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AUGUST 2015

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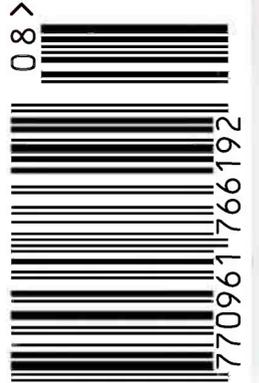
# KEF

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**loudspeakers**

- REGA DAC-R
- MUNICH HIGH-END SHOW REPORT
- EXPOSURE 3010S2-D INTEGRATED AMPLIFIER
- MITCHELL & JOHNSON DR-201V DAB/VHF TUNER **EXCLUSIVE!**
- MUSICAL SURROUNDINGS NOVA II PHONOSTAGE **EXCLUSIVE!**
- OPPO HA-2 PORTABLE HEADPHONE/AMPLIFIER/DAC

AUGUST 2015



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**7 PAGES OF LETTERS - THE BEST WINS A PAIR OF KEF Q100 LOUDSPEAKERS! (UK ONLY)**



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# welcome

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Paul Rigby, Rafael Todes, Jon Myles,  
Martin Pipe, Mark Osborn



A network attached CD player? That was quite a peculiar concept not so long ago. Indeed, when I was first confronted with one I scratched my head and wondered why would anyone want to send CD over a network? Or is it the other way around? And then the penny dropped. It's both. A CD player which also lets you stream from your computer or an outside network making the unit a go-to, one stop source device. Many have appeared since I first unsuccessfully cogitated on this idea, of varying quality, price and ability. I think we all liked Onkyo's take on

this concept, however, the imaginatively named C-N7050 (!) you can find reviewed on p21 this month. Onkyo just do it well – at a very affordable price. This is a great introduction to “computer” audio, right down to its control app. OK, you don't get an ESS Sabre32 DAC on-board, but you do get a set of good modern parts in a thoroughly decent CD player. So for all of you wishing to upgrade their CD player – just buy this CD player!

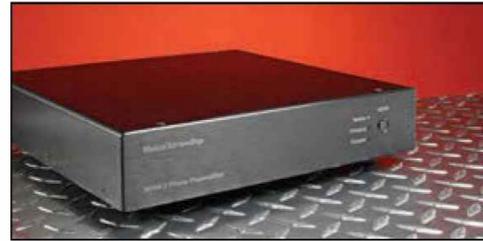
I peered at the analyser and saw almost nothing. Spooky. I was measuring noise from the Nova II phono stage at the time and our analyser said there wasn't any – well almost; it was so low as to be negligible. This is possible nowadays, if you know what you are doing – there are some super low noise silicon devices out there. But Musical Surroundings have capitalised on this by running their phono preamp from a rechargeable battery, to eliminate power supply earth leakage currents and the hum they cause, as well. Neat thinking. The result is a phono preamp one step ahead of most in sophistication. I was surprised at the price being asked as a result. If you are a vinyl enthusiast take a close look at this product, expertly reviewed by Paul Rigby on p86. I very much warm to clever-fidelity like this.

I did know Jon Myles went to an audiologist, but I didn't quite realise what happened there! This is the first time we have ever run a piece looking at the human end of things – and what is involved – see p28. I found it intriguing; I hope you do too.

Martin Pipe is a mine of information on all things high fidelity, but he is even more than this when the going gets really complicated – meaning the strange and tortuous story behind surround-sound, or quadraphonics as it was originally termed. I had to clamber into the loft and grapple with partying spiders to claim back my JVC CD-4 quad decoder for his piece. My CD-4 LPs were also shipped to Southend-on-Sea. You can read the first part on p90 – fascinating.

Our August 2015 issue is packed with unusual articles, as always: I do hope you enjoy reading them – and don't forget to write!

**Noel Keywood. Editor.**



## hi-fi world

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## testing (see [www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) for full explanations of all our tests)

To ensure the upmost accuracy in our product reviews, *Hi-Fi World* has extremely comprehensive in-house test facilities, and our test equipment - from big names like Rohde & Schwarz and Hewlett Packard - is amongst the most advanced in the world.

Loudspeakers are measured using a calibrated Bruel & Kjaer microphone feeding a Clio-based computer

analyser, using pulsed and gated sinewaves, in a large room to eliminate the room's influence. Pickup arm vibration is measured with a Bruel & Kjaer accelerometer.

No other UK hi-fi magazine has in-house testing, and none has access to such advanced tests across all types of equipment. That's why you can depend on *Hi-Fi World* reviews.

## verdicts

- ● ● ● ● OUTSTANDING
- ● ● ● EXCELLENT
- ● ● GOOD
- ● ● ● MEDIOCRE
- ● POOR
- £ VALUE

amongst the best  
extremely capable  
worth auditioning  
unremarkable  
flawed  
keenly priced



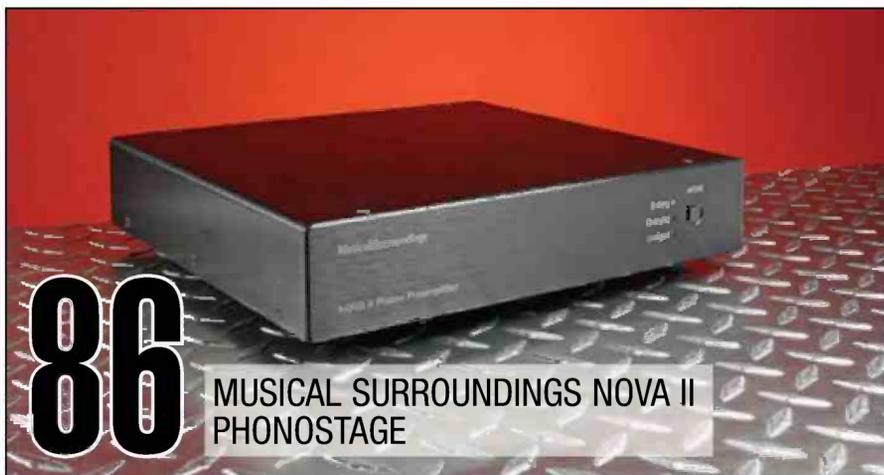
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# Audio Cable Award Grand Slam

**Products of the Year 2014:**

Black Diamond Speaker Cable

Black Diamond USB

Blue USB

Black Power Cable

Black Diamond RCA

Black Diamond XLR



"But perhaps their reticence is understandable when the product sounds as good as this – after all, why let others in on the secret? Used in a variety of systems the Black Diamonds consistently revealed a wider perceived bandwidth, bigger soundstage and the ability to present transient details in an effortless fashion"

HiFi World, Awards Edition Jan 2015



Find out why Tellurium Q® cables are achieving an audio cable grand slam from the publications below. Why not contact Tellurium Q® or one of our many dealers, now.



email:news@hi-fiworld.co.uk

# news

## LUXMAN ABOUNDS

The venerable Japanese audio specialist has added a D-06u CD/SACD player, C-700u stereo preamplifier and M-700u stereo power amplifier to its roster.

