS VERDICT

This is surely one of the very best value machines on sale today. The maturity it offers in its sonic performance is at a different level from its price rivals, and easily competes with machines costing twice or even three times as much. It simply doesn't comport itself like a budget silver disc spinner. Once again then, Cambridge Audio shows itself a master of making humble hi-fi sound superb.

Sound Quality: 82%

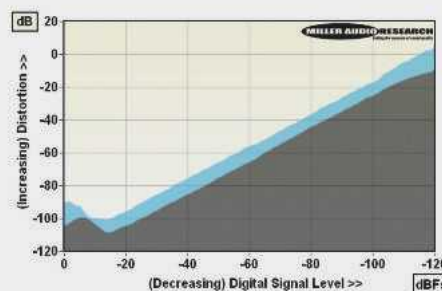


CAMBRIDGE AUDIO AZUR 651C

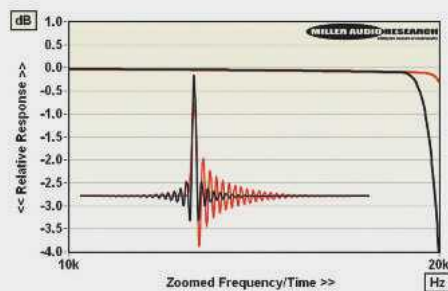
In common with earlier Cambridge Audio CD (and universal) players, but in contrast with almost all budget disc spinners, the 651C offers a selection of digital filter modes. The Linear and Steep filters still have pre- and post-ringing artefacts in the time domain but the former offers a constant (time coherent) group delay while the latter has a very sharp cut-off at the edge of the audioband (amounting to -4dB between 19kHz and 20kHz). The Minimum phase filter is arguably the most interesting because its time domain response has more post-event ringing but no pre-event ringing [red traces, Graph 2 below], a compromise often judged preferable during listening tests. The bandwidth and transient content of the music selection will certainly feed into any personal preferences, of course!

The 651C's general performance is also first rate, offering a 2.3V output from a low 46ohm source impedance, a wide 109.5dB A-wtd S/N ratio (particularly so from a single-ended RCA output), a Class 1 clock accuracy (within ±50ppm) and very low 120psec jitter. Distortion is also very well managed, and although perhaps not as low as expected with twin Wolfson WM8742 DACs, Cambridge's analogue stage holds the value to a very consistent 0.003-0.005% from 20Hz-20kHz over the top 30dB of its dynamic range [see Graph 1, below]. Intermodulation distortion is very low indeed at 0.00009%. Stereo separation is >100dB from 20Hz-20kHz and channel balance <0.1dB over the same audible frequency range.

Readers may download a full QC Suite test report for the Cambridge Audio Azur 651C CD player (including the impulse behaviour of all three filters) by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Distortion versus digital signal level over a 120dB dynamic range (black = 1kHz, blue = 20kHz)



ABOVE: Frequency and time domain responses (Steep filter = black; Minimum phase filter = red)

HI-FI NEWS SPECIFICATIONS

Maximum output level/Impedance	2.3Vrms / 46ohm
A-wtd S/N Ratio	109.5dB
Distortion (1kHz, 0dBFS/-30dBFS)	0.0030% / 0.0037%
Distortion & Noise (20kHz, 0dBFS/-30dBFS)	0.0031% / 0.0049%
Frequency response (20Hz-20kHz)	+0.00dB to -0.10dB
Digital jitter	120psec
Resolution @ -100dB	±0.2dB
Power consumption	18W (1W standby)
Dimensions (WHD)	430x85x305mm



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BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

Chris Heard turns the volume up for Santana, Zappa and The Meters, savours a key Dylan album and relaxes just a little with Guy Clark's 'outlaw' country music debut LP

Rarely has a long-playing record located the zeitgeist more potently than Bob Dylan's third album, *The Times They Are A-Changin'*. In the six months leading up to its release in January 1964, Martin Luther King had made his 'I Have A Dream' speech and President Kennedy had been assassinated. It was against this tumultuous backdrop that Dylan produced some of his most memorable and affecting writing, creating a core of work that would define him as spokesman for his generation.

With four songs in particular – the title track, 'Only A Pawn In Their Game', 'With God On Our Side' and 'The Lonesome Death Of Hattie Carroll' – Dylan effectively invented a new language to reflect the maelstrom of events, striking a chord the world over with his words of righteous anger, all delivered with that slightly nasal vocal tone that has divided opinion ever since. But *The Times They Are A-Changin'* was more than just the record with the bold black-and-white sleeve that chronicled the civil rights era. Its sound – deftly recorded by Tom Wilson to encompass only voice, acoustic guitar and harmonica – was tempered with some of Dylan's most tender love songs in 'One Too Many Mornings' and 'Boots Of Spanish Leather' and hymns of empathy for the working man ('The Ballad Of Hollis Brown', 'North Country Blues'). The LP ends with 'Restless Farewell': for Dylan the artist a coded prophecy of things to come, perhaps, encapsulated in the line 'My feet are now fast and point away from the past'.



➔ Zappa's 1969 double album *Uncle Meat* is reissued on Back to Black



➔ *Santana III*: 'the most fully-realised work of the band's original vision'

Along with the album's predecessor, *The Freewheelin' Bob Dylan*, it was this period of Dylan's work that pretty much nailed the clichéd folkie image, spawning a thousand suede-jacketed copyists and making the most cohesive case thus far for the discourse of politics in music. Bob himself may have lived to regret the pigeonhole it put him in, but the record's stark poetry, lyrical clarity and the power of its message remain undiminished after half a century. If you buy only one life-changing protest album this month, make it this one [Mobile Fidelity, two 45rpm discs].

MEAT DISH

The song titles alone on Frank Zappa's fifth album *Uncle Meat* are enough to lure you in on their own. Who would not be intrigued to hear what 'Nine Types Of Industrial Pollution' and 'Dog Breath In The Year Of The Plague' sound like? Now that this highly-experimental 1969 double album by The Mothers Of Invention has been given another airing on vinyl [Universal Back To Black], it's as good a time as any for non-Zappa converts to consider whether this is the right moment to plunge headfirst into his strange and wonderful universe. More than almost any other artist, the rock world is divided into Zappa fanatics and those who just don't get him at all. Truth be told, I'm in the latter camp. So what might a listen to *Uncle Meat* do to tempt the refuseniks?

Well, for a start it's one of the most adventurous records of its era in terms of

CHRIS HEARD

Chris Heard is an experienced music journalist and, as our picture illustrates, a longstanding vinyl LP collector. He runs an online record store specialising in vinyl reissues and new releases, and in the spring of 2012, opened a music (and coffee) shop nestling amid the splendour of the Malvern Hills.



studio innovation, experimenting with tape speed and overdubbing, speeding up and slowing down recordings, and using effects on unconventional instruments to create an avant-garde sound collage designed to challenge the status quo.

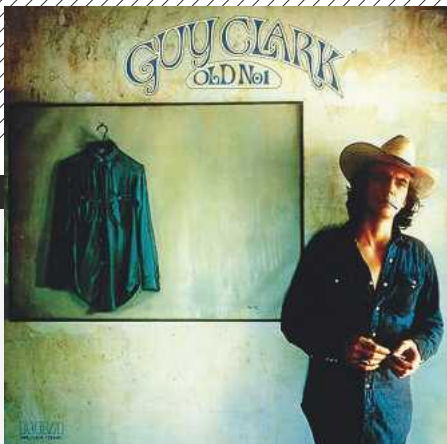
'It was my campaign in those days to do things that would shake people out of [their] complacency,' said Zappa, suggesting that record buyers were 'accustomed to accepting everything that was handed to them'. So it was, using a mix of orchestral music, free jazz, blues, doo-wop and rock 'n' roll, that Zappa and The Mothers set about trying to combat audience 'ignorance' and making them question what they were hearing. None of this necessarily makes it any good, and if you find yourself a tad patronised by Frank's artistic pronouncements, then maybe like me you are missing out on one of the most singular voices in rock.

Personally I prefer the earthy chutzpah of Zappa's friend and fellow sonic pioneer Captain Beefheart, but if you're bored with middle-of-the-road music and seeking out something different, *Uncle Meat* stands as one of Zappa's most significant works.

SANTANA PEAK

The music of Santana, particularly the first few albums, makes for some of the most durable rock ever recorded, and it seems like every other month there's a reissue project involving upgraded versions of their greatest works of the late 1960s and early '70s. Each one seems to re-ignite the passions of those who bought them first time around, while a young generation is finding its own affection for the Latin-flavoured Chicano rock of 'Black Magic Woman', 'Oye Como Va' and others. By the time their third album (self-titled but better known as *Santana III*) was released in 1971 the group, led by Mexican Carlos Santana, was at the peak of its international fame and the darling of critics from San Francisco to St Albans.

Also known from its cover art as 'Man With An Outstretched Hand', *Santana III*



➔ A 1975 Nashville 'milestone' debut album by Guy Clark, *Old No. 1*

represented the final work of the original line-up of the band that had taken Woodstock by storm two years earlier. Hits such as 'Everybody's Everything' and 'No-One To Depend On' helped to cement the group's status as global superstars, but as the decade wore on they would turn to more experimental jazz and Latin flavours, making *Santana III* probably the most fully-realised work of the band's original vision.

ESSENTIAL METERS

Along with James Brown, there was probably no greater influence on the development of American funk music than New Orleans' The Meters, whose sixth studio album *Fire On The Bayou* from 1975 is reissued on 180g LP by Music On Vinyl. Stalwarts of the swampy Louisiana blues scene since the mid-1960s, the band were veterans of records by Allen Toussaint, Professor Longhair, Lee Dorsey and Dr John before striking out with their own series of tightly-played 'second line groove' albums, spawning stone-cold funk classics such as 'Cissy Strut' and 'Look-Ka Py Py'.

Fire On The Bayou represents arguably the last of their essential works, marking the period in which funk was giving way to disco – the beginning of the end of America's golden age of soul. The Meters would enjoy more secondary success with acts such as Robert Palmer before the core

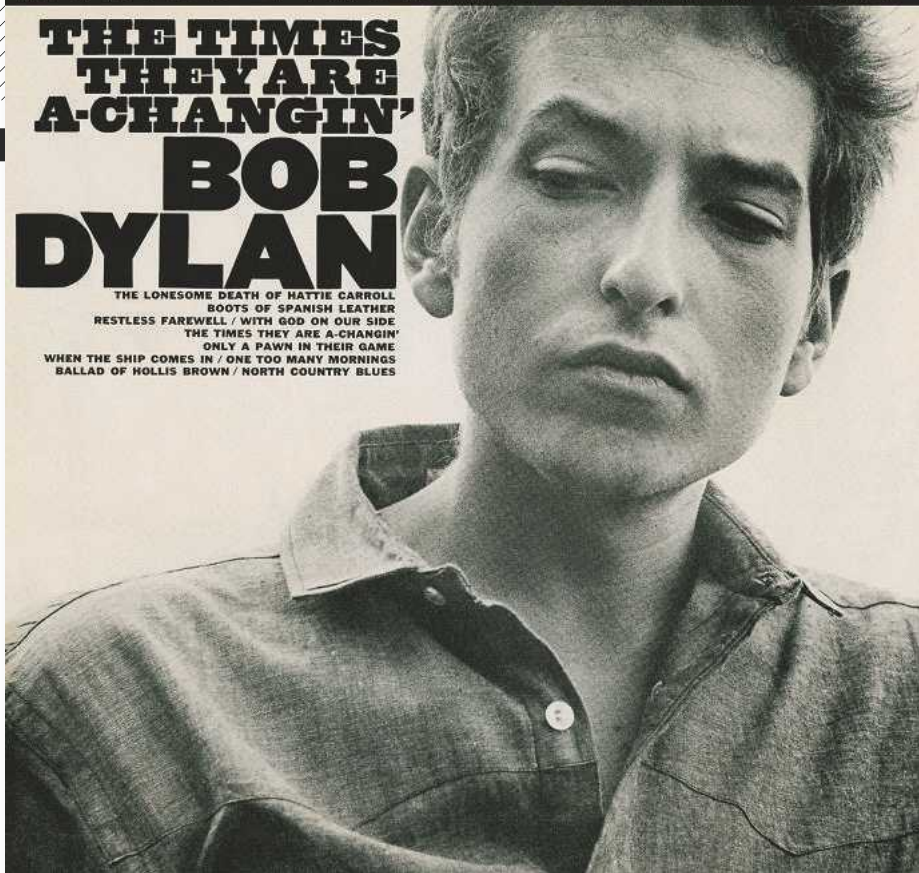


➔ Uma Thurman as 'Mia' in Tarantino's 1994 *Pulp Fiction* [Back to Black]

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THE TIMES THEY ARE A-CHANGIN'
ONLY A PAWN IN THEIR GAME
WHEN THE SHIP COMES IN / ONE TOO MANY MORNINGS
BALLAD OF HOLLIS BROWN / NORTH COUNTRY BLUES



of the group later morphed into the Neville Brothers: no slouches themselves when it came to gospel-infused rhythm 'n' blues.

TEXAS MILESTONE

Texan singer-songwriter Guy Clark's 1975 debut album *Old No. 1* was a milestone in the emerging 'outlaw' country scene, the more thoughtful and progressive end of Nashville's output during the 1970s. Featuring a young Steve Earle – whom Clark mentored – alongside Emmylou Harris and Rodney Crowell on backing vocals, *Old No. 1* was particularly notable for Clark's recording of 'Desperadoes Waiting For A Train', his own song which had been a hit for Jerry Jeff Walker.

Along with his later album *Texas Cookin'*, Clark's music showed that Nashville did not start and end with the conservative pop of Tammy Wynette and Don Williams, and that a darker, more authentic Americana, channelling the spirits of Hank Williams and Townes Van Zandt had a place in contemporary country music [4 Men With Beards].

PULP MAGIC

What is it about the music to Quentin Tarantino's 1994 *Pulp Fiction* that makes it so exceptional, a pack leader in a world of mediocre soundtracks and so-so film scores? Well, ultimately, it's all about the tunes, an inspirational alchemy of selection on the part of the director that

➔ 'A life-changing protest album', Bob Dylan's *The Times They Are A-Changin'* is on Mo-Fi at 45rpm (two LPs)

brings together rock 'n' roll ballads and surf-pop with blue-eyed soul and acoustic melancholia to create a seamless blend. Then there is the dialogue. In the relatively staid Hollywood of the mid-1990s, *Pulp Fiction's* screenplay was so sharp and fresh, an injection of adrenaline that had a similar effect on the mainstream movie world

'Pulp Fiction includes songs that shouldn't work but do'

to that of punk on the music scene.

This combination of razor-sharp wordplay (John Travolta, Samuel L Jackson, Uma Thurman and others) and choice American pop has a magic of its own, from the crashing opening bars of Dick Dale's 'Misirlou', through Kool & The Gang's funky 'Jungle Boogie' and Ricky Nelson's 'Lonesome Town', to Chuck Berry's rousing 'You Never Can Tell' and The Statler Brothers' chirpy 'Flowers On The Wall'.

Along the way there are songs that shouldn't work but do (Neil Diamond's 'Girl You'll Be A Woman Soon', performed by Urge Overkill, Maria McKee's 'If Love Is A Red Dress'), and bona fide classics – 'Son Of A Preacher Man' by Dusty Springfield, the film's pivotal piece. Influenced by musician Boyd Rice and a close coterie of Tarantino's friends, the soundtrack hangs together like a tapestry that's bigger than the sum of its parts [Universal Back To Black]. ☺

Vinyl Release

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

Little Feat *Sailin' Shoes*

The band's second studio LP saw them add feisty funky grooves to their Country-inspired rock sound. Now it's reissued on 180g vinyl, **Steve Sutherland** listens again

The fax read 'Happy Headache'. It was from Andrew (Von) Eldritch, head honcho of The Sisters Of Mercy. Written in his best gothic script, of course.

It was my first day as editor of *NME*, quite a lonely gig when you've just been shipped in from the mag's deadliest rival, *Melody Maker*, and hardly likely to win any popularity contests any time soon amongst your new work colleagues.

RAINBOW SHOW

So I'm in my new office, being glowered at by everyone who slouches by, and on my new desk, next to the fax, is an envelope which I soon discover contains a packet of aspirin and a 'good luck, you'll need it' note from a previous *NME* editor, Mr Neil Spencer. Apart from best wishes, Neil's much-appreciated note also goes on to remind me that some 15 years earlier, while still a longhair at college, I'd naively applied for the self-same job I was starting right now. It was an application, Neil points out with some amusement, he had himself politely rejected after reading what I

considered my sole necessary qualification for the job: a hastily hand-written review of Little Feat's recent gig at the Rainbow Theatre in Finsbury Park.

This gig was in August 1977 and it was the only time I ever got to see the Feat, a band I was extremely enamoured of while wasting my time away at Uni. They'd started up some eight years earlier in Los Angeles after Lowell George, their nominal leader, had been kicked out of Frank Zappa's Mothers Of Invention to start his own band. Lowell was a gritty, soulful singer, a witty songwriter and a dab hand at the slide guitar. The compadres he hooked up with were no less talented. Richie Hayward was an amazing drummer he'd played with in a previous band called The Factory. Bill Payne was a virtuoso blues and jazz pianist who had the ability, as Lowell used to say, to 'take 'em to church'. And bass player Roy Estrada was a key member of Zappa's Mothers and went on

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...



to become Orejon in Captain Beefheart's extraordinary Magic Band.

Tough LA hombres with tender hearts, Little Feat hit their groove running on an eponymous debut album which suggested a future strolling, smiling and stoned, down a similar path to that of The Band, playing rock songs with a contemporary vibe that would draw liberally from the traditional mainstays of American music – Country & Western and Blues.

Their second album, *Sailin' Shoes*, the one we're here to talk about, followed pretty much the same map except for a pleasing detour across the tracks for a foray into

the funky side of town – a trip which would become the determined destination of the band's third LP, *Dixie Chicken*.

LADY CAKE

Right now, though, we find the Feat at the crossroads. The title track, about ladies in turbans and cocaine trees, fishin' poles and blokes called Jedidiah, is about as laid-back as laid-back comes, like J J Cale taking a snoozy tilt at Allen Toussaint. It's a lovely thing and in this fan's mind at least, the perfect aural accompaniment to the surreal album sleeve. There's a juicy slice of lady cake, kicking her shoes off on a swing while a giant snail and little Lord Fauntleroy look on. It's woozy and weird and strangely sexy – just like the sound the Feat had begun to produce.

Other stand-out tracks are the stonking 'A Apolitical Blues', a growling take on Howlin' Wolf, which finds Lowell refusing to take anyone's calls – no matter if its Chairman Mao (apparently label boss Mo Ostin, who was eager to badger the band into writing a hit) or even that hero of all American heroes, John Wayne. The slide guitar is like razor wire, the piano like the stuff they used to play in those saloon-cum-bordellos you saw in Westerns at the movies. Play it to someone unfamiliar

'The title track sounds like J J Cale taking a snoozy tilt at Allen Toussaint'



The band in 1973 (l-r): Bill Payne (keyboards), Richie Hayward (drums), Sam Clayton (percussion), Lowell George (vocals), Paul Barrere (guitar) and Kenny Gradney (bass)



➔ Priced £12.99, the 180g re-release of Little Feat's *Sailin' Shoes* is available to order online from www.rockbox.co.uk

with the Feat and they could easily be persuaded it's The Rolling Stones at their debauched best during their infamous sessions for *Exile On Main Street*.

'Cold Cold Cold' is another bluesy moan, Lowell begging for a 'peach or a pear or a coconut please' for some reason from the uncommunicative hotel room service. Desperate, down-on-yer-knees stuff indeed. 'Teenage Nervous Breakdown' is heads-down-no-nonsense boogie, delivered at a rattling locomotive pace, and later often segued into 'Cold' and another of the album's corkers, 'Tripe Face Boogie', when the band hit their rampant stride on stage.

The playing on the aforementioned tracks brought the Feat to the awe-struck attention of their contemporaries. They had the groove, they had the feel, they had the soul and, on a trio of songs syphoned from Lowell's sentimental side, the heart too.

'Easy To Slip', the opener, is cool and lazy, a bleary-eyed smooch dedicated to living a life of heavy-lidded lassitude. Hey,



➔ Lowell George on stage in the 1970s wearing his trademark boiler suit



it's a-ok to be lazy, dude! Then there's 'Trouble', such a sympathetic, soothing song that I know a photographer who used to sing it to his first born as a lullaby.

The jewel in the crown is 'Willin'. It had featured on the band's debut in a slightly faster version and, it must be said, sounded kinda hokey. Ry Cooder had guested on slide because Lowell was incapacitated.

INSTANT CLASSIC

The *Sailin' Shoes* version is something else entirely. Transformed from a Country song to something resembling Southern Soul, it's a hymn to survival, a hippy trucker outlaw anthem about smuggling 'smokes and folks from Mexico' and never getting 'weighed' by the man. 'I've been kicked by the wind/ Robbed by the sleet/ Had my head stoved in/ But I'm still on my feet/ And I'm still willin', Lowell sings and grown men openly weep. 'If you give me weed, whites and wine/ And you show me a sign/ I'll be willin'/ To be movin'.

