



One for all
Flexible 2TB CD-ripper
& network music system

Mini test

Four Bluetooth desktop
speakers battle it out



Hi-Fi Choice

PASSION FOR SOUND

Issue No. 399

July 2015

Pocket players

Six hi-res portables
for music on the go

Wired for sound

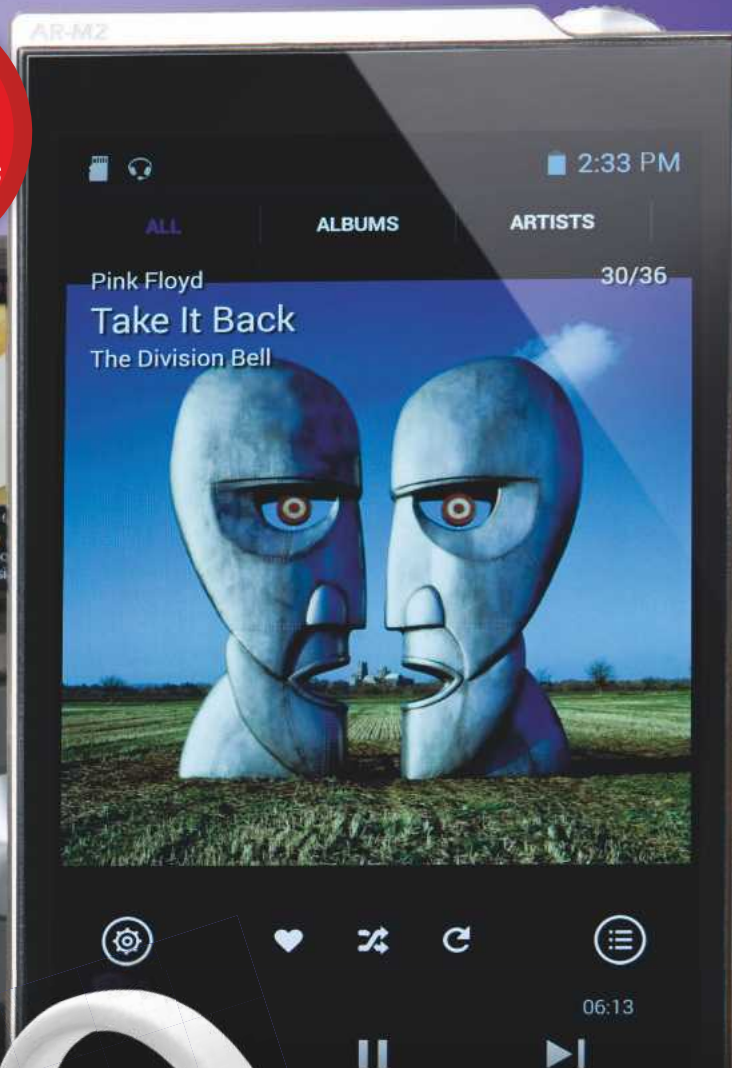
How digital cables can make
your hi-fi sound even better

WIN!
24 pairs of
headphones
from AKG

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PRODUCTS ON TEST:

A&K, Dali, Krell,
MartinLogan,
Sony & Tangent



Cambridge CXN
Versatile network music
player from all-new series



**Pleasure
principle**
Oppo's superb
PM-3 headphones



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US\$13.99

NOVAFIDELITY X40



"OUTSTANDING... amongst the best"

Hi-Fi World - April 2015



DXD
Digital eXtream Definition

HI-RES MUSIC SERVER | PLAYER | STREAMER
CD RIPPER | DAC (ESS SABRE 32bit/384kHz DAC)
INTERNET & FM RADIO | QOBUZ and more...

DSD
Direct Stream Digital

Store & play all of your hi-res music on one component with up to 4TB storage. Connect the X40 to your existing system with a range of Analogue and Digital outputs (including Balanced XLR). Record from Vinyl (in 24bit/192kHz) and radio. Listen to streaming services like Qobuz, take control with your smartphone/tablet and much more...

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PASSION FOR SOUND



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BADGES EXPLAINED

OUR AWARDS



EDITOR'S CHOICE:
Awarded to those products that are judged to deliver outstanding performance



RECOMMENDED:
Products that we feel meet a high standard of performance



GROUP TEST WINNER:
Comparative tests can only have one winner, and this badge says it all!

Welcome

www.hifichoice.co.uk Issue No. **399** July 2015



Mid-May is always a highlight in the hi-fi show calendar with the High End Show held in Munich. This year's international event saw attendance figures rise by 16 percent, with visitors travelling to the show from 71 countries around the globe eager to witness the latest developments in the

world of audio. Previous years have seen the show focus on the more exotic areas of the market – this is the High End Show after all – with eye-watering prices to match, but Munich 2015 seemed to spread its wings and include real-world price tags for the first time, attracting a slightly younger audience as a result – check out the highlights of the show on page 14 and get more insight in *Opinion* on page 79.

Our cover story is a fine example of the broadening hi-fi horizon. Just a few years ago the majority of hi-res portable audio players cost upwards of £1,000, but the market has recently been buoyed by the introduction of a number of surprisingly affordable models. Our *Group Test* starting on page 26 looks at six, offering an usually broad range of prices, and compares their performance and usability. Portable music has come a long way in recent years and the must-have iPod is finally beginning to look outdated as fans move towards transportable high-quality audio. It's not all about the player or file formats though, and you'll need to factor in decent headphones like the PM-3 from Oppo on page 56 to fully appreciate those sonic gains.

Lee Dunkley Editor

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Blue Aura X30 Bluetooth stereo speaker (Mini Test)

"There is a wealth of good-quality solutions to cater for all your digital connection requirements"

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Never miss an issue – turn to p62 for our latest subs offer



Boost to hi-fi

Yamaha continues to grow its stereo separates range with the introduction of a new integrated amplifier and relaunched CD player

PRICE: £1,000-£1,400 **AVAILABLE:** SUMMER **CONTACT:** 0844 811116 **WEB:** UK.YAMAHA.COM

SINCE 2013 YAMAHA has made clear its commitment to extend its hi-fi range of models with an increasing number of dedicated two-channel separate component introductions. This has not only helped broaden its range but has also created further appeal for audiophiles, thanks to a wide selection of models targeting customers looking for components at differing price points. With an enviable musical heritage and a hi-fi division

spanning 60 years, the Japanese audio brand maintains that stereo hi-fi components continue to be at the core of its thinking, and the introduction of a new integrated amplifier along with a revamped CD player looks set to reinforce this pledge to continue the brand's two-channel focus.

The A-S1100 stereo integrated amplifier is priced at £1,400 and bridges the gap between its A-S701 and the A-S2100 integrated amplifiers

launched in the summer last year. Like the A-S2100 (£1,699), the A-S1100 amp borrows some of its technical know-how and features from the flagship A-S3000 (£3,999) integrated amplifier by utilising similar ideas like Yamaha's floating and balanced power amplifier design along with Mosfet technology, and claims that it delivers a valve-like sound characteristic that makes it ideal for longer listening sessions.



Power output is quoted at 2x 90W into 8ohm and 2x 150W into 4ohm and the new amp is equipped to handle analogue sources via four gold-plated RCA stereo inputs. A moving magnet and moving coil phono stage is fitted – showing the

The A-S1100 amp borrows some of its know-how from the flagship A-S3000

brand's commitment to vinyl enthusiasts – with gold-plated RCA inputs and an earthing point. Electronic volume control module and tone circuitry are also on board.

The softly lit meters can be selected according to your preference to display VU or peak input audio signals. The window of the meters is a precision-fit, with no gaps.

Internally, the A-S1100 features a symmetrical layout with the power supply located in the centre and the power amp blocks on either side, helping to achieve greater separation between the left and the right channels and an even weight balance distribution across the mechanically rigid chassis.

The A-S1100 integrated is available in black or silver finish with piano black, natural birch or dark brown side cheeks.

Accompanying the A-S1100 is the CD-S1000 MkII CD player, costing £1,000. Yamaha says that it's largely based around the older model, but with a new colour option and some minor changes under the hood that include revamped D/A converters and comprehensive sound tuning. We're told it will feature a USB DAC handling 24-bit/192kHz asynchronous formats. Both models will be available this summer.

COMMENT

TURN OF FORTUNE FOR TURNTABLES



They say that in life things are cyclical and that something that was once fashionable and has since fallen from grace will return to be flavour of the month again. And for whatever reason, right now that particular fad appears to be the humble record player and the black plastic discs that spin on its platter. Of course, we've known for a long time that vinyl is hard to beat when it comes to the warm sound quality, and removing a disc from its sleeve and sticking it onto a turntable is always going to be better than pressing play on a CD or MP3 player, but it seems that the general public that's not usually so bothered about things like resolution and sound quality appears to be jumping on the bandwagon too.

In early May *The Daily Mail* reported that vinyl album sales enjoyed a 20-year high of 1.29-million in 2014 – following seven years of unbroken growth – and that the trend has continued into 2015. According to the latest figures, LP sales are 69 percent better than they were at this time last year, while 7in singles are up 23 percent. Research by ICM seems to suggest that it's 18-24 year olds that are driving the upwards trend, with one in five of those that were asked having bought at least one record in the past month.

And the best news of all is that it's not just hipsters and ebay hawkers that are buying the black stuff, it's actual music fans. As if to highlight the point, John Lewis has reported a resurgence in sales of turntables with a 240 percent rise over 2014 after increasing its range of players from just one to eight. Blair Christie, the buyer for audio and gaming at John Lewis, said: "The UK's renewed love affair with vinyl shows no signs of slowing down, and we expect turntable sales to continue their upward trajectory throughout 2015".

While it's unlikely that they're going out and investing in the best Pro-Ject or Rega decks that money can buy, the fact that there's an interest in the black stuff at all is reason for cheer, providing a genuine feeling that despite the popularity of streaming and portable devices, there's life in the old dog yet.

T+A's new 2000 Series

A brace of integrated amplifiers, a DAC and a turntable are all on their way from Germany

PRICE: £3,432-£5,577 **AVAILABLE:** NOW
CONTACT: 01353 721089 **WEB:**

T+A HAS ANNOUNCED details of its new 2000 R Series, incorporating two integrated amplifiers, a DAC/network client and a turntable.

The PA 2000 R (£4,204) boasts 180W per channel and features linear output stages; gas-tight gold-contact relays and separate tone controls. Meanwhile, the £5,577 PA 2500 R (pictured) has larger heat-sinks and a power output of 2x 260W. At the rear, connections for both units include balanced XLR inputs, RCA inputs, RCA preamp outputs and non-magnetic brass loudspeaker terminals.

The MP 2000 R (£4,204) DAC converts PCM signals up to a claimed 384kHz and DSD256. It also has a digital tuner and a Bluetooth streaming module.

Lastly, the G2000 R turntable (£3,432) is fitted with a modified pressure-cast aluminium Rega tonearm and Ortofon 2M Bronze MM cartridge. For an additional £1,300 a high-end version is available featuring a Clearaudio Carbon-2 tonearm and MC-2 MC cartridge.



IN BRIEF



KEF'S NEW HEADPHONES

● KEF has unveiled details of its new M400 on-ear headphones (£200), M100 in-ears (£120) along with a relaunch of its M500 series (£250).

The M400 includes a supra aural ear shell, 40mm neodymium drivers and a metal frame. Utilising what KEF calls an industry-first non-toxic production process, the M100 has 10mm neodymium drivers and has a choice of three ultra-thin silicon ear-tips. Finally, the M500 comprises neodymium drivers, an aluminium frame and foam earpads.

KEF.COM

Denon's M series micro

PRICE: £349 **AVAILABLE:** NOW
CONTACT: 02890 279830 **WEB:** DENON.CO.UK

Meet Denon's M series micro hi-fi, which has been designed for the audio enthusiast who prefers a smaller system that doesn't compromise on sound quality.

The new D-M40 system comprises the RCD-M40DAB CD receiver with SC-M40 two-way speakers. It's capable of playing MP3, AAC and WMA files via a USB port along with lossless

FLAC and WAV formats. It has a 2x 30W power output and also provides a digitally transmitted play function designed to upgrade the sound quality from 'iDevices', along with an upgraded headphone amp with dedicated gain control.

Thanks to its "Simple & Straight" circuit design, adverse influences on the sound signals are, claims

Denon, minimised, ensuring that the audio reproduction is "faithful to the original performance". The accompanying SC-M40 speakers include a 25mm soft dome tweeter and 120mm woofer.

The RCD-M40DAB is available in a choice of black or premium silver finishes while the SC-M40 loudspeakers come in either black or cherry wood.



SCANSONIC HD

Design | - the Philosophy

Having worked with Raidho speakers for more than 12 years, I found myself faced with a completely new challenge when I was asked to design a new range of high-performance speakers for the Scansonic brand.



Michael Børresen



A small speaker that does what it does really well

A&K's AK380

New portable music player from Astell&Kern

PRICE: £3,000 **AVAILABLE:** NOW
WEB: ASTELLNKERN.COM

FOLLOWING ON FROM the launch of the AK240 (*HFC 387*), a portable digital audio player equipped with a balanced output and native DSD playback through a dual-DAC setup, Astell&Kern has, it claims, gone a step further with its new AK380.

Improved functionality includes an upgrade from 24-bit/192kHz to 32-bit/384kHz DACs, advanced jitter reduction and an optional headphone amp module that attaches to the player.

Additional features incorporate a higher capacity battery, an extendible docking connector, a wide range of music file format support and a 4in touch screen. Wi-fi connectivity enables network streaming and firmware updates (both PC and Mac), while Bluetooth support allows for wireless streaming to headphones and loudspeakers. Crafted from aircraft-grade duralumin, the AK380 also offers 256GB of internal memory, while the addition of an optional microSD card allows expansion to 384GB.

Connections located on the side of the portable player include a USB Micro-B input for both charging and data transfer and a 3.5mm headphone output.



IN BRIEF

INTRODUCING THE WIDAPTOR



● Crystal Acoustics' new Widaptor receives music over wi-fi and then transmits it to any active speaker or hi-fi system, turning your existing setup into a cohesive wireless music system. The company says you can use any number of Widaptors in parallel, linking audio systems in the various rooms of your home into a single multi-room hub.

Simply connect your Widaptor to any audio system or active speaker and you can transmit your music to it from your smartphone, tablet or laptop/computer (PC/Mac). Widaptor also supports USB playback from a memory stick or HD storage device.

Compatible with all the WiSound wireless speakers from the Crystal Acoustics Reference Wireless Series, the Widaptor costs £50.

CRYSTALAUDIOVIDEO.COM

Icon Audio unveils CDX2

PRICE: £995 **AVAILABLE:** NOW
CONTACT: 0116 2440593 **WEB:** ICONAUDIO.COM

Leicester-based valve specialist Icon Audio, has launched its second CD player, the CDX2. Replacing the CDX1, the new X2 has been specifically designed to "deliver comparable sonics but at a lower, mid-range price". Featuring 24-bit/192kHz upsampling technology, the CDX2 uses an all-triode valve Class A output stage incorporating T J Full Music or original Mullard valves and

weighs in at a hefty 9kg. The digital and analogue circuitry is hand wired using full-sized high-quality components.

Additional features include a top-loading Sanyo CD mechanism, a heavier alloy clamp – which also acts as a flywheel to increase rotational stability during playback – and a coaxial digital output.

In keeping with Icon's 'built to last' philosophy, everything in

the CDX2 is serviceable and replaceable and, as each CD player is finished in the UK, Icon is offering a range of David Shaw Signature upgrades including Jensen copper foil oil-in-paper capacitors and premium new old stock valves.

According to Icon's founder and chief designer, the aforementioned David Shaw, the aim was "to craft a CD player with real warmth and dexterity". ►



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Confucius, from The Book of Rites



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The Melco N1A and N1Z are revolutionary digital music storage devices designed from the ground up as audiophile components. Pure, unadulterated; clearly better. *All Network Accessed Storage is not the same.*

"...sound quality that is a step up from any other network attached music library I've heard... The Melco N1A is a truly impressive piece of equipment ... possessed of a gorgeous sound - it comes unreservedly recommended."

Hifi World March 2015



"Indeed, in some respects the sound was the best I have yet heard for digital audio replay... It fulfils the objective of providing a simple-to-use 'computer free' hard drive music source with very low noise and jitter."

Hifi Critic March 2015



"If you are serious about streaming, this is a very fine one-stop solution to get the very best out of your system."

Hifi Choice May 2015



Introducing Exogal.

The new Comet DAC/Preamp

Extraordinary high-resolution digital audio as you've never experienced it before brought to you by audiophile design legends. Its revolutionary technology enables you to hear music exactly how the artist intended it – with no noise, just pure sound – wherever you choose to listen.

IN BRIEF



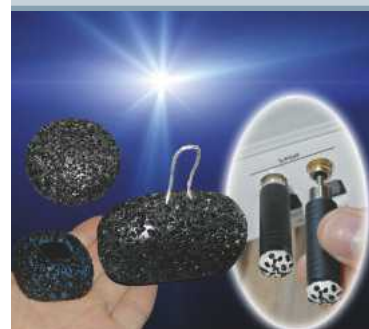
NEW VISO CANS

● NAD Electronics has unveiled the latest edition to its VISO headphone range – the on-ear VISO HP30 (£169). Featuring proprietary RoomFeel technology, this closed-back design includes an internally damped acoustic chamber and a 40mm driver with neodymium magnets.

Described as ideal for those who demand high-quality sound while on the move, the HP30's ear cups are attached to the aluminium headband, while its soft foam ear pads conform to the ear to isolate outside sound and provide long-term comfort.

Available in high-gloss black, red, or white, the HP30 comes with a neoprene travel case, two detachable cords and aeroplane adaptors.

NADELECTRONICS.COM



TWEAKS FOR ALL

● In its continuing search to improve sound quality, Coconut Audio has introduced four new handcrafted high-end tweaks. The series includes the Plug tweak (£25), which can be plugged into any available RCA port to prevent noise from leaking into a system; the VibraDome (£50), which is purported to clean any unwanted vibrations; the Proximity Stone (£95), which is claimed to clean unwanted radiation, and the Hanger (£190). Suspended from the RCA ports or screws, it's designed to clean electronic noise from circuit boards.

COCONUT-AUDIO.COM

Gramofon add-on

PRICE: £43 **AVAILABLE:** NOW **WEB:** GRAMOFON.COM

THIS LITTLE BLACK Gramofon box is designed to make it even easier to stream music to any audio system around the home. Made by Fon, it started out as Kickstarter project in 2014 and launched initially as a companion to the Spotify Premium music streaming service. A recent software update now incorporates Qualcomm's AllPlay platform, which opens up a raft of additional services and facilities.

This means that in addition to Spotify Premium, Gramofon now supports all the other music-streaming services on the AllPlay platform, including Napster, Rhapsody, TuneIn, Aupeo, doubleTwist and Soma FM. Streaming services like Tidal will be added and, says Fon, will be fully compatible with Gramofon.

Having plugged Gramofon into your system via the supplied stereo RCA cable, it connects to your wi-fi network. The AllPlay software enables you to play music stored locally on your smartphone, tablet or computer and adds multi-room functionality, enabling you to choose to play music in just one room, or different material in several rooms. Acting like a wi-fi hotspot, it'll also be possible for visitors to join your network and play tunes from their own devices too.

Most important of all, says the company, AllPlay is essentially futureproof and Gramofon plans to automatically update its firmware on a regular basis to ensure it's compatible with the latest technological developments.

VPI unveils Prime turntable

PRICE: £3,750 **AVAILABLE:** NOW **CONTACT:** 0131 5553922 **WEB:** RENAISSANCEAUDIO.CO.UK

American turntable specialist VPI's latest Prime record player is – according to the company – an effort to return to its roots while taking full advantage of the latest improvements in technology and design at the same time. And so the Prime boasts a curvier and more attractive appearance and comes equipped with a 10in tonearm that's been 3D printed.

Described as simple to operate – just press the start button, move the tonearm into position and then lower the needle – this is also the first solo design by the son of the company's founders, Mat Weisfeld.

Additional features include a 300rpm, 24 pole AC synchronous

quiet operation motor, isolation feet, stainless steel/Delrin (resin) record clamp, black textured vinyl chassis and remarkably low wow and flutter specification.

The end result, claims VPI, is a level of detailed vinyl reproduction that you would normally expect from a much more expensively priced turntable.





Munich High End Show 2015

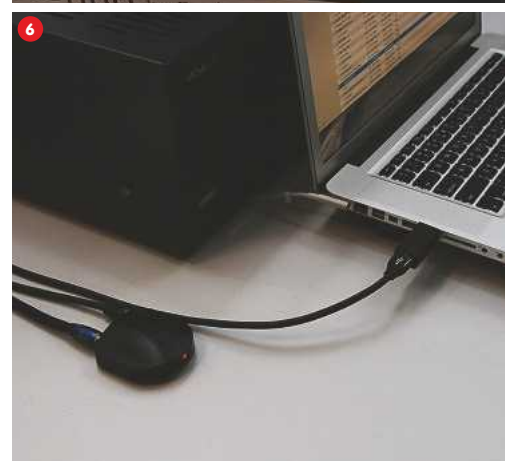
Hi-Fi Choice joins the crowds in Germany to get a glimpse of some hot hi-fi treats coming soon

WHEN IT COMES to hi-fi shows we're spoilt for choice. Las Vegas' Consumer Electronics Show kick starts the year in fine style, while The Hi-Fi Show – held by our sister title *Hi-Fi News* – bookends the year in November. Sandwiched neatly between the two in mid-May sits Munich's High End Show, which is without doubt the biggest gathering of its kind in Europe.

As the name suggests, the event focuses on the top end of the market, concentrating on some products that are so costly that they'll make your eyes water just thinking about them, and this year's exhibition was no exception with everything from cables to turntables, portable media players to speakers on display.

The good news is that despite the name, it's not all super expensive kit that's beyond the reach of mere mortals, and if you take the time to wander around the 506 exhibitors showing off some 1,000 different brands, you will find plenty of products that are more real-world when it comes to pricing.

This year marks the 12th time that the show has been held in the impressive MOC exhibition centre in Munich, and the 34th time it has run in succession. Although busy, it's never as crowded as CES in Las Vegas and it's more inclusive with plenty of families visiting. Turning a blind eye to the German beer and the fine selection of sausages, we turned our attention to some of the amazing kit...



1 Naim's new DR amplifiers available later this year will feature the Discrete Regulator and NA009 transistor developed for its flagship Statement. Existing owners can get an upgrade. naimaudio.com

2 Chord unveils its replacement for the QBD76 DAC. The DAVE (Digital to Analogue Veritas in Extremis) with DSD and DXD file support up to 768kHz. Here this autumn at £7,995. chordelectronics.co.uk



3 Copland's £1,800 DA 215 valve-based headphone amp, preamp and DAC is a 32-bit DSD-capable design that can be operated in fixed and variable output settings. copland.dk

4 Taking tech from its flagship Titan, IsoTek's Genesis One is designed to provide a clean mains supply to a product and power additional low-voltage components from the same supply. isoteksystems.com

5 The Funk Firm's Super Deck Grande at £2,100 is an evolution of its Little Super Deck. It allows for the mounting of two arms and its 'main' arm mount is reversible for either a nine or 12in tonearm. thefunkfirm.co.uk

6 Audioquest shows the new Jitterbug interference suppressor and Beetle DAC. The three-input DAC builds on the Dragonfly and looks set to go on sale here this summer for less than £150. audioquest.com

7 Leema showcases its Libra digital DAC with 24-bit/384kHz, DSD and DXD support. The £6,000 DAC/preamp has plenty of ins and a volume control that works in the analogue domain. leema-acoustics.com

8 Avid's first foray into pre and power amps costs over £80,000, but the company employs a trickle-down approach so we can look forward to more affordable models soon. avidhifi.co.uk

9 Living Voice's incredible Vox Olympian horn has to be seen to be believed and appears to be running on 750kg of lead acid batteries. livingvoice.co.uk

10 Pro-Ject's upgraded RPM10 – the Ultra – swaps the acrylic platter of the standard model for a gun-metal effort along with additional carbon fibre. Let's hope it makes series production. project-audio.com

11 Norwegian brand Hegel shows its H300 integrated amplifier that claims 2x 250W and adds a DAC board with an upgraded version of AirPlay that promises far higher performance. hegel.com

12 Focal has developed bespoke drivers for its new Sopra range. The Sopra 1 standmount and 2 floorstander should go on sale in the UK from June and look set to cost £8,000 and £12,000 respectively. focal.com

13 Neat's new Momentum SX7i is a 2.5-way floorstander with an isobaric bass arrangement that should give it some serious bass extension. It's set to cost £5,700 when it arrives in September. neat.co.uk

14 Analogue Works follows up its superb Turntable One (HFC 388) with three new models priced at £800, £1,500 and £3,000. analogueworks.co.uk

Webwatch

Andrew Simpson checks out the best hi-fi websites, social media and online content



Meet Meridian

Since 1977, Meridian has been at the forefront of creating cutting edge hi-fi, and this new video featuring interviews with cofounder Allen Boothroyd tells the story behind the company's unique approach. youtu.be/QleLY2m-clU



Newborn buds

Barely a week goes by without a new hi-fi concept hitting Kickstarter's pages, but what makes Trinity Audio's ear buds different from the rest is their CNC machined shells and custom screw-in filters, explaining why these buds beat their £40k target by £67k. kck.st/1cQGosC



Vinyl icon

From cameo roles in blockbuster movies like *A Clockwork Orange* and *X-Men* to receiving design awards from royalty, few hi-fi companies can claim such a rich history as Transcriptors Limited and its iconic Hydraulic Reference deck. Read more about this special spinner at transcriptors.eu



1563 words for bi-wiring

No it's not the latest Kate Bush album, but an indepth look at the pros and cons of bi-wiring on KEF USA's blog. From the technical to the presupposed, this is well worth a read if you're about to splash some speaker cable cash. bit.ly/1LqxfD6



Rack chat

Shot at this year's Bristol Show, this short interview with Quadraspire's Alester Kells (see page 64) reveals exactly what goes into crafting those vital supports that provide a platform for our cherished components, with brass couplings getting top marks. youtu.be/ykn_FiJN8zo



Lounge act

London-based hi-fi dealer Audio Lounge knows more than a thing or two about what makes a great system, so it's good to see its blog packed with plenty of opinion and expert insight, from the cassette tape's resurgence to the valve versus solid state debate. bit.ly/1HkwtPb

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CHOICE TWEETS

Q ACOUSTICS (@QACOUSTICS)
KEF Vive la Revolution! Vive @QAcoustics New 3000 Series speakers ready to 'change the world' at last week's Munich show



KEF AUDIO UK (@KEFAUDIO)
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OBSESSED WITH HIGH RESOLUTION

► **DETAILS**

PRODUCT

Cambridge CXN

ORIGIN

UK/China

TYPE

Network music player/DAC/digital preamp

WEIGHT

3.5kg

DIMENSIONS

(WxHxD)

430 x 85 x 305mm

FEATURES

- Network UPnP playback/Internet radio
- Apple AirPlay/Spotify Connect
- aptX Bluetooth with optional dongle
- DSD playback over USB from computer
- Fixed and variable outputs on XLR/phonos

DISTRIBUTOR

Audio Partnership

TELEPHONE

0207 9402200

WEBSITE

cambridgeaudio.com



All change

New logo, new look and all-new CX series, **James Parker** discovers if the same old Cambridge magic still remains

New range, new name, new markets: that's just about the story of the Cambridge CXN network audio player.

Not only does the new model carry the company's new, abbreviated corporate identity, shorn of the word 'Audio', it also leads off an all-new CX range of hi-fi and home cinema components with freshened-up styling (see *Meet The Family* on p20), and takes its streaming products into the mid-market hi-fi arena.

That places it above the likes of the existing Cambridge Audio Stream Magic models, but this isn't quite the flagship streaming music model. That accolade goes to the new addition to the upmarket Azur 851 range, the

£1,200 851N, which was launched alongside the CX range.

Both models are built around the same inhouse-developed streaming module, code named Zander, and can be driven by a redesigned Cambridge Connect app on smartphones and tablets. However, while the 851N has adopted the same digital-to-analogue technology as the other digital products in the 851 range, the digital heart of the CXN is the familiar Wolfson-sourced solution seen in previous streaming products from this company – but with some new twists.

The CXN shares the new look of the rest of the CX range, being available in black or silver, with a simple, clear fascia layout (including a striking

dished main rotary control and crisp graphics), and a curved under panel to break up the lines and move it beyond a simple, slimline slab.

The 'engineered in the UK' theme is played up in the packaging and the fascia, with Union flags much in evidence. The CXN even boots up with the flag and 'Great British Sound since 1968' on the display, and I half expect to hear *Land Of Hope And Glory* through the speakers! Cambridge makes great play not only of its inhouse engineering expertise, with a strong design team based at its London HQ working on everything from electronics to software coding, but of how it's managed to simplify the products in the quest for improved ►



CONNECTIONS



- 1 USB Type-A port for wi-fi antenna
- 2 Balanced XLR outputs
- 3 Line-level RCA outputs
- 4 S/PDIF & Toslink digital outputs
- 5 Ethernet port
- 6 USB Type-A port for storage



MEET THE FAMILY

The CX range has been designed, Cambridge says: "To fit modern life beautifully and simply, while at the same time delivering class-leading audio performance". That beveled base, inside which is a low-resonance chassis, is all about giving the components "a unique 'floating' aesthetic", while under the lid the intention was "to capitalise on the existing strengths of the brand while seeking to take rhythm, timing and musicality... and elevate them to best in class".

In addition to the CXN there's a £300 CD transport, the CXC, using a proprietary Cambridge servo system in the

transport/disc-reading section, and designed for use either with the digital-to-analogue conversion in the CXN, or with that built into the CXA60 and CXA80 amplifiers.

The two amps sell for £500 and £750, and offer outputs of 60W and 80W respectively. Both feature the same simplified signal paths found throughout the range, though they have built-in 24-bit/192kHz DACs and can work with Bluetooth devices with the optional BT100 receiver. In addition to its greater power, the CXA80 also offers a balanced input to match the CXN's outputs.

sound quality, shortening signal paths and ditching superfluous components.

Neither is this just a streamer/network player/whatever you choose to call it. The CXN is also designed as a DAC and a digital preamp, having a range of inputs including an asynchronous USB, plus a choice of fixed or variable analogue outputs on both RCA phonos and XLRs. It also has AirPlay and Spotify Connect capability, with a choice of wired or wireless network connection, and can additionally be used with the optional Cambridge Audio BT100 aptX Bluetooth receiver (£70) for wireless music streaming from smartphones, tablets and computers.

Well connected

It can handle content at up to 24-bit/192kHz over network connections or from USB storage devices, for which a Type-A USB socket is provided on the rear panel (alongside another used for the wi-fi antenna that comes supplied), with a further socket on the fascia. It's worth noting, however, that these sockets aren't designed for the connection of Apple iOS devices, so for those you'd best stick to AirPlay.

The CXN also has both optical and coaxial digital in and outputs, while

its Type-B USB input will also handle DSD content, albeit using the DoP protocol rather than in native form, and has a ground lift switch should you encounter hum when connected.

All inputs are upsampled to 24-bit/384kHz using Cambridge's second-generation inhouse Adaptive Time Filter processing, running on a 32-bit Analog Devices SHARC processor. This also provides the digital volume control when the CXN is used in preamp mode,

If the rest of the CX range approaches this high standard, it could be special

allowing resampling at every volume level, rather than the more common 'bit-reduction', which can impact on sound quality.

It's also worth noting that while the Zander streaming module used for network playback has all sorts of technical advantages, according to Cambridge – not least of which is the fact it's "some 10 times faster than some off-the-shelf modules" – it's impressive in other ways too.



Cambridge's own price rival is the old Stream Magic 6 V2 (HFC 393), which at first seems to have a similar feature set, but closer scrutiny shows that the new model – which is the same price – has been improved in just about every area. We liked the V2's sound, but weren't so sold on the looks – no such problem with the CXN. Outside the home stable, lower-priced rivals include Pioneer's N-50A (HFC 359) and Marantz's NA6005. Both go a long way towards matching the CXN's flexibility, so it's clear that Cambridge is aiming its new network player at selling on its performance, not just by undercutting the competition.

As well as it being striking that a UK-based company has developed its own streaming solution, which of course is a classic case of 'doing things the hard way', it also brings with it a clear display, complete with album/radio station artwork, and that slick smartphone/tablet app interface.

Cambridge Connect is unlike many familiar network player apps in that it browses UPnP servers directly, rather than doing so via the player, and then hands playback duties back to the hardware when playing begins.

This method of cutting out the middleman and harnessing the processing power now available in Android and iOS handheld devices makes it considerably faster than if it were purely working as a network-connected remote for the player with which it's working. And the CXN/Cambridge Connect combination is certainly one of the speediest and smoothest interfaces out there, a delight to use, and one from which other manufacturers could learn a lot.

In fact, I'd go so far as to suggest that, while the conventional remote is adequate enough (and also provides whole-system control, via Cambridge's C-BUS), and the combination of a decent display and that twist-and-push main control makes using the CXN 'hands on' pretty viable, I'd still invest the extra money for a budget Android tablet to run the app to make the most of this unit.

It needn't cost a fortune – around £100 will get you a 7in Asus MeMO Pad – and even more affordable tablets are available and will do the job – but it makes a huge difference to the user-experience.

Sound quality

This is just the starter to what is a highly enjoyable sound from the CXN, which lives up to its promise of focusing on rhythm, timing and bass quality. Though it's not exactly without competition at this price-level, the CXN shines through not only due to its ease of use and wide-ranging ability, but with a sound that sets it apart from those 'streamers' with a tendency to play things safe in the quest for a less 'digital' presentation.

It may upsample the digital signal, with typically finessed smoothness and refinement, but that doesn't stop it kicking hard when you creep up on it with the latest Prodigy album, *The Day Is My Enemy*, in 24-bit/44.1kHz and unleash the title track. Boy, can this little player thunder and thump! The authentic Prodigy aural onslaught is unrestrained, bass lines shake the room and the electronica going on

above it all is suitably sharp edged. Add in impressive dynamics and you have a real power track, being handled with just the right mix of definition and sheer attack.

Impressively, the CXN repeats the trick when things are dialled down a few notches with Blur's reggae-tinged *Ghost Ship*, from *The Magic Whip*, (reviewed last month) dishing up a rumbling, but tightly defined, bass line while bringing out plenty of detail in the vocal and instrumentation. Play this track through a decent amplifier combined with some speakers able to handle that powerful low end and you're not going to be at all disappointed by the results.

Getting a bit into this whole bass thing by now, I give some tracks from an Ian Dury compilation a spin, just to enjoy that whip-crack Blockheads

It's worth investing in a budget Android tablet to make the most of the CXN

rhythm section, and the Cambridge doesn't let me down. Not in terms of motive power and certainly not when it comes to revealing all the clever things that the rest of this tight-knit band is doing in its usual jazzy, funky manner.

Keeping things well away from the audiophile approved, I play in some of the *Concert For New York* from more than a decade back, in a DSD64 rip from SACD. Again the CXN does its stuff with fine live presence on a rough and ready version of *Miss You* by Mick and Keef, and then a slamming nine-minute *Won't Get Fooled Again* from The Who – not clean, not nice, but very definitely fun.

A swift handbrake turn into the solo piano version of Mussorgsky's *Pictures At An Exhibition*, another DSD64 from the Mercury Living Presence recording, and the Cambridge delights with the focus on the piano, placed convincingly in an open, natural soundstage, a little deep behind the plane of the speakers to allow the ambience to wrap round it, but at the same time with all the percussive power of the instrument on tap when required. Not at all bad for a recording just about to hit its 54th birthday, and a fine example of what good SACD/DSD can do when carefully mastered from old analogue tapes, and then played on fine equipment.

But then whatever you throw at it, the CXN seems to shine, thanks to its winning combination of delicacy



and resolution, allied to all the weight and slam that you would expect from a streamer/DAC at this level – and then some.

Conclusion

By any standards, this is an impressive network audio component, going far beyond the 'buy a streaming platform off the shelf, add on a DAC and stick it in a nice box' approach of some similar products we've seen in the past. Putting in the design time has paid dividends for Cambridge, and if the rest of the CX range approaches this high standard, it could just be something rather special ●

HI-FIChoice

OUR VERDICT

SOUND QUALITY



LIKE: Powerful but poised sound; high standard of build; simple to use

VALUE FOR MONEY



DISLIKE: Bluetooth is extra; nothing else at the price

BUILD QUALITY



FEATURES



WE SAY: A versatile network player with smart looks and great sound at the right price

OVERALL



Q&A

Dominic Baker

Technical Director, Audio Partnership



JP: What was the design thinking behind the CX range, and how does it fit into the Cambridge lineup?