The D-06u offers coaxial, optical and asynchronous USB inputs for external digital sources. For disc playback, the LxDTM transport mechanism is a proprietary Luxman creation featuring a die-cast aluminium loader and a Burr-Brown PCMI792A DAC supporting PCM data up to 32bit/384kHz and DSD data up to 5.64MHz via the USB input. The player comes with dedicated 'Luxman Audio Player' software for PC/Mac, enabling a wide range of digital audio formats to play through the D-06u via the USB input including FLAC, ALAC, WAV, AIFF, MP3, DSF and DSIDIFF.

The C-700u preamp includes Luxman's fourth-generation ODNF (Only Distortion Negative Feedback) amp circuit, directly coupled to the LECUA 1000 attenuator circuit trickled down from the flagship C-900u preamp plus a 'line straight' button that bypasses the included tone controls and phase selection for the balanced inputs.

The M-700u stereo power amplifier is rated at 120W per channel. There is also a user-selectable mono mode with a rated output of 420W. Price for each is £6,995.

Click on [www.luxman.com](http://www.luxman.com) for more information.



## ONKYO ENTRY-LEVEL HOME THEATRE

Onkyo has announced three home entertainment packages: the Dolby Atmos-ready 7.1-channel A/V receiver (TX-SR444); Dolby Atmos A/V receiver and speaker package (HT-S5805) and a standalone Dolby Atmos 5.1.2-channel speaker system (SKS-HT588).

The TX-SR444 delivers 100W per channel and has four HDCP 2.2-compliant HDMI inputs and one output which can pass 4K/60 Hz video from source devices to the display. The HT-S5805 5.1.2-Channel Dolby Atmos Home Theatre Package combines the same capabilities in a HT-R494 7.1-Channel A/V Receiver, together with a wall-mountable Dolby Atmos 5.1.2 speaker system. Each front speaker houses a 12cm driver and 2.5cm balanced-dome tweeter as well as an up-firing 8cm woofer separately powered by the receiver's height channel.

The front monitors join a dual-drive 2-way centre speaker and two compact full-range surround speakers. The speaker set and A/V receiver ship with a gloss-finished powered 80W subwoofer.

The SKS-HT588 5.1.2-channel speaker system (identical to the one shipping with the above HT-S5805 package) is suited to any Dolby Atmos-ready A/V receiver.

The TX-SR444 7.1 channel A/V receiver with Dolby Atmos (5.1.2) will be available at £350. The HT-S5805 Dolby Atmos 5.1.2 channel A/V Receiver and speaker package, only in black, is rated at £700 and the SKS-HT588 5.1.2 channel Dolby Atmos speaker system, only in black, will sell for £450.

For more information visit [www.uk.onkyo.com](http://www.uk.onkyo.com)



## SARUM SUPER ARAY POWER CABLE

For this new power cable from Chord, the mains plug is a bespoke version of an MS Power mains plug – the conductors have been heavily silver-plated and changes have been made to the internal structure of the plug casing. The changes act to both stiffen the casing and to allow the fitting of two silicone tubes. The new IEC plug is also a bespoke Chord Company design. The internal contacts are heavy-gauge and again, are heavily silver-plated.

The cable is available in 1m, 1.5m and 2m lengths from stock. Custom lengths can be made to order. The Chord Company can also terminate with Furutech 16 amp IEC connectors. Where space is restricted, Chord can also fit-to-order the Schurter IEC plug.

Sarum Super ARAY power cable for 1m is priced at £1,700. Additional lengths are charged at £450/m. For more information, call 01980 625700 or click on [www.chord.co.uk](http://www.chord.co.uk).

## SVS PRIME

The new SVS Prime range comprises tower, bookshelf, centre and satellite models equipped with technology from the SVS Ultra designs.

The Prime Tower speaker has a new 3.5-way crossover along with two individually tuned and isolated 158mm woofers.

The Prime Bookshelf speaker has a stiffened 158mm polypropylene woofer cone, a motor with aluminium shorting ring and a vented voice coil former. The 25mm aluminium dome tweeter utilises an FEA-optimised diffuser.

The Prime Centre is a true three-way, four-driver design featuring a 25mm aluminium dome tweeter, dedicated 89mm midrange driver and dual 133mm woofers.

SVS's first satellite speaker, the Prime Satellite offers a 25mm aluminium dome tweeter and 114mm polypropylene cone woofer. Prices include Tower at £819 for Black Ash or £969 for Piano Gloss; Bookshelf at £399 for Black Ash or £479 Piano Gloss; Centre at £289 for Black Ash or £369 for Piano Gloss and Surround at £219 for Black Ash or £289 for Piano Gloss. The Prime 2.1 system (with SB-1000 sub) retails at £589 for Black Ash or £679 for Piano Gloss and, finally, the Prime 5.1 system (with SB-1000 sub) sells at £849 for the Black Ash or £999 for the Piano Gloss.

Call 01423 358846 or [info@karma-av.co.uk](mailto:info@karma-av.co.uk) for more information.



## DYNAUDIO CONTOUR

The Contour LE series consists of the bookshelf Contour S 1.4 LE (£2,950) and the floorstanding Contour S 3.4LE (£5,250), both available in Burbinga piano lacquer, oiled walnut, mocca piano lacquer and black piano lacquer. At the heart of the cabinets sit die-cast aluminium woofer baskets finished in matt black while the metal front is finished in satin black. The high-gloss black piano lacquer version of the Contour features a metal front made of stainless steel.

The Dynaudio soft dome tweeter includes OFC copper cable. The crossover has further been refined by using special ceramic resistors and high quality capacitors. The Contour woofers include proprietary Dynaudio technologies such as Magnesium Silicate Polymer cones, aluminium wire voice coils on Kapton formers and die-cast aluminium baskets.

Click on [www.dynaudio.com](http://www.dynaudio.com) for more information.

## SONOS STARTER SET

Sonos has announced the availability of its new '2 Room Starter Set' which consists of two PLAY:1 speakers. Users are able to play different songs in each room or the same song in both.

The PLAY:1 gives you access to music via iTunes, a collection of streaming services (including Spotify, Rdio, Deezer, Napster, Last.fm, Hype Machine, Shuffler.fm, Qobuz and others) and over 100,000 internet radio stations.