Sneaky Pete Kleinow adds some sweet steel guitar and whaddaya know? An instant classic, copiously covered by the West Coast elite and the song which, above all his others, Lowell is best remembered for today.

The rest of the album, though, sends up a few smoke signals. Both 'Got No Shadow' and 'Cat Fever' are Bill Payne compositions and betray a hankering for the dreaded

jazz-rock fusion which, with Lowell struggling with drug abuse and unable to maintain control, would be the direction the band eventually swerved towards.

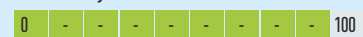
And that's what they were mostly noodling away at, the night I saw them at the Rainbow. Until God smiled down and, if memory served, a technical glitch left Lowell to carry the show acoustic and solo. There he was, a fat little guy in a white boiler suit, caught in the spotlight. I think he did 'Willin'. I know it was genius.

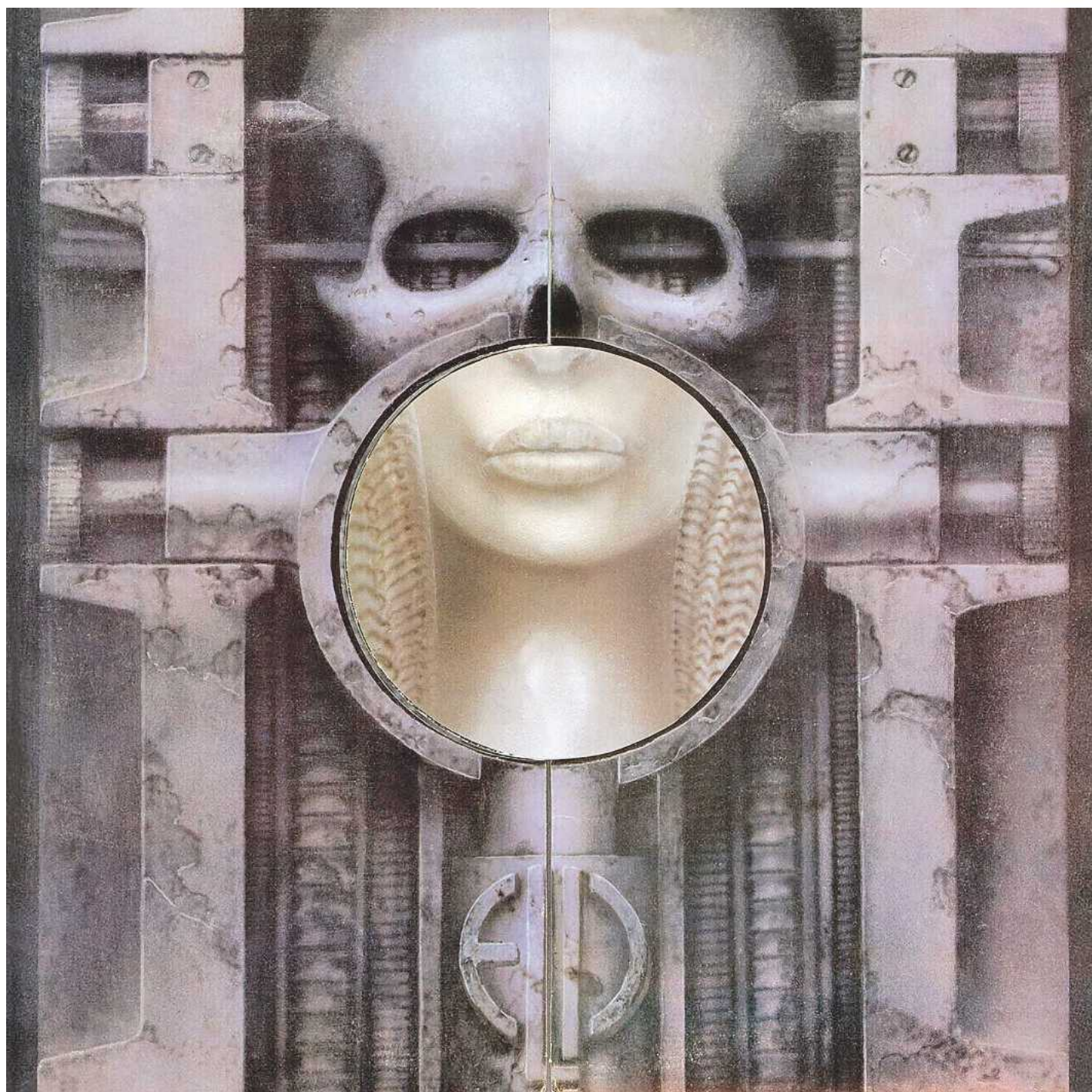
Lowell died less than two years later, aged just 34. ☹

RE-RELEASE VERDICT

Cut from analogue masters and supplied in a gatefold sleeve with the original artwork, this Warner Bros-licenced reissue on the Rhino label also comes keenly priced when you consider the price tags attached to much of the 180g vinyl now making its way onto a hungry market. Our copy arrived flat and clean, and sounded silent across all 11 tracks. Soundstaging was particularly pleasing, while detail and ambience were up there with that offered by the best premium releases we've heard in recent months. Highly recommended. HFN

Sound Quality: 89%





ELP *Brain Salad Surgery*

It's over 40 years since the band's fourth studio LP was released, but *Brain Salad Surgery* now enjoys iconic status among ELP's huge fanbase and has proved to be a defining album in the history of prog rock. And it all began in a disused Odeon cinema...

Words: **Johnny Black**

Still widely considered the crowning achievement in Emerson Lake & Palmer's incendiary career, *Brain Salad Surgery* was very much a product of its time – the year 1973.

In January 1973, ELP turned over a new leaf by leaving Island Records to establish their own label, Manticore, which they hoped would give them greater control over their cash flow and profits.

The band's extravagant touring requirements, demands for the latest technology and generally OTT *modus operandi* meant they needed ongoing major cash infusions simply to survive.

For example, where most bands starting work on a new album might have hired a rehearsal space, ELP bought an entire abandoned Odeon cinema in London and fully refurbished it as Manticore Studios, their personal multi-level rehearsal hall and production facility.

MORE ORGANIC

'*Brain Salad Surgery* represented creating an album out of a collective inspiration,' Greg Lake explained many years later. 'That was the motivation behind buying this cinema – to try and do something with more of a live, rather than preconceived, feel.'

Convinced that their previous album, *Trilogy*, suffered from too



Emerson and Lake on stage. Emerson is using a ribbon controller to vary the sound of his Moog synth

Pictured in the late 1970s

Promo shot, again from the late '70s



The band (top, l-r): Emerson (keyboards), Lake (bass), and Palmer (drums). Inset picture shows label of original LP

Emerson and Lake on stage. Emerson is using a ribbon controller to vary the sound of his Moog synth

Pictured in the late 1970s

Promo shot, again from the late '70s



much over-dubbing, they set to work, along with King Crimson lyricist Pete Sinfield, to create something more organic.

Emerson came to the sessions in January with hand-written plans for the album's centrepiece, the sci-fi epic 'Karn Evil 9'.

'I approached Greg and Carl with a sheaf of manuscript papers, and we set about rehearsing, going over the material.'

ELP's next priority was their month-long 'Get Me A Ladder' tour, which set off on February the 20th from Kiel in Germany. The tour served to road-test new compositions, including 'Karn Evil 9 – 1st Impression', 'Toccata' and 'Still... You Turn Me On', but when the entourage swung through Zurich, Switzerland, on April the 15th, it also brought the group face to face with visionary artist H R Giger.

'He was an extraordinary, fascinating person,' remembers the keyboard wiz, 'but he lived his life on

another level. He was obsessed with surgical procedures, skin diseases... I went back to the hotel and said to Greg and Carl, "You've got to come meet this guy, he's weird!"'

Despite some initial reluctance, the others conceded that Giger's

visions were astonishing, although they did require toning down to make them acceptable as an album cover.

When the tour ended in early May, ELP had several tolerably well-rehearsed songs and a potentially stunning sleeve.

IN THE MOOG

Back in the UK, rehearsals resumed at Manticore, but during this phase Palmer additionally found time to take a course in Timpani at The Guildhall School of Music, enabling him to expand his kit to include not only timps, but also gongs and one of the earliest examples of a percussion synthesiser – used to good effect on the album. ➔

'I said to Greg and Carl, "You've got to meet this guy, he's weird!"'

VINYL ICONS

PRODUCTION NOTES

There were three main production phases in the creation of *Brain Salad Surgery*. The first saw the band rehearsing and making demo recordings at its newly-established Manticore Studios in a converted Odeon Cinema in London's Fulham.

Carl Palmer has recalled how, 'we stored our equipment downstairs, and had our workshop and rehearsal facilities upstairs. In the back of the balcony area, where the old cinema's concession stand would have been, is where we rehearsed.'

By June, they had moved to the legendary Olympic Studios in Barnes, a former dance hall, whose illustrious roll of clients had included The Rolling Stones, Led Zeppelin and Jimi Hendrix. This was where ELP recorded 'Karn Evil 9 1st Impression' before finally moving to Advision, a massive city centre 24-track facility, whose other notable sessions have included classic Yes albums and Jeff Wayne's musical version of *War Of The Worlds*.

'We didn't have Pro Tools and all the things that exist now,' Emerson has said. 'If a person made a mistake, you didn't say, "Oh, we'll fix that later." We really had to get it right as we played together.'

Perhaps the most impressive technical achievement was the construction of a system which allowed Palmer to trigger electronic sounds from his drums. The electronic sounds could then be blended with the sounds of his acoustic kit. The technique was used effectively to produce atmospheric sonics in 'Toccata'. Palmer admits, however, that the set-up, 'was totally unreliable, you couldn't really move it from one end of the room to the other without it going wrong, so it was really hell to tour with.'



As ever, Keith was also champing at the bit to explore the latest technological marvels so, naturally, when Moog Music developed its first polyphonic module Keith became the recipient of one of the first examples, which he immediately employed on the album's opening track, the William Blake hymn 'Jerusalem'.

COMPLICATED PROCESS

In June, the band moved to Olympic Studios, with Greg Lake as producer. 'Nothing came quickly,' recalls Lake. 'It really was like building a house one brick at a time. And sometimes you'd put up a wall and take the whole bloody thing down again. It was a laborious and complicated process, because we were searching, that's the truth of it.'

Nevertheless, the trio knew they had now attained a level

of performing virtuosity that would allow them to tackle some prodigiously difficult pieces.

'Jerusalem', for example, was something Emerson had attempted in his days with The Nice, 'but the rhythmic element never came



together satisfactorily. But with Lake and Palmer, 'We knew how to embrace the drama in the music and organise it properly, and I think Greg felt comfortable singing it.'

Another challenge was their adaptation of Alberto Ginastera's 'Toccata' from his 1961 Piano

Concerto No 1. This complex piece took a long time to master, but then, 'After we'd spent about two weeks

recording, it came to management's attention that we should get permission from the publishers, Boosey & Hawkes. I approached them and they said, "Nope. Sorry."'

STRANGE LOOK

Undaunted, Emerson flew out the next day to meet Ginastera at his Geneva home, but after the composer heard the piece, 'he had a strange look on his face. He seemed to be extremely astounded, and he said something like "That is terrible." I interpreted that as literally - terrible. I thought, "Well, that's it. We obviously can't use that one." But then I learned that in

'Boosey & Hawkes said no when asked for permission to record "Toccata"'

Emerson and Lake sport matching white suits and boots in this mid-'70s shot of the band backstage. Drummer Carl Palmer sits between them

The Swiss surrealist artist H R Giger and 'Work No. 218 ELP II', which formed part of the LP sleeve

The band in the studio in front of Emerson's Moog System synthesiser



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Alternate Format Discography



Keyboard innovator Emerson on stage in the late 1970s

French “terrible” means the same as “formidable” or “unbelievable”. He was, in fact, overwhelmed by the recording, so all was fine.’

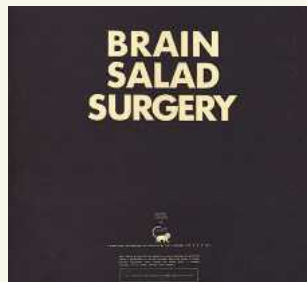
Unquestionably, the album’s tour de force is the sprawling three-part ‘Karn Evil 9’, a prediction of how computers would change society, which was started during June at Olympic. ‘We’d been playing ‘1st Impression Part 1’ upstairs in the smaller room at Manticore for about a week,’ revealed Carl Palmer. ‘Out of the blue we decided to take the gear downstairs and try playing this particular piece there. On the big stage it just took off!’

FLIP THE VINYL

However, it was ‘1st Impression Part 2’ that would propel the album into the American charts. ‘It got played on FM radio a lot,’ remembers Emerson. ‘The fact that it started off side two didn’t hurt. You had to flip over the vinyl, and this was the first thing you heard – “Welcome back my friends to the show that never ends.” It’s a tight, well-constructed piece. The solos were plotted out well – the keyboard solo into the guitar solo into a bit of a drum solo.’

Recording of the album was completed with Greg Lake’s ballad ‘Still...You Turn Me On’ in September at Advision Studios, and after some re-mixing, *Brain Salad Surgery* hit the high streets on November the 19th 1973, nicely timed to coincide with a major tour of the USA that would end with two Madison Square Garden shows in December.

Massively successful on both sides of the Atlantic, *Brain Salad Surgery* peaked at No 2 in the UK and No 11 in the USA. ‘Of all our records,’ concludes Emerson, ‘this was our biggest, and even today, it’s the one most everybody knows. It touched a nerve with a lot of people.’ ☺



ORIGINAL LP

There are well over 70 versions of *Brain Salad Surgery* out there in various formats, so bear with me while I endeavour to whittle them down to an essential few.

When the album made its first appearance on vinyl [Manticore Records – K53501] in November 1973, its striking H R Giger cover art ensured that it stood out from the competition in every record store in the land. Like the music on the disc, the cover was a stunning artefact, a cleverly folding-out package of delights, which also included a large colour poster complete with lyrics.

Unfortunately, the album’s reproduction quality fell far short of the standards of the music. Why? Well, for starters there was an oil crisis in 1973, one result being that much of the vinyl available at the time of release was re-cycled.

It has also been noted that early UK pressings are hard to find, and this is almost certainly because a shortage of wood pulp meant that the sleeves had to be manufactured in the USA, then shipped home, sometimes being filled with US pressings, sometimes UK. On balance, if a UK pressing can be found, it probably has the edge on an a US version. No promises, though.

CASSETTE/8-TRACK 1973

The simultaneous cassette release [MAN CS 66669 0698], inevitably couldn’t compete with the LP’s visual and tactile appeal, while the 8-track cartridge [MAN TP-66669] was an abomination on so many levels that it merits a mention here only because of the fact that it existed. (Other items considered cool in 1973 included light beer,

the Cusinart, big hair and bell-bottoms. I rest my case.)

FIRST CD 1987

The first CD version I can find [Manticore 258174] arrived in 1987, when it was clearly felt that the average CD buyer lacked the wit to realise that this artefact was *Brain Salad Surgery* without the words ‘Emerson, Lake And Palmer – Brain Salad Surgery’ plastered in ugly block capitals across the front of Giger’s sublime artwork. Thankfully this abysmal lapse in taste has been rectified on subsequent CD reissues.

Fortunately, the CD, mastered I believe by Barry Diament, did sound somewhat better than its earlier vinyl counterparts in that it was less noisy, more detailed and sounded more spacious.

REMASTERED CDS 1993

Things were tweaked a shade in 1993 when Victory in the USA came up with a special package [828 468-2], mastered by Joseph Palmaccio. Arguably the best sound up to that point, it also offered both parts of ‘Karn Evil 9 – 1st Impression’ edited together. It even attempted to replicate the original album cover by introducing a split front on the digipak.



RHINO REISSUE 1996

Sticking with the Palmaccio masters, Rhino [R2 72459] upped the game in 1996 with a bonus documentary, *The Making Of Brain Salad Surgery*, and a 3D cover on which two Giger images morphed together when the case moved. Opinions remain divided on the merits of this technique.

DVD-A/DVD-VIDEO

Rhino returned in 2000 with a



DVD-A and DVD-Video re-boot [R9 75980] remixed by Paul Klingberg and John Kellogg. The DVD-A once more enhanced the audio, while the five video portions offered live and rehearsal footage.

3CD VERSION 2008

If your head isn’t spinning by now, let me mention that in 2008 Sanctuary unveiled an all-singing all-dancing three-disc version [Sanctuary, 5308195]. The first disc offers the original album, while the third is an excellent surround sound SACD version. This is basically the DVD-A surround mix converted to DSD. Nevertheless, it boasts superb sound. Obsessives might like to check the vocal on ‘Benny The Bouncer’ – it’s a different take than the one on the original issues.

The second disc contains different recordings and mixes of the album tracks, as well as two bonus songs: ‘When The Apple Blossoms Bloom In The Windmills Of Your Mind I’ll Be Your Valentine’ and ‘Brain Salad Surgery’, which first appeared on an *NME* flexidisc released in 1973 [pictured centre].

Sony Legacy currently has in the pipeline a three-disc 40th Anniversary Deluxe edition which, under the supervision of Jakko Jakkzyk, promises the original album remastered, an ‘alternate album’ of previously unreleased material and a DVD-A of new 5.1 mixes of the original album. What more could we ask for?



Madison Square Garden, NYC

It's said to be one of the ten most expensive stadium venues ever built and is licensed to hold up to 20,000 concert-goers at a time. **Steve Sutherland** continues his tour of the world's legendary live music venues with the story of Madison Square Garden

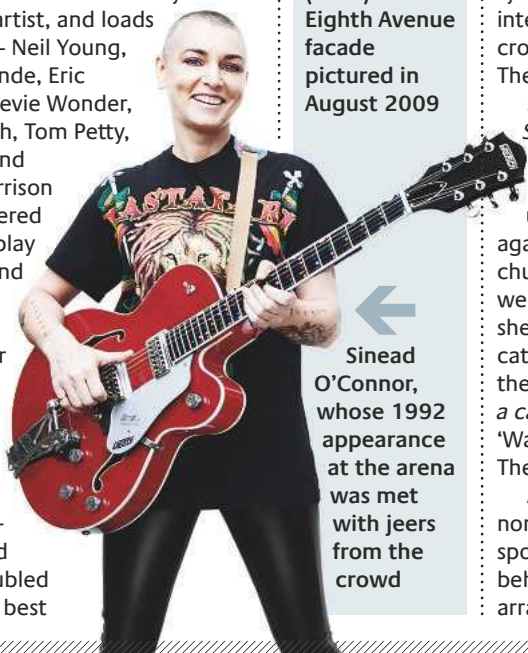
Right Said Fred. That's how far outta whack they were. Right Said Flippin' Fred! It was my first week editing *NME* and, in some post-post-modern ironic trance, some now long-forgotten indie acts on the terribly hip Heavenly label (plus St Etienne, who should have known better) had covered the said Fred on a terribly post-post-modern ironic EP.

All well and good, it's a free country and all that but... the dopey staff I inherited at *NME* had decided it would be terribly post-post-modern, not to mention a tad ironic, to put 'em all on the cover together.

No wonder sales of the paper were in the toilet. Several arguments ensued. I was adamant an alternative cover was called for but I was new and I didn't have one. Now, the reason I'm telling you this is because it was something that happened at Madison Square Garden – the very venue we're here to celebrate – that saved my bacon.

EXTRAORDINARY THING

There was this gig, you see, to mark Bob Dylan's 30th anniversary as a recording artist, and loads of his pals – Neil Young, Chrissie Hynde, Eric Clapton, Stevie Wonder, Johnny Cash, Tom Petty, Lou Reed and George Harrison – had gathered at MSG to play his songs and celebrate. Strangely, one of their number happened to be Sinead O'Connor, the shaven-headed and deeply troubled Irish singer best



↑ Street level view of the entrance to the venue as it is today and (inset) the Eighth Avenue facade pictured in August 2009

← Sinead O'Connor, whose 1992 appearance at the arena was met with jeers from the crowd



known for her moving cover of Prince's 'Nothing Compares 2U'. She had elected to perform Bob's gospel number 'I Believe In You' but when Kris Kristofferson introduced her to the crowd as 'an artist... synonymous with courage and integrity', the 20,000 sold-out crowd did an extraordinary thing. They booed!

Sinead, you see, had been on *Saturday Night Live* a couple of weeks before – this was October 1992 by the way – and had torn up a photo of the Pope to protest against child abuse in the Catholic church. It seems the MSG crowd weren't too happy with Sinead so she stood there, shaking, getting cat-called. Her reaction was to stop the backing band and launch into an *a cappella* version of Bob Marley's 'War', the song she'd sung on *SNL*. Then she ran off, sobbing.

Apart from Kris Kristofferson, none of the other artists on the bill spoke up for Sinead – extraordinary behaviour in my opinion. So I hastily arranged an interview and there

she was, in classic black and white surrounded by roses on my first ever *NME* cover. 'Prophet Or Lost?' was the headline. Sold pretty well as I recall. (Smugface.)