DB: We wanted to move our products on a level, set much higher standards for design, functionality and build quality, and take our products in a new performance direction. A great deal of effort went into minimising the number of components in the signal path, to add more musicality and better rhythm and timing to our existing strengths of resolution, dynamics, speed and power, and all with our trademark bulletproof build and reliability.

How does the CXN differ from the Azur 851N network player?

The CXN and 851N are different products for different markets. It's more accurate to refer to the CXN as an evolution of the multi-award winning Stream Magic 6 V2 (HFC 393), representing the culmination of five year's continuous experience of developing all elements of a streaming platform inhouse.

The CXN doesn't handle DSD files over network streaming. Was that a conscious decision, and does Cambridge have plans to introduce it at some stage?

Yes it was a conscious decision as part of an ongoing evaluation to establish the level of customer interest in DSD, and how and if they want the codec support to be implemented within the products. At the moment we continue with an open mind.

We're seeing new streaming services popping up almost on a weekly basis at the moment, how easy is it to add support for extra services to products such as this should the need arise?

Our policy is to offer additional streaming services only where we can fully integrate them directly into our platform rather than try to simply 'bolt' something onto our own app. At the moment, with Spotify Connect and AirPlay, we feel we have the two best options currently available, although we do continue to evaluate other options.

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How we test

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Unique group tests

Our *Group Tests* are supported by rigorous and exhaustive listening tests carried out by experts

HI-RES PORTABLE PLAYERS GROUP TEST

THE PROCESS OF reliably auditioning six Digital Audio Players isn't as straightforward as doing a single standalone review. Each player is connected with its supplied power lead, or if it is hub-powered it's put into a suitable USB port, and powered continuously to make sure that its built-in rechargeable batteries are at full capacity before listening takes place. This procedure ensures that all of the models have reasonable use before any listening begins, and they are all kept powered or topped up to maximum charge throughout the comparative listening procedure.

The testing period takes place over several days, with all the players given time to warm up

before each listening session commences. Each player is in turn connected to several pairs of headphones at differing price points and with varying impedance sensitivities to test their performance thoroughly. They are also connected via the 3.5mm audio output to a reference hi-fi setup to discover how well they perform as a source at the front of a dedicated system driving a pair floorstanding speakers.

Numerous tracks are listened to, but the sessions focus on four albums chosen to provide a wide variation of musical styles, recording quality and sample rates. Each track is played several times until a definitive picture of the player's sound quality is obtained.



BLIND LISTENING TESTS

This crucial process is very carefully controlled so that we get reliable and consistent results in a relaxed and friendly atmosphere. Our listeners must not feel that they're being tested, despite being unaware of the brand or price of the products they are auditioning.

The session begins by setting the volume level to an agreed point, one that all three panellists feel comfortable with, yet that is

high enough to make differences easily discernible. Then the choice of music is agreed – it needs to be familiar, but also well recorded and of sufficient variety to give meaningful listening comparisons. The chosen selection of music is played, and the panellists are encouraged to discuss their impressions of the sound of the product. This is then repeated, and periodically the panel listens to earlier products for reference purposes. The

consensus, or otherwise then forms the basis of our sound quality section.

At the end of the session, there's a final debrief when panellists discuss their findings. It's an exhaustive process, but carried out in this way is free from prejudices based on brand, price or appearance, while the different sensitivities of the listeners help to round out the analysis in order to make it more widely applicable.

REFERENCE SYSTEM

INTEGRATED AMPLIFIER
Musical Fidelity M6500i

LOUDSPEAKERS
Dynaudio Excite X38

EQUIPMENT SUPPORTS
Audiophile Base

CABLES
QED XT40 speaker cable

HEADPHONES
Oppo PM-3, Sony MDR-1A,
Final Audio Pandora Hope IV

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HI-RES PORTABLE PLAYERS £169-£1,500

Keep on moving

As downloadable music gets more sophisticated, **Lee Dunkley** auditions six top-flight portables capable of playing all your music files at the highest quality available

FOR THOSE THAT can remember, the modern day portable music player was originally started by Sony. Since the Walkman – originally named the Stowaway, but quickly changed – first launched in 1979, music fans have been fascinated with taking music out on the road. The eighties was a great time for the Walkie, and the first blue and silver portable Compact Cassette players changed our relationship with music forever, bringing music from home hi-fi systems to the streets with every audio manufacturer of the time introducing their own mostly more affordable models to portable music fans of the day.

Street life

While the decade went on to be dominated by the introduction of the Compact Disc, most of us fell in love with the cassette portable for listening to music on the move. It transformed a train or a bus ride to the office or school into an energising experience that could put a smile on faces even on a dismal Monday morning commute. By the end of the nineties things had moved on and Sony's dominance in the physical media portables market was hardly anywhere to be seen.

Apple's first-generation iPod was launched in 2001 and changed the music-on-the-go landscape forever with one of the world's most popular music portables that had a 5GB HDD capable of storing and playing music files downloaded from its iTunes music store. But the success of the iPod was not down to its storage – other brands were already doing this – it was the mechanical click wheel, followed by a touch-sensitive version in 2002 that was the game changer. This was an altogether nicer interface

to use and integrated seamlessly with computer software to import tunes.

But with years of listening to compressed music files owing to limited storage capacities and formats of the time, today's fans increasingly desire to hear tracks at full resolution, without compromise. With this in mind, the six models here all cater for hi-res audio. It's a broad market with entry-level players jogging alongside high-end ones, offering different features and ease of use. Read on to see which models come out on top. ▶





ON TEST



**Acoustic Research
AR-M2 £900 p29**
The revamped speaker brand's first audio player offers playback of all hi-res formats including DSD, and has bags of style to boot.



**Astell&Kern
AK120 £1,100 p31**
One of the first portable hi-res players, this model is still popular among aficionados for its neat operating system, but how does it compare to the latest competition?



**FiiO
X5 £289 p33**
This 24-bit/192kHz affordable player supports a wide range of lossless formats with current storage support for up to 256GB via dual microSD card slots.



**Hidizs
AP100 £230 p35**
Not many people know this brand, so it has a tough job ahead to prevail over more established players. The specs suggest that it's off to a good start though.



**Lotoo
PAW Gold £1,500 p37**
King of bling, this new contender sets the bar high when it comes to build and specs, and even the heavyweight casing is accentuated with 24k gold elements.



**Sony
NWZ-A15 £169 p39**
With roughly the same dimensions as a 4th-gen iPod Nano, this entry-level portable handles 24/192 lossless formats and is from the brand where it all started.

Box



Reference Series

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Acoustic Research

AR-M2 **£900**

Veteran hi-fi brand returns to embrace portable music with this sophisticated hi-res audio player

DETAILS

PRODUCT
Acoustic Research
AR-M2

ORIGIN
China

TYPE
24-bit/192kHz &
DSD-capable Digital
Audio Player

WEIGHT
245g

DIMENSIONS
(WxHxD)
71 x 136 x 15mm

FEATURES
• Quoted battery
life: 9 hours
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storage
• MicroSDXC slot
(128GB max)

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The first of our newcomers, Acoustic Research relaunched itself as an electronics brand earlier this year – see *Brand Reboot* – and the AR-M2 is its first hi-res audio player, with more products slated for release in the next 12 months we're told.

First impressions are very good and in terms of spec and price it looks set to be pitched against Sony's eagerly anticipated NW-ZX2 – which sadly wasn't available in time to take part in this roundup. Its proportions mean it looks more like a smartphone than any other digital audio player (DAP) in the test, and it's easily the most stylish and desirable model here and the large 5in HD-IPS touch-sensitive display is easy to navigate and quick to get to grips with. Screen resolution is 720 x 1,280 pixels and it's clean and clear with responsive onscreen icons that make it easy to find your way around the operating system. If there has to be a downside it's the positioning of the

onscreen info, which often clashes with the album's artwork text when they overlap at the top of the screen.

The M2 can connect to wi-fi, which also provides access to NAS drives thanks to DLNA support. Additionally you can download apps like Spotify, Tidal and Qobuz for streaming music.

Downloading and installing the Android file transfer software to my desktop is straightforward enough and enables me to drag-and-drop hi-res music files to the AR-M2's 64GB internal storage without any real issues. Usefully, the metadata and album artwork remains intact within the transfer. A MicroSD card slot bolsters storage capacity, and is compatible with cards up to 128GB.

Sound quality

As a familiar hi-fi brand but one of the newest names in digital audio portables the AR-M2 sets out to be the challenger to similarly priced rivals, and Acoustic Research has its work cut out when it comes to sonic performance at the price. But the challenge is certainly met head on and the AR-M2 does an expert job with playback via its own hi-res music player app with all material across a broad range of formats and qualities. Its fair to say that DXD shows off its capabilities the best with a 24/352 file of Mozart's *Violin Concerto No.4 in D Major*, as the AR-M2 conveys the performance with plenty of texture in the strings and demonstrates a tremendous sense of the recording's acoustic space and is unsurpassed by the competition on test here.

Switching to something a bit more rocky, and the clarity of the vocals and the way the AR-M2 places instruments across the frequency range expertly in the mix makes it the easy listen of the group. Bass and treble details are in excellent proportion, but just in case there's a bunch of EQ adjustments should you want to fine tune the AR-M2's sound balance to suit your own personal preference. There's also an effective bass boost and a 3D control that attempts to widen the soundstage ●



BRAND REBOOT

After years of apparent hibernation, the announcement of the one-time speaker brand's relaunch came at this year's Bristol Show – held at the end of February – with news of two models triggering the rebirth of the 60-year old hi-fi name. Acoustic Research is perhaps better known for its innovative speaker designs and suspended sub-chassis belt drive turntables, but has rebooted as an electronics brand under the Vox corporation's new owners in the US.

The AR-M2's file format handling is impressive and covers WAV, AIFF, FLAC, ALAC, APE, DSD64 and DSD128, plus DXD files. It boasts a bespoke high-current, high-output Class A amplifier, plus audiophile-grade analogue volume ALPS potentiometer. A high-grade Burr-Brown PCM1794A DAC is also on board and the headphone amplifier can handle cans with impedances from 16 to 300ohm.



Hi-Fi Choice

OUR VERDICT

SOUND QUALITY
★★★★★ **LIKE:** Top-notch sound with all file formats; ease of use

VALUE FOR MONEY
★★★★★ **DISLIKE:** Track info can clash with album artwork

BUILD QUALITY
★★★★★ **WE SAY:** The best-sounding hi-res audio player we've heard at the price

FEATURES
★★★★★

OVERALL





Connectivity without compromise.

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Design
Concept.*

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Want to find out more? Visit rotel.com to find your nearest authorised Rotel retailer.



Astell&Kern

AK120 **£1,100**

This popular player has been around for a couple of years now, but does it still set the standard for hi-res?

DETAILS

PRODUCT
Astell&Kern AK120

ORIGIN
Korea

TYPE
24-bit/192kHz & DSD-capable Digital Audio Player

WEIGHT
143g

DIMENSIONS
(WxHxD)
59 x 89 x 14mm

FEATURES
● Quoted battery life: 14 hours
● 64GB internal storage
● 2x MicroSDXC slot (128GB max)

DISTRIBUTOR
KS Distribution

TELEPHONE
01903 768910

WEBSITE
astellinkern.com

The last few years have been an interesting time for fans of hi-res portable music players and Astell&Kern has attracted a lot of interest from fanciers, and with good reason. Back in 2013 its first AK100 player (*HFC* 370) was quickly followed by the AK120 – finished in black (as shown here) and AK120 Titan finished in silver. Both models improved on the AK100's storage capacity of just 32GB upping it to 64GB (while doubling its price), and if you add two 64GB micro SD cards the tiny player is capable of providing a massive 192GB capacity, affording space for several thousand HD tracks.

This is one of the more sober-looking models in the group and it appears a little outdated compared with more cutting-edge designs. Though the 2.4in IPS touchscreen display isn't nearly as sophisticated as the AR-M2, it places album artwork neatly behind the menus without any clashes and the menus operate just as smoothly. Also on board are dual mono Wolfson WM8740 24-bit/192kHz DACs to improve audio quality, and the AK120 can be

used as an outboard DAC hooked up via its USB or optical digital inputs to a source and output via a suitable jack output lead from the headphone/line out socket to an external amplifier.

The volume control on the side has protective wheel guard extensions and you also get a rather nice Italian leather case to protect the dinky unit. The only other accessories are the Quick Start guide, the micro USB lead and self-adhesive screen protectors. Charging is via USB and claims to give up to 14 hours of continuous playback use when fully topped up.

Sound quality

The AK120 gives a refined and enjoyable presentation with the opening of *Don't You Worry 'Bout A Thing* by Stevie Wonder and is a thrilling listen. The clearly identifiable enhancement of the dual mono DACs gives a good sense of stereo separation and detail and the accompanying piano at the beginning of the track has a remarkable sense of placement that sounds three-dimensional compared with the slightly flat rendition from the lower-priced FiiO X5, for example.

Convincing bass is something that A&K players have in spades thanks to their low frequency range extension, and the AK120 is able to extract the bass line from London Grammar's *Hey Now* (24-bit/44.1kHz) to tremendous effect and it appears as if suspended in mid air in the stereo picture, making it among one of the most enjoyable versions that I have heard. One of the joys of high resolution is the sense of real air and reverb around Hannah Reid's vocals and this makes the track a great listen.

Desperado by Diana Krall downloaded from highresaudio.com is as delicate and intricate as it should be with her rich and silky vocals coming through effortlessly on the AK120. With the latest firmware version installed, DSD sampler tracks are simply astonishing with a fantastic deep bass and the rich tones of the orchestral pieces sounding more lifelike than ever ●

MIND THE GAP

One of the issues with the original firmware for the AK100 was that it didn't support gapless playback out of the box. This is essential for Floyd fans, devotees of live albums and dance mix heads, and thankfully the AK120 incorporates this capability in the firmware version installed on our test model. Gapless playback is easily selectable from the settings menus and can be found alongside a five-band graphic equaliser that utilises sophisticated touch-sensitive level adjustments, as well as setup menus and Bluetooth connectivity for pairing with suitably equipped playback devices (along with the inevitable drop in sound quality, of course). With a quoted 30hm output impedance, the AK120 should be able to drive a wide range of headphones. Format playback capabilities include the usual suspects of: WAV, AIFF, FLAC, ALAC, APE, MP3, AAC, WMA, OGG and DSD up to 2.8MHz.

Dinky size, but decent file handling



HIFIChoice

OUR VERDICT

SOUND QUALITY
★★★★★ **LIKE:** Sound; dual DAC capability; DSD playback

VALUE FOR MONEY
★★★★★ **DISLIKE:** Lacks sophistication of today's portable player rivals

BUILD QUALITY
★★★★★ **WE SAY:** This unit stacks up for its sound, but is being overtaken by stylish new rivals

FEATURES
★★★★★

OVERALL



REVOLUTION



How could we improve the T+A R Series? After painstaking analysis, the only option was to start again from the ground up, using the latest techniques developed for our multi award-winning HV Series. Ultimately, the only facet that remains unchanged is the name, together with the original great idea: to design a collection of devices perfectly matched to each other, representing in terms of sound and technology the absolute extreme of what is possible in keeping with the R Series stylish yet compact form. The amplifiers of the new R-series are of symmetrical construction, exploiting the double-mono principle and our High Voltage technology. The Multi-Source player features separate High-Resolution converters for DSD and PCM formats, whilst the audiophile turntable can be fitted with various tone arms and cartridges. The previous R-series was considered the standard of perfection in casework, so we have raised the standard even higher, with the whole case now consisting of machined thick-walled aluminium. But even better than reading about our new R Series is to listen to it, and your specialist T+A dealer is already looking forward to seeing you.

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Email: info@dynaudio.co.uk

FiiO

X5 £289

This hi-res audio player may lack some style, but looks aside it's a flexible solution at an attractive price

DETAILS

PRODUCT
FiiO X5

ORIGIN
China

TYPE
24-bit/192kHz
Digital Audio Player

WEIGHT
195g

DIMENSIONS
(WxHxD)
68 x 114 x 16mm

FEATURES
• Quoted battery life: 12 hours
• 2x MicroSDXC slots (256GB max)
• 2.4in IPS display (400 x 360)

DISTRIBUTOR
KS Distribution

TELEPHONE
01903 768910

WEBSITE
hifiheadphones.co.uk; fiiio.net/en

Those in search of an alternative to the more widely available but pricier hi-res portable audio players will have noticed a growing number of surprisingly affordable models coming their way from FiiO. We've seen a couple of models over the past 12 months from the Chinese brand, with its X3 model appearing in HFC 382 last year and the X1 in last month's issue. So it won't come as much of a surprise to learn that the X5 is the next model up in the FiiO line and is an amazingly affordable 24/192-capable hi-res player with the promise of DSD playback via future firmware upgrades.

One of the areas where the brand manages to make cost savings is in the lack of any internal storage. Instead the X5 has two microSD slots that can accommodate cards up to 128GB. Arguably another area where savings look like they've been made is in the design of the player itself, which rather surprisingly looks a lot

less stylish than its £100 X1 sibling, and is finished in a rather utilitarian black casing although a soft silicone rubberised skin is supplied. In terms of features, the 2.4in display feels a bit low rent thanks to a rather subdued backlight – even at maximum brightness and full battery charge – and the screen's mirror-like finish means you see as much of your own reflection displayed as you do the menu text.

The X5 is the only player here to have a scroll wheel for navigating around system menus. It's a neat touch that operates well, but the central enter button is a little unresponsive and the outer shortcut buttons are unintuitive and change their functionality as you move through the system menus, which means it can take some time to get to grips with. Output socketry is very well supported and you get independent line-level and optical digital output jacks along with a headphone out, suitable for impedances from 16-300ohm.

Sound quality

With the comprehensive EQ settings – see *X Factor* – switched off, the X5 delivers its smoothest performance. The frequency range is nicely extended across all file formats and it puts on a decent show. However, the sound signature isn't quite as expansive as some of its nearest price rivals, and the frequency response manages to sound a little contoured even though EQ is off. It's a sonic subtlety, but the X5 doesn't quite manage to draw me in during listening sessions as much as its nearest rivals. It has a knack for enhancing high frequency details on some tracks and manages to cruelly highlight occasional sibilances a little more keenly than I'd like on Diana Krall's version of *California Dreamin'* downloaded from highresaudio.com.

Bass extension is good and promising with Stevie's *Living For The City* at 24/96, but the X5's rendition seems to be lacking some of the track's soul and sounds as though it's just going through the motions ●

X FACTOR

The FiiO X5 uses a TI PCM1792A DAC chipset that is compatible with APE, FLAC, ALAC, WMA and WAV lossless music formats up to 24/192kHz. The company says that DSD playback will be added and optimised in pending firmware upgrades. More impressive than the planned DSD playback capability, though, is the X5's ability as an outboard USB convertor that enables it to be used as a hub-powered inline DAC between a computer connected to an external music system to effectively upgrade its audio.

Menus may be a tiny bit unintuitive and awkward to navigate, but once you find your way around the X5 you'll discover some useful facilities and options such as gapless playback, power on volume level, gain settings and a 10-band graphic equaliser with preset EQ as well as manual adjustments for frequency bands labelled from 31Hz to 16kHz.

Style is lacking, but outputs are plentiful



HIFIChoice

OUR VERDICT

SOUND QUALITY
★★★★★
VALUE FOR MONEY
★★★★★
BUILD QUALITY
★★★★★
FEATURES
★★★★★

LIKE: Versatility; price; warm sound
DISLIKE: Lack of openness and resolution; unintuitive menu system
WE SAY: Flexible player and inline DAC at an attractive price, but has poor ease of use and lacks style

OVERALL





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Exposure Electronics Limited

Unit 18, Winston Business Centre, 43 Chartwell Road
Lancing, West Sussex BN15 8TU, United Kingdom.

www.exposurehifi.com

Hidizs

AP100 **£230**



BARGAIN SPECS

Hidizs is yet another portable audio brand trying to make its way in the UK market. The China-based company was first formed in 2009 and spent several years conducting extensive research and development to establish its positioning and entry point into the portable hi-res audio player market. And it looks as though the time was well spent, as the AP100 is the first model to come from the company and yet it is packed with high-grade audio technology, which includes a Cirrus Logic DAC, CS8422 SRC upsampling chip, AD823A audio filter and CS48L10 DSP chip to list but a few. It also uses a dual crystal oscillator to ensure sampling rates are matched.

What's more it comes supplied with a leatherette case, USB cable and screen protector. Charging is done by USB only and gives around 10 hours of music playback from the built-in 3,000mAh Li-ion battery.

DETAILS

PRODUCT
Hidizs AP100

ORIGIN
China

TYPE
24-bit/192kHz
Digital Audio Player

WEIGHT
156g

DIMENSIONS
(WxHxD)
66 x 107 x 16mm

FEATURES
• Quoted battery life: 10 hours
• 8GB internal storage
• MicroSDXC slot (64GB max)

DISTRIBUTOR
KS Distribution

TELEPHONE
01903 768910

WEBSITE
hifiheadphones.co.uk; hidizs.com/EN/Products/

Hoping to break into the affordable hi-res portable audio player market is the unassuming AP100 from Hidizs. Launched earlier in the year at CES in Las Vegas, it quickly got our attention thanks to its affordable price tag and hi-res capabilities. Its looks are a little utilitarian and it's around the same size as an iPod Classic, but it can playback an impressive selection of file formats including hi-res audio up to 24/192, but no DSD.

Unlike the FiiO – its closest rival – it has 8GB of internal storage, which is expandable to 72GB by adding a 64GB MicroSD card to its storage slot. It feels solidly built and is among the lighter models in the group. It has a 2.4in TFT screen with 320 x 240-pixel resolution, which is okay but nothing to get excited about. Menus are easy to navigate and operation is intuitive. Some of the text is a bit small for tired eyes, particularly the numbers that represent the frequency bands beneath the seven-band graphic equaliser which can be very hard to decipher.

Plus the screen can be difficult to view from any angle other than straight on, and onscreen artwork and track information quickly becomes solarised when you look at the player off axis.

Screen aside, this is a slick portable with useful features like gapless playback, headphone sensitivity output and support for WAV, FLAC, WMA, MP3, OGG, AAC, APE, AIFF and ALAC, while DSD is in the pipeline with future firmware upgrades.

With an ability to upsample tracks via the Cirrus Logic 24/192 DAC – see *Bargain Specs* – the AP100 sets itself up as a very versatile portable at the price, and is a neat little feature that can in theory help to improve on subtle audio details. In addition, there's a healthy array of socketry, and the AP100 can also be used as an inline DAC between a computer connected to its microUSB input and fed out via optical or coaxial digital outputs to a full music system.

Sound quality

For such a modestly priced player, the AP100 has a sound that comes very close to higher-priced models. Listening to Norah Jones' *In the Morning*, which is one of only a few 24/192 ALAC recordings in my collection, vocals have more of a raspy quality to them that makes me feel as though I'm actually hearing the performance as it's taking place in the studio. It conjures up a remarkably solid and spacious sonic picture of the rest of the band positioned around Jones that is so solid I feel as though I could almost walk around it.

Similarly Pink Floyd's *High Hopes* captures the song's haunting church bell with all the conviction and atmosphere of the real thing, and proves just as listenable. *Take Me Back* is almost euphoric in its presentation and doesn't show any real signs of hardening up at higher volume levels. Vocals are expertly conveyed and even with the EQ setting switched off there's a slight hint of mid warmth that gives male voices a silky quality and makes the AP100 easy to listen to over longer periods of time ●



Fuss-free styling and easy to use



Hi-Fi Choice

OUR VERDICT

SOUND QUALITY
★★★★★ **LIKE:** 3D-like soundstage; ease of use; price

VALUE FOR MONEY
★★★★★ **DISLIKE:** Poor screen; file format information not displayed

BUILD QUALITY
★★★★★ **WE SAY:** Great sound at the price, but let down by slightly mediocre facilities

FEATURES
★★★★★

OVERALL





Turntables
Best turntable £800+
Clearaudio Concept



Lotoo

PAW Gold **£1,500**



This newcomer's blingy style may not be to everyone's taste, but its file flexibilities look certain to impress

DETAILS

PRODUCT
Lotoo PAW Gold

ORIGIN
China

TYPE
24-bit/192kHz & DSD-capable Digital Audio Player

WEIGHT
280g

DIMENSIONS
(WxHxD)
60 x 104 x 25mm

FEATURES
• Quoted battery life: 11 hours
• SDHC & SDXC slot (2TB max)
• Native DSD file support (2.8MHz & 5.6MHz)

DISTRIBUTOR
KS Distribution

TELEPHONE
01903 768910

WEBSITE
hifiheadphones.co.uk; lotoo.cn

Like many things in the world of hi-fi, the digital audio player market has models at a variety of price points offering different performance levels and flexibilities. One look at the PAW Gold from Lotoo (pronounced low-to) and you can see that it is firmly aimed at the high-end market. It may be new to the UK, but Lotoo has an established professional-audio background and is best known as a supplier of audio workstations and broadcast automation systems.

Taking its first steps into the domestic hi-res audio player arena, the PAW Gold makes a striking debut. The chunky full-metal casing is machined from a solid brick of what the maker calls aircraft-grade duralumin and the volume and navigation control is accentuated with 24k gold elements. Love or loath its blingy looks, the tough-looking PAW Gold is clearly built for a life on the road. The scratch-resistant 1.8in OLED screen displays comprehensive menus that

are a little utilitarian in their layout and functionality, and lack the touchscreen slickness of the Acoustic Research or Astell&Kern models. However, they offer in-depth fine tuning, including extensive sound and filter adjustment as well as useful personalisation settings like volume control direction – showing off the Lotoo's considerable flexibilities – see *Pro Background*, right.

Storage is via an SD card slot with support for SDHC and SDXC cards and the PAW Gold claims futureproof support for 2TB-capacity cards as and when they become available. Battery power is recharged by mains wall wart only, and you'll need to invest in an additional US-to-UK 3-pin adaptor as this isn't supplied. A USB 3.0 micro-B port gives drag-and-drop file transfers from a computer, while a Burr-Brown PCM1792 DAC chip handles PCM sample rates up to 384kHz as well as DSD at 2.8 and 5.6MHz. A headphone driver supports a wide range of cans, and there's a sensitivity adjustment switch on top of the unit.

Sound quality

Gapless playback isn't supported, meaning that Pink Floyd or live recordings fans will dislike the tiny pause that happens as the Lotoo moves between tracks. It's a momentary interruption in an otherwise glitch-free performance, but annoying all the same. This will hopefully be rectified in future firmware upgrades.

Sticking with Pink Floyd's *The Division Bell* the Lotoo makes it easy to appreciate the album's dark and moody atmosphere and well-crafted soundstage. High-frequency details sparkle and seem to float within the sonic picture. Vocals are superbly rendered too, and switching to *Hotel California* by the Eagles I am aware for the first time of the tiniest amount of reverb on the lead vocal. This encourages me to listen out for more subtle details on a recording that I thought I knew well, in the hope of hearing additional nuances for the very first time ●

PRO BACKGROUND

Beijing-based Infomedia is the high-tech company behind the Lotoo and has been developing, manufacturing and marketing broadcast equipment, automation and production systems in the radio and television industry for over 10 years. Although new to hi-fi circles, the Lotoo brand already has a range of portable recorders with built-in stereo microphones under its belt, but this is its first foray into the high-resolution audio player market.

The Lotoo's pro roots are evident in the comprehensive system menus and audio options available with studio-based ATE (Acoustic Timbre Embellisher), which is a type of processing more usually associated with digital mastering, as well as preset and user-set EQ options.

Audio format support covers DSD, FLAC, ALAC, WAV, AAC, MP3, WMA, OGG, M4A, CUE, APE and WavePack music files.

Robust build and flexible controls



Hi-Fi Choice

OUR VERDICT

SOUND QUALITY
★★★★★ **LIKE:** Insightful sound; flexible menu options; robust styling

VALUE FOR MONEY
★★★★★ **DISLIKE:** No gapless playback; user interface is outdated

BUILD QUALITY
★★★★★ **WE SAY:** An excellent hi-res audio player, although it's lacking in operational finesse

FEATURES
★★★★★

OVERALL





SSC RECORD POINT 420 - RRP £125

The new SSC Record Point 420 can be used with most record players. Providing a good contact between the record and the platter thus greatly stabilising the record, giving less distortion and a more realistic sound image as a result.

As you can see from the image, inside the SSC Record Point 420 is the integrated string suspension design. Between two anodised aluminium caps is the high grade steel core with the SSC triple ring technology which is typical of SSC products.

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Sony

NWZ-A15 **£169**

In this svelte hi-res music player, Sony has pared back the features in order to appeal to entry-level users

DETAILS

PRODUCT
Sony NWZ-A15
ORIGIN
Malaysia

TYPE
24-bit/192kHz-capable Digital Audio Player

WEIGHT
66g

DIMENSIONS
(WxHxD)
43 x 110 x 8mm

FEATURES
● Quoted battery life: 30 hours
● 16GB internal memory
● microSDXC slot (64GB max)

DISTRIBUTOR
Sony Europe

TELEPHONE
0845 6000124

WEBSITE
sony.co.uk

As the brand that arguably introduced the music portable to the world with its Walkman sub-brand towards the end of the seventies, Sony was once again ahead of the curve when it introduced its first hi-res models a couple of years ago with the flagship NWZ-ZX1 (due to be superseded at any moment by the ZX2, which was unavailable in time for this test) and the 'entry-level' NWZ-F886. The NWZ-A15 effectively replaces the F886 and is much more compact, with dimensions akin to the 4th generation iPod Nano. It has a 2.2in screen that's plenty big enough and easy to operate via the four-way navigational control below the display.

Features retained from the F886 include an FM radio and Bluetooth connectivity for streaming to a speaker or headphones, with aptX and NFC also added. Another significant addition is the provision of a microSD card slot, which allows you to expand

the paltry 16GB built-in memory to 80GB using a 64GB microSDXC card, albeit at additional cost.

Music transfer is a simple drag-and-drop process using the supplied software and I am able to transfer my hi-res tracks up to 24/192 on to the microSD card without any hiccups. There's no provision for DSD playback, however, which may be a bit of a stumbling block for some music fans.

Operating the player is simple and logical, and I am up and running in next to no time. Two small buttons below the display provide quick access to the home screen and power options. You simply navigate up, down and across using the click pad on the front and press play in the middle. On the right edge are volume controls, a Hold slider switch and the aforementioned SD card slot.

Sound quality

Directly comparing a 24/96 ALAC of *Living For The City* by Stevie Wonder with all enhancements switched off reveals that the NWZ-A15 is almost on a par with the AP100. The bass is a bit more augmented and thumpy, but this can easily be tempered by adjusting the custom EQ settings if it happens to be too much for your taste, as it is for mine. This brings the clarity of the higher frequencies more to the foreground, but without the sense of sparkle that you get on the AR-M2 costing over five times as much. The bass level really shows up with a 24/44.1 ALAC of London Grammar's *Hey Now*, and is a tonal balance that you'll either love or hate.

Diana Krall's vocal on her version of *Desperado* is silky smooth with the 24/48 FLAC music download from highresaudio.com. The accompanying piano tends to merge with the orchestral strings arrangement, and only here is the focus from the Sony a little more blurred and shut in when compared with, say, the Acoustic Research. Otherwise it's an effortless performance from the NWZ-A15 that's very easy to enjoy and appreciate on longer listening journeys on public transport ●



WALK THIS WAY

The NWZ-A15 may be the entry-level model in Sony's hi-res audio range, but it supports Bluetooth and aptX, while playback features include ClearAudio+, Clear Bass, DSEE HX (upscales lower bitrate MP3 files) and Dynamic Normaliser. A five-band equaliser (None/Heavy/Pop/Jazz/Unique/Custom 1/Custom 2) provides further tweakability, with a handful of DSP modes thrown in for good measure. These claim to recreate the acoustic qualities of listening in a sweaty little club, soulless arena, etc.

File format compatibility includes WAV, AIFF, WMA, AAC, HE-AAC, FLAC and ALAC, plus MP3 of course. The standout omission here is still DSD, though. You can play AVC, MPEG4 and WMV 9 video files, but watching movies is rather pointless on such a small screen and I would trade it for DSD playback any day of the week, but that looks set to be reserved for the NWZ-ZX2 when it arrives.

Slender style that's right for any pocket



Hi-Fi Choice

OUR VERDICT

SOUND QUALITY ★★★★★	LIKE: Decent sound quality; convenience; price tag
VALUE FOR MONEY ★★★★★	DISLIKE: Lacks some hi-res details; there's no DSD playback
BUILD QUALITY ★★★★★	WE SAY: This nicely priced pocket player makes a good start for those wanting to enjoy hi-res audio
FEATURES ★★★★★	

OVERALL



Group test verdict

Having listened to all six digital audio players, **Lee Dunkley** sums up his experience with all of the contenders and announces a winner

THE PORTABLES MARKET has changed considerably in the past few years and lossless hi-res audio has reshaped our expectations of what can be achieved from today's mini players. We've come a long way since the first Walkman models and even the once ubiquitous iPod is looking outdated in terms of its format handling and audio quality.

All the models on test here have something to shout about, whether it's great looks and user interface, DSD playback or good old-fashioned value for money, there's something for everyone.

The player lacking the style and credentials of the best performers is the FiiO X5, which doesn't do enough to stand out from the competition.

Astell&Kern's AK120 has been around for a while and is still a popular model with stockists, but its styling and slick functionality are beginning to look a little outdated compared with newer rivals. It still manages to compete in the sound stakes though, and narrowly misses out on being recommended here.

Newcomer Hidizs' AP100 is awarded the first badge. It doesn't quite match the Sony in terms of its

memory storage and battery life for the price, but its sonic capabilities are impressive even if its onscreen display and operational system are nothing to shout about.

Sony's entry-level NWZ-A15 is simplicity itself. Audio performance is decent and the entertainment giant knows how to put together a great interface and user experience at a real-world price.

Another new name, Lotoo is likely to divide opinion thanks to statement styling and old-school menus. Its pro audio background is clearly in evidence across all formats.



The slightly chunky AR-M2 is the standout digital audio player of the moment. It looks great, has a smooth touchscreen operating system and manages to extract every last nuance from all your recordings, which after all is what listening to hi-res audio is all about.



Make/model	Acoustic Research AR-M2	Astell&Kern AK120	FiiO X5	Hidizs AP100	Lotoo PAW Gold	Sony NWZ-A15
Price	£900	£1,100	£289	£230	£1,500	£169
Sound	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Build	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
	Great looks and neat operation, this is the best hi-res audio player we've heard at the price	A popular buy with distributors, its sound still stacks up, but it's being beaten by stylish new rivals	Flexible player and inline DAC at an attractive price, but has poor ease of use and lacks some style	Remarkable sound at the price, but with slightly mediocre facilities and poor info screen	An excellent hi-res audio player, but user experience lacks finesse and styling is not for all	This nicely priced pocket player is a good starting point for anyone new to hi-res audio

Key features

Wi-fi/Bluetooth	Wi-fi	Bluetooth	None	None	None	Bluetooth
Built-in storage	64GB	64GB	None	8GB	None	16GB
SD card slot	1x micro (128GB max)	2x micro (128GB max)	2x micro (256GB max)	1x micro (64GB max)	1x SDHC (2TB max)	1x micro (64GB max)
Battery life	9 hours	14 hours	12 hours	10 hours	11 hours	30 hours
DSD-playback	Yes	Yes	No	No	Yes	No

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OPEN-BACK HEADPHONE: SRH1840 £467 HFC 388

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CLOSED-BACK HEADPHONE: Oppo PM-3 £350 p56

Oppo's gorgeous PM-3 headphone is 'entry-level' in name only. It shares a cut-down version of the upmarket PM-1 and PM-2's planar magnetic drivers and performance-wise knocks much of the similarly priced portable competition into the middle of next week.