All Sonos players are compatible with one another so even if you've already got a unit in the house you can continue to add speakers in as many rooms as you like over time. Users are able to control every player in the house using the free app for smartphones or tablets.

The limited offer 2 Room Starter Set is priced at £299 and available for purchase on the Sonos website. Contact [www.sonos.com/en-gb/shop](http://www.sonos.com/en-gb/shop) for more information.



## DIGIBIT WAMP & ARIA MC

The wamp combines a wireless power amplifier and wireless media streamer, featuring a pair of monoblock, 100W Class D power amplifiers. The plinth style can be used as a support for floor-standing loudspeakers, so the system converts any passive loudspeaker into an active wireless hi-fi system.

Users can stream music up to 24bit/48kHz via AirPlay and up to 24bit/192kHz via Wi-Fi 802.11ac. Bluetooth 4.0 and wired LAN is supported, along with DSD as a DLNA renderer. A stereo bookshelf wamp model (50W per channel) will also be available for customers using shelf mounted loudspeakers. wamp also comes with a built-in 32bit/384kHz and DSD64/128/256 compatible DAC, offering gapless playback and free iPad/Android apps. Price is to be announced.

The new aria mc (media center) streams audio, video and pictures from the Internet, PC, Mac, iOS and Android portable devices and smartphones, as well as from any attached hard disk, NAS or other networked device, via Bluetooth 4.0, Airplay or DLNA.

aria mc connects either to Blu-Ray players or to an A/V receiver via its HDMI input and comes with two LAN ports. It also supports PCM (up to 32bit/384kHz) and DSD (64/128/256kHz) both in stereo and multichannel.

There is a 16GB SSD reserved for the OS and a choice of 2TB, 4TB and 6TB HDDs for a library. It includes a free app for iPad/iPhone and Android control. Contact [www.digibit.es](http://www.digibit.es) 2 for more information.



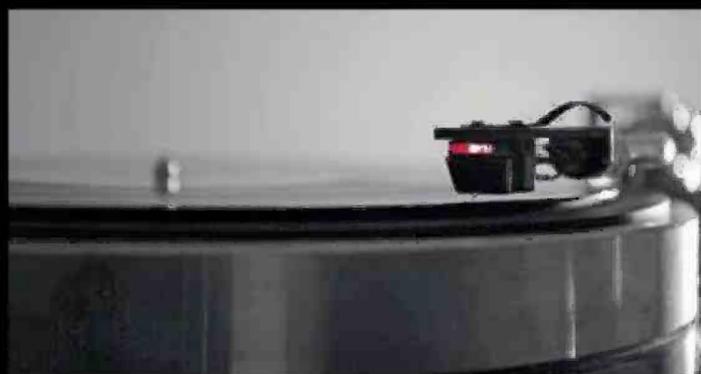
## MONITOR AUDIO BRONZE

Monitor Audio's new Bronze speaker range uses the new generation of C-CAM drivers with cabinets in four vinyl finishes: Black Oak, Walnut, Rosemah and a new White Ash. Invisible driver fixings and floating magnetic grilles are included too.

The proprietary bass and mid drivers utilise a new type of 'dished' C-CAM cone, which employs the entire cone surface to radiate sound, unbroken by the centre pole-piece aperture. The driver's voice coil is thermally coupled to the back of the cone. A new 25mm C-CAM Gold Dome tweeter extends each system's frequency response to 30kHz. Structural improvements include a new venting system that allows air to flow outside the tweeter's magnet assembly into a rear loading chamber, avoiding air compression.

The new Bronze drivers are individually mounted on a through-bolt which fixes at the back of the cabinet and tensions the driver at the front.

Reflex loading is of the HiVell variety, borrowed from the Gold range, which uses rifled port grooves. Prices are from £230 per pair. Click on [www.monitoraudio.co.uk](http://www.monitoraudio.co.uk) for information.



## THE OPTICAL PHONO CARTRIDGE

DS Audio has introduced the DS-W1 optical cartridge with a pure analogue contact system that uses a conventional stylus and cantilever. In contrast to moving-magnet (MM) and moving-coil (MC) cartridges, which work on the principle of electromagnetic induction, the DS-W1 uses an optical system to convert stylus/cantilever movements into audio signals.

The DS-W1, which uses a boron cantilever and Shibata stylus, is housed in a machined aluminium body and weighs 6.5 grams and comes with its own phono equaliser/power supply, so doesn't require a phono stage and can be installed on almost any tonearm.

Price is £6,250 including the dedicated phono equaliser/power supply. Click on [www.ds-audio-w.biz](http://www.ds-audio-w.biz) or call 0118 981 4238 for more information.

## AESTHETIX ROMULUS & PANDORA STANDARD & SIGNATURE

The Pandora is a valve-based DAC with one USB and three S/PDIF inputs (plus an optional second USB input). The Romulus includes the same features and construction as the Pandora but adds a CD transport mechanism.

Aesthetix uses a proprietary DSP running on a Motorola DSP56362 chip. The filter's outputs are converted to analogue by a Burr-Brown PCM 1792A running in pure differential mode, using custom-manufactured crystal oscillators.

Both the Romulus and Pandora feature a current-sourced fully differential zero feedback valve amplifier. Output buffering is also run in pure differential mode with zero feedback. The Pandora features three separate transformers. First, the digital/DSP section is given its own transformer and regulated power supply, while individual digital sections are further locally regulated to isolate them from each other. A second transformer and dedicated regulator are used for the control system and a third transformer, custom-manufactured for Aesthetix, is used in the analogue sections.

An optional high-resolution volume control can be added to the Romulus and Pandora, allowing them to directly drive a power amplifier.

The Romulus and Pandora Signatures offer true native DSD 64 and DSD 128 over the USB inputs.

As with all Aesthetix Signature editions, critical coupling capacitors are replaced with Dynamicaps from Peter Moncrief and the four standard rubber feet are replaced with Harmonic Resolutions Systems' Nimbus Couplers specially made for Aesthetix.

Available now in both standard and Signature editions, with a choice of either black or silver faceplate. Price for the Aesthetix Pandora is £5,600 with the Signature at £8,300. The Romulus is priced at £6,500 with the Signature at £9,300. The optional high resolution control is priced at £950.

Existing Romulus and Pandora units are factory upgradable to Signature editions. Click [www.aesthetix.net](http://www.aesthetix.net) for more information



## GRACE DESIGN

In our review of the Grace Design m920 headphone amplifier/monitor in our July 2015 issue we gave the UK price as £1500. It should have been £1970 including VAT.