BEATLE COMES BACK

The only time I ever actually went to MSG, apart to see Lennox Lewis draw a World Heavyweight Championship bout with Evander Holyfield, was in 1984 but I'll save that for later. What you need to know right now is that the Madison Square Garden we're here to talk about, the one perched atop Pennsylvania Street Station on Manhattan Island, is the fourth iteration of a venue that first saw the light of day in 1873 as an open-air hippodrome in Madison Square run by the great circus entrepreneur PT Barnum. Opened on the 11th of February 1968, our MSG is home to the New York Knicks baseball team, the NY Raiders hockey team and loads of famous boxing matches including Ali/Frazier I.

The first major gig of note occurred on Sunday the 1st of April



1971 when George Harrison staged his Concert For Bangladesh. Alerted by his pal, sitar-wizard Ravi Shankar, to the plight of a people being decimated by a vicious civil war and the aftermath of a devastating cyclone, Harrison decided to raise cash and awareness for the cause by getting some of his superstar buddies to do a show. This despite the fact that, apart from fleeting guest appearances with John Lennon's Plastic Ono Band and Delaney & Bonnie, he hadn't actually performed in public since The Beatles quit gigging in 1966.

A SELL OUT...

Promoted through a small advert in the *New York Times* which promised a concert by George Harrison And Friends, the show sold out immediately so a matinee was added. Beatle bud Ringo Starr signed up (he performed his hit, 'It Don't Come Easy'), Billy Preston did 'That's The Way God Planned It', Bob Dylan did, among others, 'A Hard Rain', 'Blowin' In The Wind', 'Just Like A Woman' and, in the later show, a rousing 'Mr Tambourine Man', Eric Clapton, deeply addicted to heroin at the time, dragged himself out for the occasion, and Harrison did 'Something', 'Wah Wah', 'While My



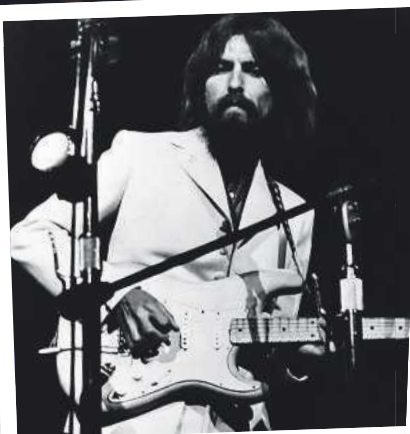
KEN REGAN

← The Concert For New York City was held on October the 20th 2001 in response to the 9/11 attacks

← Bob Dylan at the arena during his 30th anniversary show

← George Harrison took to the stage at the venue for his first major appearance since The Beatles' quit gigging in 1966 for his 1971 Concert For Bangladesh

← On stage for the finale of the 9/11 Concert For New York City – organiser Paul McCartney

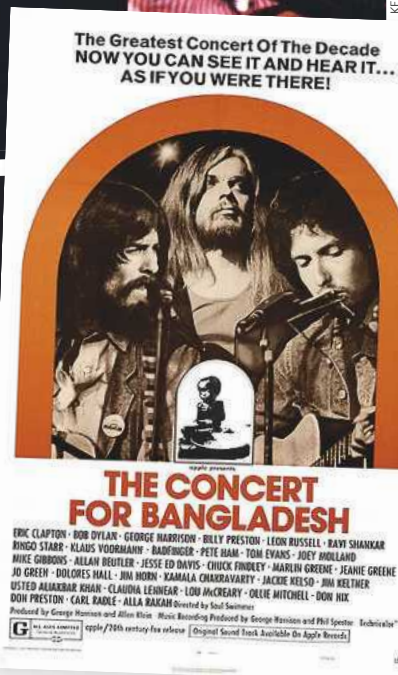


Guitar Gently Weeps', 'My Sweet Lord' and 'Bangladesh', the single he'd just recorded with legendary producer Phil Spector.

MORE BENEFITS

The gigs spawned a triple LP and a documentary for Apple Films and, apart from his own single, Harrison also produced, the Ravi Shankar EP *Joi Bangla*, all of which raised millions for the cause despite the UK government refusing to waive purchase tax.

Fourteen years later, when Bob Geldof founded Live Aid, he cited the Bangladesh concert as its inspiration, and MSG continued to host other notable charitable events, including The Concert For New York City, held on the 20th of October 2001 in honour of the police and fire departments and others who had lost their lives in the September 11 attack on the World Trade Centre. A hugely emotional occasion organised by Paul



McCartney (who performed 'I'm Down', 'Yesterday', 'Let It Be' and a new song, 'Freedom'), performers included Rolling Stones Mick Jagger and Keith Richards ('Miss You', 'Salt Of The Earth'), The Who ('Who Are You', 'Baba O'Reilly', 'Won't Get Fooled Again'), David Bowie (Simon & Garfunkel's 'America', 'Heroes'), Elton John, Bon Jovi, Jay-Z, Destiny's Child, Eric Clapton, Buddy Guy, The Backstreet Boys,

Janet Jackson, plus comedians Adam Sandler, Will Ferrell, Mike Myers, Jim Carrey and Jerry Seinfeld, to name but a few. All were broadcast live on VH1 and signed merchandise, CD and DVD sales raised \$35million for those affected.

And again in December 2012, in the awful aftermath of Hurricane Sandy, yet another stellar line-up starring Bruce Springsteen, The

'The capacity crowd did an extraordinary thing. Booed!'

CLASSIC VENUES



J. STONE/SHUTTERSTOCK.COM

Rolling Stones, The Who, Kanye West, Alicia Keys, Chris Martin, Paul McCartney, Bon Jovi and Eric Clapton raised over \$50million, performing a five-and-a-half hour Garden show that went out live on cable and satellite.

KING IN NEW YORK

Other memorable Madison gigs include the four sold-out shows that Elvis Presley played in June 1972 – amazingly, the only shows he ever played in New York – the 1973 Led Zeppelin gigs which were recorded for the live footage that wound up in their *The Song Remains The Same* movie, and Michael Jackson's 30th Anniversary Special which took place in September 2001 (7th and 10th) earning him a cool \$15million. The best seats cost five grand each, but you did get to go to dinner with MJ after the show!

My only gig at the Garden was the aforementioned event in 1984 when Duran Duran hit their US zenith. Nile Rodgers of Chic guested on the encores and I got to hang out backstage and play pinball with Madonna. But hey, enough of my namedropping!

The Grateful Dead managed to play the Garden 52 times between 1979 and 1984, including a couple of nine-night runs in '88 and '91, and Elton John pretty much made the venue his home from home, playing there over 60 times – one

'Lennon, making good on his word, nervously stepped onto the stage'

of them, the 60th, to celebrate his own 60th birthday. But the Elt gig everyone remembers is the one on Thanksgiving 1974 when John Lennon made what turned out to be his last ever concert appearance as an unannounced guest on the show.

GOOD ON HIS WORD

It happened like this. Lennon had been recording his *Walls & Bridges* album when Elton popped into the studio to help out on a song called 'Whatever Gets You Through The Night'. Lennon was complaining that

he was the only Beatle not to have reached No 1 in the States as a solo artist and Elton bet him his new track would put that right.

Lennon was sceptical so the wager was made – if the song went to No 1, Lennon had to join Elt on stage. Well, the single duly zoomed to the top and so Lennon, making good on his word, nervously stepped onto the stage to a rapturous reception, bashing through rocking versions of 'Whatever Gets You...', plus 'Lucy In The Sky With Diamonds' (which Elt had already recorded) and 'I Saw Her Standing There', which Lennon announced thus:

'We tried to think of a number to finish off with so I can get out of

here and be sick, and we thought we'd do a number of an old, estranged fiancé of mine, called Paul. This is one I never sang, it's an old Beatles number, and we just about know it.'

Exiting the stage, Lennon told the waiting pack of journalists: 'It was good fun, but I wouldn't like to do it for a living!'

Thanks to Mark Chapman, he never got the chance.

ON A ROLL...

Madison Square Garden still continues to pack 'em in. Indeed, the very weekend I'm writing this, Arctic Monkeys headlined there, their biggest US show to date. And as an encore, they did a spiffing version of The Beatles' 'All My Loving' as a tribute to the 50th anniversary of the American arrival of the band who began it all. ☺



DINA REGINE

↑ A film of the Hurricane Sandy benefit concert was released in 2013

↖ Elton John (far left) appeared in 1974 with John Lennon (centre top). It was to be Lennon's last ever live show

↖ Elvis ticket, and Led Zep's Robert Plant

↓ The Arctic Monkeys

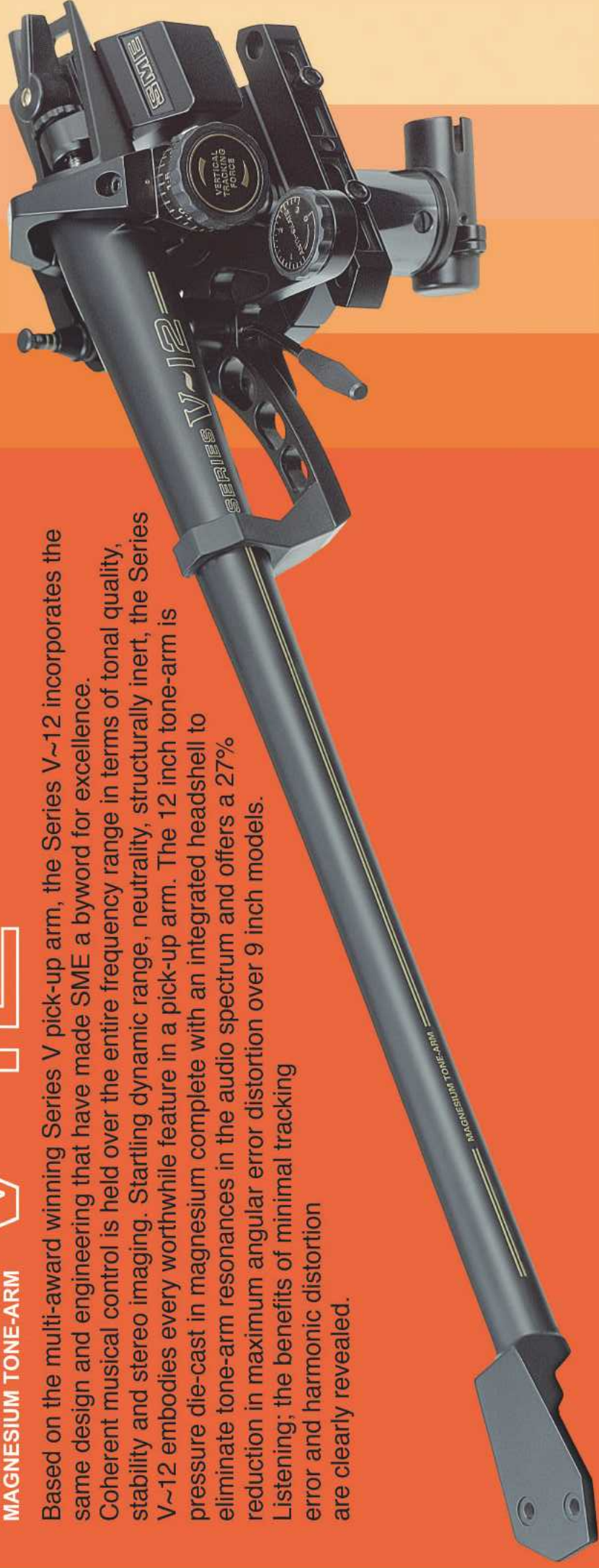


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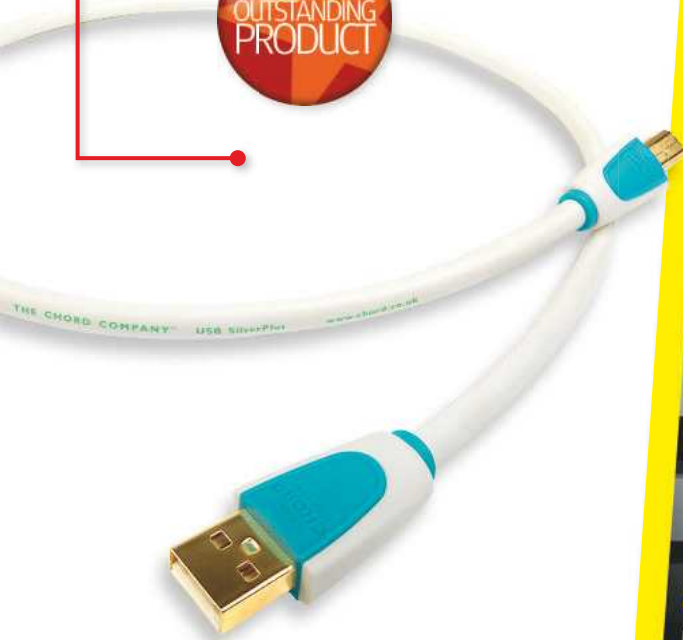
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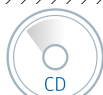
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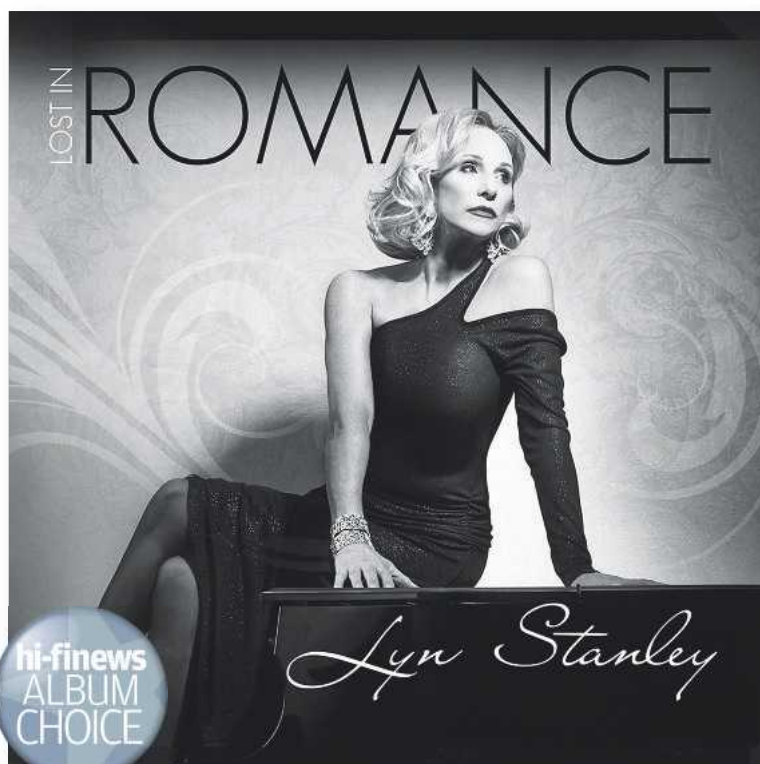
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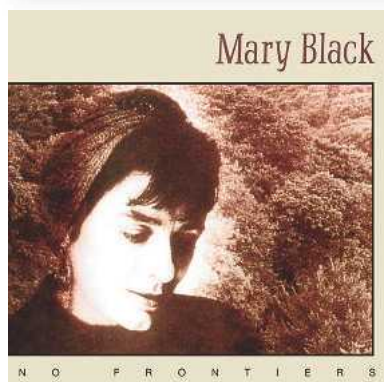
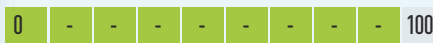
LYN STANLEY

Lost In Romance

Lyn Stanley (no catalogue number) (two 45rpm LPs)

A hit at CES, Lyn Stanley's debut contains standards delivered with such composure and skill that it's hard to believe this chanteuse has only been singing professionally for four years. Discovered and mentored – after huge success as a ballroom dancer – by Paul Smith, long associated with Ella Fitzgerald, Ms Stanley self-financed this gem, inadvertently creating an audiophile's delight. Something possessed this newcomer to 'our' world to go for 180g vinyl, 45rpm playback, mastering by Bernie Grundman – she was as surprised as anyone by its reception. The 15 cuts are sung with elegance rather than flamboyance, à la Helen Forrest and Doris Day. Simply gorgeous. (Available from www.lynstanley.com.) KK

Sound Quality: 90%



MARY BLACK

No Frontiers

Pure Pleasure PPAN016 (180g vinyl)

Part of a run of LPs that would allow Black to transcend the generic constraints of 'Irish folksinger', *No Frontiers* enjoyed global mainstream success back in 1989. While there are odd moments that seem almost recidivist – if, that is, the idea was to break out from her regional niche – there are others where she's trying too hard to make the leap, most notably a so-so take on 'I Say A Little Prayer For You'. She should know that covering a song previously rendered perfect by Aretha Franklin is as ill-advised as invading Afghanistan or buying a toupée. That aside, it's a graceful set, polished and enticing, with lush sound for LP addicts to savour. KK

Sound Quality: 87%



CAROLE KING

Tapestry

Mobile Fidelity MFSL 1-414 (180g vinyl)

One might doubt that there's any home without a copy of this masterwork from 1971 – one of the best-selling LPs of all time, with multi-platinum status. And it deserved every single sale, as it's not just a paradigm of the singer-songwriter genre but a landmark in *female* achievement in a male-dominated industry. Every song is a treasure, but then King had been pumping out hits for others for more than a decade before going solo – two of which are included here in her takes: '(You Make Me Feel Like) A Natural Woman' and 'Will You Love Me Tomorrow?' Add in 'So Far Away', 'Tapestry', 'You've Got A Friend'... on killer vinyl and sounding truly sublime. KK

Sound Quality: 90%



VELVET UNDERGROUND

Velvet Underground

Sundazed LP5466/B00191930-1 (180g vinyl)

What a wild curio! This ultra-rare 1970 LP from The World's Most Overrated Band is the sort of album that causes frenzies in secondhand shops, a cash-in compilation culled from their first three on Verve and MGM. Calling this a 'greatest hits' LP would be a conceit too far, as they never had any, but it's actually a fine introduction to the band that single-handedly turned rock into pretentious, self-indulgent 'art': 'Femme Fatale', 'Heroin', 'Beginning To See The Light' and seven others. No rare tracks, so devotees have them already, but the package is desirable. As VU were so hip, they probably hated the label for releasing it 44 years ago. Lou Reed, RIP. KK

Sound Quality: 80%





COMPACT DISC



SUPERAUDIO



DVD



BLU-RAY



VINYL



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DARYL HALL & JOHN OATES

Voices

Mobile Fidelity UDSACD2114 (SACD)

With this release from 1980, Hall & Oates still maintained their peerless Blue-Eyed Soul/Philly Soul sensibility, but the two had clearly been tempering the silky, seductive sound of their earlier efforts with something harder, shinier, more modern. Just as a wine critic talks of 'tar', 'cherries' and 'tobacco' when describing a red, this set certainly includes hints of 'Billy Joel', 'Boston' and 'The Cars' in its sound. But just when you think they've gone all pop, out comes a heart-stopping remake of The Righteous Brothers' 'You've Lost That Lovin' Feeling', and their own, original version of 'Every Time You Go Away'. A blissful album; impossible to resist. *KK*

Sound Quality: 87%



RUSH

Counterparts

AudioFidelity AFZ152 (SACD)

Biting my tongue – readers know what I think of prog-rock – Canadian power trio Rush have the benefit of being slick, polished and tuneful. Moreover, its fans know that each member is a virtuoso musician. Their 15th album, from 1993, continued to be more song-driven than one might have anticipated given earlier excess, and it was something that pleased both the fan boys and a wider audience: it was their highest chart placing in the US, after nearly 20 years. While clearly identifiable as Rush, it's all over the place stylistically, from stadium-style power rock of 'Stick It Out' to the almost delicate 'Cold Fire'. Worth buying just for the drum sound. *KK*

Sound Quality: 89%



DUSTY SPRINGFIELD

Dusty In Memphis

Analogue Productions CAPP 8214SA (SACD)

As with *Tommy* – both albums date from 1969, by the way – this is a title re-released so often that it would be embarrassing if it didn't deserve it. I have at least seven versions, and to my ears, this SACD is arguably the best-sounding after this label's LP edition. All you have to do is listen to the space around the instruments on 'Son Of A Preacher Man', the way the brass builds, the massed vocals and Dusty's inimitable voice, to hear its worth. As if it weren't a 'sexy'-sounding song to begin with, here it borders on the salacious. Dusty's way with 'The Windmills Of Your Mind' delivers more chills-down-the-spine than before. With three bonus tracks. *KK*