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Issue 1

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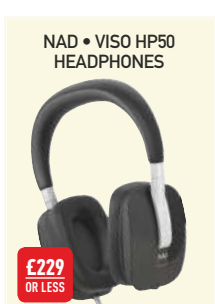
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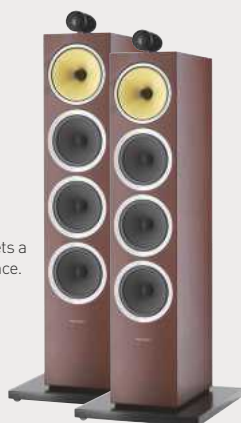
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2 Unlimited

David Price discovers the German Physiks Unlimited Ultimate is a Teutonic transducer loudspeaker that thinks outside the box

Loudspeaker design is the art of compromise. There is no single correct way to make them, so designers come up with their own approaches, all of which are trade offs between one thing and another. Electrostatic panel speakers offer detail and evenness, but tend not to be able to move air very well, so are bass-light. Moving coil speakers can thump out strong low frequencies but require several drivers and these often cross over unevenly, causing all manner of balance and phase woes.

German Physiks is a loudspeaker manufacturer that offers a particularly interesting and unique compromise, an omnidirectional speaker (where the sound fires all around) using a special, bespoke Dicks Dipole Driver. Developed several decades ago by an ingenious mathematician, the DDD is quite unlike anything else in production. This transducer is theoretically highly complex, and not the easiest to make, but it side steps a whole range of problems that other drive unit types

It delivers a near translucent midband with seamlessness from top to bottom

suffer. This makes it a true piece of hi-fi esoterica, which goes its own way – unlike so many high-end loudspeakers.

The Unlimited has two drive units; in the bottom is a conventional cone woofer, and in the upper section is the DDD. The latter has a voice coil/magnet assembly and cone that is longer and narrower than a conventional cone driver. When the voice coil of a normal drive unit moves, the whole cone moves with it and the sound goes off in the same direction as the cone is moving the air. But the DDD behaves very differently; the lower end of its operating range can be described with Thiele/Small resonant parameters, while in the next frequency band up to the coincidence frequency it works like a standard piston driver. Then there's an overlapping band where piston

movement is progressively replaced by bending waves, until all the sound is generated purely by bending movement in the cone, according to German Physiks. Because of the cone's special shape, the coincidence frequency is spread over an extended frequency range. The last mode of operation happens above the bending wave band at the dipole frequency, when the first standing wave occurs and where modal break up begins.

This gives a completely different set of properties to a conventional multi-drive unit moving coil loudspeaker. The key one being dispersion; the DDD is omnidirectional and is far less prone to producing a 'sweet spot'. This means the sound propagates better and the speakers are less fussy about placement. This applies to the tone, too; the even tonal balance is less likely to be disturbed when sited in an unusual part of the room. Speakers with conventional drivers only produce the correct tonal balance in a narrow range of positions, due to their tendency to beam at high frequencies, but not these. Also, because the DDD has a very low-moving mass, transient response is very good which gives a realistic feel to the music. The driver also works from 200Hz to 24kHz, which avoids the need for an intrusive crossover; below this a downward-firing 200mm woofer takes over.

The manufacturer claims a frequency response of 32Hz to 24kHz, and a power handling of 110W. Sensitivity is quoted at 88dB/1W/1m, which is average for a speaker of this size.

Sound quality

Spending £10,900 on this speaker buys you a fundamentally new approach to the problem of producing music from electrical energy. Radically different to its rivals, it's in a gang of one in so many ways.

You might think that the unique drive unit inside would instantly broadcast its presence, but it is less obvious than you'd expect. This speaker looks startlingly different, yet doesn't sound completely unlike all other transducers ever made. Indeed, it's more subtle

DETAILS

PRODUCT
German Physiks
Unlimited Ultimate

ORIGIN
Germany

TYPE
Omnidirectional
floorstanding
loudspeaker

WEIGHT
28.9kg

DIMENSIONS
(WxHxD)
240 x 1,050 x
240mm

FEATURES
• 1x carbon fibre
DDD, 1x 200mm
woofer
• Quoted sensitivity:
88dB/1W/1m
• Quoted frequency
response: 32Hz to
24kHz

DISTRIBUTOR
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TELEPHONE
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WEBSITE
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than this; you might say its self-effacing nature is what sets it apart. Put a pair of conventional speakers in your listening room and there's a set of issues that you have to accommodate – for example they need to be toed-in, carefully placed to give a convincing stereo image and then you sit back and have sound beamed at you. Not so here...

If you have ever wondered what an omnidirectional speaker sounds like, the answer is that it doesn't sound like anything much at all. Indeed, it sounds a lot more like sound as we hear it in nature; there's no need to 'learn' how to listen as you have to with conventional stereo speakers. With an omni, the sound propagates more organically, less affected by the anomalies of the listening room. That's why they work very effectively with minimal messing about; in my case I run them about 40cm from the rear wall, to strengthen the bass, and then abandon the setting up phase and settle down to listen.

I kick off with a bouncy piece of eighties pop in the shape of Scritti Politti's *The Word Girl*. A soulful song tinged with reggae, it has a powerful bassline underpinning some silky vocals from singer Green Gartside and big digital keyboard stabs. The Unlimited's rendition of this sets a clear template for the rest of the review period, showing an almost supernaturally wide recorded acoustic, and a slightly light bass. This isn't to say it isn't fun though; it is certainly tuneful and integrates beautifully with the magic that the DDD is able to deliver further up the frequency range.

Another striking aspect of the sound, in addition to the way it propagates

The downward-firing 200mm woofer is located on the underside



Q&A

Holger Mueller

German Physiks founder



DP: How did the DDD come about?

HM: It was conceived and developed by a German engineer called Peter Dicks, who spent eight years developing a computer model and then refining this by producing many prototypes and using the results of measurements to progressively improve the accuracy of the model. There was a further two years where Peter and I worked together to get it into a commercial product. It is tricky to build. We make these ourselves by hand and it is a comparatively slow process, which must be done with care. We have been doing it for a while – 22 years – so we have it down to a fine art now!

Does German Physiks make any other type of speaker?

We have 16 models in our range at the moment. These all use the DDD driver, some use one, some two and some four, and these are combined with progressively larger and more powerful bass systems and so can play louder and go deeper. Our flagship Gaudi model uses four DDD drivers, eight 6in woofers and four 12in subwoofers; it can go down to 15Hz and produce sound levels up to 120dB! These have to be tri-amped and are supplied with an electronic crossover. Depending on the finish and configuration, a set of Gaudis can cost up to about £200,000. These do sell, albeit in small numbers!

How should the loudspeakers be placed in the room?

The main thing is that you need to keep them a metre or so away from walls. This aside, there are no hard and fast constraints. Being omnidirectional, they are usually much easier to set up than conventional designs where the precise position in the room can have marked effects on the sound. At shows I usually find that the first position I try the loudspeakers in will produce a good stereo image and then it is just a matter of trying a few adjustments to optimise the bass.



The DDD is able to fire the sound around the room

itself all around, is the smoothness and ease across the midband. Vocals sound sweet and those chiming keyboards never grate, as can happen with some less balanced loudspeakers. Drums sound tight and propulsive too, and time very convincingly; the Unlimited seems able to really dig into the deepest nuances of the playing and throw fine detailing out that other speakers just trample over. The overall effect is almost like listening to a very good pair of electrostatic headphones, but writ large right across my listening room. This is both consummately natural and relaxing to experience, and also very different to a conventionally engineered pair of floorstanders.

Switching to some classic seventies rock in the shape of Led Zeppelin's *Kashmir*, and the speakers turn in a fascinating sound. Once again, it's obvious they aren't going to beat a pair of JBL Everests in their ability to move air around the room; there are other speakers a fifth of the price that do this better. However, what is spectacular is the sheer size of the sound, and the wonderfully accurate way that instruments are placed within the soundstage. There is very little sense that music is coming from the Unlimited at all; it's just there like a part of the furniture, and suddenly when you put some music on the room comes to life. The coruscating drum sound is a joy – so fast, so cutting, so natural – and this works in perfect time with that epic guitar riff for which the song is famous. Robert Plant's voice can sound a little nasal through some speakers, but this

one is open enough to capture the nuances of his singing, too. The German Physiks holds things together really well, again sounding like an open window on the original recording; not quite the biggest one I have ever heard, but still wide enough ajar to peer through properly.

It is with classical music that this loudspeaker is at its best, though. The opening Lento Allegro of Ralph Vaughan Williams' *Symphony No.2* has a beautiful cor anglais set to rousing strings, and the Unlimited captures this beautifully. Indeed, the London Symphony Orchestra under Bernard Haitink sounds magnificent across the piece, this speaker delivering a near translucent midband with wonderful seamlessness from top to bottom. Again, perhaps you might criticise it for a slight lack of physical weight to massed strings, but this is more than compensated for by a spaciousness and air the like of which you struggle to get even from top electrostatics. Depth perspective is particularly impressive, giving a brilliantly immersive sound. The Unlimited copes well on crescendos too, considering its relatively compact dimensions, but isn't really quite able to compete with a larger more conventional box such as B&W's 801.

Conclusion

It is hard not to love the immersive, widescreen sound served up by the German Physiks Unlimited Ultimate. With brilliant spatial accuracy, it suits classical music down to a tee, but works very well across all music types because of its speed and grip. The only obvious compromise is the bass, which although tuneful and propulsive just isn't as physically strong as many rivals at the price. This, of course, is for the prospective purchaser to take a view on – it is so obviously able in many ways that most speakers are not, that many won't mind one jot. Full marks then to this bold, quirky and highly capable loudspeaker ●



HOW IT COMPARES

B&W's £11,500 Matrix 802D is the high-end speaker equivalent of a Range Rover, doing most things very well but not reaching top of the class in any single respect. It has an open, powerful and even sound; it can take large amounts of power and go very loud without drama – although it punishes low-powered amplifiers. It has a wide bandwidth with no nasty peaks or troughs, but is better suited to smooth amps. The German Physiks shows it to have mediocre imaging and a shut-in sound by comparison. The B&W hits back with a far more muscular bass, a gutsier nature and less compression at high levels. As ever, listening for yourself is the only way to choose.

Hi-FiChoice

OUR VERDICT

SOUND QUALITY

★★★★★

VALUE FOR MONEY

★★★★★

BUILD QUALITY

★★★★★

EASE OF DRIVE

★★★★★

OVERALL

★★★★★

LIKE: Superlative soundstaging; speed; musicality

DISLIKE: Limited bass by class standards

WE SAY: Uniquely capable design, there's nothing quite like it

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Digital do-it-all

The X40 does almost everything you could want – and more – and claims audiophile credibility too. **James Parker** explores

Most people thinking of committing their music collection to some kind of digital storage solution have a wish list in mind. They'd like an all-in-one unit able to rip, store and play their CDs; or something able to access internet radio and lossless streaming services such as Qobuz; or perhaps a means of ripping their LP collection to hard disk for playback.

Maybe they want to record from the radio, be it internet-streamed or FM; or have a unit holding music able to be accessed by other players around the house; or even something to store and play not only hi-res PCM-based music but also DSD.

If you've been sitting reading that and ticking off the things you'd like to

have, then you're not alone. Happily, the people at Novafidelity, and its sibling brand Cocktail Audio, like the way you think, mainly because they clearly think the same way. All the functions previously mentioned – and quite a few more – are loaded aboard the Novafidelity X40, its latest player. Er, recorder. Umm, server – well, you get the idea.

Of course, the two brands aren't any stranger to this kind of 'everything you need plus a device for taking stones out of boy scouts' hooves' thinking: right from the entry-level Novafidelity X12 (*HFC* 395) starting at around £420, there's a lot on offer, including CD ripping, playback and the ability to act as a standalone unit with just the addition of speakers, as

DETAILS

PRODUCT
Novafidelity X40

ORIGIN
Korea

TYPE
2TB music server system

DIMENSIONS
(WxHxD)
435 x 99 x 325mm

FEATURES
 • 2TB storage capacity (as tested, models available up to 4TB HDD or 1TB SSD)
 • Inputs: 1x RCA; 1x 3.5mm jack; 1x optical; 1x coaxial; 1x MM phono
 • 3x USB host ports
 • Ethernet networking (wireless via optional dongle)
 • Outputs: fixed and variable analogue RCA and XLR; optical, coaxial and AES/EBU

DISTRIBUTOR
Sygnifi Ltd

TELEPHONE
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WEBSITE
sygnifi.co.uk

a server for other network players or as a client for local music storage on a computer or a NAS device.

Sitting at the top of the range, the Novafidelity X40 takes the design of the Cocktail Audio X30, a past Editor's Choice winner (*HFC* 383), and then adds some more bells and whistles onto that machine's already impressive array of things you can ring or blow.

Yes, the X40 is rather more expensive than the X30 – in the base 'add your own hard drive' specification, £1,199 plays £799 – but at first glance it appears to offer less than the more affordable model, as the X30's built-in 50W per channel Class D amplification has gone overboard in the process of creating the new model, so the X40 needs to be used as a conventional source component into an amp.

However, the gains outweigh the losses, as the X40 has added the ESS Sabre32 Reference DSD/DXD digital-to-analogue conversion solution: whereas the X30's Burr-Brown PCM1792a DAC tops out at 24-bit/192kHz, this one can handle both DSD64/2.8MHz and DSD128/5.6MHz content as well as DXD up to 24-bit/352.8kHz and PCM at up to 32-bit/384kHz, and do so in native form, not by jiggery pokering the content down in resolution.

It's all under the control of a hunkier Digital Signal Processor, in place of



the 700MHz CPU used in the cooking model, while there's also a toroidal transformer to keep things quieter under the hood, and a more substantial chassis and case, complete with a 12mm aluminium front panel to improve rigidity and resistance to mechanical and electrical interference.

Also new is a moving magnet phono input: the X30 could perform the trick of recording from its built-in FM and internet radio tuners (complete with timer recording from internet radio streams), as well as accepting line and digital inputs and ripping CDs, but the X40 can also have a turntable plugged straight in to allow digitising of vinyl at up to 24-bit/192kHz.

That big, clear 5in TFT display makes operation a breeze

Completing the package is a choice of analogue outputs: to reinforce its serious intent, the X40 comes complete with balanced XLRs as well as the regular RCA phono socket outputs, and both sets can be used at either fixed level – for use into a regular amplifier – or variable for direct connection to a power amplifier or active speakers.

So what else can it do? Well, it offers a choice of wired or wireless networking, the latter using an optional 'dongle' (£29, and it fits in one of the USB sockets on the rear panel), though I'd probably stick with the former if shunting a lot of hi-res files around.

As already mentioned, it can be had in a range of hard-drive capacities up to 4TB, using 2.5in or 3.5in drives, and either conventional hard-drive or solid-state storage for faster access. To give you some idea of how the whole pricing model works, the 2TB model supplied for review is £100 more than the 'bare-bones, fit your own drive' version, one with 4TB installed is another £100, and the top-end model with a 1TB SSD is £1,899.

It's your call, really: fitting a drive into the X40 is no harder than changing the storage in a NAS drive, in that you undo a couple of bolts, slide out the drive tray, fix the drive in place with four screws, and then stick the tray back in place. The only thing likely to take a bit of time is the process of formatting the drive.

Well, that and loading the X40 with some music might also hold you up a bit, especially if you try to copy an entire 128GB USB stick to the hard drive as I do before I start listening. Ripping CDs is rather speedier – and of course you can choose whether or not to store them at 'full-fat', something more phone/personal player-friendly, and at what bitrate/speed you want to rip them at. The default is 'very fast', which runs at

about 3x speed, while choosing the slowest 'excellent' setting will take 50 percent longer than the running time of the disc.

Fortunately adding music to the X40 incrementally isn't a chore, whether from disc or 'stick', and a library can be built up quickly and easily.

I use the X40 both into the new Cambridge CXA80 amplifier and my usual Naim Supernait 2, and as a server for my usual network players and a client for my QNAPs NAS units, and while it's clearly slicker running music from its own hard drive storage, thanks to a reasonable browser-based interface usable on computers, tablets and smartphones, it also performs the server and client

By any standards, what this fiendishly capable unit can do is remarkable

functions well. It can even be run directly from the handset supplied, once you've found your way round the myriad buttons, not least due to the big, clear 5in TFT display on the front panel.

Sound quality

The sound of the X40 is instantly appealing: whether on internet radio stations or with hi-res music all the way up to DSD, it has no shortage of punch and drive, coupled with fine insight into the detail of a recording.

It makes the most of the extra quality available in DSD, DXD and hi-res PCM files, thanks to substantial bass as adept when crashing out the rhythm section of The Who in full flight as it is with grumbly synth-bass lines or the weight of a full symphony orchestra. What's more, it's not just that there's a lot of bass on offer: the speed and definition down in the ►

CONNECTIONS



- 1 Balanced AES/EBU/XLR analogue pre-outputs
- 2 FM tuner antenna
- 3 Storage drive bay for hard drive
- 4 MM phono input
- 5 Toslink and coaxial digital inputs
- 6 Toslink, coaxial and AES/EBU/XLR digital outputs

Q&A

Julian Cooke

Business development
manager, Sygnifi



JP: What were the challenges involved in improving on the X30, and how were they achieved?

JC: We found people loved the features and sound quality that the X30 provides, but audiophiles didn't want to be paying for an integrated amp they weren't going to use. They also wanted even higher sound quality and support for all of the hi-res file formats.

We also continually try to improve all of the products in the range throughout their lifetime delivering new features and make them even easier to use in the firmware updates released every few months. It's also handy that these updates can be reflected across all models in the range (hardware permitting).

The X40 has compatibility with DSD files: why was this important, and is DSD more of a must-have in some markets than others?

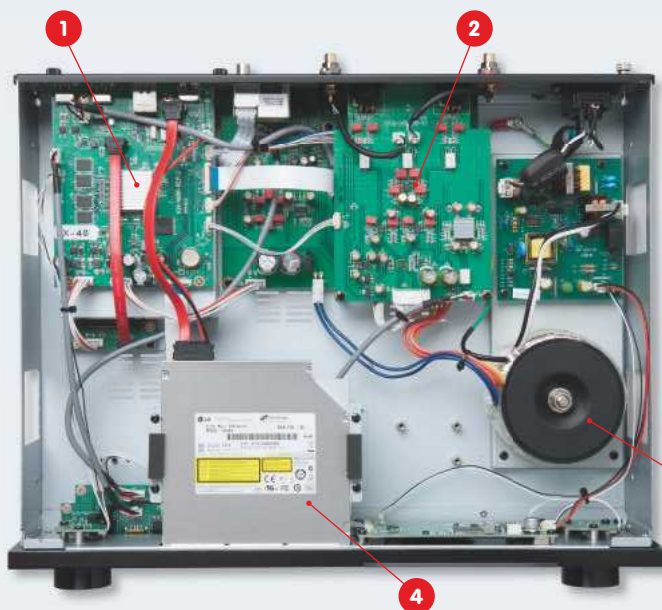
DSD files are becoming more readily available over the web and we were increasingly being asked about them – so this is something we really wanted to support. The X40 is a high-end component so it's important to be able to play these high-end file formats to achieve the best possible sound quality.

Like other models in your range, the X40 is available in a variety of configurations: which are the most popular? Do buyers prefer SSD over HDD drives? And do many buy the 'bare bones' model and install their own hard drives?

Our most popular models by far are the 2TB and 4TB HDD versions. That additional storage really comes into its own if you have hi-res music files that can be significantly larger than FLAC or WAV files ripped from CD.

Going for an SSD is great if you can afford it as data transfer speeds are higher and they are totally silent with a longer life because they have no moving parts. The largest capacity SSD we do is still the 1TB. Any higher and the prices just get silly!

IN SIGHT



- 1 X MOS 32-bit/500MIPS Digital Signal Processing Unit
- 2 32-bit ESS Sabre reference Hyperstream DAC
- 3 Toroidal power supply
- 4 High Speed Slot-loading CD drive

lower registers is equally impressive, whether with lightning-fast electric bass or the rosiny growl of an upright instrument. It's a sound seemingly designed to encourage you to turn the system up and enjoy the clout on offer. And when you do so the reward is truly thrilling power and slam, more than up to the standard of a very good CD player.

Things get even better when you load up a DSD file and revel in the

whether playing solo classical instruments or high-octane rock recordings. If the material you load onto the X40, and the rest of your system, are up to the task, this is a recorder/player fully able to deliver all that a recording has to give, and do so with no more than a twist and a push of the main control.

Yes, you're going to have to spend some time with it to do any more than scratch the surface of the wide-ranging competence here – by the way, it makes very good rips from LP (and is of sufficient quality to mean you'd better be using it with a pretty good turntable, not one of those plasticky budget buys) – but this is one of those components that rewards with extended use.

Just when you think you've got it all, chances are you're going to find something else it does – and does very well indeed ●

Its ability to drive rhythms cleanly ensures music holds the attention

big, organic-sounding low-end higher-resolution recordings can deliver, while at the same time giving you all that sense of space and character that's so much a part of the appeal of hi-res played on good equipment.

Play some tight small-group jazz, and the X40 reveals its ability to shimmer out cymbals and present piano with full weight. Step things up to the current Blur set, and its speed and ability to drive rhythms cleanly ensures the music holds the attention and rewards close listening.

Conclusion

By any standards, what this fiendishly capable unit can do is remarkable: all that flexibility has been achieved without any compromise in sound quality, as soon becomes clear



The most obvious challenge comes from the less expensive X30 (HFC 383): it could save you a healthy chunk of money if you have no interest in vinyl ripping or hi-res audio, but the X40 will also comfortably outperform it even with CD-quality music.

Beyond that, the closest rival is something like the Bluesound Vault, which has the simple disc-ripping ability of the X40 and some of its network capabilities – but lacks the 'do-it-all' features the X40 has.

You could take the view that there's not much here that you can't do with a PC connected to your hi-fi, provided that you also budget for a NAS, USB phono stage, offboard DAC, FM tuner...

Hi-FiChoice

OUR VERDICT

SOUND QUALITY



VALUE FOR MONEY



BUILD QUALITY



FEATURES



OVERALL



LIKE: Features; powerful, persuasive sound; balanced outputs

DISLIKE: Browser control interface

WE SAY: Novafidelity has added winning sound to its already amazing flexibility





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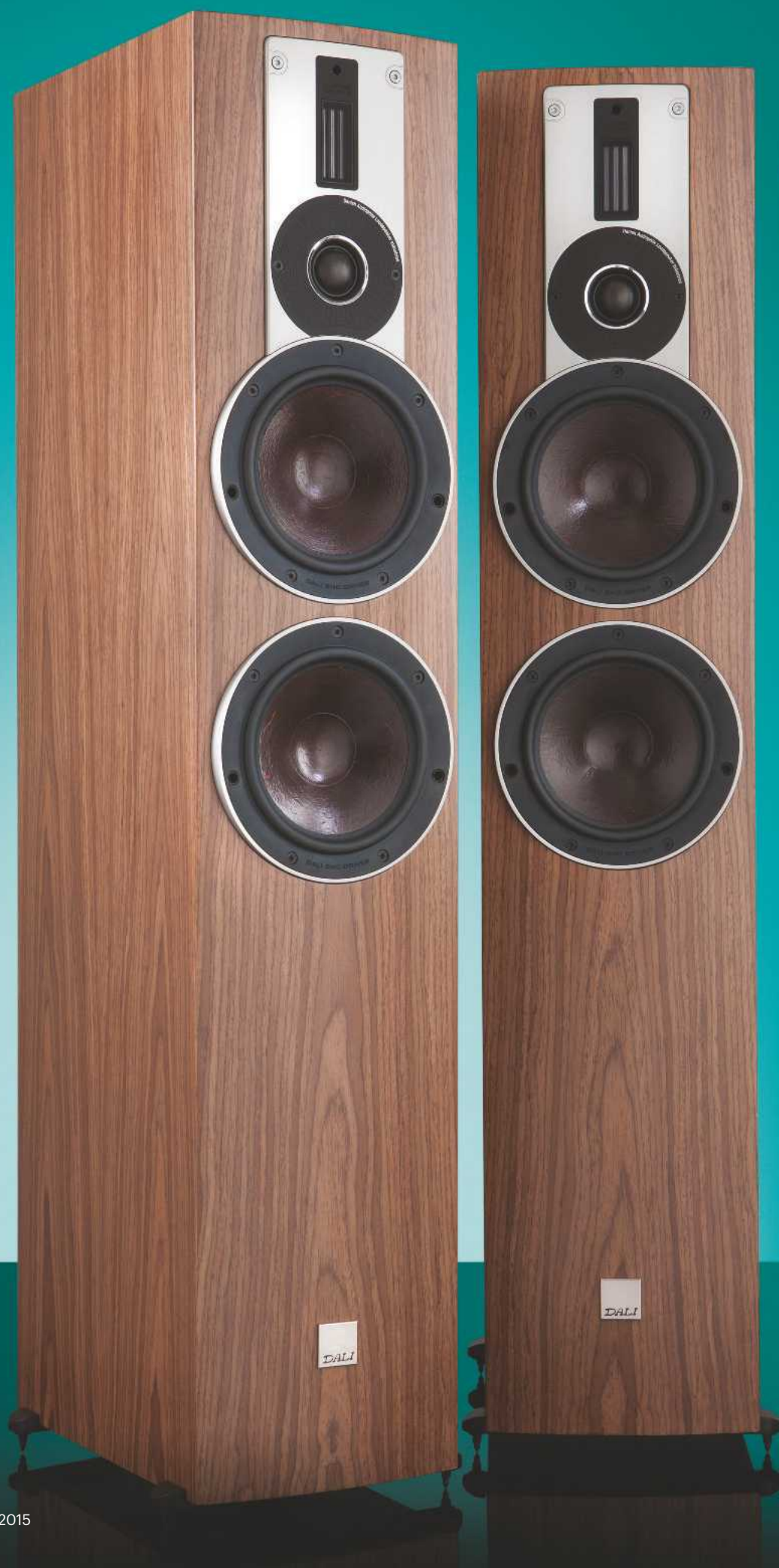


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Six-ual healing

DALI does things a little differently and this luxury floorstander cuts to the musical chase. **David Vivian** takes a listen

Loudspeakers come in all shapes and sizes but there seems to be a point along the size versus price axis where the usual hi-fi considerations simply fade away. By this I mean you begin to relax while listening, the need, however subliminal, to make allowances for the volume of the enclosure, the number of drive units and the success or otherwise of their integration lets go and an immersive sense of realism takes over. The good news is it's easy to hear (ironically because you'll find yourself listening less intensely) and it doesn't require a visit to the 'High End' to achieve.

I reckon DALI's Rubicon 6, a substantial £3,000 floorstander, is the

Intimate acoustic ensembles are treated with appropriate delicacy

kind of loudspeaker that should be able to pull it off, a realistic point of entry to an experience where the power of the music, rather than the limitations of the transducer, commands your attention. Of course, as DALI is keen to point out, merely stuffing an impressive number of high-tech drive units into a tall box won't cut it either.

Founded in 1983 by Peter Lyngdorf, DALI (or the Danish Audiophile Loudspeaker Industry to give it its proper name) is, as Ron Burgundy might put it, kind of a big deal, employing some 200 workers producing 250,000 speakers a year from a 200,000 square foot facility in Nørager, Denmark, and it exports over 90 percent of its output. Its span of speakers is huge, going from the budget-conscious Zensor range to its A-game Epicon lineup. The Rubicons sit one level below that.

The DALI way is to do almost everything inhouse, the sole exception being dome tweeters which, while designed by DALI, are manufactured by Scan-Speak. When it comes to midrange drivers and woofers, however, the Danish brand has furrowed its own unique development path. Sidelining the usual solid iron cores for a soft magnetic compound (SMC) formulated from a composite of materials, including magnetic granules, with the aim of improving efficiency, reducing electrical conductivity and significantly lowering distortion, permitting a crossover design that retains a flat frequency response across the critical midrange where the ear tends to be the most sensitive.

This sits well with DALI general philosophy to sound reproduction which, in essence, is to keep things fast, dynamic and fun. In this regard, its drivers are lightly damped, using low-loss rubber surrounds. Pace and timing are paramount.

The Rubicon family comprises five models. The 2 is a standmount, while the 5, 6 and 8 are floorstanders. There's also a centre speaker for multi-channel/AV setups. The Rubicon 6 is tall and deep, but quite slim with a gently curved baffle and rear panel. The braced MDF cabinets are beautifully finished in real wood veneer and feel very inert, though at just over 20kg apiece not all that heavy. The two 165mm wood pulp cone main drivers split low and mid duties, the lower unit operates full range and the other handles the midrange, while the 29mm fabric dome tweeter hands over to a 17 x 25mm ribbon supertweeter at 14kHz. This has a claimed frequency ceiling of 35kHz but is chiefly chosen for its wide dispersion characteristics meaning a broad 'sweet spot' and that little, if any, toe-in positioning

towards the listening position is required.

Round the back are a brace of reflex ports corresponding to the separate chambers for the main drivers, while the two pairs of speaker terminals for bi-wiring, otherwise connected by brass links, are gold-plated and look suitably heavy duty. Thankfully, it doesn't require much effort to 'walk' the Rubicons into position – it's advisable to leave at least a foot of space to a back wall and as much again to the sides – whereupon, if you want optimum stability and a solid coupling to the floor, you can attach the spiked outriggers.

Befitting its price, size and sonic ambition, the Rubicon 6 stands in for my regular ATC SCM 40 reference speakers and enjoys the front-end services of a Roksan Caspian M2 CD player, Chord Hugo DAC, with amplification provided by a Roksan Caspian M2 integrated amp, both by itself and with a Caspian M2 power amp in a bi-amped configuration.

Sound quality

The big, heavy ATC is by no means an easy act to follow, simply because it is so truthful to the source material. It tells it like it is. If a recording is less than masterfully produced you don't just know it, you know why. Imperfection is revealed just as starkly ▶

DETAILS

PRODUCT
DALI Rubicon 6

ORIGIN
Denmark

TYPE
3-way floorstanding loudspeaker

WEIGHT
20kg

DIMENSIONS
(WxHxD)
200 x 990 x 380mm

FEATURES
• Ribbon supertweeter
• 29mm fabric dome tweeter
• 2x 165mm wood fibre coned bass/mid drivers
• Quoted sensitivity: 88.5dB/1W/1m

DISTRIBUTOR
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Q&A

Matt Miller

DALI UK sales & marketing manager



DV: Why is it advantageous to have both a dome and a ribbon tweeter?

MM: DALI's trademark hybrid tweeter module combines the dome tweeter with the ribbon tweeter for an amazing rendering of the high frequencies, and a dispersion of high-frequency sounds that outperform all other tweeter technologies. The ribbon tweeter is the master of wide dispersion and combining it with the soft dome, we get a tweeter module that starts as low as 2.5kHz and performs well above 30kHz.

Why did you opt to use wood fibre as a cone material?

This gives the woofer a light, rigid and randomly uneven membrane. This makes the cone easy to move, ensures even piston-like movements and reduces surface resonance. This results in lots of detail and very little colouration in the reproduced signal, even at low volume.

There seems to be a trend towards speaker enclosures with 'boat-shaped' curved side panels to minimise internal standing waves. Is the Rubicon 6's gently curved baffle and back panel as effective?

Any shape that can avoid flat surfaces will inherently reduce standing waves, while also adding to a speaker's aesthetic. Constructed from solid MDF, the Rubicon cabinet also provides a sturdy base for the drivers, which are screw mounted into the 25mm-thick front baffle, eliminating vibrations and resonance.

All DALI speakers have a quite distinct sonic personality. Is this more important to you than absolute tonal neutrality?

The development and refinement of new technologies to increase the realism of the home entertainment experience is the main objective in our quest to create what we believe to be the best loudspeakers in the world. All our speakers are voiced by ear – not by numbers – and this approach enables us to truly represent the music we love in the most transparent way possible.

IN SIGHT



- 1 29mm fabric soft dome tweeter
- 2 Ribbon supertweeter
- 3 Mid and bass driver reflex ports
- 4 Bi-wire speaker binding posts
- 5 165mm wood fibre mid and bass drivers



For a few hundred pounds more, ATC's heavily built and butch-looking SCM 40 (HFC 389) sounds more muscular and tonally even and gives no favours to poor recordings while PMC's similarly priced twenty.24 is another highly talented exemplar of the 'what's good for the recording studio' approach. Staying with the Brit camp, the Spendor D7 (HFC 370) is a design that seems to get everything right effortlessly yet can't quite live with the Rubicon's speed and vivacity. An interesting alternative, if you can't quite stretch to the DALI's £3k, is Triangle's Esprit Antal EZ. Plenty of pace and *joie de vivre* from the French brand.

as genius; there's no veneer, no rose-tinted filter, no innate intention to butter things up. Sparkling excellence shines through just as clearly as a murky mess.

Perhaps wisely, the Rubicon doesn't try to compete on these terms. It goes its own way and if that doesn't meet with studio-certified levels of tonal neutrality, it's highly enjoyable and

It tracks the deftest shifts in timing without sounding unnaturally sharp

musically satisfying nonetheless. And yes, it does that 'serious' thing where dynamics, air and bass are sufficiently convincing to relieve you of the burden of having to mentally compensate for the information that should be there but isn't.

Soundscapes are well proportioned, musicians, singers and instruments exist in three dimensions both bodily and spatially and there's a generosity to the presentation that's immediately beguiling. Strong on detail, focus and

intelligibility, the DALI sounds wonderfully integrated with a spry, open, unfettered quality that makes it easy to listen to without being in any way 'easy listening'. It has that crucial believability in spades with a beautifully expressive and lucid midband underpinned by a seriously deep and powerful bass that never forgets to be agile and tuneful.

The doubled-up tweeter complement seems to do wonders for the upper frequencies which are clean, extended, free from grain and gloriously textured. But, perhaps unsurprisingly, where the Rubicon really excels is with tempo and rhythm. It tracks the deftest shifts in timing – a dragged beat, a subtle change of emphasis – with the greatest of ease without ever sounding unnaturally sharp or punchy. Rock – I'm thinking of Led Zeppelin's *Kashmir* – thunders out with satisfying energy and drive, sounding properly massive and unstoppable. At the other end of the musical spectrum, intimate acoustic ensembles are treated with appropriate delicacy, if a little more tingle factor than you'd get with the ATC. Whether that's strictly correct is a moot point. Probably not, but it doesn't seem to matter.

Conclusion

All right, the Rubicon 6 isn't what you'd call a monitor-class design. For those seeking tonal neutrality it comes across as being a little too well lit, so it's probably not a good idea to team these speakers with electronics that sound leaner and brighter than the rich and beefy Roksans. That said, the tall, handsome DALI is a musical communicator of the first order bringing speed, timing, bass, brio and, perhaps most impressively of all, a believable sense of scale and dynamics to the party ●

Hi-FiChoice

OUR VERDICT

SOUND QUALITY



VALUE FOR MONEY



BUILD QUALITY



EASE OF DRIVE



OVERALL

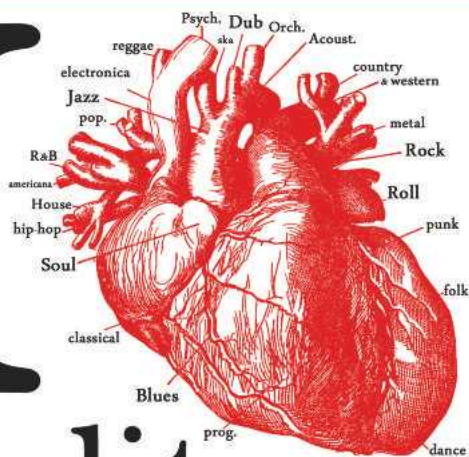


LIKE: Fast, open, articulate sound with great timing; cuts to the musical chase

DISLIKE: Won't sound its best with lean/bright electronics

WE SAY: Reproduces music with believable scale, pace, dynamics and a sense of joy

I fidelity



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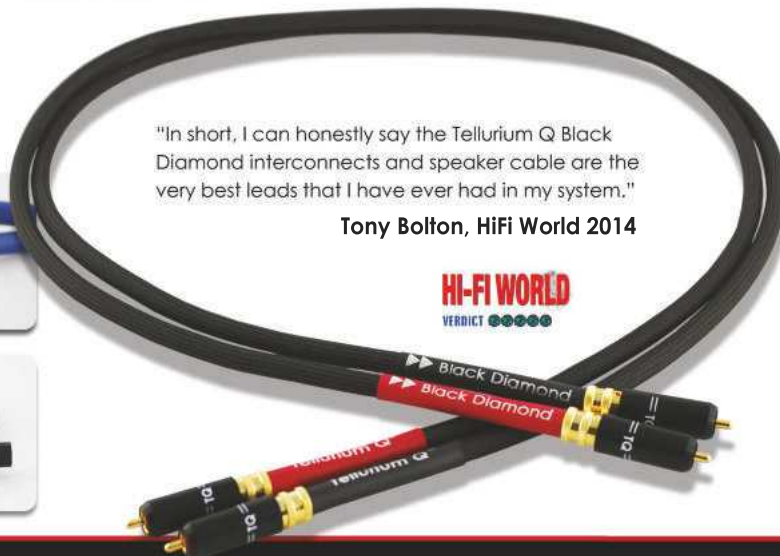
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DETAILS

PRODUCT
Oppo PM-3

ORIGIN
China

TYPE
Over-ear, closed
back headphone

WEIGHT
320g

FEATURES
• 55mm planar
magnetic drivers
• 4 detachable
cords
• Carrying case

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Three for all

Oppo has already impressed the high-end sector. Now, high-tech meets the high street as **David Vivian** tests its latest headphone

At the height of his boxing powers, Muhammad Ali would often quip: "How can I lose with the stuff I use?". Oppo's plan to sink its rivals is obviously built along similar lines, but in the fiercely fought £300-500 headphone market, that's going to require more than a fast-foot shuffle.