## HARBETH M40.2

Successor to the BBC's old LS5/8 monitor loudspeaker, Harbeth's new incarnation was launched at the Munich High End Show.

The new, three-driver Harbeth design has now been upgraded with a revised crossover. The M40.2 is also reportedly more sensitive and efficient, enabling it to work with small amplifiers, while the crossover network apparently uses the latest software simulation tools and measuring systems.

Production is due to begin shortly at Harbeth's Sussex factory. Price is £12,000 for the cherry veneer model. For more information, call 01444 484371 or click on [www.harbeth.co.uk](http://www.harbeth.co.uk)

# Reference Quality



**KEF has redesigned its iconic Reference range of loudspeakers. Jon Myles takes a listen to the luxurious Reference 1 standmount.**

**K**EF is one of those legendary British hi-fi brands that has built its reputation on constant innovation, meticulous engineering and obsessive attention to detail.

Since its founding way back in the early 1960s the company has produced an array of iconic and best-selling loudspeakers at a variety of price points.

Its Q series range, for example, are among the best-sounding budget 'speakers on the market while the strikingly-shaped Blade models showcase some of the latest thinking in cabinet design.

So when the Kent-based firm unveiled the latest iteration of its famous Reference range it's not surprising that we sat up and took notice. It's sobering to think the Reference series first appeared some four decades ago – having undergone continuous development and improvement ever since.

The latest range consists of two centre-channel models, a subwoofer, a pair of floorstanders and the Reference 1 standmount under review here. Priced at £4500, it's slightly unusual in being a true three-way model where two-ways are more the norm at this size. Having said that, the Reference 1 is slightly larger than most standmounts, measuring 17.2" (437mm) x 8" (203mm) x 15.25" (387mm), h/w/d. It's also a bit heavier at some 40lbs (18.2kg) – a testament to its sturdy

construction and bracing.

The review sample had a gorgeous Deep Piano Black finish but Satin American Walnut and Luxury Gloss Rosewood are also available. As are a pair of dedicated bolt-on stands which add a further £1000 to the price.

To enhance that feeling of quality, the Reference 1s also arrived at Hi-Fi World's listening room encased in a hefty pair of aircraft packing cases. As did one of the product's main designers Jack Ocle-Brown (not in a packing case but at the office) to explain some of the thinking behind the new design.

Chief of these is the latest version of KEF's Uni-Q driver array – a 1" aluminium-dome tweeter positioned in the centre of the 5" aluminium midrange cone – and derived from the flagship Blade model. It means both drivers are operating in the same acoustic plane which, in theory, should bring improved stereo imaging and greater dispersion. The idea of a tweeter in the throat of a midrange unit isn't unique to KEF and is also used by the likes of Tannoy.

But where KEF's version differs is via the addition of its proprietary Tangerine waveguide which sits in front of the tweeter and is aimed at controlling its break-up modes and provide an element of gain at certain frequencies to aid the integration between the mid and treble units.

Beneath the Uni-Q array sits the dedicated 6.5" bass unit – a shallow, concave aluminium unit with a narrow surround. Straight out of the box it was obvious this unit went very low for a standmount, but also did it very cleanly.

However, the Reference 1 has an interesting tuning option. Supplied with the 'speakers are two tubes for the rear reflex port – one long and one short. Leaving them out or inserting one or the other makes a significant difference (see Measured Performance for more details) and may be an essential element depending on your room.

The rear panel also has twin binding posts to allow bi-wiring or bi-amping and, instead of the usual jumper links, KEF's superb alternative consists of two large rotary controls. Turn them to the left to accommodate bi-wiring or to the right for single-wire. It's elegant, efficient and makes the process so

much simpler; I wish more manufacturers would do this.

## SOUND QUALITY

Some loudspeakers impress you immediately with their upbeat sound but as time goes on begin to sound a little flawed. Others go the other way, needing some care and attention but sounding better the more effort you put into getting them right. Put the KEF Reference 1s in the latter



***The Reference 1's rear panel features a tuneable reflex port as well as twin 'speaker posts for bi-wiring and bi-amping and KEF's innovative Link system for single-wired use.***

category. As befits their price they need careful positioning and the right ancillaries to sound at their best.

Their essential nature is very smooth, totally uncoloured and exceptionally open. They also generate an impressive soundstage

for a standmount loudspeaker.

Michael Tilson Thomas and The San Francisco Symphony's rendition of Mahler's 'Symphony No. 5' has both power and delicacy. The KEF's were adept at providing instrumental separation – there was an air and space around the orchestra that few standmounts can offer.

Much of this is down to the Uni-Q driver which really did sound amazingly accurate. There's no zing or harsh edge to the tweeter – meaning the likes of violins had a natural and believable quality.

Nor did the bass unit ever intrude unduly; it had just the right amount of force on the lower frequencies. In fact, I was actually a little taken aback at just how clean the KEFs sounded at times, with a thought that perhaps they were robbing the music of some of its power.

Playing The Clash's 'London Calling' via a Creek 100A and Exposure 3020S2-D (both of which are not short of Watts) brought the same definition evident in the 'Symphony No 5', but lacked some drive.

Switching to a McIntosh MC152 power amplifier, however, with its greater power delivery the KEFs really started to come on song, demonstrating just how fussy the KEFs can be about partnering equipment.

But in a way that is one of their great strengths. They are so accurate and open that they shine a clear light onto the rest of your set-up. Get it right and they can be tremendously enjoyable.

Moving them closer to the wall and experimenting with the port tubes clearly demonstrated the Reference 1 has an exceptional low-end response for a standmount – actually better than many a floorstander I've heard.

Peter Hook's bass on New Order's 'Bizarre Love Triangle' is firm, punchy and solid, underpinning the track's synth work beautifully but never becoming over-dominant. Inserting the longer tube brought an added bounce to the low-end and provided an extra rhythmic thrust to the music, while switching to the shorter alternative brought a little more depth but at the expense of some outright definition. In the end I preferred the former option overall, but this will be very much room and music dependent in individual set-ups and the option to experiment in this



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way is an important plus point for the Reference 1s.

Once you have them set-up to your liking they tick all the boxes – superbly clean and extended high frequencies, a smooth midband and bass that goes deep but doesn't boom.

"live recordings through the KEFs had a real frisson of excitement to them, the 'speakers able to capture atmospherics better than most"

They also have the ability to go shockingly loud on the end of the right amplifier without ever sounding as if they are beginning to reach their limits. Playing some classic hard rock like AC/DC's 'You Shook Me All Night Long' – which by its very nature demands to be played loud – I could really turn the wick up without the KEFs losing their composure.