Sound Quality: 90%



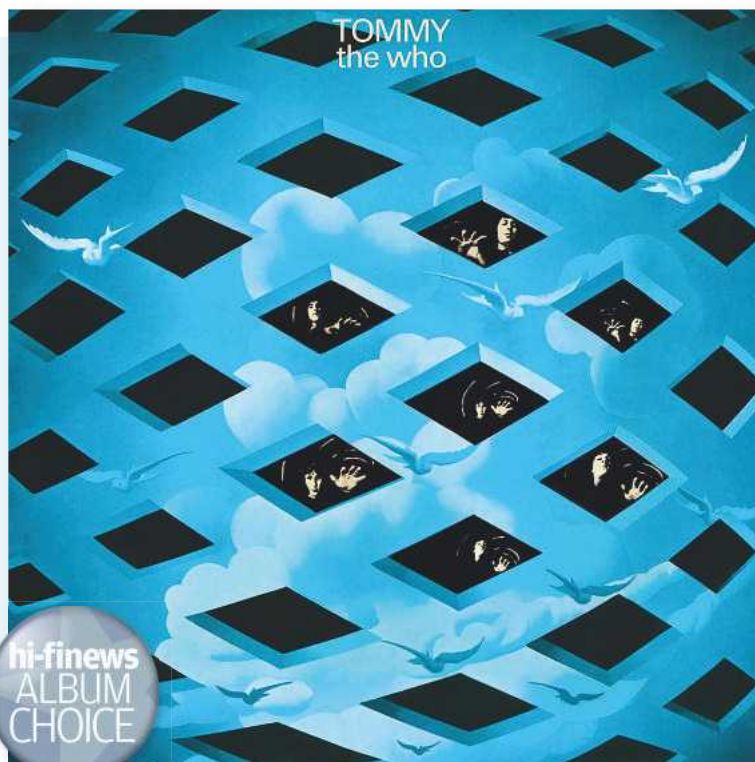
THE WHO

Tommy Super-Deluxe Box Set

Polydor 3747396 (three CDs + Blu-ray audio disc)

Not solely to blame for creating the rock opera – *Mastermind* candidates could name at least two others – *Tommy* is a milestone in the evolution of the rock album *per se*. It stands up well, a coherent if fanciful tale that's secondary to excellent music; many tracks work well out of context, like those that make up *Sgt Pepper* (which may or may not be a concept album depending on your choice of critic). Reissued countless times, this must be the ultimate: Disc 1 with the original album, Disc 2 with unreleased outtakes, Disc 3 is the album in 5.1 surround on Blu-ray, while Disc 4 is a 'bootleg' of a live show from 1969. In a slipcase with poster and 88-page hardback, it's a perfect companion to the deluxe *Quadrophenia*. *KK*

Sound Quality: 90%



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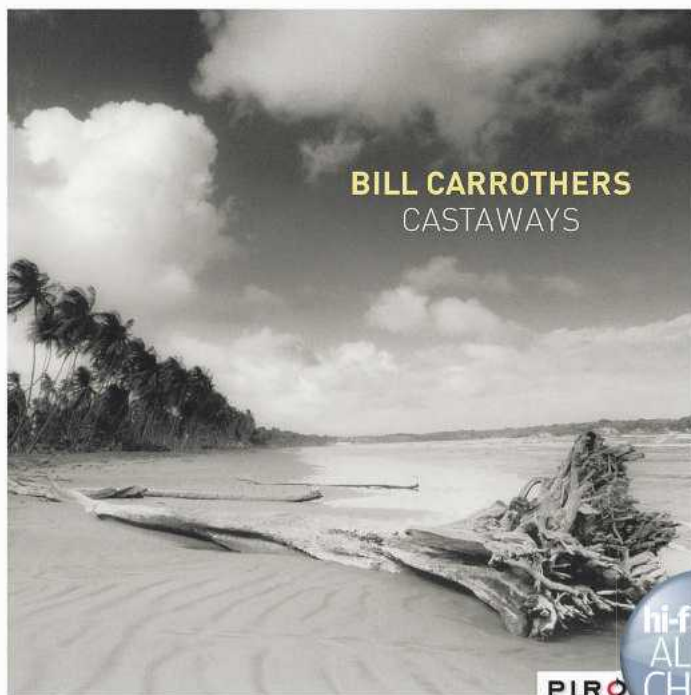
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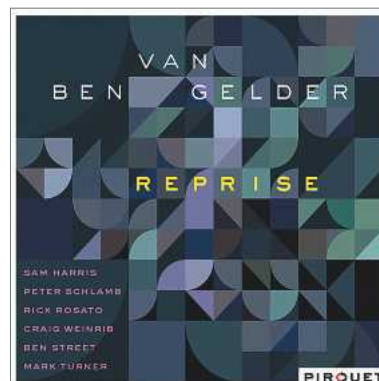
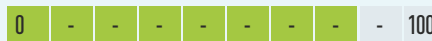
Castaways
(88.2kHz/24-bit; FLAC)

www.hiresaudio.com; Pirouet PIT3067

The reclusive American pianist Bill Carrothers has recorded several albums for the Munich-based Pirouet label over the years. For *Castaways* he was accompanied by fellow American bass virtuoso Drew Gress and Belgian drummer Dré Pallemmaerts, the set recorded in April '12 and first released on CD. Now the studio master can be enjoyed in its native 88.2kHz/24-bit format and it sounds beautifully balanced, the trio laid out in a sound image you can

virtually walk into. Carrothers' talent has been hugely underrated (other than by loyal followers, naturally). On *Castaways* his absorbing compositions once again meld hard and post-bop with occasional classical references, as in the track 'Siciliano', based on JS Bach's concerto movement, BWV1053. Meanwhile it's the contribution by bassist Gress that stands out – especially on the plaintive 'Araby'. *JB*

Sound Quality: 80%



BEN VAN GELDER

Reprise (88.2kHz/24-bit; FLAC)*

www.hiresaudio.com; Pirouet PIT3074

Young Dutch saxophonist Ben van Gelder's 2012 debut album *Frame Of Reference*, published by his own BvG Music enterprise and released on vinyl as well as CD, is followed up by a fresh outing recorded in New York's prestigious Sear Point Studios. Less contemplative than his auspicious debut and featuring pretty much the same line up of Craig Weinrib (drums), Peter Schlamb (vibraphone) and Rick Rosato (bass on all but two tracks), but with pianist Aaron Parks replaced by Sam Harris, van Gelder's quintet once again exhibits a medley of styles, shifting from angular unisons to freewheelin' blowing. It's hard to believe they're all in their 20s such is the maturity of their playing, van Gelder's inventive compositions certainly belying his age. It's a pity the sound isn't more open and airy, the textures at times masked by the slightly cramped soundings. *JB*

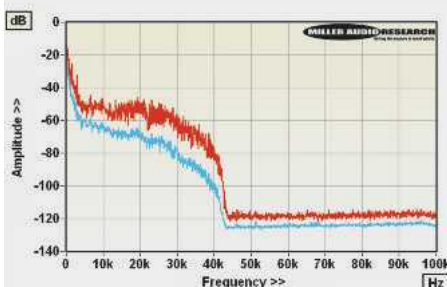
Sound Quality: 75%



OUR PROMISE

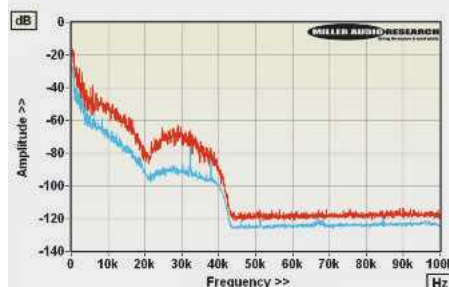
Following our Investigation feature [*HFN*, Jun '11] where we examined the claimed quality of high-resolution downloads, *Hi-Fi News & Record Review* is now measuring the true sample rate and bit-depth of the HD music downloads reviewed on these pages. These unique reviews will be a regular source of 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



Pirouet's studio is impressive [www.pirouet.com/home/studio.php?page=6] and this 88.2kHz file was both recorded and mixed at the facility. Lower level tracks show some artefacts at ~32kHz but it's otherwise clean and dynamic. PM

LAB REPORT



Unlike *Castaways* [see left] this Pirouet album was not recorded at Pirouet's studios. The spectral shaping of this 88.2kHz file, with its 22kHz mirroring, could look like erroneously upsampled 44.1kHz content. The jury is out... PM



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TIZIAN JOST TRIO

United In The Big Blue (88.2kHz/24-bit; FLAC)

www.hi-resaudio.com; Enja/Yellowbird 9722-2

Jazz fans craving that spine-tingling sensation of being in the performance space with musicians should look no further than *United In The Big Blue*, where pianist Tizian Jost is accompanied in these original compositions by bassist Thomas Stabenow and drummer Mario Gonzi. Jost is perhaps best known as a member of the Stephan Holstein Trio and accompanist to saxophonist Till Martin over the years, as well as being a passionate champion for Brazilian music. He was co-leader of the band Domundo during the '90s. There's much to admire in the creativity of Jost's writing, tracks such as the brooding 'Missing The Right Word' and intriguing 'Not An Easy Way To Go' replete with ingenious juxtapositions in melody, harmony and phrasing. The sound is intimate and full-bodied, exquisitely balanced with lifelike dynamic contrasts throughout. *JB*

Sound Quality: 80%



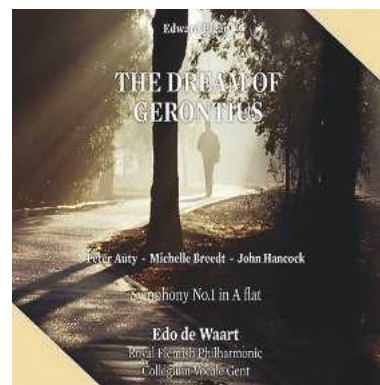
SCHUBERT/MENDELSSOHN

Symphony 5; Symphony 4 'Italian'; Norwegian CO/ Iona Brown (192kHz/24-bit; ALAC/FLAC/WAV)

www.naimlabel.com; naimcd026

Recorded live in Hamar, Norway in August 1997, this is the later of Iona Brown's two Naim programmes with the orchestra, resampled from co-producer Ken Christianson's original tapes [see also *HFN* Oct '13, p103]. She had almost reached the point where arthritis stopped her from playing the violin and allegedly she was found to be a hard taskmaster by the young Norwegian players. Although the resonant acoustic slightly clouds the sound, these are thoroughly recommendable performances – she creates a long line in Mendelssohn's slow movement, for instance, with vigour in the *Saltarello* finale and a rapid speed for (iii), 'con motor moderato', as the booklet has it! Keen allegros in the Schubert too, with relaxation for lyrical passages but no abrupt gear-changing. In fact, two wholly unmannered readings to relish. *CB*

Sound Quality: 80%



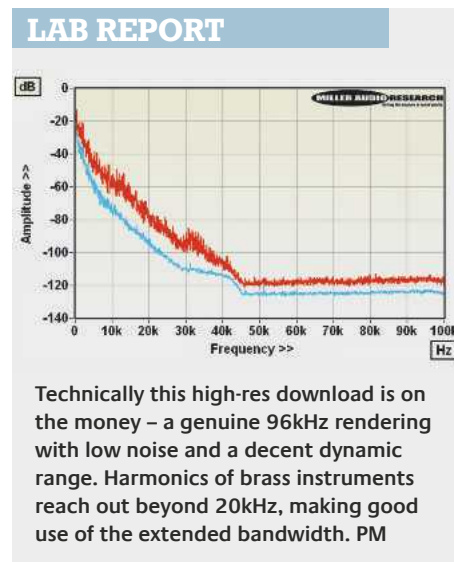
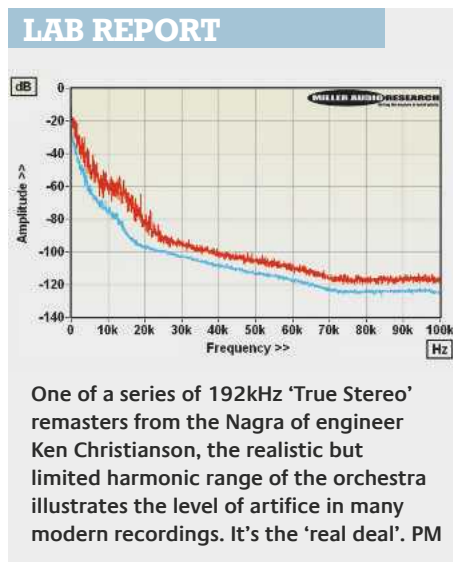
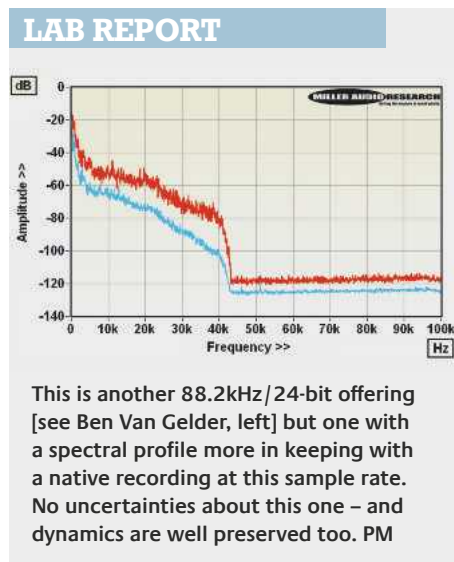
ELGAR

The Dream of Gerontius; Symphony 1 Soloists, Collegium Vocale Gent, Royal Flemish PO/ Edo de Waart (96kHz/24-bit FLAC)

www.hi-resaudio.com; Pentatone PTC 5186472

Thanks to preparation and de Waart's keen ear for balance, every detail of Elgar's orchestration of the A-flat Symphony is heard – possibly with greater definition than you'll find elsewhere. But it's all rather literal and comes at the cost of passion, heartache and a sense of momentum. *Gerontius* has been the almost exclusive recording preserve of English knights – Ashkenazy the exception. The attractions here are fine orchestral playing and choral sound (set back in a spacious Antwerp hall). The tenor Peter Auty excels in Part 2; the mezzo Michelle Breedt is all right but makes you miss Janet Baker; the baritone John Hancock has a massive voice. They are set too forward for my taste. The Elder/Hallé *Gerontius*, albeit at 44.1kHz/16-bit, brings it all to life, and comes with texts too. *CB*

Sound Quality: 65%





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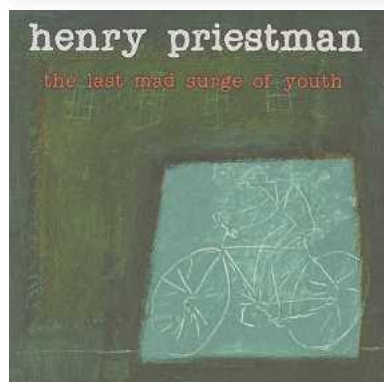
BABE

Volery Flighty

Moshi Moshi Records MOSHLP55

This is the most startlingly beautiful album I've heard in yonks but, frustratingly, it's so individual that it's hard to find a category that comes close to describing it. The musicians involved seem to be mainly Gerard Black and Amaury Ranger. Black was formerly of Glasgow's electropop quartet Findo Gask but is now with enigmatic French ensemble François And The Atlas Mountains, as is Ranger. The songs often consist of inscrutably repeated phrases, set to achingly beautiful melodies against minimalist cheesy keyboard lines, sometimes underpinned by experimental trip-hoppy beats. Black's lovely falsetto gives many tracks a curiously celestial atmosphere. Easy listening it's not. Head-scratchingly stimulating it is. *JBk*

Sound Quality: 90%



HENRY PRIESTMAN

The Last Mad Surge Of Youth

Proper Records PRPCD119

After a 35-year career that has seen him contribute his many and diverse talents to '70s new wave combo Yachts, '80s multi-platinum hitmakers The Christians, TV ads and soundtracks, Priestman has lately (and successfully) re-invented himself as an earthy, folksy singer-songwriter. The aged-in-the-wood lyrical insights in his 'Farewell Common Sense' concisely skewer the malaise at the heart of modern life, while his sturdily inventive musical arrangements throughout the album and his convincingly sincere vocal warmth contribute to a timelessly classic sound that is, nevertheless, not in the slightest derivative, clichéd or out-dated. *JBk*

Sound Quality: 85%



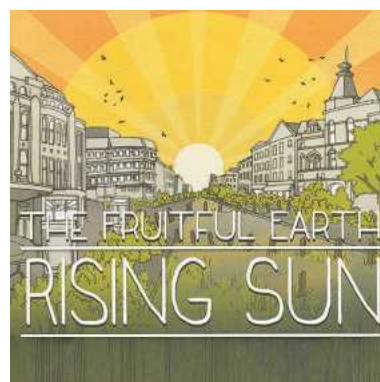
TWO WINGS

A Wake

Tin Angel Records TAR041

Two Wings' 2012 debut *Love's Spring* drew acclaim for its sprightly re-imagining of modern folk-rock. This second outing, still fuelled by the songs of vocalist Hanna Tuulikki and guitarist Ben Reynolds, further explores the outer limits of their genre, insinuating avant-garde jazz here, soaring twin-guitar rock there and medieval musings hither and yon. It's a stirring and thoroughly enjoyable concoction, although Tuulikki's Bjork-meets-Kate Bush vocalisings might deter those who feel folk singers should always sound sweet. The tender lullaby 'Go To Sleep' is perhaps their most accessible song, and is the best starting point for those with reservations. *JBk*

Sound Quality: 85%



THE FRUITFUL EARTH

Rising Sun

Big Peach Records KIWICD2

It's been a long wait since this London based band's 2011 debut album, but those who enjoyed it will be pleased that, despite line-up changes, the heart of the band remains '70s-oriented singer-songwriter Sarah Blair. Unfortunately, several of her song titles, 'Natural High', 'Rolling Free' and 'Sweet Music', reveal how close she often comes to pastiche rather than homage. She does a fair simulation of Carole King via Elton John on several cuts, the best of which are probably the rousing 'Up All Night' and the closing 'Love', but when she tries to get clever, as in the tempo-shifts of 'Honey Bee', it sounds like a couple more rehearsals would have been wise. *JBk*

Sound Quality: 83%



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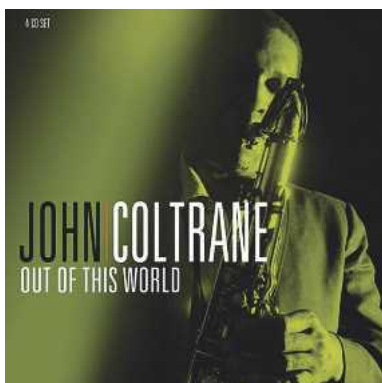
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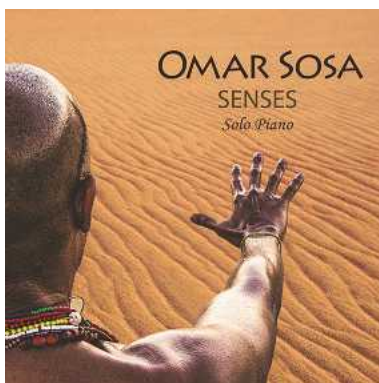
JOHN COLTRANE

Out Of This World

Proper Records Properbox 181 (four discs)

Yet another excellent compilation in Proper's mammoth series, as usual offering four discs and authoritative documentation. Here the absorbing booklet essay is by the set's compiler Simon Spillett, who is as well-known as a saxophonist as he is as a writer. While Properbox 136, *Early Trane*, covered the early days as sideman through to *Blue Train* and beyond, this one picks up the Coltrane story in his later days with Miles, in 1960. So you get a live 'So What' and the studio recording 'Teo' before plunging into the development of Coltrane's own classic quartet, as discs 3 and 4 take us through to 1962 and the Village Vanguard recordings. Fantastic value. *SH*

Sound Quality: 80%



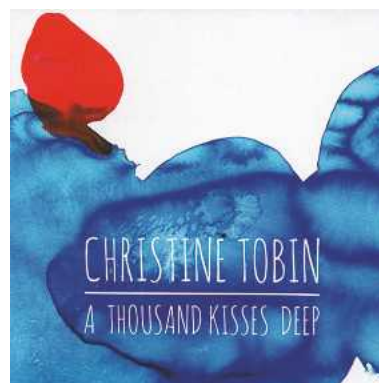
OMAR SOSA

Senses: Solo Piano

Ota Records OTA 1026

Although Sosa has been making solo piano recordings since 1997, he's recently been better known for his Afro-Lectric groups and for the album *Eggun*, which celebrated the 50th anniversary of *Kind Of Blue*. But *Senses* was recorded almost incidentally while he was working on a dance theatre scoring project at EMPAC in Troy, NY. When the creative team rested, Sosa was free to improvise at the Yamaha grand in EMPAC's studio. There are no cascades of notes, no bravura flourishes and, as Sosa says, the music reflects the sadness he was feeling at the time. But listening to the tracks later, they brought him peaceful feelings instead. They can do the same for you. *SH*

Sound Quality: 85%



CHRISTINE TOBIN

A Thousand Kisses Deep

Trail Belle Records TBRO3

She's won awards for her original compositions, but here the Irish-born, London-based jazz singer pays homage to a major influence, Leonard Cohen. You'll guess from the artwork that she's going to start with 'Famous Blue Raincoat', and here what used to be a gentle 3/4 seems to become a choppy, urgent 6/8 – closer to Cohen's original than to the celebrated Warnes version. You might also guess that she'd finish with 'Dance Me To The End Of Love' but she owes nothing to Peyroux either. This isn't one of those respectfully anodyne, obese tribute efforts, because Tobin shakes these songs up in a way that really tells us what they mean to her. *SH*