The stuff Oppo uses is a meticulously developed implementation of the planar magnetic driver technology that's normally the preserve of some very fancy cans indeed. When Oppo launched its own flagship show-opener last year, the PM-1, no one was greatly surprised that such a large, luxurious

open-back design, intended purely for home use, eschewed conventional dynamic cones for planar drivers. It cost £1,100 after all. A few months later, Oppo pulled off the same trick with the considerably more affordable PM-2, sacrificing little of the sonic performance that had set a benchmark at the £1k price point.

The £350 PM-3, however, has really set Felix among the featherweights. More compact and with over-ear closed-back swivel-able cups, it's Oppo's stab at a portable design – an audacious fusion of trickle-down planar magnetic tech and high-street wearability at a price that must be

leaving some serious rival brands dazed and others founded on celebrity endorsement blithely unconcerned.

Portable headphones with planar drivers are rare enough, but Oppo says the PM-3 sets the bar for weight. At 320g, it's only slightly heavier than a regular quality pair of headphones with less magnet-reliant dynamic drivers. On-the-go ease of drive, previously a problem for this typically power-hungry type of headphone, is another game-changer, making the PM-3 ideal for use with a smartphone or, better still, a smartphone and pocketable headphone amp/DAC such as Oppo's own HA-2 (HFC 397). Oppo admits getting this right was a tough call and took around a year to crack.

Why all the fuss about planar magnetic drivers? That's simple: sound quality. Manufacturers such as Oppo, Audeze and Hifiman wouldn't go to all the trouble if it wasn't for the sonic pay off. Loudspeaker legend Magneplan pioneered the technology which, in the simplest terms, consists of conductive membrane diaphragms flanked by grids of powerful magnets that attract and repel the ultra-thin and light film diaphragms in response to a signal.

Oppo's contention is that planar magnetic technology offers the best overall solution for the majority of customers who demand high-quality and high-resolution sound, possessing many advantages over traditional dynamic driver technology, not least inherently lower distortion. It's something they share this with all film-based transducers, but planar magnetic drivers add the benefit of being potentially portable as, unlike electrostatic designs, they don't require a special desktop bias power supply and amplifier. Electrostatics arguably hold the upper hand when it comes to ultimate sound quality at home, but planar magnetic technology has practical benefits that offers more to a wider public and, therefore, a much better return on your investment.

Headphone aficionados will probably be able to recognise PM-3s (available in black or white) on the street but, unlike some, these aren't cans that broadcast their identity. Classy, neat and not too bulky best sums up the look which, I suspect, will suit most just fine. There are some nice touches such as the brushed aluminium panels on the cups and the well-upholstered leather-look earpads and headband padding. Yes, leather-look. The PM-3 is clearly built to a price. The good news is that most of the budget has been spent where it really counts, under the bonnet, and what build compromises there are – the plastic main frame and

faux-leather earpads – are perfectly comfortable and serviceable. As befits the PM-3's portable/versatile design, you get four plug-in cables: a generous 3m length with a 3.5mm plug and 6.35mm adapter, a pair of 1.2m cables with remote buttons for iPhone or Android and a plain one with no remote at all.

Portability also requires a good degree of isolation and, short of opting for a noise-cancelling design, the PM-3 is about as good as it gets at keeping the hubbub of the outside world at bay and the finer details of the music close and intimate. Snugly fitting earpads and good isolation also prevent the need to trowel on the bass too thickly to mask any ambient noise that's leaking through. Even so, the bass output is elevated 5-6dB from a nominally flat frequency response to achieve a subjectively 'neutral' balance on the move. There's some subtle 'tuning' at the top end, too, in order to avoid excessive hardness and sibilance with less than perfectly produced tunes.

Sound quality

The PM-3's 'house' sound is one of which Goldilocks herself would approve: just right. Transparent enough to easily differentiate between the sonic efforts of an iPhone or Samsung Galaxy *au naturel* and variously upgraded with the Oppo HA-2 amp/DAC or Chord Hugo (HFC 386), the thing that sticks out about the PM-3 is the way everything sounds so natural, unshowy and unforced. No bass bloat, no mid muddle, no treble tinsel – just delicious weight and detail, nicely in proportion, convincingly imaged in three dimensions without falling into

the trap, as some £300 headphones do, of sounding suspiciously airy and expansive. It creates a sense of ease that kills fatigue and reduces curiosity about how much better really pricey headphones would sound.

Do I crave for more analysis listening to the baby Oppos? Not really. With a hi-res feed, not at all. The detail's all there but never seems overt or spotlighted, just lucid and uninhibited. Musical complexities aren't 'difficult', timing is right on the money, especially with the Chord Hugo in the loop. Steely Dan's *Aja* – in truth, not the duo's most glittering studio triumph even in digitally re-mastered form – sounds satisfyingly vivid, dynamic and muscular. Immersed in the music, I

The PM-3 shows great respect, finesse and a sense of performance

don't feel inclined to focus on its hi-fi inadequacies. The PM-3 has the happy knack of heading straight for the musical heart of the material. If its overall balance is a little more relaxed than that of some rivals, it certainly doesn't stop it conveying presence and vitality to the full.

Sometimes manipulative smoothness and warmth can be mistaken for naturalness, but there's no euphonic buttering up here. Maybe it's not quite the ideal headphone for hardcore headbangers, but pump up the volume and excitement most definitely gets out of bed. The forceful, up-front sound on *Rave Un2 The Joy Fantastic* from Prince sounds exceptionally solid

and rhythmic with whip-crack transients and outstandingly explicit vocals. Contrastingly, a delicate touch is apparent with classical music. Dvorak isn't generally noted for his jaunty tempos and the Oppos show great respect, finesse and a sense of performance with the slower pace and orchestral sensibilities. String tone has a particularly natural and unforced quality – smooth and nicely integrated with just the right amount of body.

Conclusion

So, to recap, Oppo's gorgeous PM-3 headphones are 'entry-level' in name only. No, they don't sound quite as polished and detailed as their larger and more expensive open-back PM-1 and PM-2 siblings. But they do share a cut-down version of those models' planar magnetic drivers and so biff much of the similarly priced portable competition into the middle of next week. That they are also well made, look smartly understated and remain comfortable to wear seals them an enthusiastic recommendation ●

Hi-Fi Choice

OUR VERDICT

SOUND QUALITY

★★★★★

LIKE: Top-notch sound; comfortable and well made

VALUE FOR MONEY

★★★★★

DISLIKE: Not one for headwear fashionistas

BUILD QUALITY

★★★★★

WE SAY: Undoubtedly Oppo's best-value headphone. Planar driver sonics in an affordable, portable package. Brilliant

EASE OF DRIVE

★★★★★

OVERALL

★★★★★

CONNECTIONS



- 1 Padded steel headband
- 2 Over-ear closed cup with planar magnetic driver
- 3 Detachable cord with remote



Size matters

They may look like a throwback from the past, but there's more to these speakers than meets the eye reckons **David Vivian**

Streaming for real music lovers" says the ad line Berlin-based Teufel has attached to its stocky, semi-active Raumfeld Stereo M loudspeakers. Sons of Sonos, brides of Bose, lovers of titchy, moulded plastic multi-room speakers listen up, this isn't – repeat isn't – for you.

I'm sure Teufel would love to carve a slice of the ever-expanding multi-room streaming cake for itself. All it has to do is win over those wedded to the notion that modern living is to have décor-integrated kit in every room with the proposition that streaming convenience and flexibility are not incompatible with proper, hi-res, sound quality.

At first glance, you'd have to conclude that it doesn't have a hope.

The Stereo M is unapologetically bulky, wilfully retro, and short of placement inside a cupboard has no intention of dissolving into the background. The 'active' speaker that contains the electronics – 140W per channel Class D integrated amp/DAC, network wi-fi streaming – even sports a fifties-style brushed aluminium dashboard incorporating volume knob and four pre-set buttons for accessing favourites if you don't want to use the dedicated controller or iOS/Android app for your smartphone or tablet.

Then again, perhaps real music lovers with a penchant for streaming have already folded the new tech into their finely graded bespoke separates systems or opted for the custom install solution. It's all a bit *Catch 22* and, as I struggle to liberate the weighty

DETAILS

PRODUCT
Raumfeld Stereo M

ORIGIN
Germany

TYPE
3-way wireless
standmount
speakers

WEIGHT
21.5kg

DIMENSIONS
(WxHxD)
210 x 420 x 275mm

FEATURES
● 25mm fabric
dome tweeter
with coaxial
110mm mid unit
● 140mm
Polypropylene-
coated bass driver
● Quoted power
output: 2x 140W
● 1 analogue input;
1 USB 2.0 input

DISTRIBUTOR
Lautsprecher
Teufel GmbH

TELEPHONE
03308 080489

WEBSITE
raumfeld.com

speakers from their packaging, I'm still left wondering where I'm going to put them. I settle on my bedroom, which already houses a second system comprising a Monitor Audio A100 (HFC 388) streaming amp/DAC driving a pair of Edwards Audio SP2 (HFC 393) floorstanding speakers. A little friendly competition. Rather worryingly, the speakers can be positioned only a couple of feet apart. The rear panel of the active model has one analogue input, while music stored on memory sticks finds a home with the USB slot.

To be fair, although distractingly large, the rear slot-ported reflex MDF enclosures are solid, beautifully put together and nicely finished, with a matt varnish, in black or white. The Raumfeld speakers appear to be the real deal, each enclosure housing a coaxial mid-treble driver teamed with a long-throw 140mm woofer in a true three-way configuration. The 25mm fabric dome tweeter has a cool-looking waveguide chassis in the centre, that sits proud of the mid driver's coated cellulose cone with the aim of emulating a true point source and minimising phase and timing anomalies, while the stoutly built bass driver features a polypropylene cone.

Unapologetically retro, the Stereo M loudspeakers are incredibly well built

The best news is that once you've downloaded the Raumfeld app to your smartphone or tablet, you're ready to go – no individual amp, disc player or laptop required (though you can hook-up a NAS, hard drive server or any computer storage if you want to). As long as you have a fully functioning wi-fi router, the app's set-up procedure is a breeze and the control interface every bit as intuitive and slick as Spotify's. All right, no support for DSD right now, but all formats from lossy (MP3, Ogg, WMA and AAC) to genuine hi-res (up to 24-bit and 192kHz) run smoothly whether wirelessly streamed or plugged in.

Sound quality

If you wanted, you could put the Stereo Ms on a chunky pair of stands, run the supplied speaker cable connecting the active speaker to its passive sibling neatly along the skirting board, experiment with positioning, place your favourite chair in the sweet spot and, tablet in hand, trial Raumfeld's unusual retro/new-tech fusion as a main system. But, as part of Raumfeld's bigger multi-room streaming remit, that's clearly not their natural home. Positioned too close together on top of a (admittedly pretty solid) chest of drawers is where they have to impress.

My regular Monitor Audio/Edwards Audio second string setup (speakers again less than ideally spaced) sounds lean, fast, airy and very explicit here and, in almost every respect, qualifies as a 'music lover's hi-fi system. I'm not sure what to expect from the Stereo M, but I could have hardly imagined it would be quite so different. Running through the usual gamut of internet

radio stations, Spotify and USB stick-stored CD rips, the sound seems almost ridiculously smooth and velvety in comparison – amply endowed with 'couth' and sophistication, but lacking a degree of energy and sparkle. Not a turn off by any means, just a bit of a shock. Too much of a shock, actually, to entertain any further comparisons with the Monitor Audio/Edwards Audio system. Instead, I am intrigued to see if I can live and get on with a presentation that is so fundamentally skewed from what I am used to.

I suspect that there are two possible reasons why the Stereo M seems to

The system sounds satisfyingly solid and propulsive with full-blooded tonal colours

initially sound like this. One, it really is as flat as three year-old lemonade and doesn't like being placed on bedroom furniture. Or two, it is concealing a big Class D stick and, as is sometimes the case, is simply just choosing to speak quietly unless roused to do otherwise.

Going with the second hunch, I turn up the volume and stand back to hear the results. Although the sound remains very 'controlled' and seemingly low in distortion, the gains in presence, weight and dynamic expression seem almost disproportionately potent, boosting the speakers' ability to imbue music with a sense of life and impetus.

The Stereo M can't quite muster the startling immediacy that characterises

some true, two-box active designs. That said, the extra weight and resolution of small details are now beginning to lend music a realism that draws me in, the perceived top end roll off being less of an issue. Fed a CD rip of Don Grusin's sumptuously produced *Geography* album, for instance, the system sounds satisfyingly solid and propulsive with full-blooded tonal colours and nicely resolved timbres. The bass is a genuine surprise, not just integrating beautifully with the coax mid-treble drivers, but digging deep with real grip and rhythmic integrity.

The system's full-bodied presentation is even more appreciated with thin, undernourished recordings, lending The Crusaders' otherwise masterful *Healing The Wounds* album a more fleshed out, three-dimensional realisation of the vitality and super-tight playing that drives most of the tracks. If there's a caveat – and it's probably something to do with the slightly dark tonal balance – it's that hi-res material doesn't soar quite as effortlessly as it should, reinforcing the Stereo M's already sky-high listenability, but without adding much in the way of tingle factor.

Conclusion

Respect to Raumfeld. The Stereo M delivers streaming with a hi-fi ethos, letting the music make its own case without the addition of artificial sonic sweeteners. If hi-res doesn't quite hit the heights, the system's ability to make CD or lower-quality material seem better than you remember it, sometimes by a large margin, is a neat trick to say the least, especially as, in my case, the placement of the speakers is deliberately 'real world'. If you can live with the size and price, it does little to challenge the notion that kicking back in your favourite chair to listen to music on a well-balanced hi-fi is one of life's pleasures. Whichever room you happen to be in ●

CONNECTIONS



- 1 25mm/110mm coaxial tweeter/mid driver
- 2 USB port for memory sticks
- 3 Analogue RCA line input
- 4 Robust speaker binding terminals
- 5 140mm woofer

Hi-FiChoice

OUR VERDICT

SOUND QUALITY ★★★★★	LIKE: Smooth, well-upholstered sound; imaging; build quality
VALUE FOR MONEY ★★★★★	DISLIKE: Hard to accommodate; dark tonal balance knocks back hi-res tracks
BUILD QUALITY ★★★★★	WE SAY: Near top-notch sonics, but retro aesthetic and bulk won't suit everyone
FEATURES ★★★★★	

OVERALL





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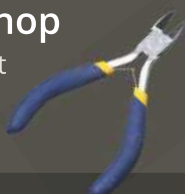
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Good WOOD

David Price talks to Eddie Spruit and Alester Kells about how a career as a lawyer went slightly off course, leading to the setting up of Quadraspire

Life is what you make it, and Eddie Spruit is living proof of this. Had he followed his planned career path, he would be in London now, dispensing law on behalf of corporate multinationals. A student of the School of Oriental and African Studies, young Edward's major was in the economics of China and Japan. Then on graduating, he decided to do a conversion course to become a lawyer, and found himself working for Pfizer pharmaceuticals, as you do.

"The reason I went there," he tells me, "is that they wanted a part-time lawyer, and this let me take a little time off to pursue my hobby, which was – and is – cabinet making". Eddie duly did, and soon realised, "it was more interesting studying law than practicing it. The guys there – the partners – looked old for their age and were doing silly hours. I thought, life is too short. I wanted to do what I wanted to do, and cabinet making was my passion!"

He began renting a workshop in London's East End, and started making one-off pieces of furniture. "This was 1992, and I realised

that if I was going to leave law, I needed a steady income, and had to do a product that would give me cash flow. With one-off stuff, you never know how long it will take, how many you are going to be doing in a year, so I started to make little jewellery boxes in the shape of a sail. With some friends we would rent a shop off Oxford Street for six weeks or so before Christmas, selling all kinds of

If I had known about bamboo 20 years ago I'm not sure we would have ever used veneers

designer stuff. I developed a little display stand using aluminium columns and triangular curved shelves. After about the third year, a guy setting up a hi-fi shop came in and suggested I did a rack..."

At the time, Eddie was doing a special commission for someone. A solid cherry desk, six feet by three feet, it had extreme curves and was an interesting shape. "So I

thought, I'll use that shape to make my shelf," he remembers. "I came up with a prototype very close to what ended up being the Q4. The guys thought it was good, but said that I should take it to Graham's hi-fi shop. They said that they already had enough racks, but we got talking and after a while suggested I drop mine off because they were doing an assessment. A week later they phoned me up and said mine was the best of all they had tested, and that they wanted to recommend it to their customers."

Big in Japan

Eddie was making them in small batches, and looking for a subcontractor to mass produce them. His dream was to use this to let him leave his law job completely, and then he could settle down to do his bespoke furniture. Then in 1996 Malcolm Steward did a review in *Hi-Fi Choice* and, "it just took off from there, basically", he remembers. One thing led to another, and he got exports, then Linn Products asked him to supply racks for its factory and shows. This introduced him to a Japanese distributor



Quadraspire's entry-level Q4 EVO (left) flagship X REF (centre) and mid-price SVT (right)



One of Quadraspire's high-precision automated cutting machines



Everything from wood cutting to power coating metal is done in the factory

that he has worked with to this day. "They started importing into Japan, and they came over and that relationship just got stronger and stronger, which is crazy! I think from about the turn of the millennium we were doing a container a month to there, about £20,000 of furniture!"

Quadraspire was originally named after one of Eddie's early pieces of furniture, a charming and quirky four-way folding corner table. But suddenly he found himself a respected hi-fi accessory manufacturer, and the range grew. His Japanese distributor asked for ever more exotic designs, and ever higher quantities. He was still living in London at this point, but made the decision to move to Bath with his new wife and get a factory. He had been let down by several

contractors, and wanted to move his production inhouse. "I moved to the West Country and started the factory from scratch. It was a long journey; never having done manufacturing before, it was a lot to learn!"

Eddie loves designing, but his focus has always been to keep supplying his customers, he confides. "Trying to be reliable, supplying within the timeframe, keeping to a certain standard, because there's no point cutting corners." This has stood the company in good stead, but it hasn't been a cakewalk. One problem he has faced is keeping his range in check; Quadraspire has at various points done quite a bewildering range of hi-fi racks, and for

It's still amazing when you go to hi-fi shows to see manufacturers stack their kit on cheap stands

this reason he has recently decided to slim things down to the Q4 EVO (the entry-level product in Cherry, £110 per tier), SVT (premium range in Bamboo, £280 per tier) and now X REF (flagship design, £1,000 per tier). There is also the option of the new Bronze upgrade package, which replaces the standard power coated aluminium spikes with carefully selected and machined bronze metalwork. This costs an extra £200 on the Q4 EVO, and £400 on the SVT.

"The aim with this was to come up with something that is pleasing to the eye in the home, but really competes on sonic terms with the really expensive designs." There's also a custom build service; "We can make racks to customers' individual requirements – so if you need longer, wider, deeper,

THREE'S COMPANY

The current Quadraspire range comprises the Q4 EVO, SVT and X REF. All are carefully shaped so that they store as little energy as possible. As the range progresses up in price, more work is done to guarantee superior isolating properties. I got the chance to make direct A-B comparisons between the three Quadraspire ranges, as well as hearing the difference between the standard aluminium columns and the Bronze spike upgrade pack. Listening tests were made with the kind help of Audio T of Bristol (audiot.co.uk/storefinder/bristol/), using a £30,000 system comprising a Naim NDS/555 streamer (£13,925), Bryston BP26/4B SST pre-power amplifier (£8,925) and PMC twenty.26 loudspeakers (£5,750) – with the Naim streamer being moved directly from each Quadraspire rack to the next.

The Q4 EVO rack delivered a good sound; the system sounded crisp and smooth with a pleasingly rhythmic nature. There was very little to object to, it presented as a well chosen system that was able to perform to a high level. When an extra tier was added with the bronze spike upgrade, the sound changed to a surprising degree. It was as if a layer of noise had been stripped out, revealing more pronounced spaces between the notes. This gave a more dynamic sound, one that carried the rhythmic accents of music far more clearly. It also seemed to improve the timing quite markedly. For example, on the Rolling Stones' *Beast Of Burden* it was far easier to hear drummer Charlie Watts playing ever so slightly off the beat, giving it a wonderfully loose and human feel. Before, the music seemed a little more opaque and the rhythms and dynamics less pronounced. It was a surprisingly profound improvement, considering its modest nature.

Moving to the SVT was less surprising. The sound got slightly better, with a marginally stronger and more articulate bass, and a slight smoothing of the upper midband. It was a useful upgrade, but less significant than the first change. The music flowed better, had a greater sense of ease and seemed fractionally larger in scale; certainly things at the back of the recorded acoustic got a little better defined. Finally, moving to the X REF was dramatic; greater even in scale than the first change to the Bronze spikes, it was like moving from CD to hi-res. The sound was larger still, significantly deeper and seemingly less caught inside the speakers. Tonally the recording seemed less brittle and yet more detail came forth; it was even possible to hear a hi-hat cymbal that had been previously lost in the mix. The most palpable improvement was the focus and insight; strands in the mix now played independently of one another and this gave the music so much more life. As significant as any cable upgrade I have come across, it brought a far more nuanced and insightful sound.



thicker, whatever, we can do it." This is only possible because everything is made at the company's large factory just outside of Bath, and not in China by an OEM manufacturer.

Eddie says his business has grown strongly thanks to Japan, which is a market that understands the importance of hi-fi supports. "They just naturally get it. In many countries the thing you place your system on is seen as ►

INSIDER FEATURE QUADRASPIRE

Eddie Spruit celebrates the original 'quadraspire' corner table



A sneak peak of the new bamboo speaker stands coming soon

BOOPLINTH

"This is made from solid bamboo. In its natural form it is almost as light as beech or maple, but when you heat the bamboo so the sugar inside melts a bit, you get a caramel look. It is pure bamboo, cut into thin rectangular strips, and laminated together side by side to create a sheet. This is cross laminated together for a kind of plywood effect. We machine from that, now to create the Booplith – we cut the panels roughly to size then glue them together using special hard glue to get the thickness, and then we machine it out of that one piece of bamboo. It's not so bad machining 20mm bamboo, but when you machine 66mm bamboo like this, it's very hard wearing on the tool and the machine!" The Booplith company sell it for £1,650 including fitting.

booplith.com



The new Booplith for the Linn LP12 is beautifully made by Quadraspire

an irrelevance, or at best an aesthetic choice. But the Japanese know that supports can have a dramatic effect on the sound. It's a message I haven't needed to push out there."

In the UK, despite getting some excellent dealers on side and his very helpful *Hi-Fi Choice* review some two decades ago, he has encountered resistance. Many people don't think hi-fi supports play an active part in the sound quality of their system, and those that do have traditionally thought metal and glass supports are the best. I put it to Product Engineer Alester Kells that this is a little odd, given the propensity of both to resonate. Surely what is needed is a structure that is light but doesn't store energy, rather than a heavy one that rings?

Wood you believe it

After studying at Central St Martins, Alester graduated with a degree in Product Design and is passionate about his day job, which also happens to be a hobby too. "A lot of people were a bit sceptical about the original Quadraspire rack. They thought it didn't have much substance to it, and wondered if it was really going to work. The market was all about glass and steel, but it wasn't and isn't the answer. Rather, wood is an excellent material and comes in so many variants, all with differing strengths and damping properties. Since the sound of a hi-fi system is affected by ground and air-borne vibration, the way that energy travels through a rack has a big effect. It's mechanical, we know this."

Given that people have known that speaker stands have their own sound for the past 30 years, why does Alester think so many believe that precisely the same thing at the other end of the playback chain cannot possibly make a difference? "It's about

getting across the idea that a good hi-fi support will cost a lot of money, but will make your system right. It will let you get more from all of the other products you have invested in. By not having your system set up properly, then you might as well be throwing that money away, because you are not going to make the most of that system."

Having not worked in hi-fi manufacturing until recently, Alester recalls his horror at going to hi-fi shows around the world and seeing just how cavalier many companies are about system supports. "It's still amazing when you go to hi-fi shows and see major electronics manufacturers with their kit

In 1996 a good review appeared in *HFC*, one thing led to another and it just took off from there

stacked up, box on top of box, on some cheap Ikea coffee table or suchlike. At the recent Munich High End Show there were some really big names – including, amazingly, a speaker manufacturer – paying no serious attention to this part of the system. Some of the stands looked pretty, but the kit was turned off, it was doing its job – and not very well."

Quadraspire is passionate about the virtues of wood in all its myriad forms then, and is a recent convert to bamboo – a material both Eddie and Alester think is superb for audio applications. Eddie explains: "One of the companies that we spray wood for, came along in 2010. It was an importer of bamboo sheets from China, and we decided to try some samples. We machined a Q4 EVO from bamboo and compared the two blind. It was

clearly better than the veneered MDF, which itself is a really good platform. It's a fantastic material and we have got a really good response. Indeed if I had known about it 20 years ago, I wonder if I would ever have used veneers – probably just bamboo in three or four different finishes."

Prepare to be bamboozled

One thing led to another, and Quadraspire is now getting ever more serious about this marvellous material. There is a new speaker stand, combining bamboo uprights and Nextel-covered top and bottom plates, out this autumn, and the company has collaborated with a highly respected Manchester-based Linn dealer to make the Booplith, a bamboo plinth for the Linn Sondek LP12 turntable. There's even a set of bamboo wall brackets, too. It's so strong that it is very difficult to machine, and wears out tools quickly, but its structure, and the fact that it has so much air inside it, makes it ideal for audio applications, he tells me.

Perhaps the company's most important product is the flagship X REF, which builds on the SVT rack. It too is a low-mass design with curved shelves and no parallel lines; this breaks up standing waves and avoids storing energy. The new rack uses more extreme curves and mass is further reduced, with special grooving on the underside to minimise resonance. It has laminated bamboo shelving and is coated in Nextel for sound deadening. Its edges are more acute than normal to lower weight and assist energy dissipation, and small conical bronze spike locators hold the shelf in place. "It's a whole new market for us," says Alester, "with a whole new level of care and attention, but that's what we have always been about" ● quadraspire.co.uk

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THIS MONTH



ED SELLEY

EXPERTISE: REVIEWER

Active in the industry since 1999, Ed's first record was *Boss Drum* by The Shamen. He splits his time between reviewing and protecting hi-fi kit from toddler son Will.



NEVILLE ROBERTS

EXPERTISE: ENGINEER

Neville has an eclectic taste for classical baroque and jazz. His wife was forced to marry his transmission line speakers in the eighties and he collects BBC test card music.



DAVID PRICE

EXPERTISE: REVIEWER

DP two-finger typed his first hi-fi review some 25 years ago. Since then he's edited *Hi-Fi World* and *HFC*. He describes himself as an "unreconstructed analogue addict".



JASON KENNEDY

EXPERTISE: REVIEWER

Editor of *HFC* from 1998 to 2001, Jason's first turntable was Rega's Planar 3 and Elvis' *40 Greatest Hits* was his first vinyl, so don't go stepping on his blue suede shoes.



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➤ Top floor

I have a Rotel 02 Series CD player, preamp, power amps, tuner and Rega P2 turntable and use Musical Fidelity's V90 DAC with the CD player. At present I am using Spendor S5e floorstanding speakers, which are bi-amped, but I'm thinking of upgrading with a new speaker up to £3,000. What would you suggest is a good match for my system? Also, any chance of a floorstanders *Group Test* priced between the £2,000 to £4,000 price bracket?

Gordon Jaye

LD: Hi Gordon, it's always good to receive suggestions for *Group Tests*, but the price range you've given is a bit outside what we'd normally pitch our floorstanding speaker roundups. We do have a floorstanding *Group Test* coming later in the year, but this will be with sub-£2k models. We do, of course, cover more upmarket models in our standalone reviews in *Exotica* as well as our *Beautiful System* and *Dealer Visit* features – so look out for our informative reviews in these pages.

JK: If you like your current Spendors but want something better you could do a lot worse than try Spendor's A6R at £2,500. This is a floorstanding two-way that has the coherence and evenness of balance that you are used to, but can deliver greater bass extension and higher levels with ease. It's probably a bit easier to drive too. The alternative

to put up against it would be PMC's twenty.23 at £2,300, this is also a two-way but uses a transmission line rather than a reflex cabinet and delivers a detailed, fast and musically engaging result that will have you glued to the listening seat.

➤ Which is best?

I have a question regarding cables that I would appreciate your advice on. If purchasing a CD-based system, which setup would you suggest to provide the most accurate/lossless data transfer?

Option 1, comprising of a CD transport, a digital interconnect and an integrated amplifier with a DAC. Or option 2, comprising a traditional CD player, an analogue interconnect and an integrated amplifier?

If the standalone CD transport in the first option is identical to the transport present in the traditional CD player and the DAC chip present in the integrated amplifier is also identical to the DAC present in the traditional CD player, this would leave the only different factor being the connecting cable choice/data transfer method – digital or analogue. As a result, which 'data transfer' method would provide the least amount of information lost?

Mike Farrow

NR: Hi Mike, this is a straight choice between a digital

interconnect or an analogue one with all other things being equal. My view would be that there is very little to choose between the two, given that you would be using good-quality interconnects anyway. I therefore think that your decision will depend on other factors, such as are you likely to want additional digital sources apart from CD in the

future, for example internet radio and file streaming?

Other sources are likely to require higher bit depths and sampling frequencies than the straightforward 16-bit/44kHz requirement of a CD. So can you get the quality of DAC that you may require in the integrated amplifier solution that you are considering? Just a thought.



Jason believes Spendor's A6R should be ideally suited to Gordon's current setup



There are benefits to using Tidal on a tablet, laptop or mobile phone

JK: Good question Mike, in theory digital connections are more robust/less easy to corrupt than analogue ones. However, because digital connections introduce jitter this doesn't prove to be the case in music systems and keeping the DAC next to the transport is the most effective way of building a good-sounding CD player at a realistic price. There are high-end transport and DAC combinations that perform extremely well, but we are talking about brands like MSB, dCS and Esoteric – all megabucks components with digital connection types not found on affordable kit.

Will I get the benefit of Tidal if I use it on my mobile phone?

DP: If you had a CD player with – let's say – an ESS Sabre 9018 DAC feeding a line-level integrated via analogue interconnects, then the sound could be harmed by the poor implementation of the DAC (ie noise on the circuit board from the transport, noise from the power supply), a poorly executed analogue output stage, interference from the interconnects and then the signal routing inside the amplifier. Conversely, doing it the other way could be compromised by interference on the digital interconnect, interference from the same ESS DAC fitted inside the amplifier to its own analogue stages, interference from the power supply of the CD transport and amplifier and so on. And then there's always jitter, in both cases, too! My point is that it's just impossible to say 'in the field', even though common sense

suggests option 1 should work better. You need to audit every single component in the chain, and that's difficult. The easy answer is to simply go and find a dealer and do a comparative listening test for yourself.

LETTER OF THE MONTH

What's the res?

After reading your recent *Group Test* on music streaming services (*HFC 396*), I noticed that you recommended Tidal as a possible option at £20 per month. I have heard from more than one source that although Tidal claims to offer a certain level of (high) resolution to its customers, not all of those customers will get that level for their £20, depending on what equipment they will be using it with. For example, if someone chooses to use a basic mobile phone and a pair of headphones, they will not be much better off than using Spotify and at double the price. Is this true or am I missing something?

Neil Porter

ES: Hi Neil, having run a number of tests over the course of the streaming services *Group Test* (*HFC 396*), I can confirm that there are some benefits to Tidal even on a Motorola Android phone or iPad. It is also worth pointing out that you can use Tidal in full-bore lossless on your system while still streaming and storing compressed versions of the same files on your phone to save space if you need to.

What is the cause of the humming from Barry's CD player?

Rattle and hum

I hope that you can help me remove the unbearable hum emanating from my system. This occurred when I introduced a CD player.

The player in question is a Cambridge Audio Topaz CD5. Amplifier is Rotel RA310. Speakers are KEF Cadenza with Thorens TD125 turntable and SME 3009 tonearm. I have checked the amp, speakers and turntable, which works well with no hum. I have tried changing the CD player and alternating interconnects. The amplifier does not have a specific CD connection, but I have tried both its extra and tuner inputs, and the problem still seems to persist.

I would greatly appreciate advice to cure the problem. All Richer Sounds could suggest is trying a different CD player.

Barry Cross

NR: Hello Barry, I'm afraid that you are the victim of the classic 'hum loop' problem that is usually caused by having a signal earth connection at two points in your audio chain. It's not an actual fault with any piece of equipment as such, but just a consequence of connecting different designs of equipment together. Firstly, I would never recommend disconnecting the earth connection in the mains plug in any piece of equipment as that will compromise safety. As the problem seems to occur only

TWITTER QUERIES



David Hannah

@HiFiChoiceMag best turntable/amp/speaker combo for £1,500? Any thoughts? For playing rock/metal.



Hi-Fi Choice

@facetsquared first up at well under £1,500 @MF_HiFi's compact Merlin 1 system r/wvd in April's issue has lots to offer



Hi-Fi Choice

@facetsquared alternatively Pro-Ject Debut Carbon Esprit /@CambridgeAudio Azur 651A with @QAcoustics 3050 or @BowersWilkins 685 S2 speakers



Hi-Fi Choice

@facetsquared but if you like the 1 brand approach @RegaResearch's Brio R amp/RP3 deck/RS speakers take some beating - lots to pick from!



David Hannah

@HiFiChoiceMag many thanks. The Rega 3 and amp was recommended by a dealer too. Some auditioning to be done.

when you connect your CD player to the Rotel, a better solution is to disconnect the earth screening of both the left and right interconnect phono plugs from one end only – at the ends that plug into the Rotel. That should solve the hum loop, allow both the CD player and the Rotel to have earth connections and maintain the earth return for the audio signal. Also, keep the signal screen of the interconnects earthed at the CD player end.

JK: That's an odd one especially if you've tried another CD player and got the same result. If what Neville suggests doesn't work, I would surmise that because your amplifier was built before the CD era that it is having trouble with



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Mark can get a dual tonearm adaptor for the SME Model 10

the relatively high output that they produce. Tuners, tape recorders and other pre-digital line-source components delivered far lower output than CD players and so the sensitivity of your line inputs may just be too high. The unfortunate answer, therefore, is to invest in a new amplifier.

➤ Turntable turmoil

I have finally got the time and room space to go back to my vinyl collection. My (very) old kit comprised a Manticore Mantra record deck with Linn cartridge and LVX arm, A&R A60 amp, Heybrook HB1 speakers alongside a Marantz CD52 (Special) and Technics STG4 tuner.

I will replace the CD player and tuner with a streamer at some stage, but for now I have had the Mantra serviced and an Ortofon 2M Blue fitted and am using it with a Rega Aria and Elicit-R amp, plus Focal Aria 906 speakers. Perhaps I should have started with replacing the Mantra, but it all sounds so good!

However, the Mantra won't last forever, so with that in mind can you suggest a deck/arm/cartridge combo for up to £5,000 that will make the most of my new kit? My music taste covers mostly

rock, pop and jazz and whatever you call Van Morrison's music, plus more recently classical although I suspect I will use the streamer and downloads to source the latter.

I prefer the idea of a suspended deck, but technology must have moved on in the last 30 years and there seems to be a lot more choice now. As I have started buying second-hand vinyl I like the idea of two arms, one with a better cartridge or even mono, but that probably narrows the choice too much. Any help much appreciated – great mag by the way.