Indeed, what they did was let me hear every element of what's going on in this piece, from the crack of the drum kit to the guitar fretwork and screeching vocals.

Equally impressive was the sound staging. There was width, depth and exceptional precision. Live recordings through the KEFs had a real frisson of excitement to them, the 'speakers

seemingly able to capture atmospherics better than most. On Keith Jarrett's 'The Koln Concert', for example, I could hear all of the background noise and the pianist's grunts as he struggled with the keyboard. The realistic sound of a musician at work made listening to these 'speakers a visceral experience.

**CONCLUSION**

The KEF Reference 1s are some of the best-engineered loudspeakers I have ever had the pleasure to use.



KEF's latest Uni-Q driver array features a 1-inch tweeter with proprietary Tangerine waveguide in the centre of a 5-inch mid driver.

They excel in clarity, being smooth, even-handed and uncoloured, while having exceptional bass for their size. They do need a powerful amplifier, however, and by their very nature will highlight any shortcomings in the rest of your system. Take your time with them, though, and put some effort into positioning and set-up and they are tremendously coherent and enjoyable.

**MEASURED PERFORMANCE**

Our frequency response analysis of KEF's Reference 1 shows it to be unusually smooth and flat across most of the audio band. Especially notable is the absence of a crossover dip around 3kHz, or any sign of treble peaking to add bite to the sound. This means the speaker will sound tonally accurate and, against many, smooth or even mild in its top end delivery. Absence of small perturbations in the response trace indicates a lack of small local resonances and low coloration.

Dispersion was wide, off-axis response being very similar to our on-axis measurement.

Bass rolls away smoothly below 200Hz, meaning this is an over damped loudspeaker that will have little overhang and should play a bass tune very cleanly. However, it needs to be positioned close to a rear wall to bring bass level up a bit, a position where it most effectively excites the listening room's associated axial resonant mode.

Bass from the large and very heavy cabinet extends down to a low 30Hz,

meaning this stand mounter reaches lower than most and will produce strong deep bass. The larger port insert (grey) is narrow tuned and resonant at 45Hz our analysis shows (red trace), suggesting it will add some low end bounce to deep bass. The narrower black port moved resonance down to a lower 30Hz and may well add to bass depth a little, but with less damping.

A 200mS decay analysis shows this is a low coloration loudspeaker right across the audio band.

Sensitivity was low, measuring just 84dB sound pressure level from one nominal Watt of input (2.8V), where nowadays 86dB is common. More surprising was the bass unit has a d.c.r of just 3.2 Ohms and our impedance curve shows this is a very low impedance loudspeaker – down to 3 Ohms at low frequencies. So it will draw heavy current from an amplifier, as well as needing volume to be turned up: only beefy amplifiers of 100 Watts or more need apply.

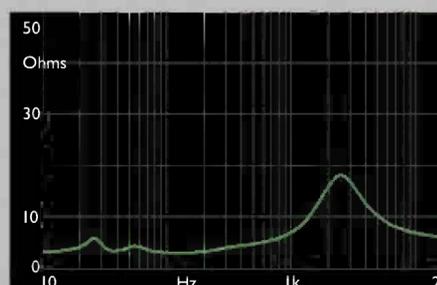
The Reference 1 measured very well all round. It will sound smooth, even natured and uncoloured. It does, however, demand a powerful amplifier with high current power supply, as impedance is low and so is sensitivity. **NK**

**FREQUENCY RESPONSE**

Green - driver output  
Red - port output



**IMPEDANCE**



**KEF REFERENCE 1**  
£4500



**OUTSTANDING - amongst the best**

**VERDICT**

A smooth, accurate clean-sounding loudspeaker that will allow you to hear right into music. Needs power, though, to really shine.

**FOR**

- tonally accurate
- deep bass
- wide soundstage
- port tuning options

**AGAINST**

- needs powerful amplification

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Go Deeper

# Power Up!

Quad's distinctive PA-One headphone amplifier harnesses the power and poise of valves to make a big, bold sound, says Noel Keywood.

**T**he contrast between old and new is made vividly by Quad's PA-One headphone amplifier sitting beside the tiny Epiphany E-Dac that I use to drive computer headphones at my work desk. Since it's a battle to keep the desktop clear, the E-Dac's tiny footprint suits my purposes; it nestles in a dark corner, behind the monitor and alongside

the USB hub that powers it. Then along comes thermionic power in the PA-One, glowing valves a serious on-board power supply requiring mains connection – no USB here – and the looming presence of Bankside power station. Or so it seems.

But Bankside in its heyday probably produced a lot of decibels from banks of generators and Quad's PA-One sort-of provides a similar

step up in proportion: it's massively powerful and dynamic, I found, bringing industrial scale to headphone sound. But you do need a home for it.

Luckily, I use an almost-industrial scale workbench from Ikea, the unfortunately named and now discontinued Jerker, and the PA-One sat easily at one end of a 35cm (14in) deep shelf, although





**The rear panel has balanced, line level and digital inputs as well as a Pre-out so the Quad can be used as a valve-equipped DAC.**

a 30cm (12in) will do fine and I'd guess it has been designed to suit this common shelf depth. The main chassis is actually 26cms deep but rear cable protrusion consumes more centimetres. So the PA-One is big as headphone amps go, if not massively so; it can be squeezed in I found. A width of 18cms and height of 16.5cm help and although a mains transformer and output transformer contribute to a substantial weight of 7.5kgs a shelf able to take the weight of books will cope.

Why put it on a workbench? Well, it might be thermionic, but it is also digital: there's a USB B (printer style) socket on the rear that connects up to any computer, and plugged into my USB hub, to which is also attached a Mac. Yep, this is a thermionic computer headphone amp! Definitely not of the portable variety I'll note but it has other charms and strengths. One is that of glowing valves; the protective cover unscrews using a screwdriver supplied, to reveal two 6SL7 pre-amp valves, two 6SN7 output double-triodes, one per channel, driving an output transformer, probably in push-pull. Quad also use a valve rectifier, an EZ81, and these always help smooth the sound I've found from experiment with World Audio Design amplifiers, since they soft-switch and are high impedance, so are easy to silence with capacitive filtering – you get very quiet d.c. power lines from valve rectifiers.

This brace of valves reflects the latest preference for pre-war triodes, especially 6SN7s, rather than smaller

post-war types like ECC83s or TV audio ECL86s. The early triodes are bigger but they have a silky smooth and wonderfully neutral sound – and that is why Quad use them in the PA-One. They run just-warm, by the way, producing very little heat.