Sound Quality: 85%



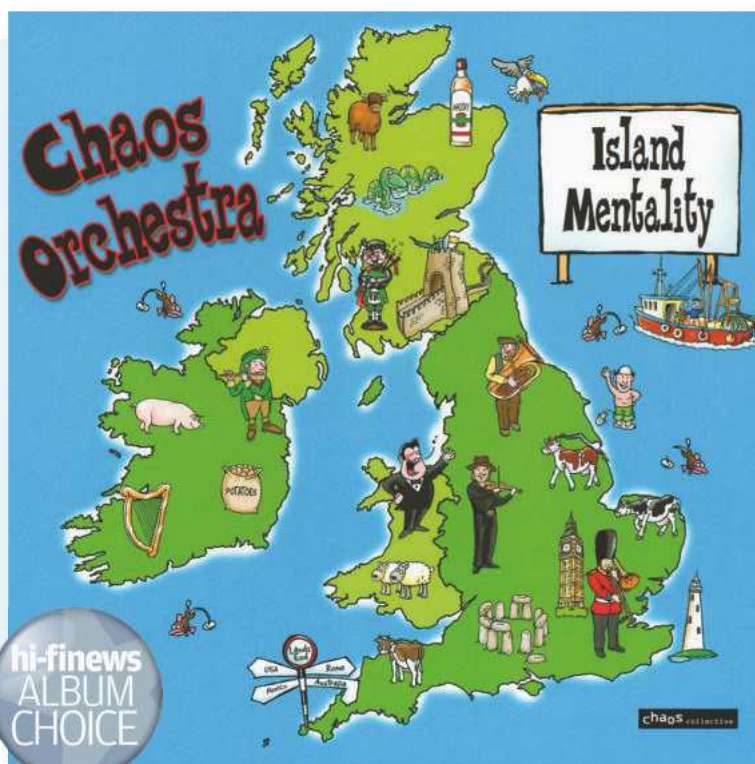
CHAOS ORCHESTRA

Island Mentality

Chaos Collective CC002

Set up by trumpeter Laura Jurd and two members of her quartet, Corrie Dick and Elliot Galvin, Chaos Collective aims to create opportunities for like-minded musicians; its first album release was the quartet's *Landing Ground*. Now Jurd is also directing the 20-piece Chaos Orchestra, and for this recording her co-producer was Mark Lockheart, veteran of 1980s big band phenomenon Loose Tubes. He also wrote one of the eight pieces here, as did guitarist Alex Roth, but the rest come from Jurd and from Simon Marsh, leader of the five-man sax section. With Loose Tubes mounting a 30th anniversary reunion, comparisons are inevitable. But you must hear this, the Chaos Orchestra's brilliant debut. *SH*

Sound Quality: 90%



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DVOŘÁK Cello Concertos

STEVEN ISSERLIS
MAHLER CHAMBER ORCHESTRA
DANIEL HARDING

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Cello Concerto Op.104, etc
Steven Isserlis, Mahler Chamber Orch/Daniel Harding

Hyperion CDA67917; 96kHz/24-bit download

Steven Isserlis has waited until he was 54 to record Dvořák's great Cello Concerto, and here he adds the earlier, unorchestrated one from 1865 (in a free edition by Günther Raphael), which he says 'bubbles with joy'. An appendix contains the original ending to the main work and an orchestral transcription of the song quoted by Dvořák, 'Lasst mich allein'. The solo performance is unsurprisingly fervent, and Daniel Harding gives an inspiring accompaniment – a true meeting of minds – while the recordings from the Teatro Communale di Ferrara have a powerful presence. The enthusiastic booklet note (with timing references) is by Isserlis himself. **CB**

Sound Quality: 90%



MOZART

Clarinet Concerto; 'Kegelstatt' Trio, Allegro in B flat
Martin Fröst/Deutsche Kammerphilharmonie, et al

BIS BIS-1893 (SACD hybrid); 96kHz/24-bit download

We've had four new versions of the Concerto in recent months, two – as here – soloist-directed and with basset clarinet. Fröst is an exceptionally nimble player and his accompaniments are sharper in focus than with the Michael Collins/Chandos CD. What makes this programme even more attractive are its couplings: a 1787 fragment completed by Robert Levin (clt/string qt) and the trio for viola (whose part gets more involving in menuetto and rondo finale), clarinet and piano. Various starrily cast chamber music players work ideally together. Three venues were used, and it all sounds very realistic at 96kHz/24-bit. **CB**

Sound Quality: 85%



SCHUMANN

Faschingsschwank aus Wien; Kinderszenen; Études
Symphoniques (with 5 posthumous studies)
Leon McCawley

Somm SOMMCD 0134

Leon McCawley is one of England's unsung pianists – his Somm discography also includes a very fine remake of a Barber programme he first undertook for Virgin Classics. The first impression you get with this Schumann CD is what a very *clean* sound he makes at the keyboard: there's never an ugly attack. Most importantly he has a real grasp of the logic behind Schumann's thickets of notes; and some of the simpler motifs (eg, in the 'Carnival Jest') are touchingly presented. He's added the five 'posthumous' *Études* in places he thinks make the 'jigsaw' complete. **CB**

Sound Quality: 80%



VERDI

Requiem Mass
Price, Simonato, Zampieri, Ghiaurov, Vienna Singverein,
BPO/Herbert von Karajan

Testament SBT1491 (mono)

Karajan first conducted the Verdi *Requiem* at Ulm in 1933 and, from 1949, various later live/studio recordings exist, including a La Scala DVD with a very young Pavarotti. Given at the 1962 Salzburg Festival, this is one of Karajan's most interesting performances. The soloists are well cast (Nicolai Ghiaurov outstanding in his debut there) although two years before some of the well-heeled ticket-holders were reportedly displeased to see a black soprano (Carmen in Karajan's 1963 RCA recording) on stage at Salzburg! The sound is remarkably good, although mono. **CB**

Sound Quality: 75%





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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

Hi-res audio... via Radio 4

Paul Miller applauds a recent on-air explanation of hi-res versus CD-quality sound and digs a little deeper into why those involved in the listening tests might have come to the conclusions they did

High-res audio went 'mainstream' for about 12 minutes at the beginning of March courtesy of the BBC Radio 4 *You & Yours* programme. On-air comparisons between CD-quality and 24-bit/96kHz music files were offered alongside expert comment from Steve Levine, a record producer with The Beach Boys and Culture Club on his CV, and Stephen Rinker, the BBC Philharmonic's resident sound engineer.

I was especially pleased to hear their succinct and, for the target audience, well-pitched explanation offered for the superiority of 24-bit/96kHz (and higher) recording. You and I even got a credit as 'the audiophile hi-fi community' for driving the availability of this content out of the recording and mastering studios and onto our PCs and Macs as part of our hi-res audio systems.

And kudos too, for the *You & Yours* production team as they attempted a series of live CD versus high-res listening tests, undaunted by the fact that listeners would be hearing both renditions through the same limited resolution/bandwidth FM/DAB transmission chain. Rather like comparing the picture quality of an HD-Ready versus 4K flat panel TV over a 1970s 625-line analogue broadcast...

LEGACY RECORDINGS

Three selections of music were played, the first two being 'sighted' with the CD version auditioned ahead of the 24-bit/96kHz render. In both instances the guests felt confident they could hear a difference and were certain that the second playback – the hi-res file – was audibly superior. However the tracks, an Ella Fitzgerald/Louis Armstrong number and The Who's 'Pinball Wizard' are

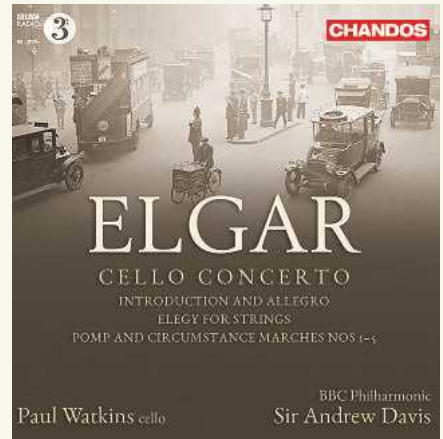


ABOVE: BBC R4 aired a live 'CD vs. hi-res' listening comparison but Elgar proved a Pomp too far

hardly illustrative of modern 24-bit/96kHz digital recordings. Nevertheless, this didn't prevent the hi-res Who's 'more realistic reverb tails' being linked to the extra dynamic range offered by 24-bit encoding over CD's 16-bits. Frankly, I cannot imagine a decades-old analogue master tape of a classic rock standard having a dynamic range greater than the 96dB offered by 16-bit CD.

Typically, where there are sonic differences between 16-bit/44.1kHz and 24-bit/96kHz renders of an old analogue tape, these boil down to the 'sound' of the respective anti-aliasing filters and other digital processing employed in the A-to-D chain. Differences are also observed depending on the preferred sample rate of the playback equipment – 96kHz media typically sounds better through a 96kHz or 192kHz DAC than the 'same' media at 44.1kHz being asymmetrically upsampled before conversion, for example.

What were the Y&Y's crew using? A 'Sony high resolution Walkman' was mentioned, the music compared over unnamed headphones. While this was



unlikely to represent state-of-the-art hi-fi, the guest presenters did at least point out that hi-res media may still not sound sufficiently different on the new generation of 'high resolution' handsets. Headphone amplifiers, as we know, can make or break a personal listening system [see Group Test, p39].

ON WITH THE BLINDFOLDS

All was going swimmingly until the third and final musical comparison – the 2011 recording of Elgar's *Pomp and Circumstance* [BBC Phil/Sir Andrew Davis, Chandos 10709]. Auditioned 'blind', the guest presenters now failed to distinguish which was the 24-bit/96kHz original and opted for the 16-bit CD version instead. And this was the only contemporary digital recording of the three excerpted. Red faces turned to crimson when Stephen Rinker had both the courage and grace to admit he was the credited sound engineer on this album!

I'd rather focus on the fact that hi-res audio is actually being talked about on mainstream radio and I sincerely hope the Beeb is not put off from continuing. Hear the programme yourself at a less-than-high-resolution 128kbps via www.bbc.co.uk/programmes/p01tds0d.

'The guests were confident the hi-res files sounded superior'



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

Roome at the top

Could a new CEO at the company charged with ensuring those receiving Freeview broadcasts are unaffected by 4G mobile services be good news? **Barry Fox** takes a closer look...

By unspoken agreement, fellow columnist Jim Lesurf dives into the physics of digital TV and radio interference from new 4G mobile broadband masts, and I dig into the commercial dirt. And I now bring glad tidings, but question marks for the increasing number of people who listen to and record digital radio using a Freeview digital PVR.

The happy news is that after six months of 4G operation the original estimate that 900,000 homes would suffer interference has now been reduced to 90,000. It's also hopeful that the official body at800, which was set up under government orders with a pot of £180 million provided by the mobile operators, has a new CEO – Ben Roome – who seems much more open-minded and keen to communicate than the last man in the job.

TOO EARLY

The less happy news is that it's far too early to be sure that 4G really is going to affect only 90,000 homes.

As Ben Roome himself admits with refreshing frankness: 'We will fully understand the problem when we have finished dealing with it'.

Four companies are licensed to run 4G mobile broadband services in the 800MHz band, with frequencies or harmonics close

enough to Freeview frequencies to interfere with weak signals in tuners or aerial amplifiers. All are very secretive and only two (O2 and Vodafone) are yet transmitting at 800MHz. The other two companies (EE and Three) are still using 1800MHz for 4G, which is no interference risk. EE and Three will start on 800MHz later this year.

It will be years before they all cover the whole of the UK. So that's one big cause of uncertainty. Other causes are that the mobile operators may change their mast powers, and the interference may vary depending on how much data traffic the 4G frequencies are carrying.

Ben Roome acknowledges that some masts may have tighter transmission frequency control than others. Although at800 reckons that 4G will not cause interference to tuners more than 900 metres from a mast, it's well known that hot weather and high pressure helps radio frequency waves hop, skip, jump and bend unpredictably over long distances.

WASTEFUL PRACTICE

Different Freeview tuners have different sensitivity and selectivity. Aerials and cabling vary widely from home to home. At800's own research shows that some people suffer interference in silence for a while, and then finally complain, perhaps after talking to a neighbour.

So at800 has stopped the wasteful practice of sending a free filter to all homes that might be at risk (a million have been sent so far) and will now only give free filters to those who complain and satisfy a800 that their problem is caused by 4G at 800MHz. But at800 will still be sending out postcards that warn of the risk of 4G interference; 8.5 million homes have been carded so far.

Affected viewers will now get home visits from aerial installers.

'We have learned a lot and are changing our approach to give better support for affected Freeview viewers,' says Ben Roome. 'We have been spending a lot to help a few,' he continues, 'and are moving from a target of 15 days to ten working days to fix a problem'.

'In one case the block electrician just gave up on at800 and bought a filter for £10'



ABOVE: at800 now has an online diagnostic tool at <https://at800.tv/received-a-postcard>

Because at800 had commissioned communal aerial filters that cost around £75, compared to £5 or less for consumer filters, the body had been mean and obstructive over giving filters to blocks of flats. At800's rulebook said that a block's electrician could not talk direct to at800, until individual residents had contacted at800 and been visited by an at800 engineer. In one case I encountered, the block electrician – with a hundred angry residents hounding him – just gave up on at800 and bought a filter for £10. This nonsense must have played havoc with at800's statistics.

DEAL DIRECT

Thankfully at800 has now seen sense and will deal direct with contractors who are faced with communal aerial issues. And whereas homes have so far only been given one filter, they can now get one for each set needed.

The mobile operators have until 2017 to start using their 800MHz allocations. So, if at any time between now and then you find your Freeview radio or TV reception marred by picture blemishes or audio glitches, or entirely ghost-busted, at800 are the people to call. ☺



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

Unsung heroes and heroines

We all love our music, but do we appreciate the background performers who work to make the recordings we so enjoy? A number of recent movie releases aim to put this right, says **Barry Willis**

Music fans are often acutely aware of personal habits and biographical trivia belonging to favourite top-tier performers. Such details are standard fare in fanzines and on celebrity-gossip websites and TV programmes. Far more people have factual knowledge about Lady Gaga or Bruno Mars than about when the first moon landing took place.

Those of us with deeper involvement in music may know a bit about a few esteemed composers, songwriters, producers or recording engineers – perhaps even some history of the music industry. But few can quote chapter and verse about the unsung heroes and heroines behind most of the music we love – the background singers and studio musicians who make solo performers and pop groups as appealing as they are.

Fortunately for them and for us, a hard-working documentary filmmakers have laboured mightily to correct this grievous oversight. Last summer saw the release of *20 Feet From Stardom*, a gorgeous production about the fate of some supremely talented but not widely known singers – some from as far back

as the 1960s and '70s, others more recent. Now available on DVD/Blu-ray, the film examines singers such as Patti Austin, who was able to leverage her talent into a sustainable career, and Merry Clayton, perhaps best known for her backing vocal on The Rolling Stones' 'Gimme Shelter'. Clayton's primary work was supporting other artists, but her promising solo efforts simply failed to break through.

HARD KNOCKS

Darlene Love is another talent prominently featured in *20 Feet*. A member of 1960s girl-group The Blossoms, Love sang backup for many of the biggest names in that era, and managed, despite the interference of producer Phil Spector, to have a few hit songs released with her as lead. Also an actress, the versatile and ebullient Love has been able to support herself by constantly adapting to an ever-changing market – a

true entertainment industry chameleon.

Harder to grasp are the hard knocks faced by world-class talents such as Judith Hill, a former backing singer with Michael Jackson. A gifted vocalist and dancer,

Hill last year got cut in the final rounds of American TV show *The Voice*, a pop-singing talent competition that promises the winner a recording contract and promotional support. Just as baffling is the fate of Claudia Lennear, a stunning beauty who toured with The Stones and sang with Joe Cocker in the 1971 concert film *Mad Dogs & Englishmen*. The fact that Lennear is a mere footnote in pop music history is an inexplicable tragedy.

In many ways *20 Feet from Stardom* is a companion piece to *Standing In The Shadows Of Motown*, a similar documentary from a decade earlier about the studio musicians behind almost every Motown hit of the 1960s and '70s. Known



ABOVE: The movie *20 Feet From Stardom* will be released in the UK on the 28th of March

as The Funk Brothers, they were a group of exploited, underpaid, and mostly uncredited performers responsible for, as the film's narration has it, 'more hit records than Elvis Presley, The Beatles, and The Rolling Stones combined'. The film also puts the story of Motown in the larger history of the 20th century.

SWEET SOUNDS

Lastly, there is *Searching For Sugar Man*, Malik Bendjelloul's fascinating 2012 tale of Sixto Rodriguez, a '70s-era American singer-songwriter who never won a following in his native country but who became an underground hero in the closed society of apartheid South Africa.

Rodriguez supported himself as a construction worker in his native Detroit (as he still does) while unknown to him, his song 'Cold Fact' sold by the millions halfway across the world. Appropriately it is an anthem to people seeking justice, freedom, and equality. ☺

‘Just as baffling is the fate of Claudia Lennear, who toured with The Stones’



ABOVE: *Searching For Sugar Man* is available on DVD from Amazon.co.uk, priced £10.99



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

A pressing issue...

How do modern LP pressings compare with those of yesteryear? **Jim Lesurf** has been looking through back issues of *HFN* and wonders if the golden age of vinyl is actually happening today

How well do modern LP pressings compare with those made back in the days before CD? Look through old copies of *Hi-Fi News* and you'll find plenty of articles, letters from readers, cartoons, and even satirical items, bemoaning pressing faults. It is easy nowadays to forget that back then the LP was a mass-market product and often treated as such by some large producers. Press 'em quick and shove 'em out the door!

Just like many pop audio CDs, production quality standards were driven by beancounters rather than engineers or music-lovers. So the chance of buying a well-made pressing depended on which company produced the LP, and which kind of music you bought.

TINY FLAWS

Back in the '60s and '70s most audiophiles were mainly interested in classical music, so *HFN* tended to focus on classical LPs. Because tiny flaws such as small scratches are more readily heard on classical recordings, a classical-music-loving audiophile was more likely than a rock fan to reject an LP as faulty, even when the disc was manufactured to the same standard.

Many *HFN* readers wrote in to the magazine to lament their experiences with pressing problems. In 1978 two of them collected statistics on how often they returned LPs to the shop or factory in search of a satisfactory replacement. [See 'Discontent' by Max Lehmann & Will McQuilland, *HFN* Sep '78.]

The results showed how companies differed, and my own experiences during the 1970s matched their findings. For EMI classical LPs the pair found that about two out of three LPs had pressing

'Fans of classical music were more likely than a rock fan to reject an LP'

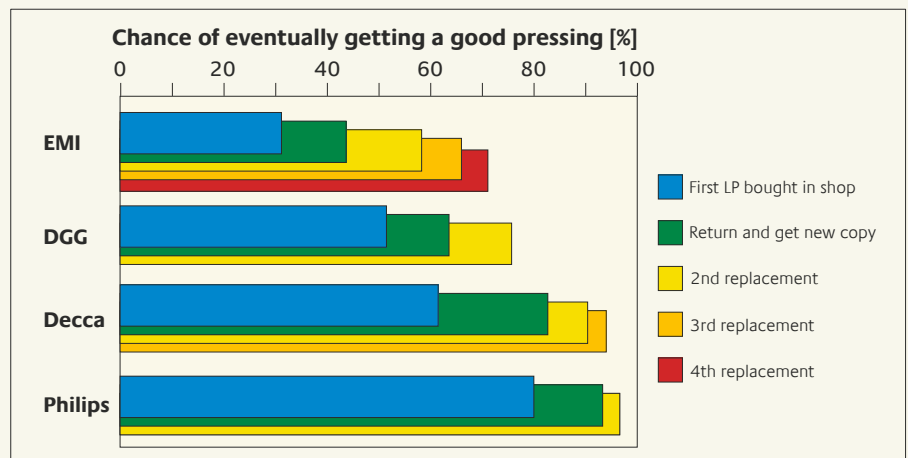
faults that justified a return to the shop for a replacement disc. By comparison, you were twice as likely to find that the first copy you bought of a Decca or Philips LP would be fine. To drag your chances of finally getting a good copy of an EMI LP up to match a first-trip Decca one you might have to make three trips back to the shop for a replacement copy! Personally,

I used to give up after obtaining two replacements of a duff disc and ask for my money back.

The 1978 survey didn't cover pop, rock and jazz LPs. I found that I was less likely to find a fault

with recordings of these genres. Probably because they had a higher recorded level more of the time, rendering any small scratches or pressing noises inaudible.

The main problems would stem from off-centre pressings causing wow or discs with annoying ripples or warps. In fact, when I used to go to my local record shop to buy classical music on EMI I would plan in advance my return trip to ask for a replacement for the disc I was to buy!



ABOVE: Statistics compiled in 1978 by two *HFN* readers to show how often they returned LPs

I've only bought a relatively small number of modern LPs so can't comment with the level of statistical confidence that I can for discs bought in the olden days. But most of the new LPs I've purchased seem very well pressed. Scratches are rare. Indeed, I would describe modern pressings as being clean and carefully pressed.

CRISP AND CLEAN

The most common effect I've noticed is that less than 10% of new LPs have just-noticeable wow due to their being slightly off-centered. Warps and ripples are rare with new 180g/200g pressings and the groove cuts seem crisp and clean.

Some readers may remember the Golden Wonder potato crisps that were popular back in the '70s. If you do, you'll know why I tend to regard that decade as more a 'Golden Wonder' than a 'Golden Age' when it comes to vinyl pressing quality. Many LPs had a shape more like a large crisp than a flat disc!