Mark Raymond

NR: Hi Mark, I'm delighted to hear that you're enjoying your vinyl collection once again. Getting a two-arm deck and cartridges within your budget will be tricky, but if you can source an SME Model 10 turntable, you can buy a M10-DP dual tonearm mounting plate adapter from Timestep, which enables you to fit a second arm to that turntable. Also, I can thoroughly recommend the Miyajima Kotetu Mono MC Cartridge, also imported by Timestep, to fit in a second arm. It is a real eye opener what you can

get from a mono recording. Anyway, don't completely rule out a non-suspended deck as there are some superb designs out there that have excellent isolation feet and sub-plinths. Have a look at the wide range of turntables from Pro-Ject, including those where the motor is effectively isolated from the plinth. As an alternative to a dual-arm turntable, you could manage with a single arm with a removable headshell, such as the Jelco 750 unipivot and have two headshells. The only down side of this arrangement is the need to adjust the tracking force when you swap between cartridges, but all you need is to keep a digital stylus force gauge handy. Incidentally, don't give up on vinyl as a source of classical music. Apart from the wealth of second-hand LPs that are available on auction sites and LP specialist suppliers, new 180g vinyl is also appearing again, such as Ingrid Fliter playing Chopin Preludes on LP from Linn Records.

➤ Ear for detail

I would value your advice on the best way to improve the sound of my system. I can spend about £2,500, and the same again next year. My current setup is Naim CD 3.5 with HiCap p/s, TDS audiophile passive harmonic 'enhancer' that I like the effect of, Classé pre and power amp (CP-35 through DPA Black Slink balanced XLR into CA-101), Proac Response 3.8 speakers. Cabling is van den Hul CS-122, Audioquest Quartz 3 (CD to TDS), Supra EFF (TDS to preamp), Mark Grant G2000 Ag or van den Hul The Wave (Squeezebox to preamp: I swap these interconnects from time to time because I find the VDH richer and more musically coherent, but unable to convey the subtle treble details like shimmering piano

Ed says that Naim's NAC-N 172 XS holds the answer to Jim's problem

HINTS & TIPS

REPLACING THE JACK PLUG ON A HEADPHONE LEAD

Headphone cables can suffer from wear from repeated flexing and pulling. This is especially true of those that are used on portable media players and the like. Indeed, we have heard of a recent case where the family cat decided to chew off the plug from a set! Whatever the reason for the damage, a repair of the plug connection is unlikely to be an option if the plug is moulded onto the cable, so fitting a new plug is the only choice.

Replacement plugs are readily available from your local stockist or online. You first need to check what type you need. They will either be 1/4in (6.35mm) diameter, 3.5mm or 2.5mm and either mono (unlikely!) with one black ring on the plug, 3-way stereo with two rings, or 4-way stereo with microphone and three rings on the plug. The connections to each ring inside the plug are in order with the centre one being the tip. On a 3-way stereo plug, the tip is the left channel (usually a green or white wire), the next is the red right channel and the body is the earth or screen wire. For a 4-way plug, the tip is left, the first ring is right, the next ring is earth and the body is the microphone connection.



ADJUSTING CARTRIDGE ALIGNMENT

Aligning a cartridge in the headshell is not as straightforward as it might at first appear. This is because the groove of the record is cut using a cutter that is tracked straight across the radius of the record, while it is played back with a cartridge that tracks in an arc across the disc, since the tonearm is pivoted at one end. The calculations required to work out the optimum positioning of the cartridge are, therefore, not straightforward. There are several different cartridge alignment calculation models around, including those by Baerwald, Löfgren and Stevenson. Each of these models has its own particular strengths, but all are aimed at minimising distortion and tracking errors at different points across the record.

Fortunately, there are a number of alignment protractors out there that make the job easy and usually use the Baerwald calculations. The overhang (the difference between the spindle to pivot distance and the cartridge to pivot distance) and the angle of the cartridge in the headshell are set by sliding the cartridge forwards or backwards and twisting it in the headshell so that it lines up with the calibration marks on the gauge. This is usually at two points on the gauge and you should repeat the process until the cartridge is lined up at both points – job done!



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notes, the room echoes of a struck tom tom drum or the acoustic air around notes, which the Mark Grant cable can do better, but is a little lean sounding.

My priority is to improve the Squeezebox first, then the system in general. I am awaiting delivery of an impulse buy MCRU linear power supply for my Squeezebox, hoping this will improve things a bit while I consider more expensive upgrades. But should I opt to add a Chord Hugo/ QuteEX/2Qute to my Squeezebox, or would I get a better all-round result swapping out the Squeezebox for a more upmarket streamer like a Naim NDX?

Currently I use the Squeezebox with a USB stick

I'm considering upgrading my system, where should I start?

plugged in the back and am happy with that simple setup, just not with the flat sound.

My preamp strikes me as next in line for attention as it is not the last word in transparency. I'm considering Townshend Allegri, Naim NAC 82 or NAC 282. Which do you think would deliver the best upgrade, or is there anything else you'd suggest? I also have a spare Roksan Caspian power amp I could press into bi-amp duties with the CA-101. If you think this would render significant improvement, which power amp would you use for which frequency range?

I'm in Northern Ireland, with quite limited access to quality hi-fi for home demo. Usually I have to research reviews and forum opinions,

buy online, try at home, and resell on ebay if it's not what I like. Thanks in advance,

Jim Hawthorne

JK: Wow Jim that's quite a set up, you must have a lot of fun with those cables. As a Townshend Allegri user myself I can't recommend it highly enough and suspect that it would let you hear more of what your current sources are capable of. That said, you may be better off with an upgrade to the streaming source as you suggest, and the Naim NDX is certainly one of the better examples available. I suggest getting the Allegri first and seeing if that and the MCRU supply bring your streaming sounds up to standard. If not, then go for the NDX next year.

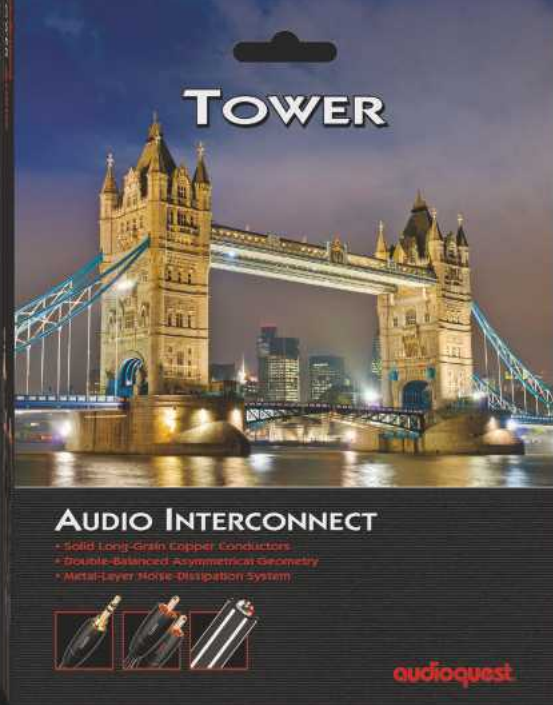
ES: In this case, why not kill two birds with one stone? Naim now has two streaming preamps, the NAC-N 172 XS and the NAC-N 272 and these would both replace the Squeezebox (and allow file playback in exactly the same method as you use presently), support your existing inputs and produce a significant boost in performance. You would then be in a position to look at a different power amp or an upgraded PSU in the next update. Reduce box count and boost performance at the same time, what's not to like?

➤ Bit of bother

I'm very new to this so you'll appreciate that my equipment won't win any prizes, but I've been fairly careful selecting components. I have a set of M-Audio AV40 active monitor speakers connected to the output of my Behringer Xenyx Q802USB mixer, into which I have my PC connected as a source via the Behringer USB interface and a Pro-Ject Elemental II turntable via a phono line in.

I know that the Behringer USB interface has a sample ▶

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rate of 48kHz, and some of my new tracks are sampled at 192kHz. I know all of the well-trodden arguments about the validity of tracks of this quality, and whether humans can actually detect the difference etc. but if we can just take it as read that I want to play them at 192kHz, I think it'll be easier.

But 192kHz into 48kHz doesn't go, so I'm not able to hear the higher-quality tracks through my speakers when connected via my mixer desk, as is my understanding.

If, however, I buy a high-quality PC sound card that supports 192kHz sampling, then bypass the Behringer codec by plugging the line out of this soundcard to a line in on the Behringer (eliminating its USB interface entirely), will I pass the higher bitrate through to the main out and so my speakers?

Ade Taylor

NR: Hi Ade, so in essence you want to know whether it will work if you use a separate DAC to convert your 24/192 audio files into analogue and feed the analogue signal into one of the line inputs on the Behringer? The answer is yes it will and I would recommend a good-quality USB DAC for this purpose, such as the Korg DS-DAC-100 (HFC 388), rather than a PC sound card as the analogue outputs of a PC sound card are unlikely to be up to the job.

➤ **Wizard of Oz**

I have lived in Western Australia for over 20 years and in that time nearly all the hi-fi shops have gone or become surround suppliers only. As a consequence, home auditions or trials are no longer available. I am in need of a new cartridge, the old one (Ortofon X5-MC) died. I have a Mitchell GyroSE with Techno arm, Music Fidelity



M1 LPS phono stage with an Audiolab 8000P (25 years old but still going strong), Audiolab 8200CDQ, B&W CM10 speakers and Taralab cables all round.

I am considering any of the Ortofon Quintet Black, Cadenza Red or Benz Micro Glider S, or even an outside chance of an Origin Live Aladdin (moving iron with good reviews). One dealer has told me he thinks the Quintet Bronze is better value than the Black, so I am getting really confused now. My main listening is Pink Floyd, Marillion, Led Zep, Dire Straits and Yes. Any help you can give would be greatly appreciated, even if you can help me bring my search down to two choices.

Ian Rennie

ES: Hi Ian, you aren't the first person to remark on the difference between the Black and the 'cooking' versions of the same range. The Black seems to be the no-holds-barred version and, as such, some people can find them a bit full on. This being said, the Quintet Black is a fantastic cartridge and from that list would be my personal preference. Having said that, depending on the exchange rate, a Dynavector DV20x2 should also be under serious consideration at the price.

Ortofon's Quintet Black is a fantastic option for Ian

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Yes, it's not just electronics, speakers also suffer the effects as detail and timing information are destroyed by the interaction between the signal and vibration and RFI/EMI.

Loudspeakers vibrate air of course, but that vibration travels everywhere via cables.

Particular care is taken with the crossover in both speakers, using technology developed by UK company Vertex AQ. Vibration is dissipated into material with thousands of pathways, while Stealth shielding developed for military aircraft and ships protects against RFI/EMI.

A second key feature are cabinets built from Tankwood, a composite so dense that it blunts diamond tools in Kaiser Acoustics' hi-tech factory near Munich.

Formed from highly-compressed beech ply and resin, Tankwood has inherently excellent damping properties but also is perfect for musicality, natural tone richness and authentic timbral colour.

Rear view of the Vivace, showing the passive mid/bass driver (top) and the additional bass unit. Finish of this particular pair is high gloss white with an exotic wood veneer front baffle. Almost any wood or paint finish is possible.

Don't think of the Chiara as a stand-mount speaker.

Vivace and Chiara loudspeakers both produce a scale, power and depth of sound out of all proportion to their physical size. So think of the Chiara as a compact floor-stander.

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Those labyrinths are the major reason the speaker offers power and scale like a floor-stander. Absorbing the huge energy inside the cabinet during intense music passages allows it to control timing and phase accuracy, key to that stable imaging and sound stage.

The result is stop-you-in-your-tracks presence and realism, a jaw-dropping re-creation of the original performance. Even playing music that's not your usual choice the effect is riveting.

A third feature of both speakers is an extra drive unit on the back passively driven by the main mid-bass front driver – similar to the Vivace (below left).

The aim is to work with and control the room, rather than fighting it and setting up difficult modes. Humans need *two milliseconds* to separate a musical tone from a noise, after which the room's ambient sound intrudes.

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Loudspeakers: Avalon, Gamut, Kawero! – Vivace & Chiara, NEAT, Totem. Cables: Chord Co., DNM, Nordost, Siltech, Vertex AQ. Mains: Vertex AQ. Supports: Arcici, Black Ravioli, Hi-Fi Racks, LeadingEdge, Stands Unique, Vertex AQ. Room Acoustics: LeadingEdge.

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Finish of this Vivace is high gloss Burgundy red with a carbon fibre baffle.



Chiara in another finish option. There's a third, passive, drive unit on the back.

Bavarian blessings

Munich's High End Show is done for another year and among all the shininess and excess **Ed Selley** sees some room for optimism as sensibly priced products get in on the action

The dust is settling on another industry get together at the MOC Exhibition Centre in Munich and as with a few preceding years I'm left with mixed emotions about what I've witnessed. Once again, I'm hugely impressed by the way that the MOC has continued to handle the show increasing in size. Much as we might bemoan the lack of such an event in the UK, I'm struggling to think of a venue here that would be so suitable and adaptable. Munich as a city is also a fine venue too.

In recent years, this positivity about the event has been somewhat undermined by the equipment that the show was actually bringing to my attention. At the end of my last visit in 2013, I found myself wondering just how much of various precious metals I'd seen by volume and whether the industry as a whole had decided to give up on new customers altogether. Almost everything of note two years ago was reflective enough to be used as a mirror and aimed exclusively at existing customers upgrading rather than getting new ones through the door. I don't mind products that cost more than my house, but when you only have those to display, I'm not sure what your long-term plans actually are.

This year felt a little different, though, and better for it. There was no shortage of insanely expensive products on show. Munich has come to rival CES as a place where the serious high end is on display and long may this continue. What made this year more interesting was that as well as these cathedrals to audio, there was a big slice of reasonably priced, clever and appealing product breaking cover and it seems that the industry might be looking to attract new blood.

More importantly, these affordable products were not tired hand-me-downs from years gone by. If we take the German market to be a little more traditional than the UK, there was still an appealing selection of post-CD products making effective use of computers, portable devices and the cloud to act as sources. These are frequently not a conventional shape and neither do they conform to the accepted roles of components, but they offer solutions that the public actively seem to be looking for rather than offering the same old answers as before.

Of course, 'affordable' means different things to different people but if we take the £400-500 and upwards point as being the inflation-adjusted equivalent to the price of a NAD 3020 in the past, this is an area being keenly



Germany's answer to One Direction give the kids what they really want

contested by manufacturers and with products that have clearly taken time and effort to develop. The really good news is that this seemed to be having an effect. Maybe I'm getting older, but there were a goodly number of younger visitors this year than I've seen at previous shows.

Furthermore, the way the equipment was being shown to the public was more inventive, interactive and simply more interesting than in years gone by. The open 'Halle' areas are slowly but surely changing from a place where companies that really wanted a room but couldn't afford one sullenly display some products with a brochure or two into a world of clever and attractive stands that really make decent use of the space available. Companies like Sennheiser, Pro-Ject and Cambridge brought stands that actually looked like they wanted to be there. Nor was this limited to just the Halle areas. Seeing Q Acoustics rub shoulders with the megabucks brands in the Atriums and having just as many people visit its demos as some more expensive rivals was a heartening sight.

Setting the trend

To be clear, I don't want to lose the exotica from the event – this is the High End Show after all – and seeing brands that rarely exhibit anywhere else is what makes it a special place. For me, this year's show was better than many previous ones and saw an industry that has its mojo back at all price points and not simply in the stratosphere. After a few years of technical flux and some confusion over what customers actually want, it looks like both sides are starting to move towards a common goal. But as my grandmother has often pointed out, one swallow does not a summer make, and I wait to see what upcoming shows bring to see if the Munich theme continues. But I feel more positive about the state of the industry post visiting the High End Show than I have in quite some time ●



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The power and the glory

Despite years of inveterate tweaking, **David Price** never fully realised quite what a difference using regenerated mains could bring. Does this mean an end to the fiddling?

There are two types of audiophile – those who listen to music and those that fiddle around with their systems. I fit into both categories, and as my setup has got better, I have spent a proportionally smaller amount of time messing with it. That's great, it was always the intention, and things are moving in the right direction. Perhaps by the time I am on the edge of deafness, I will have beaten the upgrade bug!

If we're brutally frank, one of the joys of this hobby/passion/vocation (delete as appropriate) is that there is so much room for fiddling. The hi-fi industry is a veritable repository of people who just can't sit still, who always want to go one better. This isn't bad in itself, because like maximum security prisons it keeps large numbers of dazed and confused people off the streets. A lot of these folk spend great amounts of time chasing rainbows so to speak, believing that this or that new mod will change their lives.

Whether it is exotic organic damping compounds, electrostatic charge field reducers, disc demagnetisers or whatever, there's a ready market for what I call 'hi-fi hocus pocus', and it never ceases to amaze me how much money is spent. Such wonder tweaks give the rest of the hi-fi accessory market a bad name. For every fancy £300 RCA phono plug that makes next to no difference, there's a £30 interconnect lead that usefully upgrades the free ones that

The bass is cleaner, and a layer of upper midband mush has been stripped away

'snog, marry or avoid', as the saying goes?

Decades spent reviewing all manner of products claimed to dramatically upgrade hi-fi systems, has taught me that you can't reliably predict results so you have to hear the difference for yourself. Cables are the classic example of this; the effects they have can be subtle or profound, depending on your system and you never know until you try. This goes for both signal and mains cables; some have a modest effect, others can be significant.

If mains leads can improve the sonics of a system, then what about the mains itself? When I lived in London, this was a big issue for me and I struggled to get my hi-fi to sound good, trying anything that claimed to alleviate the effect of the noise-riddled AC mains supply. I had varying success; some mains conditioners worked a bit, others seemed to 'over damp' the sound, making it smoother but flat and lifeless. This was especially detectable when playing vinyl, and in the end I gave up – electing instead just to use

good mains leads with plugs cleaned by Kontak. It sweetened things up, yet didn't detract in any way.

When I moved to the wilds of Wiltshire, I became less inclined to fiddle with my mains because it's pretty good here. For example, it's quiet enough to tell when the fridge has switched on in the kitchen, because the sound gets slightly more brittle, whereas in London, it was just so noisy that everything sounded mushy and harsh all the time. So it was interesting to try IsoTek's EVO3 Mosaic Genesis mains regenerator and power conditioner. I have been to a number of hi-fi shows where the company has run demonstrations of its products, and time after time it has improved the sound. Indeed, I chose them in the *Hi-Fi Choice* hi-res demonstration at the Bristol Sound and Vision show in 2012 and 2013. So although I have a real respect for IsoTek power products, I honestly doubted that they would make a difference out here in the sticks. I plugged the EVO3 Mosaic Genesis in not expecting much...

Getting it right

I was wrong. It has brought about an improvement of the scale I had not envisaged. It has made my reference system sound tonally smoother, darker and deeper, with more widescreen presentation thanks to improved width and depth. The bass is cleaner, and a layer of upper midband mush has been stripped away. For years I have been trying to find an amplifier clean and smooth enough to drive my finicky Yamaha NS-1000M loudspeakers, and now they seem far less bright and more amenable to everything asked to work with them.

Unsurprisingly, the better the loudspeaker, the more the improvement the IsoTek has brought. My budget reference Cambridge Audio AeroMax 6 floorstander, seems better detailed and more dynamic, while my expensive Quad electrostatics are far less mushy and muddled than I have heard them before, especially in the treble region. Indeed, my opinion of them has been raised. At £5,995 the IsoTek is very expensive, but delivers a resounding improvement, one much greater than expected. Indeed if I'm honest, it is probably more than a lifetime of tweaking has ever done ●



IsoTek's EVO3 Mosaic Genesis achieves more than a lifetime of tweaking can



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Hooked on a feeling

Why does vinyl engage with many of us more than its digital alternatives? **Rob Lane** discusses how listening to records is about more than just the quality of the sound

In a previous column I reminisced about my first separates system and how it helped to cement my love of music and hi-fi. Based around a turntable, it also cemented a deep fondness for vinyl – a love affair that was put on hold for almost 25 years when limited quality and availability pushed me into the arms of the Compact Disc, a comparatively reliable, yet cold musical companion.

Now, vinyl and I are becoming reacquainted, and the journey from analogue to digital and back to analogue again has got me thinking. We've all heard the arguments for and against both recording/playback methods, and although vinyl is in the middle of something of a renaissance, digital looks like it's here to stay. So what drives people like me to choose to play vinyl versions of records long since 'upgraded' to CD? Is it as simple as sound quality, or are there other factors at play?

I never wanted to add a CD player to my late-eighties system and was perfectly happy with my Rega Planar 2, NAD 3020e amp, Denon DRM-540 tape deck and Boston A70 speakers. I, like many, was forced into switching to digital due to the poor quality of the vinyl on offer in the nineties, and in 1991 I cashed in a student loan to buy an budget Akai best buy CD player and a copy of *Abbey Road*.

I bought into digital wholeheartedly, enjoying the three-for-£20 offers in HMV and the perceived security of

You're more likely to sit and listen to an album when it's played on vinyl

buying second-hand CDs. Just 10 years before my first CD purchase, a 1981 episode of *Tomorrow's World* had showed Kieran

Prendiville scratching a copy of Bee Gees' *Living Eyes*, saying: "You don't have to worry about grubby fingers or even scratches".

Another 10 years and several hundred CDs later and the arrival of the iPod and iTunes had a remarkable effect on me: suddenly CD felt old fashioned; digital clutter in a download world. I began to rip my collection onto a succession of Macs and consigned my sizable CDs to the attic, alongside my vinyl. A broken Rega tone-arm had already necessitated a full retreat from vinyl, with most of my favourites replaced by CD now ripped.

So more than 10 years on again, what's changed? Why have I, and so many others, chosen to return to vinyl? Fashion has a part to play; vinyl is currently very much in vogue, thanks in part to hipsters and trendy retail outlets such as Urban Outfitters, which stock new discs. And of course, whether real or imagined, sound is undoubtedly a

huge factor. But something else is at play here.

It's a 'feeling'. Various factors coming together to create the vinyl experience: the look, feel and even smell of the sleeve; the size and weight of the vinyl; the process of easing record onto deck, placing needle in groove; the need to

turn over to the flipside and the fact that recordings are (mostly) produced with two sides in mind.

These things are unique to listening to vinyl and combine – along with the superior sound – to create a unique, engaging experience. You're more likely to sit and listen to an album when it's played on vinyl, and as a result you'll enjoy the experience more, existing in the moment – mindfulness for audiophiles – and perhaps even get more out of your hi-fi system too.

Back to basics

There is a parallel. *The Gadget Show* recently ran a test of e-readers verses books. Would readers engage more fully with stories on paper more than those using e-readers? The show measured brain waves to prove that yes, reading a paper book is more engaging and so more rewarding than reading an electronic, digital, version of the same story. Something about the process of reading paper books – the artwork on the cover, the feel and smell of the paper, the weight in your hand – combines to produce a more fulfilling and enjoyable experience. Sound familiar? Memory tests also showed that paper book readers retained more information – so people pay more attention when it's 'analogue', as I do when listening to vinyl.

Interestingly, I have recently found myself also returning to CD, ditching the Mac. The inability to switch albums by the click of a cursor, the tangibility of the CD format compared with ripped files, the more physical selection process and the sleeve notes offer something approaching the experience of vinyl. And yet, it isn't quite the same; it never was. In the future, when books are beamed directly into our brains, perhaps paper book readers will view the Kindle as I view CD today; fondly, but in the knowledge that analogue is still best ●



Rob's records have been dusted down and pulled out of the attic



ROB LANE
Back to his roots

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What goes around

Chris Ward discovers a working time machine from the past that points the way to how music formats may need to develop in the future

Historians may look back on the turn of the 21st century as the era when musical content became 'intangible' – with the birth of MP3 heralding for the first time a playback solution that needed no physical musical format. Remarkable, mostly because they said something almost identical with the advent of radio at the turn of the previous century.

Fittingly, music formats have a strikingly even and regular tempo to their popularity. Wax cylinders enjoyed a reign, then the innovative but fragile 78rpm discs took the mantle only for radio broadcasting and a depression to change their tune. The flexible and quiet LP made 78s look noisy and antiquated and the radio station dictatorial in its taste. Along came rock 'n' roll, and the 45 single promised pocket money personal entertainment – with no need to pay for all those extra album tracks you didn't want. The cassette enabled a counter culture to tape the Top 40 off the radio, while Compact Discs made tape hiss as unacceptable as seventies facial hair and beige cars.

So we've come full circle. Facial hair is back and some historical patterns seem alive and well. iTunes is the height of pocket money personal expression, without the need to buy those album tracks that might grow on you. The counter culture doesn't even buy the MP3; they'll illegally download it or convert tracks from Youtube. CDs are the

We are on the cusp of a new era, and digital music needs a rethink

new legacy format, being outmoded by downloads and streaming. Vinyl appears respected and classy again, but is this just a fashion bubble? The selling of picture frames next to new LPs suggests they may not be getting much stylus action.

So what are the lessons from history? I suspect something with no substance can be perceived as having little or no value. I sometimes think our rose-tinted memories of gatefold LP covers are over stated, but squinting at tiny track listings on a phone may be breeding disregard. We need to find a better way to create deeper engagement between format and listener.

We are appreciating ever greater quality to downloads and streaming options, but simply adding more decimal points to the answer is missing the point. This is mostly creating a digital 'arms race' to make the last DAC outmoded. Listening to my treasured valve amplifier's distortion and limited dynamics confirms that the brain can't be that obsessed with numbers.

Audiophiles are drawn to the rarified and esoteric, be it tantalum resistors or an original six-eye Columbia



pressing. But when the format becomes rarified, along with the equipment to play it, we'd logically have to accept the limited appeal and high costs that come with any niche market. The challenge is not to stop advances in quality, but how to agree a means by which it can be democratised.

All of which brings me to the Sansui QS-1 from the seventies that I've just taken delivery of. This innovative product didn't try to add a decimal point; it wanted to change the game. Here's the manual blurb: "Here's... the ingenious yet inexpensive Sansui instrument that magically transforms two channel stereo signals into a breathtakingly live sound field. The QS-1 is having a profound impact... while moving into a new audio era."

The sheer ambition of these words underlines what true innovation feels like. This product clearly didn't achieve its ambition, but I think it might be revealing how to move forward from here. I sense we are on the cusp of a new era in entertainment, and digital music needs a rethink.

Anything TV can do...

People are buying huge, immersive, curved 4K screens so that compelling images utterly captivate them. And visitors that sample these AV setups are astounded by the impact and effect, and want it for themselves. People enjoy mobility, seamless integration and an absence of wires, with music that follows them around the home, commute and work. People don't want 'sweet spots' they want sweet lives. Innovation in TV has surely confirmed that the future of audio quality must be higher resolution, but how will we get the same immersive 4K quality and impact that astounds viewers? What will it take to have truly 'smart' audio or 'social' audio? What would an audio 'series link' do? How could recommendations really surprise and delight us? And how can we appreciate the artist more and find smart new ways to share value with them?

I'm throwing the innovation gauntlet down. The audio format is not keeping pace with what the market really wants and will value highly. I want a Sansui QS-1.1' and I have no idea what it is yet ●

What will be the next innovation to put the wow factor back into hi-fi?



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The empire strikes back

It wasn't so long ago that record companies were facing annihilation at the hands of internet downloads, but now says **Nigel Williamson** they're more powerful than ever

So you thought record companies were facing extinction, about to visit the great subwoofer in the sky and push up the digital daisies? Me too. But it seems that the empire is striking back and, according to a report in *Forbes*, the three major labels – there's now only Warner, Universal and Sony left standing – are quietly seizing back control of the new distribution platforms and services without anyone noticing.

For several years their position has appeared to be terminal, and the statistics make stark reading. US figures – I'm using them as they're the most readily available and dwarf all other markets – show that in 2000, total CD sales in America were 785 million. Then Napster opened the floodgates to digital file sharing and by 2008 sales had fallen by 45 percent to 431 million. Since then sales have dropped by another 40 percent to 257 million. In monetary terms this means a drop of \$8 billion in US annual retail sales since the turn of the millennium. The labels are hurting and Europe follows a similar pattern.

Initially, the labels' response was to pour all of their energies into fighting internet piracy. But since it became evident that seeking to turn millions of music fans into criminals was not making any friends, the majors have switched their strategy and have been surreptitiously buying up stakes in streaming services and in other digital

Tidal claims to pay the highest royalties to artists and songwriters

entertainment start ups. These stakes are now valued at around \$3 billion – or around 20 percent of the \$15 billion or so

of the labels' collective worth. The figure will jump much higher if and when Spotify goes public, when the three labels will share a windfall in excess of \$1 billion. Take SoundCloud, a free music-streaming service which boasts 175 million monthly users. Last year the Berlin-based company was running out of cash. Then Warner Music Group acquired up to 5 percent of it, bringing an immediate turnaround and it is now valued at \$1.2 billion. A familiar pattern has emerged: the labels take stakes for free or on the cheap in streaming companies as the price for making the music of their artists legally available – and then give themselves the right to buy larger chunks at deep discounts at a later stage.

As the usually sober *Forbes* colourfully puts it: "Led by Warner's new billionaire owner, Len Blavatnik, Universal CEO Lucian Grainge and Sony's music chief, industry veteran Doug Morris, the majors have figured out that it's smarter to bully their way into companies seeking to eat

their lunch rather than perpetually trying to sue them out of existence."

But are the artists grateful that the majors are asserting control of the distribution of their music again and, in the words of Grainge, plan to "be a formative player in shaping and developing the music platforms of tomorrow"?

Not a bit of it and it's easy to see why, for with the existing model of ownership left unaltered by the 'digital revolution', artists continue to see themselves as the losers. Critics of Spotify, for example, point out that though it now pays out almost 70 percent of its revenue to labels and publishers, only a fraction of that is passed on to artists and songwriters.

"That's the story of the music business," John Oates of Hall & Oates told *Forbes*. "It goes back to the earliest days – 'Give him a bottle of wine and take all his publishing'."

The rebels fight back

But the artists are now fighting back, too. Two months ago Jay Z purchased high-resolution-streaming services WIMP and Tidal for \$56 million and merged them into a single service to compete directly with Spotify. At the official launch, 16 of music's biggest acts were introduced as his fellow new owners of Tidal, including Beyoncé, Rihanna, Kanye West, Nicki Minaj, Jack White, Madonna, Daft Punk, Arcade Fire, Usher, Alicia Keys, Coldplay's Chris Martin and Calvin Harris. Each signed a statement that declared: "Throughout history, every movement began with a few individuals banding together with a shared vision – a vision to change the status quo." Tidal claims to pay the highest percentage of royalties to artists and songwriters in the music streaming market, but it comes at the price of the highest subscription fees.

Fascinating as this power struggle is, as consumers should we really care? Well, only, perhaps, if it results in limiting our currently unprecedented choices in how we consume music. In the meantime all we can do is don the headphones and leave Jay Z and the boardroom behemoths at Warner, Universal and Sony to fight it out among themselves while we concentrate on enjoying the fact that we currently have greater and cheaper access to music than ever before. Long may it last ●



Madonna, Kanye West and Jay Z fight back – like a modern day Han Solo, Luke Skywalker and, er, Princess Leia



NIGEL WILLIAMSON
The Force is strong

Hey presto!

Heybrook's long-lost TT2 was a great budget buy in its day and it's a fantastic second-hand bargain today, **David Price** reminisces

Warp back to 1980, and those wishing to spend a fair – if not excessive – sum on a vinyl source had a choice of a number of excellent, mass-produced Japanese direct drives, and a coterie of fine sounding, largely hand-made British belt drives. These were thought by our own domestic hi-fi press at least, to be far superior.

Within this 'Brit pack' there was a clear pecking order. Linn's Sondek LP12 was king, but cost around £350 (without arm). At the other end of the market was the Rega Planar 3 for £150 (including arm), which was regarded as just about the bare minimum you needed to spend for real hi-fi sound.

Between these two were a number of highly capable turntables such as Heybrook's TT2, JBE's Series 3,

Ariston's RD80 and STD's 305S. None sounded as good as the Linn, but they were about half the price and much better than a Rega, despite being not that much more expensive. What is surprising about these mid-price decks is just how good they sounded. With a good mid-price tonearm and a decent cartridge, you could end up with a nice source whose only real crime was that it wasn't as trendy as the Linn LP12!

Tea for two

By 1980 when the TT2 came out, almost every major development in turntable design had happened. We had got quartz-locked direct drive, but British manufacturers largely eschewed it on cost grounds. So most UK models were variations on the Linn theme, which was a variation on

the Thorens theme, which itself was a variant of the original AR belt-drive from decades earlier. Basically, an AC motor was used to turn the platter by a rubber belt. This was mounted on a chassis that sat inside a wooden plinth and was allowed to bounce by springs, tuned to isolate the deck from the outside world. The £195 TT2 was precisely this, an independently sprung subchassis deck in the best British tradition. What gave it its fine sound was the attention to detail.

The plinth was constructed from laminated, high-density particle board which was said to act as a shield from airborne vibration. Inside this was an MDF damped box steel welded to a cross-shaped subchassis mounted on three coil springs tuned to 5Hz; these



plus rubber mounting bushes did the lion's share of isolating the deck from the outside world. The subchassis held the bearing and armboard rigidly, and this formed a closed mechanical loop, so energy could be dissipated in a controlled way. The armboard was also laminated to add damping, but allowed a rigid platform for the arm.

The brass-housed main bearing used a hardened, diamond-polished shaft running on a precision steel thrust ball, lubricated by light oil. A heavy two-piece platter was fitted to give speed stability; reputedly the first 100 TT2s had black spray-painted platters because early castings had visual flaws, and the paint was used to hide this. A precision-ground drive belt circulated on the close tolerance crowned pulley, which had two steps for speed changes. The popular 24-pole AC synchronous Impex motor was used, firmly bolted to the plinth to isolate motor noise from the chassis.

Fine tuning

The TT2 didn't sound the way it did simply because of the sum total of its parts; it was brilliantly tuned by Peter Comeau, who has some of the best ears in the business. The company spent many hours experimenting and finessed it to a great degree. For example, the armboard ended up as two pieces of 9mm birch ply glued together; this was fixed to the subchassis by only one of the two bolts, the one nearest the bearing, while the other located the board only. This gave a slightly 'lossy' connection and was judged to sound best. Indeed, on the earlier steel chassis models, the second stud was cut off so it wouldn't reach all the way through the chassis. The motor was given a sprung thrust pad, which pushed against the bottom of the shaft, and the bottom of the bearing got a white nylon cup, too.

Although British manufacturers didn't sell on specifications, the Heybrook measured well for a mid-price design. The only issue was speed stability; it was quoted at less than 0.08% (DIN, peak weighted) when most thought that it was hard to hear anything below 0.1%. That was good then, but the quartz-locked direct-drive Technics SL-150 of that era turned in 0.03%. Wow and flutter wasn't – and isn't – the sole criterion of a turntable's sound of course; another was rumble, and the TT2 measured a superb -79dB (the Technics was quoted at -78dB). It was widely praised for its performance, and won

an HFC Recommended badge when it was reviewed back in 1984.

The best description one could give of the Heybrook's sound was like a slightly flat, undynamic version of the Linn LP12 of that era. Considering that it cost about half the price, that's high praise indeed as it gave cash-strapped audiophiles the chance to buy something that was better than it had any right to be at the price.

The TT2 had a smooth and warmish sound that is precisely what people think about when they talk about 'the romance of vinyl'; whatever you played on it never sounded offensive. It was always even, slightly soft perhaps, and yet furnished with a surprisingly large amount of detail,

It delivered a wide, spacious acoustic with excellent image location within it

especially across the midband. It had an especially fulsome bass, which could – if set up incorrectly – descend into boom – but when properly installed showed itself as a slight peak around the 80 to 100Hz area that seemed to push along the upper bass a bit and add some extra weight.

In 2015, this would be regarded as a positive trait; many small speakers are a little light and bright and it would really fill out the sound. Back in 1980, however, systems sounded softer and fatter and it would have had a less euphonic effect. By comparison, the Linn Sondek of the day was slightly tighter and more propulsive, while the TT2 tended to slur things just a touch and lose a bit of low-frequency articulation. Across the midband, the Heybrook was excellent; many think



With the best ears around, Peter Comeau played his part in the TT2's success

VERSIONS

Like every good deck of the day, the TT2 was continually upgraded. The original version ran a fabricated steel subchassis (easily identified by the large mains switch sat beside the nameplate), but moved to a cast aluminium chassis somewhat akin to the Linn Keel (although several decades earlier, of course). This version generally has a red illuminated neon rocker switch, although the best way to tell is to look inside – mark 2 versions have a silver chassis, not a black one. The plinth was supplied with a wood veneer finish as standard but came with the option of black.