But don't worry! Early triodes they might be but they have the bandwidth to do justice to hi-res digital audio and Quad have ensured, in their usual thorough approach, that the PA-One processes 192kHz PCM (but not DSD) through all inputs, including its Toslink optical input. This means it played a 192kHz sample rate file from my Astell&Kern AK100 digital player that has only an optical digital output; many optical inputs cannot manage this.

The PA-One has both electrical and optical S/PDIF inputs in addition to USB, I should add, so you can connect up a computer, CD player with digital output, or portable hi-res player. Since there's also an analogue output (Pre out) you can also use it as a valve equipped DAC for a CD player.

There's an analogue Line input too, so the analogue output of any player can be sent to headphones via the PA-One. Gain here was very high so the unit will accept very low inputs, right down to 46mV and still go loud with headphones. And that is very loud, because it can swing massive output volts, way more than even the most insensitive headphones need (see Measured Performance).

There are two headphone outputs, both 1/4in jacks, and a switch for high (above 100 Ohms) or low impedance phones. You get a big volume control, but no remote control – a surprise. It's not

uncommon to use an Alps motor driven volume control in this role, together with remote receiver and small, cheapo plastic remote. I guess the thinking is that headphone listeners will be within headphone lead range of the unit, not far enough away to need a remote. Just don't use a long headphone lead!

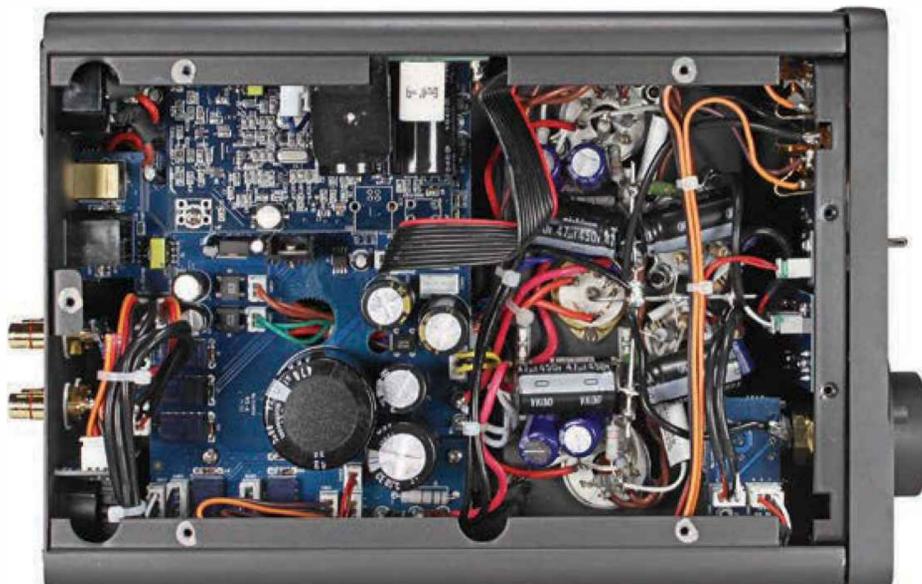
The PA-One is well built and finished – solid and very Quad. However, its dark-all-over finish is very sombre; Quad have better used light gold and grey metallic paint finishes in the past, with ochre graphics, to provide a lighter and cheerier tone. Grey text on chocolate brown background was unreadable in low light too, I found. Orange LEDs in the selector buttons were a nice touch though.

### SOUND QUALITY

Much like any good valve amplifier, the PA-One brings the dynamism of the valve sound, as well as its smoothness, to headphone listening. With my Fidelio X1s synergy was almost perfect: their low sensitivity was of no consequence at all.

With my classic-Rock test track of the Eagles careering through 'Somebody' (ripped from CD to 24/96) the PA-One kicked them hard, putting muscle behind Schmit's strenuous bass line that seemed faster than I usually hear it.

Commonly this track sounds as flat as I – perhaps cynically – expect from CD, and from a track that has been compressed upward to sound loud; it doesn't have much dynamic range measurement shows. Yet through the PA-One it seemingly had huge dynamics – and not only was the bass line made obvious but cymbals too jumped out of the mix, all the while the Hammond organ



**The PA-One is well-built and finished with neat internal layout, in typical Quad fashion.**



Quad uses pairs of 6SL7 and 6SN7 valves alongside an EZ81 rectifier.

swirled away behind.

Moving onto real hi-res, namely Fleetwood Mac (24/96) playing out of memory via Audacity, the PA-One was lightning fast and incisive, and punchy too, showing what hi-res can do on a good hi-fi playback chain.

Mick Fleetwood's opening drum sequence on 'Dreams' was beautifully rendered: fast, clean and tightly defined in the time domain, vocals stretching across a wide and airily open sound stage. Stevie

Nicks's voice hung centre stage with convincing realism, with backing vocals layered behind and offset left. The PA-One even brought some extra life to mp4 downloads from iTunes, like 'Angels' from Within Temptation where Sharon den Adele's impressively high mezzo-soprano range was made very obvious, even if mp4 compression grunge affected the band somewhat.

Swapping over to Oppo PM-1 planar magnetic headphones showed the PA-One is relatively unaffected by headphone balance. The Oppos usually sound quite warm up top but the PA-One imposed its own will and dynamism, lessening this quality.

With an AK100 connected I initially bumped into silence with 192kHz files, quite unlike what happened on the test bench. Swapping to a short lead put me into business, underlining how close to borderline Toslink is with high data rates; it was never designed to carry hi-res and the connectors and cables affect viability. 24/96 will always work via Toslink but 24/192 has double the data rate and therefore needs a higher analogue transmission bandwidth (digital being analogue remember). Was it better sounding than USB? It was a tad smoother and

svelte on balance but the PA-One so dominates sound quality, imposing its own will, it hardly seemed consequential. With opening drum strikes in my right ear beating my aural bits hard at the start of 'Tramp' and the Muscle Shoal horns blaring across the full width of the stage I wasn't inclined to be too worried about this and I did notice that Carla Thomas seemed to be singing in a bathroom and tape hiss at the end of the glorious 1967 track was dreadful! Never noticed that before. But the PA-One did Otis proud, putting real kick into proceedings; all of a sudden music was sounding funky.

### CONCLUSION

If you really value headphone listening then the PA-One is a must-have. It suits all headphones and really kicks them into life. With superb dynamics and easy-on-the-ear smoothness it exists in a realm above current silicon chip, 5V USB power line driven alternatives, riddled with charge-pump dc convertors. The PA-One has 250 honestly generated Volts inside and it's audible! This unit is easily the best headphone amp out there, providing you don't want to carry it around in your back pocket!