Now that the LP is no longer a mass-market item it seems that it is being made with much more care. Perhaps the real Golden Age for the vinyl LP is happening right now. ☺

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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

Clash of the classics

Anniversaries, special editions, not to mention centenaries and charts... classical music on radio has never been more vital. Or perhaps that should be vulgar. **Steve Harris** knows what he thinks...

For Radio 3, anniversaries are pegs on which the fabric of classical music programming can be hung. Last year, as Benjamin Britten was born in 1913, we had a rather exhausting 'Aldeburgh weekend' to celebrate him. Verdi and Wagner were both born in 1813, so there were special seasons for them too.

Once an anniversary has been done to death, sometimes to a point where you think you'll never want to hear that composer's music again, Radio 3 will hustle listeners along to the next one. Immediately after 'Britten 100' came relentlessly-repeated trailers inviting us to the celebrations of 'Wagner 200'.

And trailers are to Radio 3 what ads are to commercial stations. They make me turn off. Or turn, at least until the next ad break, to Classic FM.

PUT TO THE VOTE

Radio 3 had classical music listeners to itself until 1992, and the launch of Classic FM. You couldn't have imagined Radio 3 coming up with anything so vulgar as a classical music Hall Of Fame, with listeners voting for their favourite works, but Classic FM has managed to make this a popular annual feature.

Similarly, Classic FM was happy to build programming around album sales

charts, and this time Radio 3 was forced to follow suit. But because the Classical Artist Albums Top 40 is dominated by film soundtracks and compilations, Radio 3 focuses instead on the Specialist Classical Albums Top 20 chart, which excludes those categories.

So, Classic FM's hits of the week include things like *50 Greatest Pieces Of Classical Music* and *André Rieu's Magic Of The Movies*. By contrast, for Radio 3

in mid-January, the Tallis Scholars' Taverner was still at No 1 while the Gewandhaus orchestra's Brahms symphonies were No 2.

In spite of Radio 3's efforts to become more upbeat and inclusive, RAJAR figures last year gave it just 1.99 million listeners, while Classic FM could claim 5.3 million. But although there are many little things to hate about Radio 3, I still prefer it by a million miles. One day last autumn, switching over when the trailers had become too much to bear, I heard a familiar Radio 3 voice. Did my ears deceive me, or was that Catherine Bott?

TO THE OTHER SIDE

It was indeed. Like Aled Jones, who used to present *The Choir* on Radio 3, the *Early Music Show* presenter had gone over to the other side. It turned out I was hearing the start of what Classic FM called 'one of the biggest non-fiction series in the history of British radio.' Starting in October, the web blurb went on, *Everything You Ever Wanted to Know About Classical Music* will run for 150 weeks... For the next three years, Catherine will shine the spotlight on every area of classical music, answering

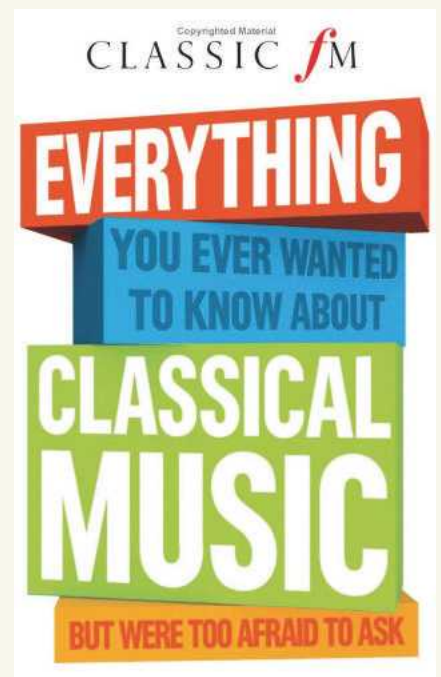
questions about the genre – from "what exactly is 'classical music'?" to "How did Beethoven manage to compose music when he was deaf?"

For 2014, there are plans to broadcast special

editions prompted by a 'birthday' that the BBC probably regards as its exclusive property. During the year that marks the 450th anniversary of Shakespeare's birth, Catherine Bott will delve into 'the role of famous works of literature in shaping the history of classical music.'

Radio 3 started this year with programmes based around the biggest and most depressing anniversary of 2014, the centenary of the First World War. But Tony

'As with ads on commercial stations, Radio 3 trailers make me turn off'



ABOVE: Classic FM has launched one of the biggest non-fiction series in UK radio history

Hall, the BBC's new director general, hasn't forgotten Shakespeare either.

BINARY BARD

Along with promises to upgrade the iPlayer so that TV programmes can be viewed for up to 30 days after airing instead of just seven days as is the case at present, Hall has announced that the BBC's entire Shakespeare TV and radio archive will be digitised and made available free to schools, in time for the 400th anniversary of Shakespeare's death in 2016.

Perhaps it's no coincidence that 2016 will mark another important anniversary, with the next renewal of the BBC's Charter. Let's hope that after that the BBC will continue, reasonably unfettered. And that Radio 3, for all its faults, will be allowed to keep up the good work. ☺

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hi-fi news, november 2012

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Sound Off!

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RELUCTANT CABLE FREAK BUT CAN SCIENCE PROVE WHAT I'M HEARING?

I have to admit that I used to be an anti-cable guy. For years I used basic leads from Hama's Silvertone range and happily upgraded my hi-fi components around them. However, I recently became a customer of a very nice audio store near Stuttgart. They offered me some cables to try at home for free, just to see if I would hear a difference. I accepted the offer mainly out of curiosity and left with pairs of Audioquest's Evergreen, Golden Gate and Big Sur.

After some hours' listening I could only conclude that while the Evergreen and Hama certainly sounded tonally different, neither could be said to sound better.

So I changed to the Golden Gate line. This time I could hardly believe my ears. This Audioquest cable really sounded clearer and brought me closer to the music.

With my interest now well and truly piqued I pulled the Big Sur from its packaging. Even more realism, fresher percussion sounds... a real 'Wow!' moment. I bought the Big Surs and improved the sound of my system a lot.

Now I am testing the Victoria cables and, yes, I will take them.



ABOVE: Audioquest Golden Gate costs £70 for a terminated 2m stereo pair

In short, I have become a cable freak against my own will!

For as long as I remember audiophiles have been divided on the subject of 'do cables make a difference?' Yet discussions between the two are always hostile. The physics guys often talk about 'an electric current' in the cable and how the way the cable is made affects this. Thus, they say, a short cable can have no significant effect on the signal.

On the other hand, there are those who say an analogue music signal is not just 'a single flowing current' but is made up of complicated overlapping vibrations and frequencies. And we all know that when it comes to waves, things get complicated!

So I wonder if any scientific research has been done into this issue? Are there any measurement methods out now that can explain exactly what is going on?

Rainer Meises, Germany

Paul Miller replies: Having measured many hundreds of analogue interconnect and speaker cables over the last 25 years or so, and witnessed many cable testing theories come and go, the reality is that we are really no further forward in establishing a hard and fast objective basis for 'cable sound'. Sure enough the standard LCR (lumped parameter) characteristics tell us how the cable might behave as a low-pass filter, how stable the dielectric appears to be, what signal loss to anticipate (*etc*) but it's our empirical experience of different cable materials, stranding and geometries that typically proves more useful in predicting a particular cable's sound. Ironically perhaps, we have achieved a better correlation between measurement and sound quality with digital cables [see *HFN* Jul '13].

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

High-end hi-fi's smell of excess

PLEA TO REVIEW MORE BUDGET EQUIPMENT

I remember some years ago, when I was directly involved with the design and manufacture of audio products, a colleague of mine describing the hi-fi industry as too much like the perfume industry in that the appearance of the packaging and the price charged dominated, rather than the actual quality of what was in the bottles.

The future of hi-fi depends on people actually buying components in sufficient quantity to allow manufacturers to produce equipment and still have enough money left over to feed themselves. Heavily reviewing products that normal people could never possibly entertain is thus ultimately destructive to the common interest we all share.



ABOVE: *HFN*'s regular Budget Esoterica slot celebrates the very best, very affordable hi-fi that is available

You might consider limiting your reviews of items costing more than, say £3500, to about two per issue and then use the freed-up space to evaluate products that normal people can afford, though I note you now devote one test per month to the best of 'Budget Esoterica'.

Michael Merry, via email

Paul Miller replies: *Hi-Fi News* has always represented the very best hi-fi equipment on the market and, over the last 30 years or so, that market has not only expanded its reach to cover all four corners of the globe but has also developed into a vibrant 'high-end scene' where price, it seems, is little barrier.

Our reviews, typically all world exclusives, reflect the cutting-edge in audio which all too often means the cutting-edge of affordability too! If you are a dedicated audiophile and you want the in-depth inside track on the very best the high-end has to offer, then *Hi-Fi News* is your magazine. Similarly, if you want to read about a Ford Focus then *Evo* magazine will probably not be your first port of call...

System sings ten years on

VALVES AND HORNS BRING MUSIC TO LIFE, SO WHY CHANGE THINGS?

Having been a hi-fi enthusiast since the early '70s I am always intrigued by the latest must-have technology and components. So when I glance over at my system I shudder when I realise that not only has it remained unchanged for over ten years but contains an amplifier using technology from the 1930s and a loudspeaker design from 1946. Am I deluded because I have not embraced current technology or do I secretly believe that certain aspects of hi-fi design have not been improved upon over the decades?

My system consists of a Pro-Ject turntable with Grado Gold cartridge, a Pro-Ject MIM phono stage, a Sony SCD-777ES SACD player and a Cary Audio CAD 5500 valve preamp and CAD 2A3 valve power amp. This drives a pair of ACR Eckhorn loudspeakers to which I have added Pioneer TAD PTR 7 super tweeters.

It is the speaker, with its 105dBW efficiency, that does all the work as the Cary amplifier is rated at just 8W per channel. Theoretically this system should be easily able to achieve in excess of 110dB, but I have never ever done this as I value my hearing.

So why have I not changed my set-up in over ten years? I want any hi-fi system to create the illusion that what I am listening to is taking place in the comfort of my home. I know



ABOVE: David's Cary Audio Design 2A3 PP power amplifier with its Sovtek 2A3 valves

this is not truly possible but it is the illusion that I want to achieve, so I am looking to be moved emotionally. I want to sing along with the artist whose music I am listening to and feel engaged with a musical event that may have been recorded in America in 1952 by an artist who died in the 1960s. By using an amplifier with valves designed in the 1930s and a loudspeaker designed in the early 1940s I feel I am able to produce a sound in my home that is truly convincing with all types of music.

I do hope in the near future to upgrade the turntable. I already have a wooden-bodied Grado cartridge waiting for it. As for changes to the rest of the system, it already does what I want so why change it? Ok, should the resources become available, I would buy the Cary 805C Signature power amps and the matching preamp. Other than that I enjoy listening to my system on a regular basis, which to my mind supports my belief that it must, in fact, be a good system.

David Cooper, via email

Paul Miller replies: Sounds like you have a lot of emotional investment in this system David – it's an old and trusted friend that provides a lot of listening pleasure. So who am I to argue! As I'm often heard to say, our hobby is a very broad church that reflects the passion of vinyl, valve and horn aficionados as eagerly as it does those who have embraced computer audio, music servers and USB DACs. Of course, there are also plenty of DACs with onboard tubes but I suspect you will remain an 'analogue audiophile' for as long as possible!



ABOVE: One of David's Eckhorn speakers with the TAD PTR 7 super tweeter on top

8

Lanes On Your Entertainment Superhighway



RJ/E Forest



RJ/E Cinnamon



RJ/E Vodka



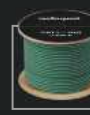
RJ/E Diamond



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.

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designed by David Shaw

*Low Distortion Tertiary
wound transformers*

Shown with upgraded KT150s David Shaw 6SN7s, Jensen copper foil in paper and oil capacitors

Absolute Simplicity 27w+27w UL or 16w+16w Triode

In recent times there has been much interest in simple valve amplifiers for their excellent musical qualities. Single Ended* designs are interesting as they strip away a whole layer of complexity, leaving the bare essentials of a valve amplifier to work their magic. But until now the power of many of these amplifiers has been limited to about nine watts unless exotic high power triodes are used. Unfortunately nine Watts is just too low for many modern speakers to create realistic listening levels.

The recent introduction of the new Tung Sol KT120 and KT150** super beam pentodes gave us the opportunity to design a new amplifier using only two valves to obtain power of 16 Watts in Triode or 27 Watts in Ultralinear configuration. Designed with equal emphasis on Triode and Ultralinear this amplifier will provide very good volume levels with most loudspeakers having three times the power than a single 300B valve.

Because the MB30s are mono blocks they each get an independent power transformer, a valve rectifier and a custom designed choke, giving the best possible quality of power. A wide range of operating conditions are available including 8 Ohm and 4 Ohm speaker taps and low and high sensitivity switch for operation with or without a pre-amplifier. The output transformers are our own LDT tertiary wound type having excellent bandwidth and dynamics, together with low distortion. A built in meter allows a very simple way to check that the output valves are operating at their optimum value and best performance. This will also tell you when a valve is due for replacement.

Things we don't include like printed circuit boards and transistors both of which we feel degrade the performance of valve amplifiers.

The MB30 is an ideal match to any well designed loudspeaker of medium to high efficiency. See our website for details.

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*Using one output valve rather than the usual two in "push pull".

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Hearing aids: an update

WHY HEARING AID USERS SHOULD BEWARE HIGH SPLs, AND READER SHARES INTERNET FIND...

I was very interested in Keith Howard's article on hearing aids and audiophiles, partly because of the audio aspect and partly because I am a retired accessibility consultant, which involved making the environment more inclusive for people with hearing impairment.

I wondered about the comment on high peaks exceeding 110dB SPL and that some modern types of hearing aids can tolerate these. My concern is that while some people with hearing loss may well need sound amplified to relatively high levels, those with a degree of hearing loss but with some hearing remaining may be at risk from excessively high levels. In theory, those excess levels could damage some of the remaining fine sensitive hairs – the stereocilia – in the ear, which provide some hearing and communication for them. Perhaps you, or some of your readers with an audiology background might comment on this?

I do appreciate this is a complex subject and every case is different. Also, you are mainly talking of peak levels, which are not the same as continuous sound at that level. However, the noise at work regulations and academic research papers show that when sound pressure levels are increased the amount of time it is safe to listen must be reduced if damage to the ear is not to be sustained. The noise at work regulations threshold is, I understand, around 80dBA, above which risk assessments are needed.

Following noise complaints, one of my jobs involved monitoring adult-education flamenco dancing with a sound pressure level meter to assess sound levels in a library training room below a block of new flats (only an architect would position a dance studio in a public library directly below a block of residential flats).

Over several nights I established that both the female dance lecturer and the public attending the lessons were exposed frequently to 95dBA (weighted) when clapping, feet stomping, and recorded background CD music was playing simultaneously.



ABOVE: The Widex paper, published in January, can be found at Audiology Online

Technically, the employer should have carried out a risk assessment under the noise at work regulations. The poor public, exposed for a bit less time than the lecturer to loud sounds, were not covered by those regulations, but the local authority still had a duty of care.

Well done for providing an entertaining and informative article. Keith deserves an award for making *Hi-Fi News* more inclusive.

Ronald Koorm, via email

Seeing the letter from Hans Dokman in the April issue which mentioned Widex hearing aids, a quick 'Google' revealed the following paper written by Widex staff in January 2014.

Could this indicate that someone in that industry is at last taking the hi-fi listener seriously? Here's the link www.audiologyonline.com/articles/what-good-hearing-aid-sound-12340.

John Coad, via email

Keith Howard replies: Wide dynamic range music signals can have crest factors (peak-to-RMS ratios) in excess of 20dB – I have one percussion recording where it's in excess of 30dB – so a peak input capability of 110dB SPL may be required to prevent clipping even if the average sound pressure level is 90dB or less. This is why it is important for hearing aids to tolerate such levels, albeit short-term, if they are not to introduce distortion on music.

I don't think it is quite fair to say that hearing aid manufacturers are taking audiophiles seriously 'at last' but the article to which Mr Coad draws our attention is certainly further evidence of this happening.

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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My perfect PC music set-up using Linux

READER SINGS PRAISES OF A COMPACT PC SYSTEM RUNNING LINUX AND SHARES HIS EXPERIENCES WITH THE SET-UP SO FAR

I want to thank *HFN* for Jim Lesurf's Investigation in the November 2013 issue into hi-res audio using Linux. The piece set me off on a trail which has led to a very satisfactory result. I didn't know anything about Linux when I started except that it appeared intimidatingly geeky. But perseverance and a bit of trial and error got me there in the end.

I am less interested in hi-res audio than in having a neatly integrated, glitch-free system in which I am confident that the computer used is having no effect on the presentation of the music.

This has led me to the following set-up: an Asus Eee PC 901 running the Audacious player built into the Ubuntu operating system installed on the PC, and a DSPeaker Anti-Mode 2.0 Dual Core optimisation system used as both a DAC for the computer and as a digital sound processor for all sources.

I also use a Marantz SA-KI Pearl Lite SACD player and an Apple Airport Express wi-fi base station for internet radio and the BBC's Listen Again, played over our home network from an iPad mini. All these sources go via the Anti-Mode 2.0 into an Icon Audio Stereo 20 SE amp driving Kudos X2 speakers.

This is the best sounding set-up I have ever had and I see no need to upgrade it (except perhaps for experimenting with driver valves, and just maybe fitting a touchscreen to the Eee PC). On paper the amplifier may be a bit under-powered for the speakers, but the X2s produce as much level as I want with the amplifier's volume control at halfway. I listen mostly to classical music, which probably helps. And I like the neighbours!

The Anti-Mode acts as a control centre. I can drive everything except track selection via its remote. It is also a sophisticated room correction and tone control device, with everything done in the digital domain. I have programmed a 'psycho-acoustic 3kHz dip' (*à la* Linkwitz) into it, which sounds just right in my smallish listening room. Since the Anti-Mode allows for up to four presets I have three dips of different depths and widths, and a straight-through setting.

I picked the Eee-PC mainly because it is small, its battery will last for a whole evening's listening and it's quiet thanks to its having a solid state rather than a mechanical hard drive. It seems more or less the ideal machine for the one thing I want it to do, which is to play music. The fact that it sits very neatly on top of the Anti-Mode is a bonus. I store downloaded music and my own transcriptions from LP (I no longer use a turntable) on 32GB USB memory sticks.

Apart from checking that sounds were not muted in the Linux alsamixer – they weren't – I did have to go into Audacious and tell it to use the USB device as its output. The computer has remembered the settings and works fine, whichever of its three USB ports I use. I bet Another Well Known Operating System wouldn't have managed that! After many years of OS-derived frustration it's a pleasant surprise when something 'Just Works'.

Most of my music files are 16-bit/44.1kHz FLAC. I have experimented with 96kHz/24-bit downloads, but am far from confident that in a blind test I could tell them apart from the 44.1kHz/16-bit files. Even high bit-rate MP3s sound quite adequate to me. If a system's amplifier

and speakers suit one's taste then all source material enjoys a head start, and once involved in the music I tend to stop listening critically to the equipment. I can tell the difference between CD and SACD, but I am not persuaded that SACD is always better, rather than just different. And in any case, who can tell what the engineers did when authoring the SACD? The CD layer might be differently mastered for the all we know.

The Linux PC was the final ingredient in a system that sounds great to my ears and without taking up too much room covers all sources I use now and am likely to want in future.

Nick Marshall, via email

Jim Lesurf replies: Thanks in turn for your letter, Nick! I was pleased to read it for a number of reasons. The system you've put together is a really neat example of what is possible. For too long Linux has been seen by many as a hard-to-use system only suitable for hackers and geeks. However, there are now a number of Linux distributions that can provide a really excellent basis for a digital audio set-up. Personally I prefer to use a ROX desktop on top of Xubuntu, but this is a colour-of-socks choice. And Ubuntu should be even lighter and more nimble. So a good choice for the hardware Nick is using. Using a small, battery powered system with a solid-state drive in place of a mechanically noisy spinning hard drive is also an ingenious way to dodge snags that can arise with a traditional desktop PC.

Using USB sticks or SD cards makes sense for similar reasons. However, if doing so I'd recommend keeping backup copies on something like a USB-removable hard drive. As well as being a 'safety' backup, this can be convenient when the number of files you have grows. My own collection passed the 500GB level some time ago. With this in mind, I chose USB-removable 1TB discs (Linux ext4 format) for this. Given the way things are going, maybe 2TB or more would be a sensible choice as higher resolutions and the number of files available grows!

For what it's worth, at present I use an internal SSD and such removables with my Linux boxes. But for RISC OS I use SD cards, both internally and for removables. Even smaller, lower powered, and of course, no mechanical noises. Just the music. I hope Nick's letter encourages others to experiment and decide for themselves.