The deck is generally reliable, with all the mechanical parts such as bearing, shaft, motor pulley and sub-platter (and mark 1 steel chassis) made to very good tolerances at a machine shop local to the factory. The optional TPS dedicated power supply is said to be prone to burning out a chip which is now unobtainable; if this happens it will need to be returned to its original spec. Drive belts are still readily available on ebay and elsewhere for under £10, and would certainly benefit from renewing if they are original. While you are doing this, the sound can be improved by cleaning the path of the belt on the motor pulley and inner platter with a tape head cleaner. Expect to pay between £100 and £300, depending on condition, for a TT2. Even three decades old, they remain excellent value for money.

the TT2's main bearing was just as good as the Linn's and it didn't suffer a lack of detail. Again though, it didn't quite have the focus of the Sondek and this was in part due to the latter's excellent speed stability.

Soundstaging was a strength of the TT2, and it gave the LP12 a tough time here despite being so much cheaper; it delivered a wide, spacious recorded acoustic with excellent image location within it, but tended to sound a little two dimensional compared with the Linn. The effect was very pleasing, and became further improved when the Heybrook TPS electronic speed controller was fitted. This gave instant switching between 33 and 45rpm, plus a tighter sound with more grip that pushed it closer to the Sondek.

Throughout its life, the Heybrook TT2 just got better and better – but more and more expensive. Starting at £195 in 1980, by the mid eighties it was £265 when the Linn LP12 was selling at £470. When production ended in 1992, the final versions cost £469 when a Linn was close to twice that. Despite the deck's obvious ability, it never caught on and has not become a cool classic that everyone's talking about. Odd really, especially when you consider that the owners of these turntables seem in absolutely no rush to sell them. When they do surface secondhand, you can get a decent one for the cost of a modern Rega P1 – which is a bargain. Happy hunting! ●

BEAUTIFUL SYSTEM
KRELL/PRIMA LUNA/
MARTINLOGAN

Point of **IMPACT**

Valves and electrostatics only do delicacy and finesse right? **Ed Selley** thinks this system missed that particular memo

On a few occasions I have found myself looking at a collection of electronics and feeling pretty sure that I know what to expect sonically. A bit of knowledge about the amp specs, the speaker size and the source equipment used and you're most of the way there. At least you might think so... This system uses a valve amp partnered with electrostatic speakers. What follows should be a laudation to the qualities we associate with these categories, but in practise it doesn't quite work out that way.

MartinLogan's ElectroMotion and Prima Luna's Dialogue have all the attributes you might expect from electronics of this nature. They then go on to augment them with some you simply don't expect. Part of this is down to their design, which in both cases introduces a twist to the accepted design principles and some of the cause lies with the source equipment, but the end result is entirely out of the ordinary.

In the case of the Prima Luna Dialogue Premium HP, the twist is the two letters at the end. The normal Dialogue Premium uses a pair of output valves per channel for power. The 'High Power' version here doubles that to four valves a side. With KT88 valves in place, it gives a hefty (and wonderfully specific) 73W in ultralinear mode. This is a meaningful amount of grunt for a valve amp and offers the possibility of really gripping



BEAUTIFUL SYSTEM
KRELL/PRIMA LUNA/
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COMPONENTS

**KRELL CONNECT
STREAM PLAYER £3,500**

Available either as a streaming transport or as here, with an internal DAC, the Connect is Krell's first foray into streaming and is a 24/192kHz-capable player with internet radio and a choice of balanced and unbalanced audio outputs.

**PRIMA LUNA DIALOGUE HP
INTEGRATED AMP £3,000**

The Dialogue HP is the latest member of the Dialogue family and is designed to offer higher power outputs than the standard integrated. A variety of output valves can be used and these can be used in triode and ultralinear settings.

**MARTINLOGAN
ELECTROMOTION
ELECTROSTATIC SPEAKERS
£2,500**

The smallest of MartinLogan's hybrid electrostatic speakers is still a pretty sizeable design with an 8in passive driver partnering a 86 x 22cm electrostatic panel for midrange and treble frequencies.



BEAUTIFUL SYSTEM KRELL/PRIMA LUNA/ MARTINLOGAN



the speakers by the scruff of the neck rather than cajoling them to perform.

The amount of casual brutality that the MartinLogan ElectroMotion needs to strut its stuff is open to debate given that it has a claimed sensitivity of 91dB/W and fairly benign impedance to go with it, but beyond the bald numbers the ElectroMotion makes some specific requirements of a partnering amp. The twist with the configuration is that like many MartinLogan speakers it uses a conventional driver to fill in the low end that an electrostatic panel can struggle with. Some more expensive models use active bass modules, but the ElectroMotion relies on the partnering amp to power both sections which means the Prima Luna is well placed to use those extra valves.

Completing the picture

The final piece in the puzzle is a digital source from a brand with a different take on design to the rest of the system. Mention Krell and most people will envisage an amp the size of a family hatchback, very possibly with a visible heat haze coming out of the top. This tends to overlook that the company has made some seriously accomplished digital sources over the years and the Connect Stream Player looks to have been built in the same

mould. It might be Krell's first foray into network streaming, but it manages to look powerful even when it isn't doing anything. In fact you could argue it looks most purposeful doing nothing at all with the giant red standby light casting a menacing glow over its surroundings.

The system isn't one that's going to vanish into the background of most rooms. Given the plethora of valves it uses, the Prima Luna is commendably

This is a system that moves air and hits rib cages with palpable force

compact, but with the considerable expanse of glassware at the front it exudes a certain sense of purpose as well. The MartinLogan is deceptive in that the bulk of its overall dimensions is a relatively lightweight frame, but this is still a fairly sizeable speaker. Everything feels pleasingly over engineered from the flawless paint finish on the rear of the Prima Luna to the supplied remote controls that have almost as much metalwork to them as the devices they control.

So, it's no shrinking violet but we know what it will sound like right?

Above: The HP variant of the Dialogue has the power needed to control the MartinLogans

Centre right: All the components feel exactly assembled and offer useful functionality

Above far right: The Connect is Krell's first streamer, but the house sound is retained to great effect

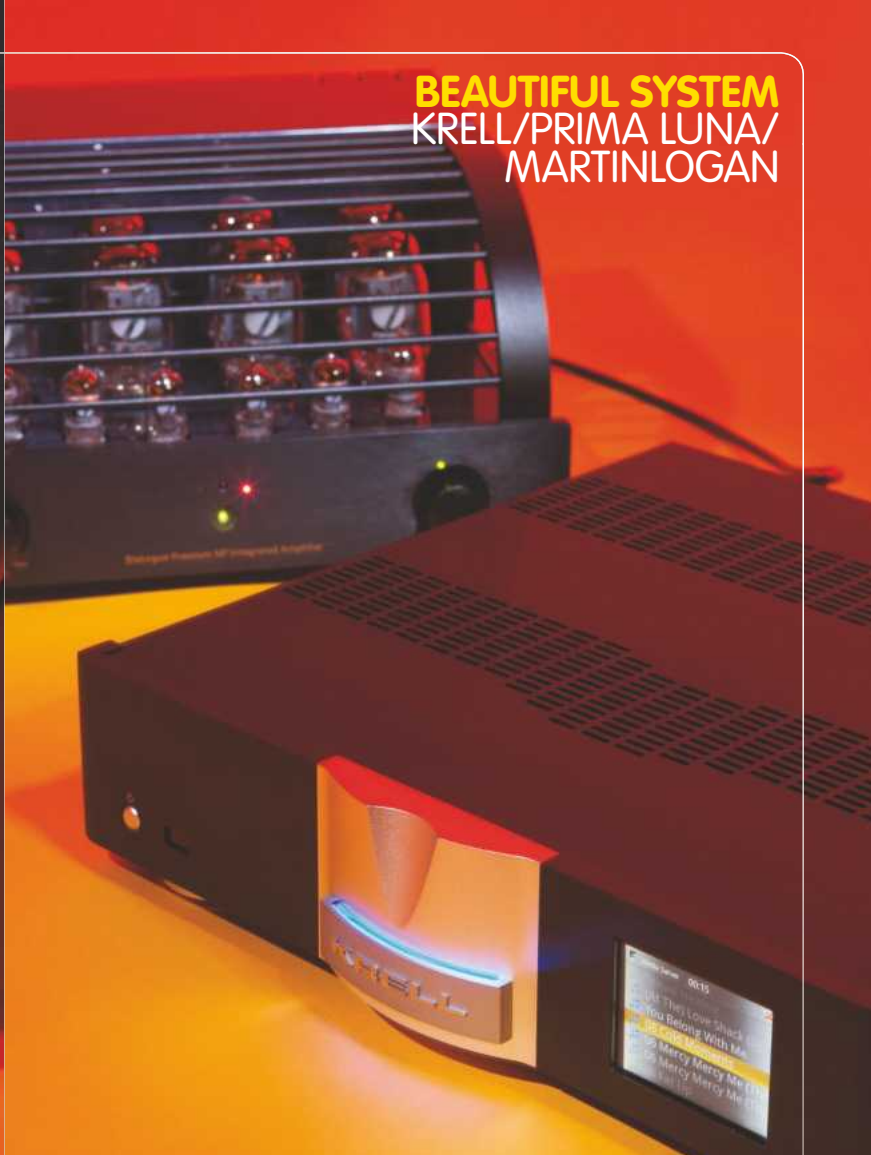
This should be a masterpiece of warmth and refinement with a soundstage to die for. With a spot of well-recorded acoustic music, it should be the audio equivalent of a shoulder massage and a nice glass of something expensive. And, for the avoidance of doubt, this system is spellbindingly good in this regard. With its considerable height over a normal seating position and impressive radiating area, the ElectroMotion creates a vision of the performance that even considerably more expensive conventional loudspeakers are left floundering trying to replicate.

Ultra vivid scene

The midrange lucidity is also absolutely superb. *Medicine* by Drew Holcombe and the Neighbours is tangibly and believably real. The decay to notes is an area that valve amplifiers seem to have the edge over their solid state brethren and although it seems minor, the effect on your perception of the performance as a whole is considerable. Combine the expansiveness of the MartinLogan with the vividness of the Prima Luna and you have something wonderful.

If the scope of this system's talents ended here, it would still make a great many people very happy, but the Krell seems to unlock another side of these

BEAUTIFUL SYSTEM KRELL/PRIMA LUNA/ MARTINLOGAN



products that gives this system traits you simply wouldn't expect. Put away the well-recorded acoustic material and reach for the gritty brilliance of Stereo MC's *Deep Down And Dirty* and prepare to be astonished. This system reproduces every low note, every electronic graunch and every utterance of Rob Birch with the determination and enthusiasm of a PA system.

How low can you go?

And not a clumsy PA system either. The 8in driver of the ElectroMotion is kept under a tight leash by the Krell and Prima Luna with the result that it starts and stops with commendable speed and agility. This doesn't stop it producing exceptionally deep bass. The 42Hz quoted roll off of the ElectroMotion must count as the most engaging understatement since Rolls Royce described the output of a giant V8 engine as "adequate". This is a system that moves air and hits rib cages with palpable force. Furthermore, the integration of the two radically different drivers is seamless and entirely imperceptible.

As a result, this system is so much more than a beguiling way to explore some safe genres of music. It has an almost chameleonic ability to shift gears and deliver a level of drive and attack that does justice to albums



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you'd never expect it would excel at. When you are done with going for it, you can turn it down, reach for something relaxing and no trace of this steely determination will impede the experience. This wide-ranging ability and sheer scale is so accomplished that there are very few similarly priced systems that spring to mind that can rival it. It is also completely painless to live with. Every aspect of the system can be controlled by remote and the

This is so much more than a beguiling way to explore some safe genres of music

Krell is completely app controlled as has become the standard for streamers. Pottering through your music collection by iPad wondering what to throw at this ensemble is one of life's little pleasures and marginally harder to do than blinking.

The final treat in this gift that keeps on giving is what happens when you give the system a little hi-res to play with. The Krell thrives on higher bitrate material and the attendant improvements in mastering and dynamic range. The jump in performance is palpable and the Prima

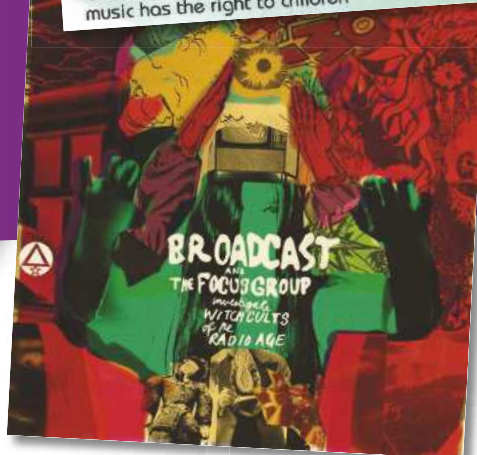
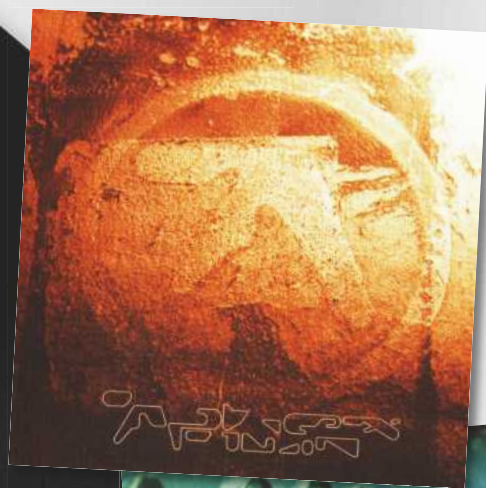
Luna and MartinLogans respond in kind. The way that an album with rough and ready mastering can be flattered while one that is sumptuously recorded can be given all the space it needs is an elegant demonstration that valves still remain entirely relevant in modern audio.

Gift that keeps on giving

Summing up this system in a succinct way is extremely difficult because the more time you spend with it, the more facets it reveals. There is scarcely space to note that the Prima Luna has a wonderful headphone output or that tuning in to Radio 4's excellent *Afternoon Drama* on the MartinLogans is to have an actual stage of actors in front of you. What is most significant is that none of these additional talents distract from one another. You could buy it for the midrange and soundstage and delight in that without caring that it will also rock with the best of them and handles electronica with an authority that serious solid state amps would struggle to match. There is something rather wonderful about how it meets your expectations while subverting them at the same time. You can judge this particular book by its cover, but trust when I say you'll be missing out on some scintillating plot twists ●



RECORDS



Sheffield's finest record label has notched up 25 years of adventurous releases and still continues to innovate. By **Simon Berkovitch**

When it comes to cutting-edge electronic music, Sheffield has a fearsome pedigree: home to The Human League, Heaven 17, Vice Versa and Cabaret Voltaire in the late seventies, the northern city also gave birth to a legendary label a decade later: Warp. 2014 saw the UK independent chalk up an impressive 25 years' worth of multi-genre releases. The musical landscape may have evolved since Warp's genesis during the acid house explosion, but its defiant, maverick spirit has remained a constant.

Back in 1989, immersed in Steel City's vibrant underground club scene, the trio of record shop employees Steve Beckett

and Rob Mitchell and producer Robert Gordon cobbled together the funds needed to put out a 500-run 12in by Forgemasters, *Track With No Name* – Warp's debut release. From these DIY beginnings, fast-forward a quarter of a century and you'll find a label that not only boasts a diverse roster of ground-breaking musicians – from genius synthesists to leftfield indie acts – but also a pioneering film company: Warp Films.

Success came quickly to the young label – and deservedly so. Second release *Dextrous* by Nightmares On Wax sold 30,000 copies, but 1990's *LFO* by LFO hit the top 20, taking Sheffield's mutant strain of techno music overground. The none-more-

bleepy *Tricky Disco* infiltrated the charts the same year, and the label's credibility was assured by LFO's fantastic *Frequencies* album (1991) and the inspired *Artificial Intelligence* series.

Early Warp singles, housed in distinctive purple record sleeves, were, by and large, made for the clubs, but more experimental textures were explored on the seminal *Artificial Intelligence* series of albums (1992-1994). The mission statement was laid out in the sleeve notes of 1992's first classic compilation – "Listening music for long journeys, quiet nights and club-drowsy dawns. Listen with an open mind" – and the artists it showcased (Richard D James AKA Aphex Twin; Autechre; The

Orb's Dr Alex Paterson) would cast a long shadow over the development of various strains of electronica throughout the nineties and beyond.

Warp's roots are undeniably in Sheffield's clubs, but its remit is broad and its taste impeccable. One of the most significant signings of the late nineties was Boards of Canada, whose *Music Has The Right To Children* (1998) brought lush, analogue textures to the Warp catalogue – as well as plenty of critical acclaim. Any label that offers sanctuary to boundary-pushing mavericks such as Chris Morris, Vincent Gallo and Broadcast alongside the cream of experimental electronica is certainly worth further investigation.

LFO

Brought the underground label overground with a classic cut of Sheffield techno

Alongside Sweet Exorcist's *Testone*, featuring Richard H Kirk from Cabaret Voltaire, one of the most anthemic releases of Sheffield's fast-evolving techno scene was LFO's eponymous release. This speaker-rattling 12in has lost little of its raw electronic power in the intervening 25 years, still reverberating with the shock of the new.

LFO was the youthful Sheffield duo of musicians Gez Varley and Mark Bell and took its name from practical electronics terminology (low-frequency oscillation) – a fitting handle for a pair that embraced the possibilities of more affordable music-making technology.

The group's sound was bass-heavy and drum machine-led – an irresistible combination. Their early demos had been played to delirious effect at Sheffield raves by Nightmares On Wax, bringing them to the attention of the emerging Warp label. The *LFO* single was an

overnight sensation, bringing the compelling bleepy variant of Sheffield's dub-tinged techno to a mass audience. The record peaked at number 12 in the UK singles chart and can be heard in all its glory on Warp's essential 10th anniversary album *Warp 10+2: Classics 89-92*.

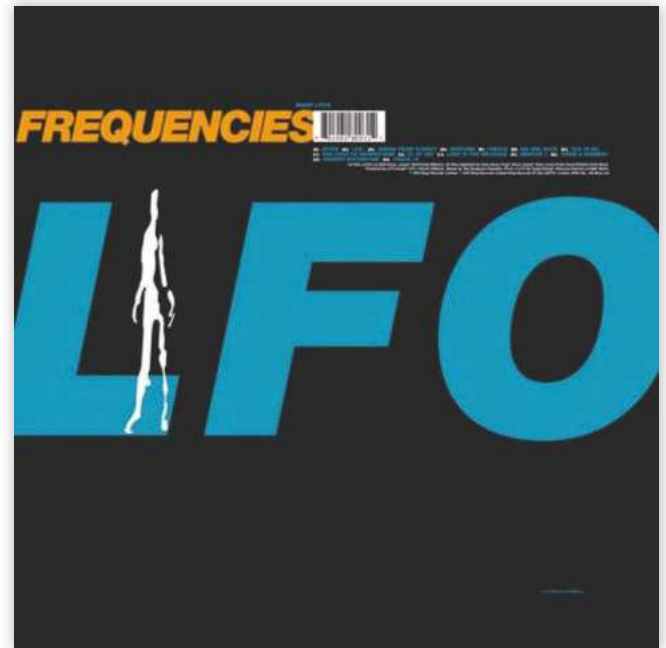
Excellent follow up *We Are Back* (1991) had more than a

Mark Bell went on to collaborate with Depeche Mode

little nod to Kraftwerk, paving the way for the pair's debut studio album, *Frequencies*, which remains one of the cornerstones of early nineties dance music.

LFO was not a prolific outfit and the 1996 LP *Advance* was the last release to feature Varley. Bell went on to collaborate with Björk on *Homogenic* (1997) and produce Depeche Mode's *Exciter*, before his tragic death in 2014.

The *LFO* single featured a Speak & Spell toy repeating the letters L, F and O over and over again



Aphex Twin

Richard D James: the unstoppably inventive dismantler of musical boundaries

British electronic musician Richard D James has been involved in a phenomenal number of releases under a perplexing array of monikers – Polygon Window, Power-Pill and The Tuss to name but a few – but his most readily identifiable pseudonym is Aphex Twin.

James' releases under this guise for Warp are among the most adventurous and invaluable contributions to the electronic music genre. His first for the label is one of his most acclaimed and a fine port of entry for those unfamiliar with his work: *Selected Ambient Works: Volume II* (1994) – 25 tracks of lush, ambient electronica.

Two important albums followed in rapid succession for the label – ...*I Care Because You Do* (1995) and *Richard D James Album*. The former was the last Aphex Twin record of the nineties to focus on analogue synths, with the latter being a move into more abstract

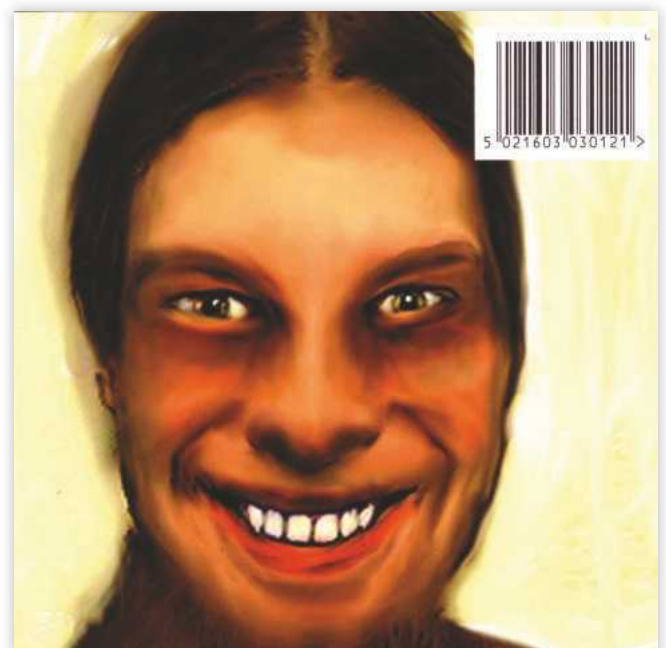
territory and exploration of software. Both featured manipulated close-ups of James's face – a distinctive style taken to disturbing extremes for the extraordinarily inventive *Windowlicker* single (and unforgettable video).

2014's *Syro* is Aphex's first studio album in 13 years

The 2001 release *Drukqs*, an experimental double disc, has nods to Erik Satie and John Cage among others in its computer-controlled piano pieces, tracks that nestle alongside more breakneck electronics.

James returned to the Aphex Twin moniker with last year's *Syro* for Warp, his first studio album under that name for 13 years. As inventive as ever, it takes in techno, glitch, jungle and ambient compositions.

Due to a shortage of money, Richard D James hand-built a lot of his music-making kit



Broadcast

A retro-futurist update of widescreen sixties psychedelia

One of the earliest hints that Warp was more than just a dance music label came from retro-futurists Broadcast. Inspired by influences as diverse as sixties psych act The United States of America and the BBC Radiophonic Workshop, the quartet's first releases on labels Wurlitzer Jukebox and Duophonic were compiled by Warp on 1997's *Work And Non Work*.

First album proper, *The Noise Made By People* emerged in 2000, capturing the group at its poppiest (see gorgeous single *Come On Let's Go*) and showcasing their love of classic sixties-era John Barry and Ennio Morricone-inspired film soundtracks.

Reduced to the duo of Trish Keenan and James Cargill for *Tender Buttons* (2005), Broadcast explored more esoteric territory from hereon in. The apex of the group's discography is arguably its

collaboration with The Focus Group, the fantastic and fantastical *Broadcast And The Focus Group Investigate Witch Cults Of The Radio Age* (2009).

Keenan sadly passed away in 2011 aged just 42, although Cargill is working on the duo's final recordings that may yet see the light of day.



Boards of Canada

Mysterious duo with a penchant for nostalgia and vintage kit

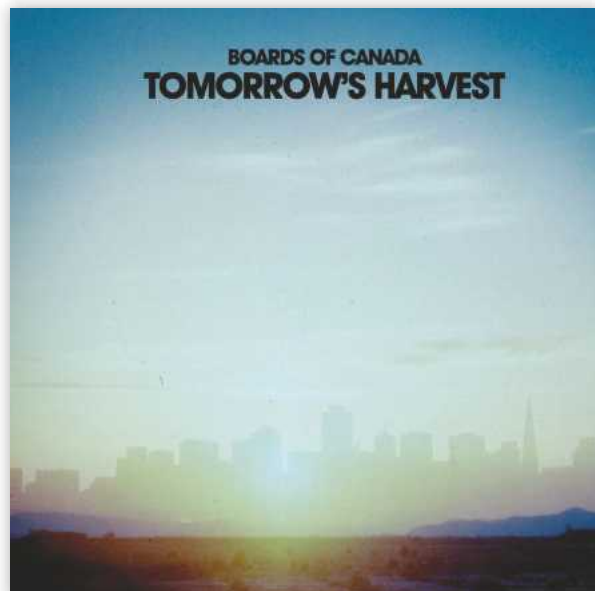
Arguably among the most mysterious musicians to record for Warp are Mike Sandison and Marcus Eoin: Boards of Canada. Notoriously elusive, they conduct few interviews, preferring the warm analogue sounds of their albums do the talking.

It was a release on Warp act Autechre's Skam Records that brought Boards of Canada to its current home – and a wider audience. *Music Has The Right To Children* draws on vintage synths, retro tape recorders, dreamy samples and studio manipulation to achieve its luscious, hazy sonics.

Second studio album *Geogaddi* emerged in 2002, featuring lengthier pieces that were darker in tone than its predecessor. Two covers of Boards of Canada compositions by Bibio and Mira Calyx also appeared on the label's *Warp20 (Recreated)* compilation.

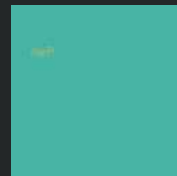
2013's Record Store Day saw the return of the duo: a record with a snippet of new Boards of Canada music emerged at Other Music in New York,

confirmed by Warp as to its genuine nature. Fourth studio album *Tomorrow's Harvest* is another excellent, emotive addition to the catalogue.



► SHOPPING LIST

With 25 years' worth of crates to dig, you're going to need some help. We cast the net wide for your listening pleasure with this great eight...



Autechre
Anti EP
Track with no repetitive beats, released as a protest against the Criminal Justice and Public Order Act in 1994.



Brian Eno
Small Craft On A Milk Sea
The ambient legend's first LP for the label was a collaboration with Leo Abrahams and Jon Hopkins.



London Sinfonietta
Warp Works & Twentieth Century Masters
Orchestrated covers of Aphex, Steve Reich and John Cage.



Sabres of Paradise
Smokebelch II
Seminal debut outing for Andrew Weatherall's techno outfit in a beautiful Richard Sen sleeve.



Sweet Exorcist
Testone
One of the greatest early 12ins on the label (1990), this is the sound of bleep courtesy of Cabaret Voltaire's Richard H Kirk.



Vincent Gallo
When
Cult *Buffalo 66* director also delivered a stone-cold classic in the shape of this excellent album for Warp back in 2001.



Pulp
Babies
One of three great single releases that Jarvis Cocker and co. cut for Warp subsidiary Gift back in the early nineties.



Chris Morris
Blue Jam
Essential 2001 compilation of sinister comedy sketches taken from the infamous BBC radio series of the same name.

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* Bordeaux finish shown

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100 James Taylor
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101 Haydn
Paris Symphonies



101 Mahler
Symphony No.9

Musicreviews



**ALBUM
OF THE
MONTH**

The Rolling Stones Sticky Fingers

★★★★★

Deluxe two-CD/Super Deluxe three-CD box set **Universal**

BY THE START of the seventies the Stones had hit their pomp. Only a couple of years earlier, their future had looked uncertain. They'd given up touring, lost their way and nobody was calling them "the greatest rock 'n' roll band in the world". Then they embarked on a potent trilogy of 'comeback' albums that began with 1968's *Beggars' Banquet*, continued with *Let It Bleed* and peaked on 1971's *Sticky Fingers*. They were tumultuous, ominous times, punctuated by Brian Jones' death and the horrors of Altamont, but once their mojo had been restored it seemed that nothing could stop them.

Sticky Fingers found the band at the high tide of their macho, edgy, showboating pageantry. Everything about the record had a cocksure swagger, down to the Andy Warhol cover with its metal jeans zipper and the tongue & lips logo,

unveiled for the first time on the disc's inner label. Now remastered and expanded in a variety of formats, the original album is augmented with previously unheard bonus material, including five studio out takes, pre-eminent among them a version of *Brown Sugar* with Eric Clapton on guitar, and live material recorded at London's Roundhouse and at Leeds University.

Dirty, dissipated and debauched, rock music has never sounded as lascivious and alternative as the Stones made it seem back then. The opener *Brown Sugar* set the tone with its supercharged guitar and horns maelstrom and Jagger's slurred vocal, which you instinctively knew was thoroughly nasty even without deciphering the words. It's instructive to compare the two versions here – the first, the famous single, is full of lowdown southern funk (it was recorded at Muscle Shoals in Alabama in late

1969). The second, featuring Clapton, was recorded in London a year later at Keith Richards' birthday party and rolls with a filthy British decadence amid potent interplay between the three lead guitars.

A previously unreleased acoustic version of *Wild Horses* makes a similarly intriguing contrast. Of the other bonus tracks, the extended version of *Bitch* is an explosion of pure lust and the loose, joyous country-rock of *Dead Flowers* is a delight. The live material, particularly from the Roundhouse gig in March 1971, is mostly a potent revisitation of earlier material, including *Midnight Rambler* and *Honky Tonk Women*. The next album, *Exile On Main Street*, recorded a year later, was a one off, a unique record with a mythical quality unlike anything else in their catalogue. But it was on *Sticky Fingers* that the Stones defined what would remain their trademark sound for the next 40-plus years. **NW**



HOT PICK

James Taylor

Before This World

★★★★★

CD

Concord

AS THE ARCHETYPE of the sensitive singer-songwriter, Taylor can be permitted to take his time at 67 years old. His last collection of compositions was way back in 2002, but his welcome return belies the passage of the years: "I feel the same inside as when I first caught this ride", he sings on the opener *Today Today Today*. The good news is that he sounds pretty much the same, his melodic and lyrical sensibilities as sharply focussed as ever.

"I feel the same inside as when I first caught this ride" he sings, and he sounds it too

Gentle folk-rock arrangements dominated by Taylor's distinctive acoustic guitar picking and his plaintive vocals are augmented by Yo-Yo Ma's graceful cello on several tracks, including the title song on which Sting also adds some lovely harmonies. His subject matter remains – as it always was – the bittersweet nature of the human condition; but if the treatment is now more ripe and seasoned, its resonance remains timeless. **NW**

MUSICREVIEWS



Leon Bridges Coming Home

★★★★★

CD

Columbia

JUST TWO YEARS ago, the 27 year-old Bridges was washing dishes in a Texas restaurant with no thought of becoming a singer. Then he heard the vintage recordings of Sam Cooke and – by his own admission – became obsessed with recreating the sound of the King of Soul.

The result is a richly nostalgic album of retro soul-pop that's been smartly produced to combine digital sharpness with classic analogue warmth. Bridges' voice sounds uncannily like his hero and his songs ooze with the same felicitous mix of smooch and soul. It's almost enough to make you believe in reincarnation. **NW**



Death And Vanilla Where The Wild Things Are

★★★★★

CD

Fire Records

THE SWEDISH ELECTRO pop duo of Marleen Nilsson and Anders Hansson take the retro futurist thing of the likes of Stereolab and Broadcast, add a smidgeon of St Etienne meets The Radiophonic Workshop and produce a sound that is hauntingly spooky, shimmeringly lovely and challengingly weird.

Marleen's ethereal voice floats in and around the chugging electronic soundscapes, composed using vintage synths, vibraphone, organ, mellotron, tremolo guitar and Moog. The final swansong of *Something Unknown You Need To Know* shifts between images of pastoral calm and industrial chaos in a shifting kaleidoscope of moods. **DO**



Sarah Cracknell

Red Kite

★★★★★

CD

Cherry Red

THE ST ETIENNE chanteuse returns with her first solo album since 1997's *Lipslide* and lo and behold, it sounds more or less like a St Etienne album – which is a very good thing. It leans heavily towards the sixties pop end of the Etienne canon, with a few lush Ennio Morricone soundtracks thrown in. Using live instruments for the most part, she delivers that big, open, spacious sound associated with those sixties trail blazers.

There are great tunes aplenty. *Underneath The Stars* floats along on a gentle organ theme with tubular bells ringing out across the choruses while *Nothing Left To Talk About* is about as fine a slice of sixties dreampop as you'll taste. **DO**



Do you agree with our reviewers?
Decide for yourself and listen to
some of this month's tunes at
www.hifichoice.co.uk

AUDIOFILE VINYL

★★★★★

Fairport Convention Myths And Heroes

180g vinyl

Matty Grooves



FAIRPORT'S FIRST VINYL release since the late eighties (when the digital rot really set in) finds the current lineup in fine fettle. In a band that has seen numerous personnel

changes since its debut in 1967, only two out of the five men standing have stayed the course. *Myths And Heroes* features a song by Chris Leslie (vocals, guitar, mandolin) and Ric Sanders (electric violin), but the majority are by other writers, most notably Ralph McTell's *Clear Water*. The stand out is *Bring Me Back My Feathers*, a real

tub thumper in fully folk rocked-out style that starts off in measured tones but gets going once the electric bass kicks in. It's not quite *Give Me Back My Bullets* (Lynyrd Skynyrd), but it's pretty close under the circumstances.

Sound quality-wise this is a warm and friendly recording, much like the band members themselves one suspects. It has decent bandwidth and dynamics if limited image scale, but it's good and clean and could be happily wound up to 11 if you want to get down with your air mandolin. It's still unusual to hear electric bass and drums alongside traditional folk instruments, but this album should ensure that it's a combo we get to hear for many years to come. **JK**

HIGH RESOLUTION DOWNLOADS


Kuniko
Xenakis: IX


FLAC 24-bit/192kHz

Linn Records

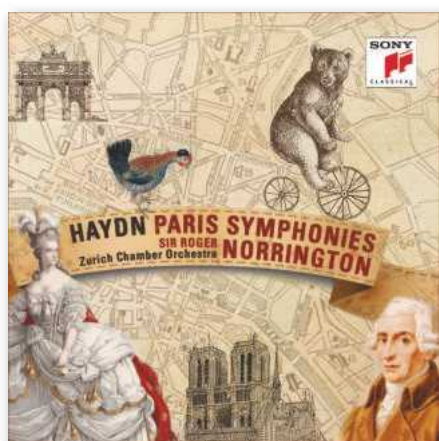
JAPANESE PERCUSSIONIST KUNIKO takes on the infamously difficult works of composer Iannis Xenakis. *Pléiades* is the dominant piece in four parts, including a range of percussive textures courtesy of marimba, vibraphone, xylophone and the 'sixxen', an instrument designed by Xenakis and customised by Kuniko. Each takes its turn in the spotlight, to create a sound that stays just on the right side of the line between music and cacophony. **DO**


Big Screen
Take One


ALAC/FLAC 24-bit/96kHz

Linn Records

PIANIST DAVID NEWTON leads this jazz trio in a joyful interpretation of tunes from films. Stepping outside the usual canon, the set opens with a playful interpretation of the theme from *Bewitched* and follows with gems like *On The Street Where You Live* from *My Fair Lady* and *Hello Young Lovers* from *The King And I*. Upbeat for the most part, the album finds its forte in the slower tunes, especially Randy Newman's *When She Loved Me* from *Toy Story 2*. **DO**



Three discs on offer for the price of one, what's not to like?