## MEASURED PERFORMANCE

The Quad PA-One has high gain of x21.6 (27dB), so just 46mV via Line In will give 1V into headphones (Low impedance setting) and that is loud. Switching to High impedance gain doubles. So any source, including a low gain phono stage, will deliver enough signal to drive any headphone to high volume. Maximum output was beyond 10V, a maximum of 19V being delivered with headphone impedance set high. Since even insensitive headphones need no more than 2V, this is more than enough.

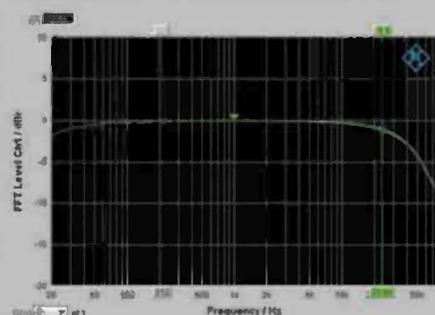
Distortion measured a low 0.03% at 1V output to headphones and frequency response was flat from 20Hz to 23.6kHz, at both impedance settings and at all positions of the volume control. The XLR input gave the same result as the phono socket input.

Both S/PDIF electrical and optical digital inputs worked to 192kHz and frequency response was flat from 20Hz to 30kHz (-1dB). EIAJ Dynamic range was inevitably limited by low level noise from the valves but was still a respectable 105dB with 24bit. That's higher than CD (102dB) – if not by much. I noticed

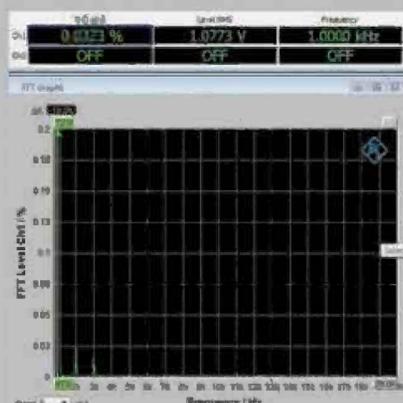
distortion and noise were lowest at 44.1kHz sample rate, so the PA-One best suits CD.

Unfortunately, the USB input was noisier, managing 97dB EIAJ Dynamic Range – unimpressive. Distortion was

### FREQUENCY RESPONSE



### DISTORTION



high at 0.8%, due to noise, against 0.1% from S/PDIF (at -60dB).

The Pre-out had much less gain than Headphone out, just x4 at High and x2 at Low (impedance headphones). Maximum output was limited to 2V (0.3% thd); it must be tapped off before the output transformer.

The PA-One works well across the board, if in measurement being a tad limited by thermal noise from the valves. USB performance was mediocre though. NK

Line in (analogue)

Frequency response (-1dB)

20Hz-23.6kHz

Distortion (1V out) 0.03%

Gain (headphones) x21.6 (27dB)

Overload 10V out

Gain (Pre Out) x4 (12dB)

Digital in

Frequency response 20Hz-30kHz

Distortion 24bit

0dB 0.003%

-60dB 0.08%

Separation (1kHz) 89dB

Noise (IEC A) -103dB

Dynamic range 105dB

## QUAD PA-ONE HEADPHONE AMPLIFIER £1200



OUTSTANDING - amongst the best.

### VERDICT

One of the best sounding headphone amplifiers available, a wide range of inputs offering unrestricted hi-res PCM playback.

### FOR

- USB & S/PDIF digital
- powerful, dynamic sound
- can drive a hi-fi

### AGAINST

- large
- heavy
- sombre appearance

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# Essex boy, made better



**Martin Pipe and Rega's DAC-R both come from Southend-on-Sea. One is, however, a rather better music-maker than the other...**

**R**ega may have made its name with turntables but it's certainly no digital slouch. Some of its CD players (and for that matter amps and speakers) are also highly-regarded. And then there's the Rega DAC, the Southend firm's first foray into this market. This affordable (£500) midi-sized component, launched three or so years ago, won over many audiophiles around the world with a sonic signature that some compared to Rega's revered P9 turntable.

The solidly-built Rega DAC was carefully-designed around a pair of Wolfson WM8742 converters (one for each channel) with digital filter characteristics switchable from the front panel. It also included a USB input – which brings us to the only serious criticism of the original

Rega DAC. The USB interface was implemented using an inexpensive chip (the TI PCM2707) that could only handle 16-bit audio with a maximum sampling rate of 48kHz. Fine if all you want to do is play CD or digital radio rips stored on your PC's hard drive but some DAC owners wanted better – most obviously the ability to play out hi-res music files downloaded to their computers.

And so to the DAC-R, Rega's DAC 'reboot'. Looking very similar to the original model – but selling for around £100 more – this new version offers the same basic connectivity and features. However, the USB interface – now built around XMOS silicon – offers full asynchronous operation and will accept hi-res audio from computer. Windows users will need to download and install the

driver from Rega's website.

In other respects, it's pretty much 'business as usual'. You get identical connectivity and the same WM8742 converters, although the front-panel digital filter switching has been simplified – three positions, the characteristics of which are slightly different depending on the sample rate of the incoming signal. Resolution, sampling rate, filter setting and input are confirmed by LEDs. But again there's no control over volume, and so you'll need a passive preamp if you want to drive a power amp or active speakers. The DSD potential of the WM8742s has also once more been overlooked.

All-new, though, is the dinky little remote that can cycle through connected sources. It cannot alas invoke standby or switch between the digital filter settings. Operation of

Rega amps and digital sources is allowed, however. Internal construction is excellent, with toroidal-core mains transformers, audiophile-grade passive components and pulse transformers for digital signal isolation.

**SOUND QUALITY**

Testing was done via an Arcam FMJ-A49 integrated amp and FMJ-CDS27 CD player/streamer, with a pair of Quadral Aurum Wotan VIII speakers. The DAC-R was connected between the CDS27's coaxial output and another line input on the A49, so comparisons between the Rega and Arcam DACs could easily be made. The USB input was hooked up to a Windows 8.1 PC. I also tried a few other digital sources (like the Mitchell and Johnson DAB tuner reviewed elsewhere this issue).

One word can sum up this DAC – engaging. No ‘silly money’ is involved here, yet musicality seems to run through the DAC-R’s veins. ‘Surfboy’ from Underworld’s debut album ‘Dubnobasswithmyheadman’ (CD), has a complex wall of sound of which Phil Spector would be proud. But this album was released in 1993, and much had changed in the recording world since Spector’s dense productions of the mid-’60s. The contribution of every element is there for the listening, even the delicate cymbal hits that occur around three minutes into this classic slice of electronica. The track’s rhythm, plus the sequenced analogue synths that follow, demonstrate the DAC-R’s thorough sense of pace and drive.