ABOVE: Reader Nick's Asus Eee PC 901 sits neatly atop the DSPeaker Anti-Mode 2.0 Dual Core system while to the left of both units can be seen his Icon Audio Stereo 20 SE valve amplifier

A Mac, a DAC and Amarra

ANOTHER READER EXPLAINS HIS JOURNEY INTO COMPUTER AUDIO, THIS TIME USING A MAC

I moved cautiously into computer audio two years ago and, like many of your readers it appears, found it very difficult to get to grips with what was needed to make it happen. Even now, two years in, I fail to grasp fully the whole server/streamer concept and still find that all magazine articles on the subject (not just yours) assume the reader has more knowledge than I believe to be the case.

When I started the journey I didn't want to go down the network route, I already have enough cables around the house, and still fail to understand why any serious audio addict (I have every *Hi-Fi News* magazine since 1985) would want more. Take, for instance, the new Krell Connect. What's it for? Why spend £2500 on one of these when you can buy a Mac mini computer with external hard drives and a monitor for around half that price and have it sitting next to your hi-fi system? This gives you a dedicated hard-wired audio source with nothing inbetween it and the DAC. The Krell of course still needs a computer and a DAC to be of any use.

I'm not adverse to spending money on hi-fi – just ask my wife – but now I guess I'm a Mac and DAC type of person at heart. And this brings me nicely to my question. I believe the best way to ensure my Mac mini plays the best 16- and 24-bit music is to use a software player such as Audirvana. This is often mentioned in magazine reviews and used at audio shows but there are others, namely Pure Music and Sonic Studio's Amarra, that are rarely mentioned.

I have purchased all three and, as a rough guide, they cost around £50, £100 and £200 each with the recently launched Amarra Symphony with Impulse Response Correction (IRC) costing quite a bit more. I recently took the plunge and upgraded to Amarra Symphony with IRC. It cost £350 for the upgrade, which is quite a lot for a leap of faith.

Impulse Response Correction is Amarra's attempt to give individuals the ability to optimise their system to suit the room it sits in and from the wife's point of view this is a whole lot less obtrusive than having



ABOVE: For Sonic Studio's music players for the Mac see www.sonicstudio.com

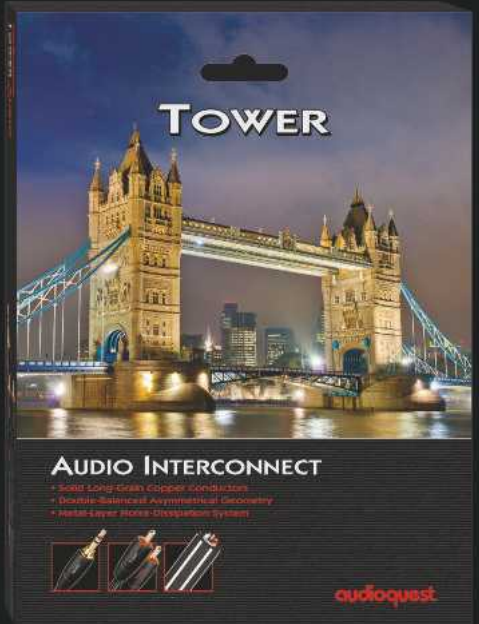
large acoustic panels fixed to every surface. It's a lot cheaper, too. I had to buy a suitable microphone to use in the setup process and purchased a MiniDSP UMIK-1 direct from Hong Kong at around £65 and a tripod from Maplin at £30.

I had always suspected that my room, which is 6m by 4m, had a hump around 40Hz and the Amarra IRC identified this and came up with a solution. Living without the 40Hz hump took a bit of getting used to because I had become accustomed to the bass bloom. Now I enjoy a smoother-sounding and firmer bass which is matched to a wider subjective soundstage – it's a very worthwhile tweak.

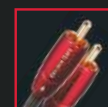
I would be interested in your opinion on this and perhaps a review of Amarra Symphony with IRC would be of interest to many fellow readers. My system comprises McIntosh electronics, including a £6k CD player that rarely gets used these days into Wilson Sophia speakers. The DAC is a T+A DAC 8.

Bobe Stares, via email

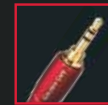
Paul Miller replies: While I have no personal experience of Amarra's room correction regime (JRiver Media Center is most popular among our reviewers), it certainly makes sense to utilise the horsepower offered by the Mac to crunch these numbers. Regarding the Krell Connect, if you re-read our review [*HFN* Mar '14] you'll discover our sample was equipped with the DAC option. As you say, the product is less relevant without it.



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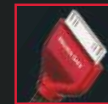
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Reel-to-reel recorders

There's no shortage of reel-to-reel tape decks to be found on the used market, but buying on looks alone can be a costly mistake. **Terry Martini-Yates** has the lowdown

Reel-to-reel tape recorders have enjoyed a bit of a renaissance in recent times, though for some they have always been an essential part of the hi-fi chain offering a ready and reliable means of being able to record and replay high quality recordings via analogue tape.

By the mid-1950s, half-track stereo tape had been marketed by HMV under its Stereosonic brand. This paved the way for other manufacturers, until by the mid-1960s the technology was at a point where it was possible to produce outstanding recordings at home.

This came at a time when recording head technology and the electronics behind it had also improved dramatically. This was great news for the tape aficionado as these improvements also brought standardisation to the format.

THE CLASSICS

Since those early days a number of classic reel-to-reels have emerged and many are to be found on the secondhand market today. They remain sought after not just for their exceptional design, but for the fact that they are able to make fine all-round hi-fi stereo recordings.

RIGHT: The Revox G36 came from a long line of tape recorders, which can be traced back to the mid 1950s. Surpassed by very few decks in its class, it was constantly improved and kept up to date. The design has stood the test of time and has attracted a large following among reel-to-reel enthusiasts

BELOW: It's all in the spec! Revox's G36 publicity brochure from the early 1960s proudly sets out the truly 'remarkable' performance of its latest recorder, guaranteeing its place in audio history



The Revox G36 is still regarded as one of the best valve-based machines to emerge from the early 1960s. Unlike other manufacturers, Revox had chosen to adopt the professional-sized 10.5in reels quite early on, maximising the usefulness of this deck in various situations. With a choice of speeds and track configurations – plus a specially mounted capstan-driven papst motor – tape flutter was reduced to a minimum. Meanwhile, the amplifiers used featured low noise double triode valves throughout.

These machines have generally proven reliable over the years. Faults can sometimes appear, though these tend to be typical of samples that retain the vintage electronics. One such issue surrounds the selenium rectifier, which can rob the valves of HT power should it fail to work correctly. Odd mechanical issues with the tape counter, control switch wafers and end-of-tape

sensor have also been documented while some users have also reported issues when using the G36 to erase modern reel-to-reel tapes.

BEST OF BRITISH

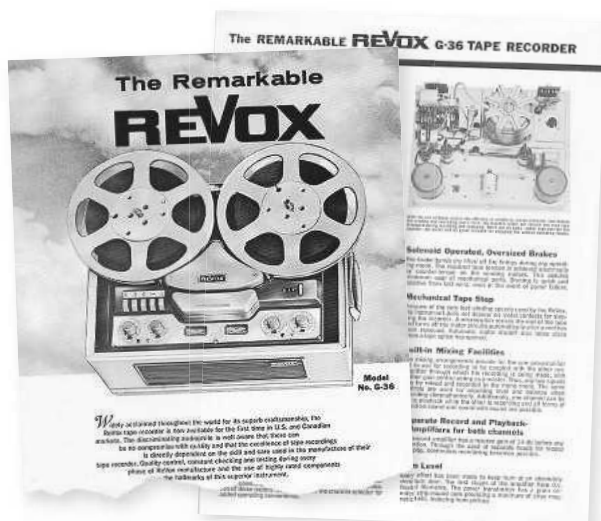
Quintessentially British, Ferrograph's Series 632 was the last in a long line of recorders to feature the Wearite

deck. Available with a choice of three different speeds, quarter or half track and switchable bias, like the Revox G36 the machine also featured

double triode valves throughout.

Often considered to be a cosmetic embellishment of the earlier series of tape machines produced by the company, the Series 632 saw the firm attempt to improve sales by softening the industrial look of its decks. Otherwise performance is as you might expect from a Ferrograph, with full-bodied recordings marred only by the fact that the deck offers a maximum spool size of 8 7/4in.

'The Revox G36 is regarded as one of the best '60s valve machines'



Over the years the Ferrograph has proven itself to be generally reliable in daily use and spares are still easy to come by. However, head wear can be a problem due to the materials used in their construction.

Appearing on the market in 1967 to great acclaim, the Revox A77 is both well executed and designed and one of the first domestic decks to use semiconductors throughout. The machine was available in a number of speed and track configurations with later models also featuring Dolby. It's a three-motor machine, with full capstan servo.

Considering the quality of the early transistors used in the initial days of the A77's production, electronic failures are few. The most important areas to check with respect to this model are head wear and the condition of the brake hubs and bands. There is an optical auto stop that requires a small bulb and this can sometimes burn out, leading to a bit of head scratching.

If an A77 has little wear but hasn't been serviced for a long time then it will undoubtedly need some restoration work, though it won't need its belt and idler replacing as would certain other machines. Also remember that the A77 went through various revisions during its long production run.

JAPANESE MODELS

By the 1970s competition from Japan had increased in the reel-to-reel market. Most of that country's major players were already well established, offering dozens of models with which to tempt



ABOVE: The Revox A77 was considered another masterpiece of electronic and mechanical engineering when introduced in 1967

BELOW RIGHT: Sony's TC880-2 was aimed at the top end of the market, offering just about every feature you could wish for

BELOW: Technics' RS1500 literally turned the tape path on its head thanks to the isoloop system

consumers. Many incorporated much of the latest tech while other machines sought to improve on the looks of the traditional reel-to-reel.

The Technics RS1500 was one machine that truly turned heads with its appearance, abandoning the conventional tape path in favour of an isolated loop or 'isoloop'. The deck uses a servo reel control system combined with dual pinch rollers on a single capstan to maintain constant tension on the tape.

Although confined to a very small number of models, the isoloop system is more than just a gimmick, giving highly stable, low flutter playback. The machine can play at 15ips, handle 10¼in reels and has both two-track and quarter-track playback heads. The unusual tape path and head layout is partly the reason why the machine handles tape so well. The RS1500 has proven to be reliable over the years with faults being confined to braking and

BEFORE YOU BUY...

A good place to start when assessing the condition of a used reel-to-reel recorder is to look at the tape transport and tape path as these can tell you the sort of life the machine has had. The condition of the heads is a crucial factor and also a good indicator of a machine's former life. A number of makes and models enjoy a following, which has created a thriving spares market. This can be a good indicator as to what is still available when it comes to replacement parts and their cost. Also, invest in a test tape and a head deflexer to keep the machine running at its best.

minor electronic issues including errors in channel balance and metering due to component aging.

UPMARKET SONY

Sony's TC880-2 appeared on the market in the mid-1970s, targeted at the well-heeled enthusiast. The deck is a very good example of elegant design married to a wide range of useful features. It offers XLR mic inputs, peak programme meters, two speeds, a half track and four heads with closed loop dual capstan, variable speed and a real time counter. The deck also boasted virtually indestructible Sony F&F ferrite heads, a quarter-track playback head and extremely responsive and precise optical



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SONY Ask anyone.
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BUYING VINTAGE



ometers. The design has stood the test of time and few faults have been noted over the years, though braking is one of the weaknesses encountered due to the bands having perished.

Akai's GX-646 is another machine probably best remembered for its good looks.

Appearing in the very early '80s as an updated GX-635, it sold relatively well and has become a bit of a classic.

Most importantly it packed quite a lot of punch for a machine in its class offering auto reverse, direct-drive capstan and Akai's famous GX head technology, which promised very long life.

These machines have proved reliable over the years with faults being confined mainly to the electronics and PCBs populated with transistors that have turned a little noisy. Akai was a dominant player

'Akai's GX-646 packs a lot of punch for a deck in its class'

in the domestic reel-to-reel market during the 1970s and early 1980s and offered a relatively large number of models, some of which have common interchangeable parts.

PREMIER PIONEER

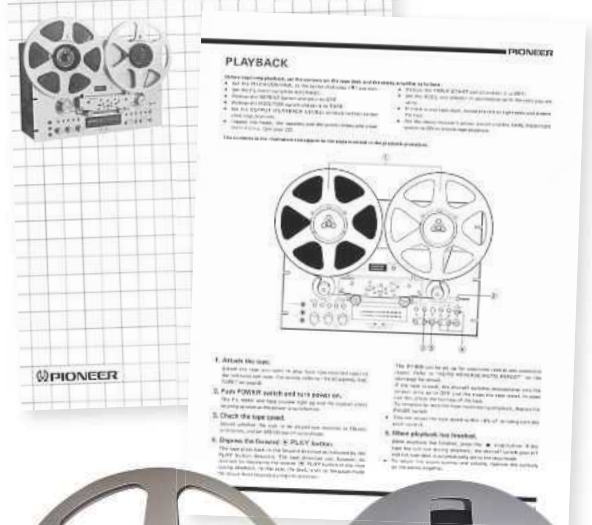
The Pioneer RT-909 is considered by some to be the finest consumer reel-to-reel the company ever produced. It is rack-mountable, handles 10.5in reels, has a dual capstan, closed-loop servo controlled drive, and electronic reel braking with auto-reverse capability. The design is simple, elegant, and does away with most of the more complicated mechanisms found in some of the other decks in its class.

The rack-mount feature saw these machines often used in small studios, which meant they received a hard life. Mechanically, the RT-909 often has problems with the tension guide rollers; the correct operation of these are crucial to the very low flutter specified. For some

reason, Pioneer machines tend to suffer more than others with pinch wheels turning to goo. The tape sensors and other switches may require attention.

Being mechanically identical to the company's earlier X-1000, Teac's X-2000 pedigree was assured. This was one of the last domestic machines to be still available in the mid-1990s. This is probably due to the Tascam connection and the home studio market it was aiming for at the time. The machine retained the X-1000's cobalt amorphous heads, closed-loop dual

3 MOTOR 4-HEAD TAPE DECK RT-909 OPERATING INSTRUCTIONS



ABOVE: The rackmountable Pioneer RT-909 found favour in studios. The design made adjusting tape azimuth easy

TOP LEFT: Coming from a long line of well regarded machines, the GX-646 was one of the last designs to emerge from Akai and boasted a host of features along with simple tape loading

LEFT: Teac's X-2000 series were some of the last recorders available on the market. They were aimed at the pro recording enthusiast

capstans, EE tape compatibility and Type I DBX noise reduction. A model designated the X-2000M is the high-speed version of the series and can play four-track tapes.

The Teac recorders have proved to be reliable enough over the years. The X-2000R is the most common of all the models and appears to have sold in relatively good numbers. All can suffer with tape contact issues due to the way the heads are mounted. This means that keeping the guides and pinch wheels clean is more critical than is the case with other machines.

LOGIC CONTROL

By the time the Pioneer appeared, little remained of the home-grown reel-to-reel market in Europe. Ferrograph produced the Logic 7, its first (and last machine) that came somewhat close to the competition. Using logic control for all the main functions, the recorder was available in a number of tape speed and track configurations and handled 10.5in reels. Although appearing too late, a fairly large number were produced until the demise of the firm in 1981. ☺





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Robert Harley, *The Absolute Sound* - September 2012

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The Audio Beat - July 2012



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BUYING VINTAGE



LEFT: The last machine from Ferrograph was the Logic 7. Although lacking some of the bells and whistles found on the competition, it still performed well enough to find its uses in professional environments

Some of these machines found their way into broadcast and studio environments and, while very much a belt-and-braces deck lacking many of the features taken for granted on Japanese rivals, today it offers a good entry point for those wanting a first vintage reel-to-reel recorder.

Although generally reliable in most respects, the drive idlers and capstan pinch wheel will eventually turn to goo. These parts will need replacing before anything else is attempted.

Another notable machine and now a classic is the Revox B77 which introduced a number of improvements over its predecessor, most notably to the head block and

electronics. These decks sold in fairly healthy numbers until production ceased in the mid-1980s.

A STICKY END

The B77 was also to be found in professional environments, which means paying close attention to condition when considering buying one used. While generally reliable, replacement heads for the

'While generally reliable, new heads for the B77 are expensive'

Revox B77 are expensive. Also, the custom cabinet in which the B77 is housed is prone to turning sticky. This is due to the suede-effect coating known as Nextel – a product once marketed by Scotch Tape manufacturer 3M! ☹

BELOW LEFT: Original ad from FWO Bauch, sole UK distributor of Revox throughout the '60s and '70s

BELOW: There was a lot more to the Revox B77 than just a restyling, with various improvements made to the design that had originated from its predecessor, the A77



ALSO CONSIDER...

The Vortexion CBL6: Often described as 'an engineer's approach to stereo', this is a very large, all-valve stereo machine based around a Wearite deck and capable of giving good performance. You'll need plenty of room to house this particular recorder, though.
Tandberg TD20A: A machine noted for its general, all-round good performance. It sports a four-motor transport and is available with either quarter-track or half-track capability. Often considered to be Tandberg's finest machine.



Akai GX-77: A space-saving, auto-reverse design [pictured above], only really limited by its maximum spool size of 7in and quarter-track heads. The machine enjoyed good sales in the early 1980s. Recordings are pretty standard in quality, but it makes a very good starting point if you are stuck for space.
Revox A700: A flagship machine when first launched in the early 1970s boasting cutting-edge electronics at the time like a three-speed quartz PLL capstan. Ticks all the boxes when it comes to sheer performance.
Pioneer RT-707: A compact machine similar in size to the Akai GX-77. Able to be rack mounted, the RT-707 is a three-motor design having three heads, a quarter-track configuration and offers a maximum spool size of 7in.

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It was arguably the world's first high-end CD player and, by lucky accident, was born a multi-box machine to boot. But how will this marvel from 1984 measure up today?

Review: Adam Smith Lab: Paul Miller

Back in the 1980s, Compact Disc's tantalising promise of 'perfect sound forever' was taken as gospel in many quarters. After all, it was a simple case of successfully retrieving a chain of ones and zeros from the disc and turning them back into an analogue signal. How complicated did that need to be?

However, one man was dissatisfied with the performance of the new medium and set about improving matters with typical fervour. The engineer in question was Stan Curtis of Cambridge Audio and the result of his labours was the Cambridge Audio CD1. Introduced in 1984, it effectively changed the face of CD reproduction, and not just due to its multi-box construction.

AIMING HIGH

As Curtis recalls it today, 'a high-end CD player didn't really exist when the CD1 came onto the market. My aim was to produce a player whose sound had dynamics and a solid bottom end, without the midband forwardness and aggressiveness that some products used in order to highlight resolving characteristics.'

Bass was a particular area of concern, as Curtis felt that players generally were



ABOVE: Designer of the Cambridge Audio CD1, Stan Curtis, appears lost in thought as *Hi-Fi News* scribe Ken Kessler gives the new flagship player a resounding thumbs up in this early '80s picture

not reproducing the low-end information of which the CD was theoretically capable. Whereas many other designers concentrated on the analogue side of things and attempted to buff-up the output of players' DACs to make things sound more pleasing, Stan took a decidedly vinyl-esque 'garbage in, garbage out' approach to the issue and came to the conclusion that the problems were actually coming from the beginning of the chain – the laser scanning mechanism.

Stan observed that many of the parts making up a CD transport were made of thin steel or moulded plastic and were of relatively poor quality. As a result, the motion of the disc as it rotated was far from smooth. In fact it often vibrated, moving up and down and making the servo's job much harder than it needed

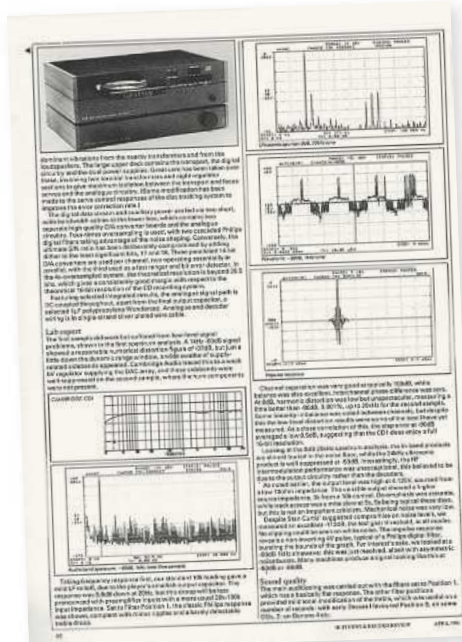
LEFT: Review of the CD1 from *HFN* April 1986 paints a glowing picture. The player's design is highly praised, especially its low mechanical and electrical noise, and fine channel separation

to be. When a piece of information was missed, the servo would have to go looking for it and by the time it had located it, time had passed and the next piece of information would be skipped. It therefore stood to reason that if less information was lost in the first place, then the servo would have to work less hard to do its job and the stream of data reaching the DAC would be all the better for it.

SPLENDID ISOLATION

The initial step was to devise a proper isolation set-up for the laser system and the method chosen for the CD1 was twofold. Firstly, the laser was mounted on a spring and rubber damper that moved at around 20Hz. This, in turn, was fitted to a lead beam suspension tuned to 1Hz. The first samples of the lead beam were created in a pan on a kitchen cooker, but production was later moved to the luxury of a camping stove in the corner of the factory!