Haydn

The Paris symphonies
Zurich Chamber Orchestra



3 CDs

Sony Classical

IN THIS NEW set of the six Paris symphonies, Roger Norrington directs a group of about 30 musicians playing on modern instruments. The result is historically informed, without sounding acerbic in terms of sonority. The playing has the sort of rich lively brilliance and vivacity we used to enjoy from bands like the Academy of St Martin in the Fields. The execution is superlative; so good, I'm tempted to say these works have never been played better on record – I can't think of a superior set. The recordings are superb too; clear, open, and lively, with plenty of attack, yet clean despite sounding crisp and immediate. The three CDs are offered for the cost of one, making this a real bargain. **JH**

HOT PICK


Mahler
Symphony No.9
Seoul Philharmonic
Orchestra
Myun-Whun Chung


CD

DG

DG IS, WITHOUT question, the label of great Mahler nines. Guilini, Karajan, Bernstein and Abbado left big footsteps in which to follow. But even in such exalted company, Chung's reading stands its ground. His performance sounds expansive without feeling slow. It has some of the fiery energy of Abbado's Vienna recording, rather than the sovereign weighty depth of Guilini or Karajan. He shapes the work with great sensitivity and DG's live recording sounds clear and spacious, with a wide dynamic range. It successfully conveys a natural 'concert hall' sound, while allowing lots of subtle inner detail to be heard. **JH**

BLU-RAY DVD

Various Artists
A Musicares Tribute
To Paul McCartney

DVD

Eagle vision



A charity event from 2012 featuring Macca himself alongside Coldplay, Norah Jones, Sergio Mendes, Joe Walsh and Duane Eddy. Each plays a McCartney tune and the choices aren't always predictable, Alison Krauss makes *No More Lonely Nights* her own, while Neil Young and Crazy Horse blast through *I Saw Her Standing There*. The sound isn't totally smoothed over, it's heavily compressed but this doesn't stop Diana Krall finding the heart in *For No One*. A four Les Paul finale with Walsh and Dave Grohl sends it off nicely. **JK**

HOT PICK

DEMO DISCS



Simon Powell, technical and marketing services manager at Henley Designs, reveals some of the music used to develop products


Hugh Laurie

St. James Infirmary
It's all about the piano opening. It's brilliantly performed and always grabs a listener's attention on a good CD player or turntable.


John Mayer
Neon

The live atmosphere is completely encompassing, and the extended blues solo before the main track kicks in really draws you into the whole album.


Herbie Hancock
Wiggle Waggle
(Mr Scruff Remix)

A great early track tweaked in all the right places and given more presence in a way that only Mr Scruff can achieve.


Santana
Black Magic
Woman/
Gypsy Queen

The shifts in tempo and transition from soft to hard rock make this track a real journey that pushes any system.

HI-RES HIGHLIGHTS

Our pick of the best hi-res downloads released over the past month...



Iron Maiden fans should check out Onkyo Music (onkyomusic.com) where all 15 studio albums, two best of compilations and two live albums are available to download in all their 24-bit glory. Linn Records (linnrecords.com) debuts John Butt's version of JS Bach's Sonatas for violin and harpsichord and the Royal Academy of Music's Mahler's *Lieder eines Fahrenden Gesellen*. HD Tracks (hdtracks.co.uk) has Blur's *The Magic Whip*, Bill Withers' *Still Bill* and Leonard Cohen's *Death Of A Ladies' Man* and High Res Audio (highresaudio.com) has Lionel Richie's *Dancing On The Ceiling*, *The Essential Elvis Presley* and The Clash's eponymous album.

Minitest

BLUETOOTH STEREO SPEAKERS £250-£300

Rhapsody in Bluetooth

The speaker dock is dead and as **Adrian Justins** discovers, Bluetooth is here to give AirPlay a serious run for its money

Not so long ago docks for portable music devices (most notably the iPod) were all the rage and pretty much every manufacturer had one in their range. Speaker docks came to prominence because active loudspeakers were few and far between, and those that existed lacked the necessary connectivity to work with phones and iPods.

But speaker docks were relatively short lived, thanks in part to the rise

of AirPlay, which eliminated the need for wired connections. At the time Bluetooth was considered suitable only for use with communication devices such as earpieces linked to a phone. But while AirPlay ruled the wireless roost, Bluetooth was busy getting its act together.

Now, there are more Bluetooth speakers out there than AirPlay ones, partly because all AirPlay products also have Bluetooth on board, but mostly thanks to improved sonics and

the development of near-CD quality streaming using the aptX protocol.

Bluetooth is now the more popular wireless connection method, and there are plenty of Bluetooth speaker models scrambling for every single bit of desktop or shelf space available around the home. A legacy of the docking days, single speaker units are more popular, but discerning listeners are more inclined to want a stereo pair, four of which we have on test here. Let's see how they perform.

Clint Freya BT

PRICE: £288 (pair) TELEPHONE: 01732 765105 WEBSITE: clintdigital.com

DETAILS

PRODUCT

Clint Freya

ORIGIN

China

DIMENSIONS

(WxHxD)
100 x 215 x 100mm

WEIGHT

0.9kg per speaker

SOCKETS

USB for software
upgrade/charging
mobile devices;
3.5mm aux line in

FEATURES

Quoted power
output: 2x 7W; aptX
Bluetooth 3.1; wall/
stand mount; bass
reflex; rechargeable

DISTRIBUTOR

Sygnifi Ltd

CLINT IS THE new name in Bluetooth speakers, although the Danish brand is already known elsewhere in Europe for its DAB radios. Unlike the other three models on test here, the Freya (named after a mythological Norse goddess) is a portable rechargeable mono speaker (priced individually at £144). A stereo pair is formed by buying two separate speakers, which are then connected wirelessly. This gives you the flexibility of unpairing them temporarily should you wish to take one off on a picnic or into a different room, for example.

The build quality of the speakers is decent, with a durable metal grille wrapped round a weighty cylinder. At the rear is a 3.5mm aux line in and on the front are a row of LED lights, which change colour and flash to telegraph the unit's status.

There's no remote control, but there are some large buttons on the top of one unit. These are plasticky affairs and require a substantial press before

they respond. Aside from powering on/off and for pairing the left and right units, you can also use your playback device to alter volume, change track, etc.

Stay close

Power output claims to give 7W per speaker and when combined as a pair they do an impressive job considering their dimensions. Clint says the speakers can be placed up to 8m apart, however I experience a fair amount of drop out when using them as a pair just 2m apart. That aside, performance is pleasing with a lively, energetic playback of *Isn't She Lovely* by Livingston Taylor. The whistling at the start is nicely honed and the vocals are crisp and defined. The lower register piano notes and double bass in Cyrus Chestnut's *Grandma's Blues* fall short in terms of extension, but



what you have is nice and tight, and evenly spread across the soundstage. It might not be the last word in refinement and the Freya's sound is a tad routine, but the new to the UK brand delivers a musical coherency that's reassuring and easy to enjoy ●

VERDICT

Freya makes an impressively versatile solution that's good for occasional outdoor use too



Blue Aura x30

PRICE: £259 TELEPHONE: 01480 4777738 WEBSITE: blueaura.co.uk

DETAILS

PRODUCT

Blue Aura x30

ORIGIN

China

DIMENSIONS

(WxHxD)
112 x 175 x 145mm

WEIGHT

1.5kg per speaker

SOCKETS

RCA stereo phono in; digital optical in; subwoofer line out; USB (for wi-fi extender only)

FEATURES

Quoted power output: 2x 30W; aptX Bluetooth 4.0; NFC; wall/stand mount; remote control

DISTRIBUTOR

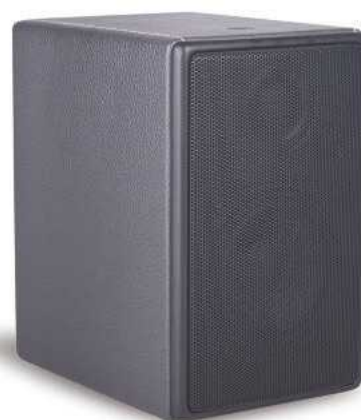
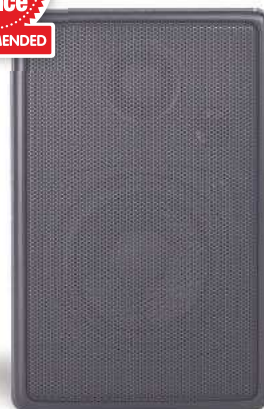
Blue Aura

AS THE SOLE UK participant, Blue Aura is a fairly new speaker name but we saw its floorstanding x40 in *HFC* 397. Like its sibling the x30 comes with a faux leather exterior and adds additional colours and build quality is reassuringly good, with a removable metal grille hiding two drivers.

Its Bluetooth implementation is the latest 4.0 version with aptX. The left speaker is a slave unit and is tethered to the right by a proprietary cable. The latter has a wealth of connectivity with RCA stereo phono and digital optical inputs, plus a subwoofer line out. There's also a USB, for use with Blue Aura's optional 2.4GHz wireless dongle, which provides extended range and multi-source setup.

Each two-way speaker has an individually amplified 20mm soft dome tweeter and 87mm paper cone, which are fed by a 30W Class D amp.

Setting up and using the x30 is an absolute doddle, with the unit being operated using a neat remote control



handset, which is a nice size and weight and has six decent quality rubber buttons that allow you to select source inputs, change or mute the volume and power on/off. Bluetooth pairing is done using a button on the rear or by NFC.

Power house

Considering its dinky dimensions, the x30 is much more powerful than it has any right to be and listening to *Isn't She Lovely* it delivers a dynamic sound that has plenty of energy. Clarity is particularly impressive in the

mid-range and higher frequencies but bass hounds will, inevitably for speakers of such compact cabinets, feel a little short changed at the bottom end. Nonetheless Cyrus Chestnut's *Grandma's Blues* comes across as smooth and well rounded, with a pleasingly light touch to the upper registers of the piano ●

VERDICT

Well built with plenty of input options. A really good sound that's balanced and powerful



Tangent Spectrum X5 BT

PRICE: £300 TELEPHONE: 01923 205600 WEBSITE: tangent-audio.com

DETAILS

PRODUCT

Tangent Spectrum X5 BT

ORIGIN

China

DIMENSIONS

(WxHxD)
166 x 345 x 205mm

WEIGHT

4.4kg per speaker

SOCKETS

Digital optical in; digital coaxial in; 3.5mm analogue in; RCA stereo phono in; USB charge port; subwoofer out

FEATURES

Quoted power output: 2x 50W; aptX Bluetooth 4.0; tabletop/stand mount; remote control

DISTRIBUTOR

BBG Distribution

LIKE THE CLINT, the Tangent Spectrum X5 BT hails from Denmark and comes in a choice of white or black finishes. Although considered a compact bookshelf, it is a sizeable beast – the height of a large pair of wellies – and requires a fair bit of real estate. Too large to use on a desktop with a computer the Tangents are well equipped for placement with a mini hi-fi system. In addition to aptX Bluetooth 4.0 the left speaker has a good array of wired digital and analogue inputs. There's also a USB port, sub line out and high-quality binding posts for hooking up the passive right speaker. Power output is quoted as 2x 50W.

The rear-ported Spectrum exudes quality in terms of design and construction, with a lustrous satin finish and walnut base plinth, one of which has a single LED status light. A wide dispersion 25mm soft fabric dome tweeter is complemented by a 130mm long-throw paper coned bass



driver, both are protected by colour-matched mesh grilles.

A nicely designed remote is also provided. It has 27 buttons, adding playback control and treble/bass adjustment to the usual suspects.

High energy

Bluetooth performance is highly energetic with an excellent sense of scale, and topped off by well-rounded delivery that ensures all parts of the dynamic range are treated equally. The double bass in *Grandma's Blues* is bold and textured, while detail

retrieval from the piano is peerless. The whistling in *Isn't She Lovely* is expertly conveyed as the speaker handles the track's mix in its stride.

Unsurprisingly, given the larger enclosure and superior power output claims, the Spectrum can be driven louder than the others tested here without sounding hard or strained ●

VERDICT

The Spectrum is a terrific Bluetooth speaker that delivers the sonic goods with aplomb



Audio Pro Addon T8

PRICE: £300 TELEPHONE: 01908 512212 WEBSITE: audiopro.com

DETAILS

PRODUCT
Audio Pro Addon T8

ORIGIN
China

DIMENSIONS
(WxHxD)
104 x 163 x 137mm

WEIGHT
1.6kg per speaker

SOCKETS
3.5mm analogue in;
RCA stereo phono
in; USB for optional
Wireless RF receiver
dongle; sub out

FEATURES
Quoted power
output: 2x 36W;
aptX Bluetooth 4.0;
tabletop/wall mount
(optional bracket);

DISTRIBUTOR
Audio Pro UK

SWEDEN IS REPRESENTED

here by Audio Pro, which has a fine heritage in the wireless speaker world with models that use RF as a transmission standard. Like the Blue Aura, the Addon T8 is the height of a paperback novel and is the perfect size for desktop use or alongside other hi-fi gear with analogue outputs.

The T8's Bluetooth incarnation is aptX-compatible (version 4.0) and additional connectivity comprises a subwoofer line out, plus a 3.5mm line in and RCA stereo phono inputs. USB is also provided for an RF adapter that lets you use it as part of an Audio Pro multi-room system.

Like all the other speakers here, you can buy the Addon T8 in a choice of black or white finishes, the latter option providing a stark contrast to highlight the well-constructed exposed drivers. Each two-way bass reflex cabinet is fashioned from a durable plastic and has a single 25mm



soft dome tweeter, which is protected by a permanently fixed grille partnered with an exposed 89cm mid/bass driver, which will be rather vulnerable to inquisitive, prying fingers.

Time for T

The right speaker has a single, barely visible LED for status information, and setup is effected using a minimalist brushed aluminium remote that trades comfort for style with hard edges. Still, operation is simplicity itself and the T8 is no disappointment sonically either, with a performance delivery that pretty much matches the Blue Aura x30. The upper registers of the piano in Cyrus Chestnut's *Grandma's Blues* are nicely defined and evenly balanced

against the double bass, which is tight and fast. Livingston Taylor's whistling in *Isn't She Lovely* is agile and clean and the drivers seem excellently matched. Stereo imaging is impressive and not for the first time I'm astounded at how polished and powerful a sound such small speakers can produce. They can't quite match the Tangent Spectrums for pure airiness or ease of delivery, but in terms of texture and warmth they have a very desirable sound ●

VERDICT

Delightful sonic delivery from a stylish, dinky speaker that's well suited for desktop use



Mini test verdict

DECIDING WHICH OF these models is the best is inevitably skewed by the manner in which they are to be used because size, method of operation and connectivity are all factors that have a stronger bearing than say a roundup of cartridges or in-ear headphones. The Clint Freya, for example, lends itself to occasional outdoor use thanks to its portability and rechargeable battery. And although it has an analogue input, it is unequivocally a dedicated Bluetooth speaker. Uniquely it can also be used as a mono speaker or as a stereo pair as the other models are tethered together and are mains powered. The Blue Aura x30 and Audio Pro Addon T8 are suited to desktop use and/or soundbar duties with a TV. The Tangent Spectrum BT5

is too big for a study, but would certainly enhance a TV, a streamer or a mini hi-fi system.

Aside from the Clint Freya's speaker-to-speaker flakiness, all models deliver a respectable soundfield with no obvious weaknesses. Unless you're dead keen on a portable model, I would discount the Clint Freya, which lacks the refinement or sonic finesse of the others on test here. There's so little to choose between the Blue Aura x30 and Audio Pro Addon T8, both of which look and sound delightful. The Blue Aura x30's superior connectivity and remote control arguably give it the edge, but it would be wise to audition them both to see which most suits your personal taste.



Proving that size does matter, the Tangent Spectrum X5 BT is the clear winner. Its finely detailed, well balanced and powerful sound is a delight that makes a superb showcase for aptX. Versatile connectivity and an excellent remote control seal the deal.



Pairing is usually a case of selecting pairing mode on both source and speaker. This should only have to be performed once, with playback taking place automatically thereafter whenever both devices are switched on.

NFC (Near Field Communication), as found on the Blue Aura x30, allows simple one-off contactless pairing with many Android phones. The latest iPhone 6 has NFC, but its use is currently restricted to contactless payments.

Bluetooth has been boosted by aptX, which delivers near CD-quality streaming, and is now common on Bluetooth speakers. If the source device supports aptX the speaker will automatically use the codec, if not SBC (with its greater compression) is used. With most setups there's no way to see if aptX is active, but if using an Apple Mac you can press alt and select the speaker in the Bluetooth drop-down menu to reveal the codec.

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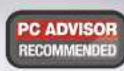
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When Martin Colloms reviewed Russ Andrews Speaker Zapperators in Hi-Fi CRITIC magazine, he admitted that his expectations weren't high. But when he heard them...

"... A reduction in noise floor, treble grain and sibilance, increased fine detail resolution and texture, and imaging was more natural with better distant perspectives. The sound was calmer, flowed better and with slightly better subjective timing and lower fatigue".

Martin Colloms, Hi-Fi Critic, Jan-Mar 2009

How do they do it?

The point at which a speaker cable plugs in is particularly vulnerable to interference and the consequent noise this introduces into the audio signal. Speaker Zapperators have been specifically designed to address this issue. Zapperators use a network of specialised, very high specification components to stably absorb RF and further reduce noise in the amplifier / speaker interface.

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Analogue Studio AS-500 Rolling Cleaner

WE ALL KNOW the importance of keeping our records clean. It doesn't matter how careful you are, dust and fluff can always find their way onto the surface of a disc, even during the short journey from the sleeve to the turntable platter. You should, therefore, always give your LPs a quick clean before you play them and one way to do this is to use a record cleaning roller.

In days gone by, record cleaning rollers used an adhesive coating on tape wound onto a roller. When clogged with dirt after repeated use, the surface layer was removed and discarded to reveal a fresh one. Unfortunately, these types of rollers were prone to leaving traces of adhesive on the record and the roller had to be replaced when all the layers were used up. Nowadays, record cleaning rollers use a silicone elastomer that has a tacky surface

that performs the same function, but without any of the messy drawbacks that come with using an adhesive. What's more, in the event that the roller gets clogged, it can be washed under a tap with a little soap to clean it.

Let the good times roll

The AS-500 consists of a roller with a silicone elastomer surface housed in an ergonomically designed handle. The grip allows gentle pressure to be applied to the record to enable the silicone elastomer to deform sufficiently to reach into the grooves. The record should be cleaned on a mat rather than on the turntable to eliminate any risk of damage to the central bearing should undue force be inadvertently applied. A length of protective clear plastic to be wrapped around the roller when not in use is also provided.



I find the AS-500 very simple to use and roll the cleaner from the label to the edge of the record radially going around the record before playing. Even though the disc looks pristine before cleaning, I am surprised by the amount of debris sticking to the roller after the process.

This is an effective product at a good price and comes recommended for vinylistas everywhere looking to clean up their collection. **NR**

DETAILS

PRICE
£24

TELEPHONE
01733 350878

WEBSITE
analogueseduction.net

OUR VERDICT



Mitchell & Johnson Wave Bluetooth adaptor

FOLLOWING THE REBRANDING

of Sansui UK to Mitchell & Johnson, this is the first product to come our way. The Wave is a Bluetooth 3.0 adaptor that can be plugged into an audio system that doesn't already have the wireless facility built in.

The curvy device measures 50 x 20 x 10mm (WxHxD) and can plug directly into an amplifier or any audio input socket (including a car stereo system) equipped with a 3.5mm stereo jack socket. Alternatively, it can be sited away from the equipment using the supplied 1.4m extension lead, and there's a twin coaxial RCA adaptor supplied for connecting it to a spare aux input on your amplifier. When used with a car audio system along with a Bluetooth mobile phone, the Wave can answer calls and you can talk using its minute microphone.

Power comes from the built-in Li-Polymer rechargeable battery that

claims to provide up to six hours use. I fit the Wave to a pair of unused inputs on my amplifier connected with male-to-female extension leads (not supplied) hooked up to the RCA adaptor and 3.5mm jack-to-jack cable. Pairing is easy and it connects instantly to a Samsung Galaxy S3 Android phone without depressing the Bluetooth button on the device or even having to enter a passcode. Sonically, the Wave is a great little performer and produces a pleasingly full sound that brings to life tunes accessed via a smartphone or tablet in a much more engaging way. In hi-fi terms the top end is a little reserved in comparison with a wired digital music player, but *Concerto Grosso No.1* by Charles Avison and Vivaldi's



Paris Concerto No.2 – both 250kbps MP3 files – sound surprisingly captivating. Streaming some jazz via a 16/44 WAV file of Oscar Peterson playing *You Look Good To Me* to the Wave demonstrates a full bass.

If you are looking to occasionally connect a smart device to your hi-fi or wish to hook up Bluetooth to the audio system in your car, then the low-cost Wave is ideal. **NR**

DETAILS

PRICE
£30

TELEPHONE
0845 6435064

WEBSITE
mitchellandjohnson.com

OUR VERDICT





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- Headphone output 16 Ω 500mW, 300 Ω 425mW

North West - Brian & Trevors 0161 766 4837. **East** - Analogue Seduction 01733 350878 / LW Audio 01284 716415.

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 / Phase 3 Audio 01903 245577. **South West** - Audio Destination 01884 243584

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LP Gear

AT95VL cartridge

AUDIO-TECHNICA'S AT95E IS

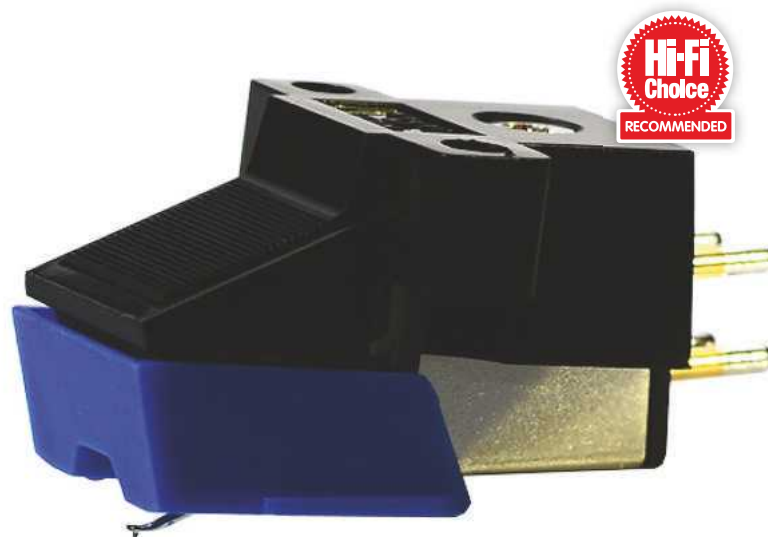
the Honda Civic of cartridges. There are better ones, there are worse ones, but you always know what you're getting – a quality product that does the job you bought it for. It's not flashy, nor is it particularly fun, but it is capable, surprisingly refined and fine value for money. For this reason it has been in production for decades, getting fractionally more expensive every year. It now sells for the modest sum of £35.

Its bigger brother – the AT110E, now discontinued – was always the better buy, offering a good deal more refinement for just a few quid more. Its smaller brother – the AT93 became something of a cult. It formed the basis of the Linn Basik cartridge, the main modification being that Linn glued the stylus in place, for extra rigidity. It sounded like a crude mod, but actually improved things noticeably.

Mods and rockers

Now, US-based LP Gear has decided to modify the AT95E. The chassis is well able to stand a better stylus, and so that is precisely what the company has fitted. The sum of \$99.95 (£65 plus carriage) buys you a 'Vivid Line Contact' diamond tip with a quoted size of 6/75µm, that has been exclusively crafted in the cartridge's native land of Japan. The new stylus is carefully mounted on a thin wall Zualum tubular cantilever.

The standard AT95 body is retained, and there's nothing wrong with that – at the price. It puts out a quoted 3.5mV (@ 1kHz, 5cm/sec), which isn't as good as some more modern moving magnets but is still perfectly fine for today's moving magnet phono stages. It is said to have a channel balance within 2dB, separation at 1kHz of better than 20dB, plus a dynamic compliance of 6.5 (x10-6 cm/dyne) and static compliance of 20. This puts the cartridge firmly in the middle; it's not weird, hard to match or a tricky load (at 47kohm and 100-200pf). Most arms will track it happily



between 1.5 and 2.5g and at 6.6g it's not a difficult fit. I find it tracks impeccably at 2g in the arm of my Rega RP3.

Before we consider the AT95VL, a quick look back at the stock Audio-Technica AT95E. In a good tonearm you get a detailed, smooth and quite musical sound. It has a good turn of speed, has pleasingly crisp and extended treble and a reasonably supple bass. The downside is that it is too opaque. Everything is a little out of focus, rather tonally homogenous, too vague to be a truly enjoyable cartridge. It's not a criticism, because you can do a lot worse at the price; it's just that it always leaves me yearning for more.

More is what the LP Gear version gives you. Indeed it's fascinating to see what the new stylus brings to the party, because you soon realise the difference is quite profound. That slightly misty, foggy feel of the standard cartridge goes to a great extent, and suddenly everything becomes a good deal more finely etched. It seems like the standard cartridge ploughs its way through the record groove like a heavy goods vehicle, whereas the Vivid Line Contact of the AT95VL is more of a sports motorbike, lithely tracing the contours of the highway! There is so

much more information; totally unexpected given the relatively modest (£30 + P&P) price difference between the two.

Spot the difference

Tonally, little changes; the AT95 isn't the world's most rich or euphonic cartridge, and the new stylus doesn't do much to change this. There's still that slightly well-lit midband, which casts a broad white light across drums, vocals and strings, but the bass seems fractionally fuller and more impactful; perhaps this is mostly the better speed and dexterity. The treble is a revelation; the original cartridge just doesn't have the fine filigree detail you would want and this really detracts from the overall experience. Not so with the LP Gear, which seems softer but more finely finessed and there's a good deal more air and space to proceedings too. This has implications for the midband, bringing a better sense of focus to the stereo soundstage, and lending more depth. Overall, it's an all-round win for this little cartridge; the modestly priced upgrade pushes it forward substantially. Oh, and if you have already got an AT95E, you can upgrade it with the LP Gear ATN95VL for a modest fee. **DP**

DETAILS

PRICE
£65

WEBSITE
lpgear.com

OUR VERDICT

★★★★★

Epiphany Acoustics

Atratus II & III RCA interconnects



FOLLOWING AN EXTENDED period of development, Epiphany Acoustics has added to its Atratus collection of cables. The Atratus II and III RCA-terminated interconnects aim to embody the company's philosophy of offering great value and high performance.

The Atratus II utilises twin-core copper cable that is fitted with a high-coverage braided shield to protect the internal signal conductor from extraneous noise pick up and interference. The conductors are insulated with a low-loss foam high-density polyethylene dielectric material. The outer sheath is finished with a black and white woven jacket. The cables are terminated in the excellent KLEI Copper Harmony RCA phono plugs. These have signal and earth pins that are silver plated over pure copper and >101% IACS

(International Annealed Copper Standard) to offer enhanced electron flow compared with more conventional RCA plugs.

Then there were three

The Atratus III makes use of twin-core UP-OCC (Ultra Pure Ohno Continuous Cast) copper cable with dual-foil and high-density copper-braid shields. The UP-OCC wire is drawn in one continuous length to remove the crystal boundaries and to increase the purity of the copper. These wires are surrounded by a low-loss Teflon dielectric and finished in a black and white woven jacket. The cables are terminated in KLEI Silver Harmony RCA phono plugs, which feature an earth connection made from solid silver and utilise a thick silver plating on the copper signal pin. As a result, the conductivity of the Silver Harmony plugs is >106% IACS.

After running in both cables I try them out with a wide range of music, from full orchestra to vocals and solo instruments. The Atratus II sounds really open with excellent imaging. It's warm and smooth, but without any tendency to gloss over detail. With the Atratus III, there's an improvement in the clarity and refinement of the sound. Bass lines are punchier and the instrument placement, although good with the II, is more sharply defined with the III.

Both of these cables punch way above their price point and are really high-quality interconnects. **NR**

DETAILS

PRICE
Atratus II: £65,
Atratus III: £100
for 1m

WEBSITE
epiphany-acoustics.
co.uk

OUR VERDICT



NuForce

μDAC3 headphone amp and DAC



DESPITE ITS AFFORDABLE price and dinky proportions (think Tic-Tac box) the μDAC3 has an eyebrow-raising spec that includes a variable gain headphone amplifier and a 32-bit DAC with support for 96kHz hi-res files of most common types including DSD. That in itself would make it a viable rival to the likes of Cambridge Audio's DACMagic XS (HFC 382) and the Audioquest Dragonfly (HFC 370), but it ups the ante with RCA phono outputs and a coaxial digital output. The latter allows it to be used simply as a USB-to-S/PDIF convertor in conjunction with a beefier amplifier.

It is solidly built from brushed aluminium and durable plastic with a nicely weighted rotary volume control. There's a 3.5mm headphone jack alongside a single LED, which glows when the USB connection is drawing power from a computer. To

the rear are the other outputs and micro USB input (a lead comes supplied). The μDAC3 is compatible with Windows and Mac computers and you need to set the Audio MIDI utility to output at your preferred resolution.

Winging it

Using the μDAC3 principally as an asynchronous USB source with an iMac I find it to really enjoyable to operate and to listen to. The cellos in Brandenburg's *Concerto No. 3* (ALAC) are finely textured and there's plenty of sparkle and detail to the midrange and upper registers of the violins. Overall, it confidently serves up a lively, well imaged soundstage. Wings' *Band On The Run*, a 24/96

ALAC download, is equally engaging as the DAC reveals the subtlety of the layering with the gentle tapping of the cymbals at the start underpinning the scintillating chords of the lead guitar. Some may find its presentation a mite too dry or too analytical, but performance-wise it's a close run thing with Cambridge Audio's DACMagic XS. The latter is smaller, but the μDAC3's volume control makes it nicer to use and the additional outputs make it much more versatile. **AJ**

DETAILS

PRICE
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WEBSITE
optoma.co.uk

OUR VERDICT



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Benz Micro LP1, boxed plenty of life left
Clearaudio Innovation Compact, good condition
Clearaudio Unity Tonearm excellent boxed
Clearaudio Basic Symmetry Phono Stage boxed
Conrad Johnson TEA 1b Phono stage
Conrad Johnson Premier Six phono preamplifier
Consonance Cyber 40 phono stage
Garard 401, Jelco 750 12" arm, new plinth and lid
Garard 401 Motor Unit, Bastin serviced
Graham Phantom Supreme 12", SME cut
Graham Slee Fanfare Gramamp 3
Haddock 242 Export, boxed
Lehmann Black Cube phono stage
Inspire Full on Technics 1210/Plinth/PSU/SME M2 arm
Linn Majik LP12 with arm cart, near mint boxed
Linn Sondek, Ittok, Troika, boxed new lid
Linn Sondek, Ittok, boxed new lid
Linn Sondek, Ittok, nice condition
Linn Sondek, Lingo, Naim Aro, superb
Linn Sondek, Grace 707, bassk psu, VGC+
Linn Sondek, Naim Aro, Staff build Armageddon
Linn Lingo, excellent
Linn Basic Plus, vgc+
Lyra Erodon Step up
Michell Hydraulic Reference, Fluid arm, excellent
Michell Technoarm A in black as new mint boxed
Michell Synco/ARB250/Eroica, great condition
Michell Focus with Hydraulic platter and Linn arm
Michell Orbe, DC motor, SME V boxed
Moth phono stage
Musical Fidelity XLP5/V8 phono stage
Naim Aro, excellent boxed
Naim Stageline S excellent boxed
Naim Stageline N vgc
Oracle Delphi, Zeta, due in
Project PhonoBox SE phono stage, excellent value
Project RPM 10 turntable with arm and platform
Project Debut Carbon, excellent boxed
Project Xpression mk2, arm and cart
Project RPM 4 Turntable/Arm with cover, great!
Project Perspective, Speedbox SE, Shure V15mx
Rega Planar 2, RB250, excellent boxed
Rega RP3 Ellys2 cartridge, excellent boxed
Rega RP6, Exact cartridge, vgc boxed
Roksan TMS 2 with Reference PSU, boxed as new
Scheu Laufwerk mk2 with Unipivot tonearm, due in
SME 3012, excellent
SME 3009/3, excellent boxed
SME V, excellent, boxed, due in
SME V12, nr mint boxed
Technics 1210, near mint, Alphason Xenon
Technics SL110 with SME 3009
Thorens TD150, SME3009 good condition
Thorens TD160 HD turntable
Thorens TD160, Audio Technica arm, boxed
Thorens TD160, Rega arm, replinthed, lovely!
Thorens TD209 turntable package
Thorens TD2030 black turntable
Thorens TD125 c/w SME3009, excellent
Tom Evans Groove, 0.85mw/100 ohm, excellent
Townshend Elite Rock c/w Excalibur, boxed excellent
Transfiguration Orpheus L, good condition
VDH Colibri M/C cartridge
VDH Concor M/C cartridge
Voyd, Voyd, split phase psu and RB900
VPI Scout, JMW arm excellent
Wilson Benesch Act 1 Tonearm, nr mint superb

Radio/Recorders

Arcam Alpha 10DAB tuner, excellent
Arcam T61, vgc+
Cyrus FM7, vgc+
Denon TU1800DAB, excellent boxed
Musical Fidelity ASDAB, sealed box
Naim NAT03, excellent
Naim NAT01 and NAPST chrome, serviced, vgc+
Naim NAT101 & SNAPS, excellent £500 Naim service
Nakamichi D10, excellent
Nakamichi DR1, vgc
Nakamichi BX2, excellent
Nakamichi S80, near mint boxed
Pioneer CT91a reference
Pure T01ES DAB Tuner
Revov PR99, rated
Tandberg TCD440a, superb!
TEAC VB8000s, super
TEAC X1000M, serviced, superb
TEAC X10R, serviced, superb
Technics RS1500 in flightcase near mint
Rotel RT1080, excellent
Yamaha KX1200 excellent
Yamaha CT7000, vgc

Amplifiers

dem Call
Almaro 318B with cage, excellent boxed
dem Call
AMR 777 Integrated
dem 299
Arthem Integrated 2 Valve Integrated
dem 999
Arcam P90, vgc+
dem 2499
Arcam A85, vgc+
dem 2799
Arcam Alpha 8P, vgc+ boxed
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Arcam Alpha 7, vgc+ boxed
used 1199
Arcam C31 preamplifier, remote excellent
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Audio Analogue Bellini VB and Donizetti Cento, superb
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Audiolab 8000P vgc boxed
dem 599
Audiolab 8200A vgc boxed
dem 199
Audion Sterling Plus KT88 Integrated boxed
used 1899
AVI Lab Series Pre/Power, excellent remote
used 1499
BAT VK50se preamplifier, vgc+
used 1199
Bryston 4Bsst2, excellent boxed,
used 999
Bryston B100st excellent boxed
used 899
Chapter Audio Couplet Power Amplifier
used 2499
Chord Electronics CPM2650 Integrated, ex boxed
used 599
Chord Electronics CPA3200/SPM1200E
used 2499
Consonance Cyber 10 Integrated
used 599
Consonance Ref 8.8 integrated valve amp
used 149
Consonance Cyber 211 monos c/w Pavane valves
used 1499
Creek OBH21, excellent
used 779
Creek 4330mk2, excellent
used 449
Cyrus aCA7.5, excellent boxed remote
used 499
Cyrus Power, vgc+
used 349
Cyrus XPower, excellent boxed
used 3499
Danzel NHB108B, excellent £20+k new
dem 249
Denon PMA1500AE, excellent
dem 199
Graaf GM50B Mk11 Integrated
used 1499
Graaf GM100 valve power amp
used 199
Jolida Envoy 211 Monoblocks, £7k new, superb
used 179
Leema Hydra 2, vgc+ boxed
used 999
Leema Elements Amplifier, excellent
dem 899
Leema Tucana 2, excellent
dem 849
LFD L51 lineage, reasonable shape
used 199
Linn Majik Kontrol & 4100 Power, excellent
used 199
McIntosh C22 & MC275 Commemoratives, boxed
used 249
McIntosh MA5100, excellent!
used 599
Meridian 501V preamp, excellent
used 179
Meridian 501 Pre
used 399
Micromega IA100, great integrated, boxed
used 649
Moon W7RS, excellent
used 2899
Musical Fidelity M3i, excellent boxed, **REDUCED**
used 549
Musical Fidelity A1000 Two box monster Integrated!
used 999
Musical Fidelity A1 FPB Preamp and PSU, excellent
used 249
Musical Fidelity 550K Superchargers, sealed boxes!
used 1499
Musical Fidelity X-T100 Integrated
dem 1499
Musical Fidelity Pre 8 and 2 x MA65 chrome fronted
used 599
Naim NAP100, vgc+
used 399
Naim NAPC82, excellent boxed
used 499
Naim NAP250, olive excellent boxed
used 299
Naim NAP250, very late olive excellent
used 1199
Naim NAP250, olive excellent
used 249
Naim NAP250, excellent late boxed olive
used 349
Naim NAP150, excellent boxed
dem 699
Naim NAPC202 with NAPSC, boxed
new 999
Naim AV2/NAPV175, remote, excellent boxed
used 399
Naim NAP180, excellent boxed
used 849
Naim NAIT 5, excellent remote boxed
used 799
Naim NAP152/NAP155XS, excellent boxed
used 799
Naim NAP90/NAP92, vgc
dem 2999
Naim NAP250, chrome bumper
new 1999
Neutonia Salis Integrated, classy Restek built
used 1499
Onix OA32 Integrated, excellent
used 999
Onix OA25 Integrated, excellent
used 799
Pathos Logos Integrated
dem 1999
Placetate Audio Passive Linestage
used 599
Prima Luna Prologue 3 Preamplifier vgc+
used 649
Prima Luna Prologue 2 Integrated, good shape
dem 799
Prima Luna Prologue 3 Preamplifier, **REDUCED**
dem 749
Puresound L300 valve preamp
dem 3599
Quad 99 Pre/Power, excellent, remote, Quadlink
used 649
Quad 405, from
used 199
Quad 33/303, vgc, serviced
used 299
Resolution Audio Opus 21 S80 Integrated
dem 199
Renaissance RA02 Monos, vgc and excellent value
used 499
Roksan Kandy K2 Power, nr mint boxed
used 899
Sugden Masterclass Monoblocks, in titanium
used 249
Sugden A21a line Integrated
used 199
Sugden Masterclass Pre/Monos in Graphite
used 149
Sugden Masterclass Pre/Monos in Titanium
used 249
Sugden Masterclass Integrated in Titanium
used 199
Tag/McLaren 60iRV, excellent boxed
used 89
Talk Electronics Hurricane/Tomado Pre/Power
used 799
Tannoy TA1400, excellent boxed
used 499
TEAC Distinction A1000 Integrated, ex demo
used 299
Trio L07C good condition
used 599
Union Research Prelude Integrated, excellent boxed
used 599
Union Research Simply Italy Integrated
used 2499
Union Research S2K Integrated, excellent
used 149
Yamaha AS500, excellent boxed
used 199
Yamaha A-S3000, nr mint boxed
dem 499