In order to quantify improvements, Stan devised a measurement system that





counted the errors on the disc as it played. Not only did this show a huge reduction in reading errors when the suspension was introduced, it also formed the basis of the third box in the full CD1 set-up – the Quality Assurance Module. The result of these modifications meant that the error correction capabilities of the player could concentrate on correcting data issues from the disc itself, rather than faults introduced by the scanning system.

Of course, data acquisition was only the first step and the subsequent stages in the CD1 were equally well developed. From his work with Cambridge Audio's amplifiers, Stan realised the importance of the power supply in the chain and, to this end, specified three transformers for the CD1: one for the

control circuits, one for the logic and the final item for the analogue output stage. This ensured that each section could be grounded separately, so minimising supply line interaction and stray signal pick up.

TRIPLE DAC CHIPS

The DAC implementation was also highly advanced compared with existing designs in order to make the conversion process more accurate. It was found that the longer the settling time given to each converter, the more accurate the resulting voltage output would be. In common with Philips' own players of the day a 4x oversampling system was used so that simple subsequent analogue filters could be fitted, but the circuitry was taken

'The CD1 locked onto the beat and bass, overlaying the vocals neatly'

control circuits, one for the logic and the final item for the analogue output stage. This ensured that each section could be grounded separately, so minimising supply line interaction and stray signal pick up.

ABOVE: Although it may look like four boxes, the full CD1 set-up with the Quality Assurance Module (bottom) comprises only three separate enclosures as the top 'two' are actually one

further still by the use of no fewer than three TDA1541 DAC chips per channel and a sequencer to feed them.

In basic terms this meant that sample number one went to converter number one, sample two to converter two and sample three to converter three, before converter one took over again for sample four. Hence the improved settling time per DAC IC. These aforementioned DAC chips are potted in epoxy to reduce their vibration sensitivity and also contain components to monitor and maintain their temperature at a steady level, thus further improving performance.

PURE ACCIDENT

Finally, the integrator stage of the CD1 was spread over three circuits, each with relatively low gain and minimal filtering to minimise the distortions that can arise from a single stage with heavy feedback. This was followed by a filter section with selectable options and a high quality analogue output section.

Amazingly, the two-box layout of the player came about purely by accident. Frantically building the first unit on New

LEFT: The CD1 Mk2 saw the main enclosure reduced in size and added further internal refinements. The original switches were replaced with less industrial-looking types



VINTAGE HI-FI

RIGHT: Under the lid the modifications made to the CD1's donor transport mechanism can be seen, plus the carefully disguised circuitry contained beneath the 'Cambridge' logo

Year's Eve ready for CES barely a week later, Curtis discovered that everything simply wouldn't fit into the intended enclosure. A spare Cambridge amplifier case was pressed into service to house the DAC and analogue sections and the first two-box CD player ever to be seen was the result.

The Quality Assurance Module was an option that added another box and a further £750 to the CD1's already not inconsiderable £1500 purchase price, but this lined up further buyers in the form of independent CD manufacturers who valued the instant readout of the quality of their product. In due course, a number of internal upgrades were made to confer Mk2 status upon the unit, before it was replaced by the even more advanced, but disappointingly single-boxed, CD2.

ADAM LISTENS

With the CD1 warmed up and connected to my Naim Supernait amplifier and PMC Twenty.24 loudspeakers via its fixed output, it was not difficult to hear why this was such a groundbreaking design. Whereas many players of the time sound shrill, thin and somewhat fatiguing, the CD1 is a very different beast. It has a fulsome sense of authority and positively bounds along when fed a good beat.

With Mark Knopfler's *Golden Heart* [Vertigo 514732-2] in the tray, I was very

'Classical pieces thundered around the room with fervour'

impressed by the sheer punch and impact of the drum beats during the introduction to 'No Cannibals'. I felt I was listening to a proper drum skin vibrating, rather than a sterile digital facsimile of one. When the track broke into its stride, the Cambridge again locked onto the beat and the bass, overlaying the vocals on top very neatly indeed.

The vocals themselves were also well rendered, although I did detect a sense of graininess beneath the surface. Knopfler's voice sounded a little gruffer than usual,

almost as if he needed to clear his throat slightly. Transferring the same disc to my vintage CD spinner of choice, the Marantz CD94/CDA94 combo, tidied things up greatly in this respect, although now the track lost a hint of its previous *joie de vivre*.

Back with the CD1, it was interesting to note that this slight midband artefact was not a continuous presence. Spinning the Webb Sisters' *Daylight Crossing* [Mercury 170 097-4] revealed two very sweet voices indeed, as Charley and Hattie Webb worked their vocal magic. Once again, the backbeat to tracks like 'Still The Only One' was firm and taut, but accompanied by a fine sense of space around instruments. Treble was also delightfully clean and crisp, but without any of the associated glare and hardness that can mar the experience of early digital products.

TAD TRICKY

In absolute terms, the CD1 was unable to rival more modern players when it came to the focus and expansiveness of the images it portrayed. Equally, it never sounded flat or two-dimensional, layering the front-to-back perspective well and laying out performers neatly between the loudspeakers. Amusingly, while pondering this comparison between old and new I found myself humming along and tapping my foot to the track playing. It seems that the CD1's infectious sense of musicality makes serious analysis a tad tricky!

It soon became apparent that this musicality transcended musical genre and artist. Grand classical pieces thundered around the room with pomp and fervour, delicately tapped jazz hi-hats had my feet stirring instantly while simple vocal material proved emotive and delightful. The latter was showcased well by the track 'Laura' from Bat For Lashes' *The Haunted Man* [EMI P915 5402]. Here, ☞

LEFT: Further glowing recommendation for the 'long awaited' CD1 came from *Hi-Fi Choice's* original review. The magazine found the unit to be well up to the standard of its Sony reference



THE LONG AWAITED

CAMBRIDGE AUDIO CD1
CAMBRIDGE AUDIO SYSTEMS INTERNATIONAL, FISHER FARM, DUNSTON, HUNTINGDON,
CAMBRIDGE CB4 9HE, UK. TEL: 0450 818181

THE long awaited Cambridge CD1 player has been on sale in the US for many months before finally becoming available here in the UK. Rumour had it that the CD1 was one of the world's best sounding players, which is as it should be, given that its price is also one of the highest. We were fascinated to see how it would stand up to our current reference the Sony two unit player combination comprising a DWS 702x decoder plus CD-P52x player, and in the UK at least under the Sony dist by at least £500.

Like the Marantz and Marantz machines, the Cambridge design is founded on the Philips system with its four times over-sampling and digital filtering. Cambridge have chosen the Philips 104 chassis as the main building block, but a solid cast metal structure with horizontal drawer loading mechanism. From this point onwards the design of the CD1 diverges from that of other machines. For example, while the D/A converter is physically 14 bit Marantz

the upper and the lower arms, and the laser lens is positioned from the former. Specially selected components are used in the filtering and output circuitry to maximize audio quality. Operating facilities are basic Philips 104 including that machine's small fluorescent display illuminated in green. However, the publications are of manufacturing quality and should give a long life.

Three additional buttons can be used simply or in combination to offer a selection of seven audio filters. These filters provide subtle modifications to the upper frequency characteristic, altering amplitude and phase, being designed to complement some of the upper range characteristics of available digital programmes. On test these filters were experienced with and it was found that several settings could indeed improve some of the brighter and edgier recordings, making them to a more musical balance.

LAB REPORT

The adjustable sections in filter response only affected the upper treble, and the primary response fitted the Philips pattern with the usual minor ripples in the upper range. These are harmless and amount to 0.2dB giving a mild loss in output at low frequencies being 3dB down at 20kHz but this related to the 120kHz loading of the pen than recorder used for the measurements. With most pre-amplifiers,

the input impedance is either greater than this, and the low frequency signal will move to a correspondingly lower frequency. For example, with a typical 50k input impedance, the -1dB

Continued over the page

TEST RESULTS

Channel balance	0.1dB	0.1%	0.00%
Inter-modulation	-19dB	-120dB	-90dB
Channel phase balance	0°	0°	0°
Total harmonic distortion, 0.1%	-92dB	-81.0dB	-81.0dB
Total harmonic distortion, 0.01%	-74.1dB	-	-
Total harmonic distortion, 0.001%	-64.0dB	-	-
Total harmonic distortion, 0.0001%	-54.0dB	-	-
Inter-modulation, 10kHz/20kHz, 0dB	-73.2dB	-	-
Inter-modulation, 10kHz/20kHz, -10dB	-73.2dB	-	-
Frequency response, left channel	+0.01dB	-0.01dB	-
Frequency response, right channel	+0.02dB	-0.02dB	-
Impedance, 100kHz unbalanced	>10kΩ	-	-
Signal-to-noise, CDRW, 90dB full	>110dB	-	-
Clipping level, 200mV, 1kHz	2,000,000	-	-
Clipping level, 100mV, 1kHz	1,000,000	-	-
Distortion, 100mV, 1kHz	<0.001%	-	-
Distortion, 100mV, 10kHz	<0.001%	-	-
Distortion, 100mV, 20kHz	<0.001%	-	-
Distortion, 100mV, 100kHz	<0.001%	-	-
Distortion, 100mV, 200kHz	<0.001%	-	-
Distortion, 100mV, 300kHz	<0.001%	-	-
Distortion, 100mV, 400kHz	<0.001%	-	-
Distortion, 100mV, 500kHz	<0.001%	-	-
Distortion, 100mV, 600kHz	<0.001%	-	-
Distortion, 100mV, 700kHz	<0.001%	-	-
Distortion, 100mV, 800kHz	<0.001%	-	-
Distortion, 100mV, 900kHz	<0.001%	-	-
Distortion, 100mV, 1000kHz	<0.001%	-	-
Distortion, 100mV, 1100kHz	<0.001%	-	-
Distortion, 100mV, 1200kHz	<0.001%	-	-
Distortion, 100mV, 1300kHz	<0.001%	-	-
Distortion, 100mV, 1400kHz	<0.001%	-	-
Distortion, 100mV, 1500kHz	<0.001%	-	-
Distortion, 100mV, 1600kHz	<0.001%	-	-
Distortion, 100mV, 1700kHz	<0.001%	-	-
Distortion, 100mV, 1800kHz	<0.001%	-	-
Distortion, 100mV, 1900kHz	<0.001%	-	-
Distortion, 100mV, 2000kHz	<0.001%	-	-

Further glowing recommendation for the 'long awaited' CD1 came from *Hi-Fi Choice's* original review. The magazine found the unit to be well up to the standard of its Sony reference



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CAMBRIDGE AUDIO CD1 (Vintage)

We have now reassessed the Philips' CD100 [HFN Oct '11], CD303 [HFN Nov '13] and CD104 [HFN Apr '14], all based on the SAA7030/TDA1540 14-bit/4x oversampling chipset. This Cambridge CD1 is the first 'vintage' player we've featured that's an audiophile re-working of this chassis even if, in the cold light of 2014, its core technical performance is still very close to that of the donor. Disc tracking and error handling was certainly improved – the CD1 handling CD-R media that our CD104 refused – and while the 108.5dB A-wtd S/N ratio is superior, this is accounted for by the 6dB increase in output to 4.1V. Distortion is higher in the CD1 over the top 20dB of its dynamic range (0.006% on the left channel at 1kHz/0dBFS) but matches back up in trend with the CD104 at –30dBFS and below [see Graph 1, below]. Low-level linearity is marginally improved with errors of +1.3dB at –100dBFS but the benefit of the multiple 14-bit DACs is better realised at 20kHz than 1kHz. There's also a low-level hash pervading the CD1's 'white' noise floor and this impacts on the jitter spectrum, amounting to 925psec here (higher than the basic CD303 or CD104). No one was measuring this sort of thing 30 years ago...

The three analogue reconstruction filters have the biggest impact (seven permutations of filters are possible – see our on-line reports). Filters 1, 2 and 3 show a –0.6dB loss in bass at 20Hz (the output impedance increases to a high 1.5kohm here) and while Filter 1 looks like the CD104, Filter 2 rolls the presence band and treble away to –2.3dB/20kHz with Filter 3 less obvious at –1.9dB/20kHz [see Graph 2, below]. Readers may compare the QC Suite test report for this CD1 with the Philips CD104, CD303 and CD100 by navigating to www.hifinews.co.uk and clicking on the red 'Download' button. PM



ABOVE: Inter-box connections are made using DIN sockets. The two sets of phono sockets are for analogue outputs, with both fixed and variable options available

Natasha Khan's plaintive vocals were a soulful delight, even if they were still delivered with a slight underlying lack of absolute purity at times. However, what was beyond reproach was the backing piano, which was beautifully rendered both in timbral and spatial senses.

The other slight drawback in the CD1s performance was discovered when listening to the track 'Let Go' from Frou Frou's 2002 album, *Details* [Island CID8112/586995-2]. The bass on this track runs deep and, although the CD1 captured the intensity and punch of the bass line, I was surprised that it wasn't quite reproducing the very lowest notes as well as might have been expected.

Switching to the Marantz revealed greater weight but somehow at the expense of impact. Seemingly the Cambridge doesn't actually go quite as low as one might expect, but it most certainly

delivers things slightly above the very lowest bass spectrum with great gusto.

BUYING USED

The CD1 was a premium product and this is reflected in its scarcity today. The fact that the DAC chips used are encapsulated means that replacing a failed component can be nigh on impossible and also makes the buying of a faulty CD1 in order to rob a TDA1541 chip for spares a futile exercise.

Fortunately, the machine's temperature stabilisation circuitry helps prolong the life of the more delicate parts and the transport is based around that of the Philips CD-104, which has been proven to be sturdy. While bringing a distressed example back to life is a daunting prospect, if a CD1 has made it this far there's a good chance it will have plenty more life left in it yet. ⚡

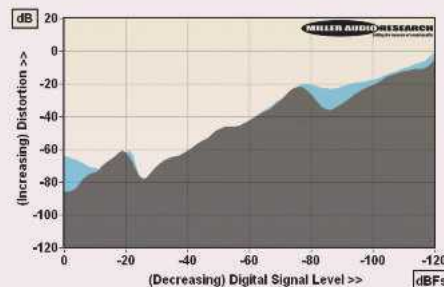


ABOVE: Stan with racks of CD1s – you'll never see this many together again!

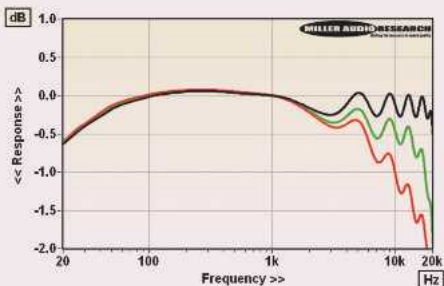
HI-FI NEWS VERDICT

The first two-box player, the first high-end player or the first real advancement in CD replay. Whichever way you look at it, the Cambridge Audio CD1 was a landmark product and instantly made other players sound dated – quite a feat when they were only two years old! Even today it is a highly entertaining listen, despite having a few rough edges. Finding a good example may take a while but, if you succeed, cherish it.

Sound Quality: 82%



ABOVE: Distortion versus decreasing digital level over a 120dB range at 1kHz (black) and 20kHz (blue)



ABOVE: Impulse frequency response showing the effect of Filters 1 (black), 2 (red) and 3 (green)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	4.12Vrms at 73-1.5kohm
A-wtd S/N ratio	108.5dB
Distortion (1kHz, 0dBFS/-30dBFS)	0.0026% / 0.015%
Distortion & Noise (20kHz, 0dBFS/-30dBFS)	0.056% / 0.018%
Frequency response (20Hz-20kHz)	-0.65dB to -0.48dB
Digital jitter	925psec
Resolution @ -90dB/-100dB	+1.4dB / +1.3dB
Power consumption	30W
Dimensions (WHD)	450x260x300mm

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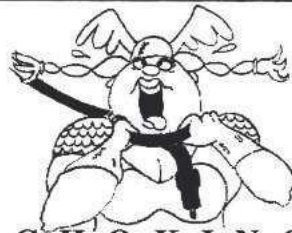
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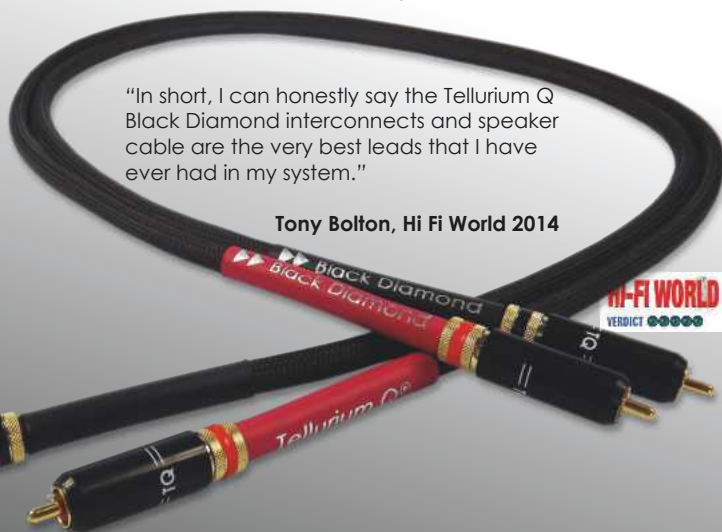
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OFF THE LEASH!

KEN KESSLER TELLS IT LIKE IT IS...

Ken Kessler assesses part one of an ambitious effort to cover the entire history of hi-fi in print



Long before I discovered music or even model cars, I was obsessed with reading, to the detriment of all else. All but living in the library from the age of seven, saving up for comic books – even my parents worried about this bookworm who, decades later, remains the least sporty human being on earth. Perhaps it was inevitable that I remain, in the era of the Kindle, obsessed with books.

VISUAL CELEBRATION

With the printed word being paramount to my existence, if I had any say-so in my legacy, I would like to be remembered for *Quad: The Closest Approach*.

But it's only others who can do this, although I have been told more than once that the *Quad* history launched a genre sorely needed by hi-fi.

While other books about hi-fi preceded it, none (that I can recall) were highly visual celebrations of specialty hi-fi, certainly not in the manner of the books that car enthusiasts, art lovers, photography buffs, wannabe Nigellas, cineastes and every other hobby take for granted. Instead, we had serious scientific tomes, numerous setup/how-to books along with the occasional monograph about a particular brand.

It was followed by two more, and also appearing since the *Quad* book are lavish titles by other authors about JBL, Thorens,

EMT, Gryphon and Stellavox, with more academic works on Tannoy, Wharfedale and Klipsch. We can now fill a shelf with books that chart the history of a phenomenon in need of all the gravitas it can muster.

Which brings me to the most ambitious literary effort yet on the part of our hobby, passion and industry. At CES, our colleagues across the Pond, at *The Absolute Sound* (aka *TAS*), published the first of three planned volumes in *The Absolute Sound's Illustrated History of High-End Audio*. Dubbed simply *Volume 1: Loudspeakers*, it is a superbly produced, copiously illustrated 314-page tome with the footprint of an LP. It is a

smorgasbord of audio, edited by Robert Harley and written by a team of 14 contributors from *TAS*'s ranks.

When one considers just the number of now-departed brands it covers, eg, Beveridge,

Apogee, Bozak and others, that deserved to have their own histories written, this book must be deemed a public service. As this book demonstrates, high-end audio has been around long enough for there to be brands with no principal players left to interview, no photo albums to pillage.

My path was easy: I wrote about extant manufacturers with archives to plunder. This book goes a long way toward creating a permanent record of companies that deserve never to be forgotten.

As much as I would like to think I know a bit about hi-fi's history, I found the book a major educational experience. It reminded me of much that I had forgotten, clarified areas about brands of which I'd heard conflicting stories (eg, IMF) and provided much new information. Most delightfully, it features countless photos never seen before. It will prove to be an invaluable resource for every audio scribe asked to write about vintage equipment or to profile a brand.

There is nothing out there like it, which is the first-ever multi-brand history of the high-end. But I am not one who whitewashes, so I am compelled to point out caveats about this fundamentally superb title that I hope do not seem self-serving nor to be sour grapes, as I wish them to be constructive pointers for the remaining two volumes – which I await eagerly.

AN ESSENTIAL BOOK

By necessity and design, the book is both US- and *TAS*-centric, which is as it should be. In addition to the purpose this book serves, it is also a vehicle to promote the magazine the produced it – fair is fair.

(Note: The same criticism was applied to *Sound Bites*, as being UK- and *HFN*-centric, but it was expressly stated to be a history of *Hi-Fi News* as much as it was of the high-end, so what else could it be? And if anyone had counted the pages, it was nearly a 50/50-UK/US split. But that's by-the-bye.)

Moreover, I am fully away of the truism that if one were to ask ten experts to list 25 superior brands in their field of expertise – when the fields aren't as clear-cut as, say supercars, of which there are only a dozen or so, or top-ranked Bordeaux, of which there are but five – you will get ten lists with little overlap beyond the obvious. I have no idea how the contents were chosen, but the book suffers serious omissions, while there are hagiographic sections about brands with disproportionate amounts of coverage relative to their achievements.

No, I won't tell you which makes are missing or overegged, because that would be churlish – more than I may already seem to some, because I believe this to be an important book, and an *essential* book. But it could have been a *better* book. ☺

'There are now hi-fi brands with no principal players left to interview'

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