Digital

used 1199
Arcam Alpha 8, excellent
dem 1999
Arcam Alpha 8se, excellent boxed
used 499
Arcam CD17, excellent
used 299
Arcam CD73, vgc+, remote
used 249
Arcam CD37, remote excellent, reduced
used 199
Atoll 100SE DAC
used 99
Audio Alchemy digital transmission interface/psu
used 499
Audio Analogue Maestro SE CD
dem 3999
Audio Analogue Paganini (later model)
dem 3999
Audio Synthesis Transcend CDT (Modded SONY)
used 2499
Ayre Evolution DVD
dem 379
Bryston BDA1 DAC, excellent boxed
dem 3999
Cary Audio CD306 Pro, near mint boxed
dem 3999
Chapter Audio Sonnet CD & Nevo remote
dem 14299
Chord 'One' CD player
used 899
Chord Qute EX DAC, excellent boxed
used 199
Consonance CD120 Linear
used 299
Consonance CD2.2, new sealed
new 499
Consonance Droplet, vgc+
dem 499
Creek Destiny Integrated CD player, boxed
used 1749
Cyrus Discmaster/Dacmaster, vgc+
used 2499
Cyrus CDX12, mint boxed just back from Cyrus
used 2999
Cyrus CD8, boxed remote
used 2249
Cyrus CD7Q chip, vgc+
dem 1999
Cyrus dAD3, remote, vgc+
used 2499
Cyrus CD8se, boxed remote
used 3749
Denon DP720AE, near mint boxed
dem 799
EAR Acute 3, mint boxed
dem 2999
Exposure 2010CD, remote
used 119
Goldenote Koala, near mint boxed
dem 2999
Ida Design Katana cd player (no remote)
used 119
Kelvin Labs DAC, rare
used 249
Leema Elements CD player sealed box
used 119
Linn Majik CD, just factory serviced, excellent!
used 599
Linn Karik 3, excellent boxed remote
used 199
Marantz CD6003, excellent boxed
used 7999
Marantz CD17, remote, excellent
used 749
Marantz CD63K1, remote, boxed excellent
dem 2999
Marantz NA7004, nr mint boxed
dem 1999
Meridian 506/20 with MSR
used 1899
Meridian G08, remote boxed
dem 899
Meridian 563 DAC reasonable condition
dem 1899
Meridian 500 Transport, excellent boxed
used 299
Meridian 602/606 combo with remote
used 1499
Metrum Acoustics Octave NOS DAC
used 6999
Micromega MyDAC, excellent boxed
used 749
Micromega Leader, remote
used 299
Musical Fidelity 3.5 CD
used 349
Musical Fidelity KAW SACD, new laser, upgraded ps
used 1249
Musical Fidelity M1 DAC, excellent boxed
used 329
Musical Fidelity M1 CDTB
dem 499
Musical Fidelity M3 black boxed
dem 499
Musical Fidelity M1Clic
dem 699
Musical Fidelity XDac, excellent
used 199
Myriad Z20DAC, excellent boxed
used 199
Naim CD5i, excellent boxed
used 449
Naim DAC, nr mint boxed
dem 1499
Naim CD5i, near mint boxed
used 699
Naim CD53, excellent boxed, remote
used 1899
Naim CDi, excellent boxed
used 599
Naim CD3.5, vgc
used 299
Naim CDX2, excellent boxed
used 1099
Naim CDX2, 2009, excellent boxed
used 349
Opus BDP83se, excellent boxed
used 1199
Peachtree DACi2, excellent
used 349
Prima Luna Prologue 8, ex demo boxed
used 1199
Quad 99DCP, excellent **REDUCED**
used 599
Rega Planet 2000, excellent
used 449
Rega Apollo R, excellent
used 1199
Rega Apollo 35th Anniversary, excellent
used 349
Rega IO DAC, excellent
used 699
Rega Saturn, excellent boxed
used 399
Roksan Kandy K2CD, excellent boxed
used 299
Rotel RCD965BX, excellent boxed
used 399
Sugden Masterclass CD original version
used 1999
TAG McLaren DAC 20, excellent
dem 599
Tube Technology Fulcrum DC transport
used 649
Tube Technology Fulcrum DAC (inc DAC64 chip)
dem 799
Yamaha CD-S3000 near mint
dem 2249

AV/Accessories/Cables

dem 599
Audeze LCD2 excellent
dem 899
Audeze LCDXC excellent
dem 899
Beyer Dynamic T1, vgc boxed
dem 499
Bryston BHA-1 Headphone amplifier, superb
used 3999
Cyrus PSXR, excellent from
dem 999
Elemental Audio Equipment Rack
dem 499
Elemental Audio speaker stands
dem 499
Ergo AMT phones with Amp 2 (£2.5k new)
dem 1499
G-W T2.6F Valve headphone amplifier, excellent
used 159
Grado GS1000 and RA1 amplifier
used 599
Isotek Nova power conditioner
dem 1199
Lehmann Rhineland
used 199
Musical Fidelity M1 HPAB
dem 399
Musical Fidelity TripleX power supply
new 199
Naim XPS DR, ex demo
dem 2599
Naim XPS, excellent boxed
dem 1499
Naim HiCap, various
dem 699
ProAudio Bono Reference Platform
used 179
Stax SR404/SR0060i, stand, cover etc boxed
dem 1999

Loudspeakers

new 799
Acoustic Energy AE1 Classic
dem 799
Acoustic Energy AE1 Mk11 in Gloss black
used 3249
Apogee Duetta Signature (Reality rebuit) Superb
dem 599
Art Audio Stiletto in Maple
new 1999
Aspara Acoustics HL6 in Oak
dem 699
Audio Physic Tempo in Cherry, fair
used 99
Audiovector Si3, near mintboxed
dem 749
Audiovector Si3 Super, near mint boxed
dem 1199
Aurum Cantus Music Goddess in Gloss black
dem 699
Avalon Ascendant Mk2, mint crated, £10k new
used 3499
B&W 805s in cherry, excellent
used 1749
B&W CDM1se in cherry, excellent
used 349
B&W CDM1nt boxed, excellent
used 299
B&W DM601s3, vgc+
used 299
B&W DM602s3, vgc+
used 249
Castle Howard, excellent
used 349
Castle Chester vgc later versions
used 1999
Davone Ray, vgc in walnut, great!
used 499
Eminent Technology LF78, some marks
dem 549
Epos M22 in Cherry
dem 349
Ferguson Hill FH007&8 'desktop' audio set boxed
dem 999
Final 400 Electrostatics with ES400 Sub
dem 2249
Focal Electra 1008, mint boxed
dem 2749
Focal Electra 1028, mint boxed
dem 3999
Focal Electra 1038, mint boxed
used 1999
Gallo Nucleus Reference 2, rare, superb & boxed
dem 499
Heco Celan 500 in Silver
dem 399
Heco Celan 300 in Mahogany
dem 1499
Heco Statement in gloss black, £3k new
used 249
Kef Q100, brand new, sealed box
new 999
Kudos C10, boxed vgc and cheap
new 2499
Leema Xandia Mk1 in black
dem 349
Leema Xero in Mahogany
used 2249
Living Voice IBX R2 in stunning Zebrano, excellent
dem 999
Mark & Daniel Maximus with treble extenders E2500sh
dem 699
Mark & Daniel Mini in Grey inc. Marble cabinets.
used 1299
Martin Logan Mosaic, excellent boxed
used 3499
Martin Logan Quests, superb sound, reduced
dem 8999
Martin Logan Prodigy, excellent
used 199
Mission 782se nr mint boxed
used 399
Mission Freedom 5, vgc in Rosewood
used 179
Mission 752, rosewood excellent
used 399
Monitor Audio RS8 excellent
dem 1999
Monitor Audio GX300, ebony near mint boxed
new 4999
Monitor Audio GX 5.1 Home Cinema set **BARGAIN**
dem 699
Monopulse Model S
new 1499
Monopulse Model A speakers
new 399
Monopulse Model C
used 1749
Musical Fidelity MCB Floorstanders, boxed vgc+
dem 1499
Naim Nsat x4, NcEnt and NSub, boxed excellent
dem 399
Naim Ovator S400, excellent
used 699
Naim CREDO, excellent
used 999
Naim SBL, vgc+
used 999
Naim SBL mk2, vgc+
dem 3999
Nola KO speakers in black
used 5995
Nola Micro Grand Reference inc stands, £15k new
used 599
PMC GB1, excellent, new boxes
used 899
PMC Twenty 21, excellent boxed, ex dealer demo
used 1399
PMC Twenty 22, excellent boxed, ex dealer demo
used 1599
PMC Twenty 23, excellent boxed,
used 2499
Proac D38 in Yew, boxed fair
used 1999
Proac D28, good condition in cherry boxed
used 1399
Proac D18, good condition in cherry boxed
dem 1199
Proac Studio 140 mk2, nr mint boxed
used 499
Proac Studio 115, excellent boxed
dem 749
Quad 21L Floorstander
used 199
Quad 11L2, excellent boxed
used 249
Red Rose Rosebud £2.5k new with (used) stands
dem 799
REL Sterling, black ash vgc
used 149
Revel M22, excellent boxed
new 599
Revolver RW45 floorstander in Cherry
dem 699
Revolver Cygnis Gold in Black, £14k new
dem 4995
Sonus Faber Elipsa, superb boxed
used 5999
Sonus Faber Cremona Auditor, boxed
used 1199
Spendor A6, in Walnut excellent boxed
used 999
Sunfire True Subwoofer
dem 399
Tannoy Prestige Autograph Mini, ex boxed
used 999
Teli CS7.2, vgc, just refurbished...
used 2499
Totem Mant Signature, boxed near mint
used 2999
Totem Mite in black
dem 449
Totem Rokk in mahogany, excellent
used 249
Totem Staf, near mint boxed
new 999
Usher Mini Dancer 2 in Maple, excellent boxed
dem 2999
Vandersteen Quattro, accessories, transformers etc
used 2999
Vedolyn DD18 sub in black
dem 1999
Veritas H3 (Lowthier drivers) in gloss black, 100db
dem 2999
Wilson Audio Duetta, excellent
dem 4899
Wilson Benesch Actor floorstanders
dem 1999

Special system deals

dem 599
Consonance Ping CD/AMP
dem 699
Linn Klassik Movie 05, excellent boxed
used 1349
Naim Uniti 24/192, excellent
dem 799
Orelle EVO CD and Amp was £2700
used 999
Yamaha CXA5000/MXA5000 as new boxed
dem Call

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Audio Origami

UniArm tonearm

ON THE FACE of it, the UniArm looks like the love child of a Naim Aro and Audio Origami's legendary PU7. The arm tube and headshell certainly pay homage to the PU7, and also the company's RB7. In common with all of the AO arms, each UniArm is made to order by arm designer and maker, John Johnnie 7 Nilsen. You can opt to have any custom colour and finish that you want for an additional cost. However, the standard finish of bead-blasted matt silver looks very elegant and will be a perfect match for most turntables. Other optional upgrades include a 12in model and a titanium armtube instead of the standard aluminium one. Most of the cost of the UniArm arises from the use of an expensive sapphire bearing for the pivot inside a double cup arrangement (to accommodate the damping fluid) and a special hardened tungsten-tipped spike. A comprehensive set of accessories is bundled, including alignment gauges, headshell spirit level and silicone damping oil for the unipivot.

Head of the class

The headshell is essentially a PU7 braced model with slots for attaching and adjusting the cartridge. If any alteration to the azimuth is required, it can be set by moving a small weight on the side of the bearing housing. The thick design of the armtube is also that of the PU7. It contains resilient OFC wire with silk insulation and the tube is foam filled. At the cartridge end, the wires are fitted with four Cardas gold PPC E cartridge tags. The other ends of the wires are fed through the top of the pivot housing and descend gracefully to terminate in a Cardas tonearm DIN connector. The female part of the connector is fitted with Audio Origami's super OFC external cable and terminated in gold Neutrik/Rean RCA plugs. As a result of the unipivot design and this method of connection, the whole arm wand can be removed and replaced with another, which may be of interest for people with more than one cartridge. The



UniArm is fitted with an arm clip and arm cueing device, both of which are integrated into the design, so no additional holes are required to be drilled into the deck.

Extending from the rear of the arm, the counterbalance weight is supported on an adjustable pillar. This is fitted below the height of the armtube on the unipivot housing to lower the centre of gravity and provide the necessary stability for the unipivot design. My review sample is fitted with a single Rega mount, but other mounts, such as the Rega 3-point and Linn, are available upon request.

The effective mass of the arm is about 11g, so it should work well with moving magnet and moving coil mid-compliance cartridges. I fit a Lyra Clavis DC MC cartridge to the UniArm and apply a small bead of the silicone damping oil to the centre pivot. After setting it up, I first check the resonance using a copy of the Vinyl Essentials test record. The actual resonance is very subtle (showing the silicone damping is doing its job well) and is very close to 10Hz. This is where it should be and promises great bass control.

A splendid CBS recording of Haydn's *Symphony No. 59* performed by Lestro Armonico is presented with

a robust, full and open sound with plenty of width and depth. The soundstage extends well beyond the area between the loudspeakers. There is also lots of detail in the upper registers and I am drawn into the excitement and energy of the piece that Derek Solomons conveys with his performance on the violin.

Another CBS recording of Barbra Streisand singing *Tomorrow* certainly has the wow factor. Streisand's voice is out in front of the orchestral backing, sparkling and clear. The crisp and punchy bass line is really tight with a great tonal clarity.

A direct-to-disc recording of Mozart's *Divertimento No. 11 K251* played by the Toronto Chamber Orchestra is captivating, exciting, full and musical. I am struck by the sense of reality and the feeling of a live performance in my sitting room.

Call to arms

The UniArm allows my cartridge to perform at its very best with superb detail and excellent imaging, coupled with a silky-smooth top end. The arm also provides a tight, punchy and well-controlled bass response. This is a really high-performance prospect at an extremely competitive price. **NR**

DETAILS

PRICE
£1,300 plus delivery
WEBSITE
audioorigami.co.uk

OUR VERDICT

★★★★★

German Physiks Omnidirectional Loudspeakers



Unique DDD design produces a very wide frequency range from a single driver

Large, deep soundstages well beyond the speaker boundaries

Exceptionally coherent and natural sound closely mimicing the live event

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Contemporary sculptural styling – priced from £8900

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Model 15 – The New Turntable from SME



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High density construction resulting in freedom from colouration

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AC/HFC/85

Alpha Design Labs

GT40a DAC/ADC

ALTHOUGH THERE ARE many devices on the market that you can use to digitally record analogue audio, they mostly only support resolutions close to CD quality at 16-bit/44.1kHz. Devices that support hi-res analogue-to-digital conversion at 24-bit/192kHz seem to be as rare as hen's teeth. At last, Alpha Design Labs has released the GT40a DAC and ADC that supports 24/192 as an upgraded version of the original GT40 by doubling the 96kHz sampling rate. The GT40a is supplied with a 15V DC 'wall-wart' power supply and a USB-A-to-USB-B interface cable for connecting to your PC (Windows 7 or later, Mac OS10 or later).

It measures 150 x 57 x 111mm (WxHxD) and only weighs 650g, but is a real heavyweight when it comes to features. Apart from being a DAC that can support up to 24/192 from its USB interface to produce an analogue signal at its RCA output sockets, it can also digitise up to 24/192 from its RCA inputs to the USB output – ideal for digitising your record collection at the highest resolution that vinyl deserves. The input is switchable from being either a line or a phono in that uses a built-in phono preamp with RIAA equalisation. The phono stage is also switchable to support MM or MC cartridges. And if that's not enough, it can function as a standalone headphone amp using any of the analogue or digital signals fed to it.

Up and running

In order to support the higher data rates, the GT40a requires the computer to have an ASIO (Asynchronous Input/Output) driver installed. Macs have this built in, but Windows PCs will require a driver to be installed. This is very straightforward and the instruction manual contains the link where the driver can be downloaded. Digital recording is all done by software and Audacity is an excellent free program that works brilliantly with the GT40a. I use it with my PC running Windows 8.1 and after



installing the driver, I set it as the default playback and recording device in the Windows control panel and I also set the default recording format to "2 channel, 24-bit, 192000Hz (Studio Quality)". By setting the GT40a as the default device, Windows will automatically switch over to it whenever it's plugged in. As all of the adjustment of recording levels is done by software, there is no way to alter the settings apart from a switchable attenuator to reduce the signal by either 6 or 12dB if a red 'clipping' LED on the front panel warns of an overload.

Considering it first as a headphone amp, I connect it to my hi-fi and listen to some vinyl on my Sennheiser HD600 headphones. Playing Elgar's *Enigma Variations* demonstrates a very pleasing sound that is refined and easy to listen to. I find I need to turn the volume control up to the two o'clock position for normal listening, so it is not the most powerful headphone amp, but it is more than adequate for monitoring and general listening. Connecting the GT40a directly to my moving coil cartridge results in a similarly great sound with excellent imaging, showing that the internal phono stage is also no slouch.

Next, I move over to my PC and connect it to a USB port and play a 24/192 FLAC of Beethoven's *Piano Concerto No.5 – The Emperor*

performed by the Scottish Chamber Orchestra. The opening blast is superbly balanced with excellent spatial imaging and is in a completely different league to plugging the headphones into the computer's sound card. Next up is a 24/96 recording of James Vincent McMorrow singing *Cavalier*. The performance is crystal clear and captivating. The GT40a copes well with the solo vocals and doesn't shy away when the music livens up.

The vinyl countdown

Finally, I set up the GT40a to digitise some vinyl at 24/192 using Audacity and saving it as a FLAC file. I play the result on a Cambridge Audio Stream Magic 2 DMP (*HFC* Issue 393). I specifically choose something that I had previously recorded at 16/44 on a Xitel INport ADC – Branford Marsalis playing *Romances For Saxophone*. The result is staggering. Although the Xitel does a pretty decent job, the GT40a yields a sound that is so much closer to the original vinyl. Branford's rendition of Satie's *Gymnopédie No.3* is mournful and hugely emotional – something that is missing from the 16/44 copy.

The GT40a is outstanding value for money. It does many things really well but when it comes to digitising vinyl, it does extraordinarily well. **NR**

DETAILS

PRICE
£395
TELEPHONE
01189 814238
WEBSITE
soundfoundations.co.uk

OUR VERDICT
★★★★★

CABLES

PART 1: Digital and networking

This month, we take a close look at digital cables and how they can have a significant effect on the sound quality of audio systems

Digital cables only have to convey ones and zeros so don't need to be anything special – right? Well, as with most things to do with hi-fi, it's not quite as simple as that.

Many audiophiles now appreciate that the quality of the sound from their system is influenced by many factors – not only within the analogue domain, but also within the digital one. Although the factors affecting analogue and digital signals are different, their impact on the sound quality is just as significant. It is, therefore, important not to neglect the quality of the digital interconnect cables that you use to connect up the digital parts of your hi-fi. However, before considering the cables, we'll first take a look at the signals that they have to transmit.

Ones and zeros

In a nutshell, the digital signal that is carried by digital interconnects and networking cables is binary data, that is to say a serial stream of binary

digits consisting of ones and zeros. A 'one' can be represented by the presence of a voltage, for example 5V, and a 'zero' as 0V. The binary number that can be used to represent the amplitude of an analogue signal is, therefore, a stream of binary digits, or ones and zeros, sent down the cable.

As the old joke goes: "There are 10 sorts of people who know about binary numbers – those who do and those who don't" This is, of course, saying that the binary number '10' is actually decimal '2' and this nicely illustrates what a digital cable has to carry in terms of binary digits. However, to accurately represent an analogue signal, it has to carry an awful lot of these binary digits in a very short period of time – at least 706,000 every second in theory. Therefore, to carry this data, we are already looking at a cable that can handle signals of around 1MHz, but it doesn't stop there.

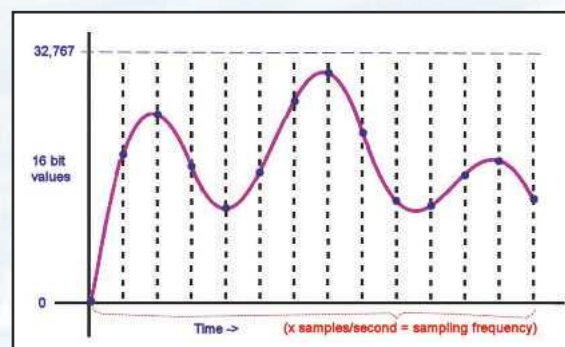
Electrically, this stream of binary data is a pulse wave (a non-symmetrical square wave) comprising

a voltage followed by no voltage, such as you'd get by turning a switch on and off very rapidly. To do their job well, digital cables have to be able to transmit frequencies in the megahertz region, rather than the hundreds of kilohertz that analogue cables are required to handle.

Getting it right

Digital coaxial cables are required to have a 75ohm characteristic impedance and, although such cables can work well for analogue audio

Sampling an analogue waveform and assigning a number to each sample



signals, the reverse is not true as standard analogue cables are not really suitable for use as digital interconnects as their bandwidth is not great enough. If a cable with a poor high-frequency characteristic is used as a digital interconnect this can result in timing errors in the digital signal, which manifests itself as the dreaded jitter. Furthermore, a cable with the wrong characteristic impedance will result in unwanted reflections of the digital signal and this can potentially cause more errors. The digital processor in the audio equipment then has to manage these errors and this can all result in a degraded audio signal.

Keeping out the riff-raff

Another requirement for digital cables is that they are well shielded from interference from external sources and also do not transmit interference from the very high frequencies that they are carrying. This can be achieved by the cable employing proper screening and also by the

PROBLEMS WITH BINARY DATA

Digital audio recording makes use of Pulse Code Modulation (PCM). PCM uses a digital number (as binary data made up from a group of ones and zeros or bits) to determine the amplitude of a signal at a point in time. Any integer number can be represented provided that there are enough binary digits, eg 16 binary digits (bits) can represent decimal numbers from 0 to 216 (or 65,536), or from -32,768 to 32,767. This is the standard used by CDs

The other aspect to consider is how often you define the amplitude of the analogue signal and this is called the sampling frequency. This frequency has to be at least twice the maximum frequency of the analogue signal you are trying to define (this is also known as the Nyquist frequency) and for CDs, it is 44.1kHz. Transmitting 16-bits down a serial cable at 44.1kHz (without parity or other error-correcting information) is a data rate of 705,600-bits per second and the cable has to support many times this frequency to transmit decent quality pulses.

The problems start if the cable has a poor high-frequency response. This causes the edges of the pulses to become curved, so it is difficult for the electronics to decide exactly when the pulse starts and stops, resulting in an error in time when the signal crosses the threshold. As with all great comedy, it's all down to good timing and if the edges are not steep, the equipment will have to use its error-correcting circuitry to attempt to regenerate the data stream. The better the cable, the less correction your DAC will have to do to recreate the original analogue signal and the more accurate this resulting analogue signal will be.

Reflections of the signal can occur with a cable operating at digital frequencies if the cable's characteristic impedance doesn't match that of the circuits to which it is connected. These reflections can result in spurious pulses, albeit at a smaller amplitude, that can confuse the poor DAC when it is trying to regenerate the original analogue signal.

internal design and layout of the conductors. Optical cables do not suffer from this, but they do have issues of their own, which we will look at later.

Well connected

Connectors are a necessary evil for cables as they need to have the ability to be plugged into equipment. A poor contact can result in resistance occurring between plug and socket. This resistance can cause degradation of the all-important edges of the digital pulses in much the same way as a low-grade cable damages the digital signal. Furthermore, the resistance can be intermittent and result in noise being generated at the point of contact. This noise will add spurious pulses to the digital data and once again, the equipment will have to use its error-correcting circuitry to do its best to regenerate the original data. High-quality connectors are therefore an essential requirement of a digital cable.

Beam me up

In 1983, Toshiba designed an optical system for the transmission of digital data between consumer audio equipment called Toslink. The data is carried on a beam of red light with a peak wavelength of 650nm and transmitted through optical cables. These optical cables usually consist of an inexpensive 1mm plastic optical fibre or bundles of plastic optical fibres in higher-quality designs. Optical cables are not susceptible to electrical problems, such as earth loops and RF interference, but have a limited range of around 5-10m due to the relatively high attenuation of light through a cable, especially one with plastic fibres. They can also be damaged permanently if tightly bent. Poor quality fibre-optic cable is prone to spurious internal reflections, which will cause imperfections in the digital data that in turn results in jitter that the DAC then has to cope with.

One of the main issues with Toslink cables is with the connectors. If a poorly designed connector is used, this can result in the end points not lining up properly with the optoelectronic devices in the equipment, which in extreme cases results in a complete loss of the signal. Furthermore, low-quality connectors can sometimes fail to fit into the sockets and can fall out during use.

Equally as important are the cables that connect your streamer to your

local area network. These are called Ethernet cables – Ethernet is a local area network standard that was commercially introduced in 1980 and standardised in 1983. Since then, it has been refined to support higher bitrates and longer link distances. In the early days of Ethernet speeds of 10Mbps via Cat3 cables were satisfactory. Nowadays, with LANS running at 100Mbps and 1,000Mbps (Gigabit), higher-quality cables and connectors are required to support these speeds. It stands to reason that using a lower-grade cable will degrade performance of the network and this can manifest itself in a number of ways, including poor spatial positioning of instruments and other subtle effects that can make the sound less real.

Optical cables are not susceptible to electrical problems such as earth loops

Then there are the USB interconnect cables that are often required to link your PC with your audio system. These cables are also high-speed digital cables and your audio system will definitely benefit from a high-quality audio-grade USB cable to link your PC-based music collection to your hi-fi DAC.

Choosing the right cable

Fortunately, there is a wealth of good-quality solutions out there to cater for all your digital connection requirements. Starting off with digital coax cables, a great example is the Atratus II RCA digital interconnect from Epiphany Acoustics (on test on page 110). This coaxial cable is a 75ohm, low-capacitance, heavy-duty digital cable with a large-sized OCC copper central conductor and a low-loss foam polyethylene dielectric. It uses high-quality gold-plated crimped connectors to offer a



Chord Company's C-Stream Ethernet cable

Russ Andrews' Kimber D60 Digital RCA cable – in a fancy case



gas-tight and robust connection. It also benefits from dual shielding, utilising both a 100 percent coverage foil shield as well as a very dense copper braid.

Another fine example of an RCA digital cable is the Kimber D60 (HFC 391) from Russ Andrews. This 75ohm cable has a pure silver conductor surrounded by two helically wound shields separated by air-articulated Teflon insulation. It is terminated with Kimber Ultraplate RCA phono plugs.

Kimber also makes the OPT-1 Toslink cable (HFC 384) that incorporates a medical-grade light conducting fibre-optic cable made from an advanced polymer to reduce signal distortion and minimise light losses

If a cable with a poor high-frequency is used this can result in timing errors

within the cable. This cable is also fracture-resistant both within the cable and at the terminations, which improve longevity and decrease impedance reflections. The dual-layer thermal and mechanical outer jacket is flexible and also protects the cable from external environmental influences as well as against warping of the fibre-optic polymer.

Ethernet excellence

You're not going to go far wrong if you invest in the C-stream (HFC 386) entry-level Ethernet cable from Chord. It features 24ct. gold-plated signal contacts with an over-moulded plug surround that comes with a non-compression cable strain relief. Inside the cable are OFC conductors and low-density polyethylene insulation. Each set of C-stream's twin conductors is precisely twisted with each pair featuring an overwrapped foil shield. The four pairs are then overwrapped with a further foil shield. The C-stream is available from 0.75m to 20m off the shelf, so there should be a suitable length for you to connect your streamer to your network hub. Another great value audio-grade cable is the German Meicord Opal Ethernet cable from MCRU that is also available in lengths up to 20m.

There is a great range of USB cables to choose from that are a serious step up from the cheap ones supplied. An excellent value cable is Scottish-based Atlas' Element USB (HFC 371). Atlas has taken the whole issue of quality digital interconnects seriously and has



Atlas' Element USB cable

even produced a detailed technical paper explaining why digital cables are as important as analogue ones for high-quality audio reproduction. In the paper, the company points out that poorly designed cables and connectors can result in unwanted reflections and timing issues that give rise to jitter and other errors in the digital signal. The Element USB is also designed to reject interference. The cable is fitted with a gold-plated Type A connector (the flat USB plug) at one end and a gold-plated Type B connector (the square USB plug) at the other.

Different strokes

Something a bit more exotic, but nevertheless still affordable, is the BMC (Balanced Music Concept) Audio PureUSB1 (HFC 387) cable that is distributed in the UK by Colab Audio. This cable, like the Atlas, is fitted with a high-quality, gold-plated Type A flat-section USB plug at one end and a gold-plated Type B square-section at the other. However, while many audiophile USB cables attempt to limit transmission losses and noise by material tuning, the PureUSB 1 provides an active electronic circuit connected in the cable itself near the DAC plug end. This circuit takes advantage of the 5V DC power available in a USB cable to power the active circuit that restores and reshapes the digital signal just before entering the DAC. The circuit also filters the noise on the USB power supply. Another advantage of this approach is the reduction of length sensitivity; the active circuit allows for the cable to be longer without causing losses, so a 5m cable sounds virtually the same as the 2m length.

So there you have it – a quick run down of digital cables. Next month, we will turn our attention to analogue interconnects and mains leads ●

JITTER

Jitter is error in the time base (clock) of a digital signal, or to put it another way, the undesired deviation of a periodic signal from the ideal timing. All digital audio is based on a clock of some sort, such as the one used to accurately sample the analogue signal at a regular interval. One of the most common causes of jitter is the result of waveform distortion due to mismatched impedances, reflections in the signal path and items with limited frequency responses in the system – all of which can be the result of using poor-quality digital cables. The outcome is that distortion is introduced into the waveform that we're trying to record and reproduce.

The process of converting an analogue waveform to numbers is called analogue-to-digital conversion (ADC) and the process of converting the digital signal back to analogue is digital-to-analogue conversion (DAC). If jitter gets into the ADC process (the recording), those errors are a permanent feature of the digital data and there is no way to recover the original waveform. However, if jitter gets into the DAC process, it degrades the playback, but the original digital recording is preserved.

Small amounts of jitter tend to blur the stereo image and the result is you find that you can't pinpoint instruments in the soundstage as clearly. As the jitter worsens, the stereo image starts to shrink and the soundstage becomes constrained between your loudspeakers. In extreme cases, worsening jitter can change the whole tonal character of the sound.

Error-correcting circuitry in the DAC can help, but it is never going to be perfect. Also, it takes a finite amount of time to do any signal processing, so it is far better to avoid introducing jitter in the first place.



Russ Andrews' Kimber D60 digital RCA (top) and the Atratus II RCA digital interconnect from Epiphany Acoustics (below)



Duet DCT++ CS

Low Distortion Loudspeaker Cable

by Black Rhodium



"Compared to many high-end cables whose bulk and rigidity (or fragility) seem contrived to make their installation as arduous as possible, Black Rhodium's Duet DCT++ CS is a positive joy to hook up. But while the cable is unusually 'bendable' its sound has real spine – its bass powerful and robust while the treble is smooth rather than incisive or biting. Certainly one for the shortlist, the Duet's warm quality is suited to sharp-sounding systems."

Paul Miller, Hi-Fi News, March 2015

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MWA-RC Magnetic Wave Absorbers



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HI-FI Choice, October 2013



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**WIN:**

AKG K511 over-ear headphones

We've got 24 sets of cans to give away for your listening pleasure

Take a look around you the next time you get on a bus, train or walk down a busy high street. What's the one piece of hi-fi candy that everyone – young and old – seems to have on their person? Yep, it's headphones. As much as we'd all like to walk along with our favourite tunes blaring out at top volume, sometimes (by which we mean, pretty much all the time), it's simply not possible – at least not if you don't want to be public enemy number one. And so the headphone has grown to become the *de facto* device that everyone has on their person pretty much all the time. But the good news is that we seem to have moved on from the flimsy foam-covered cans of the eighties when personal audio first became a 'thing', to more robust models capable not only of producing stunning sound, but also that will withstand being roughed up.

And, continuing with the theme of comparing today's models with those of old, the choice appears to have gone through the roof. Ever since hip hop moguls made billions of dollars from producing over-priced, bass-heavy celebrity-endorsed head candy, everyone wants in on the act and the choice of headphones has grown way more than anyone could ever have predicted.

Take your pick

But how do you separate the wheat from the chaff – or to put it another way, the Beats from the fluff? Happily help is at hand as we've once again done all the hard work for you and made it about as easy as it gets to lay your hands on some high-quality hi-fi headgear for just the price of a stamp.

Designed for music lovers seeking the best value for their money while refusing to compromise on quality, AKG's K511

headphone is a great choice for that personal listening experience. Its lightweight, flexible design means that it combines a comfortable fit to go along with the first-class audio performance you've come to expect from the AKG brand.

The K511 includes a self-adjusting headband, a convenient single-sided cable and 6.3mm jack adapter. The closed-back design allows you to enjoy your music in peace without disturbing those that are around you, while the high sensitivity confers great audio device compatibility.

This month we've got 24 sets of AKG's K511 to giveaway to lucky readers. To be in with a chance of winning a pair all for yourself, answer the ridiculously simple question opposite and post it to us at the usual address. Before you know it you'll be nodding along with everyone else on your morning commute. Good luck!



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- A) 6.3in
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Editor Lee Dunkley
Production Editor Jake Day-Williams
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CONTRIBUTORS

Simon Berkovitch, Andrew Everard, Richard Holliss, James Hughes, Adrian Justins, Jason Kennedy, Rob Lane, Dave Oliver, James Parker, David Price, Neville Roberts, Ed Selley, Andrew Simpson, David Vivian, Chris Ward, Nigel Williamson

ADVERTISING

Advertising Manager Simon Dunn
Tel: 01689 869853
Email: simon.dunn@hifichoice.co.uk

SUBSCRIPTIONS

Subscriptions Manager Kate Hall
UK - New, Renewals & Enquiries
Tel: +44(0)1858 438798
Email: mytimemedia@subscription.co.uk
USA & CANADA - New, Renewals & Enquiries
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Tel: 0844 848 8822
From outside the UK: +44 (0) 2476 322234
Email: customer.services@myhobbystore.com
Website: www.myhobbystore.co.uk

MANAGEMENT TEAM

Group Editor Paul Miller
Group Art Editor John Rook
Commercial Sales Manager Rhona Bolger
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Published by MyTimeMedia Ltd
Enterprise House, Enterprise Way,
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