Instruments bounce between the speakers with electronic precision, but there’s no escaping the track’s underlying humanity. You feel an involvement with what’s pouring out of the equipment. There’s indeed a tangible warmth to the bassline that features heavily, but there’s depth and precision too. The DAC-R doesn’t quite have the organic character (or absolute definition) of my reference Chord DAC 32, but the two get very close on occasions.

The effects of the DAC-R’s various digital filtering modes are at best very subtle, certain on CD. Even listening via capable speakers like the Wotans (with their revealing ribbon tweeters), it was difficult to perceive any meaningful audible difference. In the end, I tended towards the third setting (minimum phase, apodising). Somehow, it seemed to give the most



*Choose from asynchronous USB as well as two optical and two coaxial digital connections.*

natural result – certainly to my ears. But it’s a very close call.

Out of interest, the Arcam’s analogue output sounded marginally brighter and more ‘forward’ in its presentation than that of the DAC-R. More fundamental differences became obvious when driving the DAC-R from budget equipment like the aforementioned M+J tuner. The soundstage was better-delineated and the bass tighter, while musical ‘flow’ was more in evidence.

And so to the main difference between the old and new – the USB interface and its hi-res capability. Here we enter into a different world – one

that enhanced PC compatibility eases you into. A 24-bit FLAC download of Bruckner’s 2nd Symphony (Trevor Pinnock/Royal Academy of Music Soloists Ensemble, Linn) was marked by an authentic spaciousness, accuracy and rich tonal colour. There’s a lot to like here.

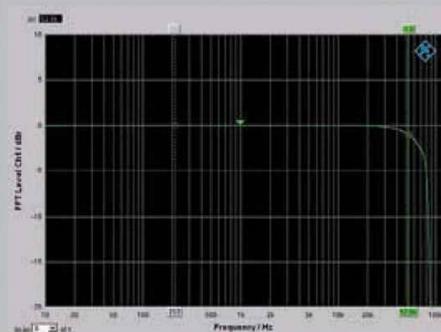
**CONCLUSION**

The DAC-R is a very similar box of tricks to its predecessor – and that’s nothing to be ashamed of. You get the original model’s musical insight but also a capable USB interface that helps to justify the slight price increase.

**MEASURED PERFORMANCE**

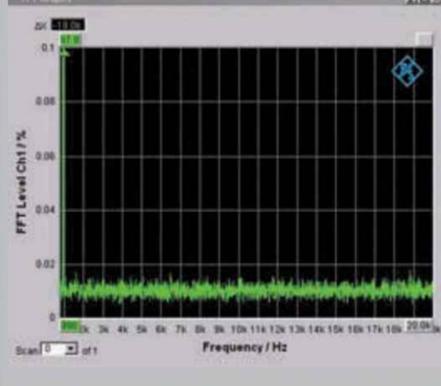
Frequency response of the Rega DAC R reached 53kHz with a 192kHz sample rate signal, using Filter 2 that gave the widest response; our published response curve shows this. Filter 1 brought this figure down to 40kHz and was a compromise between the wide response of 2 and the narrow response of Filter 3, that reached 36kHz (-1dB). These are relatively small differences, outside the

**FREQUENCY RESPONSE**



**DISTORTION 24bit**

THD @ 100%	Level RMS	Frequency
0.0830 %	2.0126 mV	997.00 Hz
OFF	OFF	OFF



audio band and don’t amount to much, but the damped time domain response of Filter 3 and deeper alias rejection may give it a slightly darker sound than the others, but differences, if discernible, will be small. None of the filters much affected CD, unlike the slow Audiolab DAC filters.

Distortion was low with CD (i.e. 16bit), measuring 0.22%, and with 24bit PCM reasonably low at 0.08% at -60dB. Better is possible nowadays, down to 0.02% (Meridian, ESS Sabre32). EIAJ Dynamic Range was also on the low-ish side at 108dB – no disgrace but far from the 115dB-122dB now being achieved commonly by rivals.

All three inputs, optical and electrical S/PDIF, and USB, worked up to 192kHz sample rate and all three had similar dynamic range values, so the DAC R is consistent between inputs.

The Rega DAC R measured well, but its measured performance is below what is possible nowadays. **NK**

Frequency response (-1dB)	
CD	4Hz-53kHz
Distortion	CD
0dB	0.003%
-60dB	0.08%
Separation (1kHz)	102dB
Noise (IEC A)	-107dB
Dynamic range	108dB
Output	2V

**REGA DAC-R £598**



**OUTSTANDING - amongst the best.**

**VERDICT**

Does a great job with 16-bit material, while turning your home computer into a source-component of genuine hi-fi potential.

**FOR**

- accurate, open and musical
- asynchronous USB port
- sensible digital-audio connectivity

**AGAINST**

- no DSD support
- little difference between filters
- no provision for balanced connections

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# Outstanding Onkyo!

**Onkyo's new C-N7050 offers CD replay, network streaming and much more for just £350. It's an absolute bargain, says Jon Myles.**



**N**ot so many years ago the choice of how people listened to their music was a fairly straightforward choice – vinyl or CD. Nowadays it's getting decidedly more complex. The two so-called legacy formats still remain but we can now add to them streaming from Network Attached Storage devices, computers or even mobile phones/tablets, on-demand music services such as Spotify, Tidal and Deezer and even an increasing number of internet-based radio services that give access to a welcome eclectic range of sounds.

Unfortunately, trying to bring all this to an existing hi-fi set-up can be

a bewildering task to the uninitiated – not to mention an expensive proposition if you are adding the functionality via separate dedicated boxes.

Which is where something like the new Onkyo C-N7050 on review here comes in. Costing just £350, on paper it seems to offer outstanding value for money for the price. Billed as a Network CD player, the Onkyo will not only spin your silver discs but also allow you to access the world of high-resolution streaming all the way up to 24bit/192kHz as well as 2.4MHz and 5.6MHz DSD. It also offers internet radio as well as playing music direct from your smart phone and iPad, or similar. What's more,

its front USB port is Apple-certified allowing a direct digital stream to be taken from an iPhone or iPod for better sound quality.

And all this in a package no bigger than a standard CD player – 102mm x 435mm x 302mm (H/W/D), weighing in at 4.6kg.

Construction is relatively sturdy for the price – the C-N7050 featuring a vibration-damped metal cabinet (in silver or black) with responsive soft-touch controls on the fascia. The CD tray is also smooth to slide in and out and there's no undue mechanical noise when the CD spins up.

If there's any sign of cost-cutting it's in the front panel display, which



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**DECEMBER 2014**

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Hi-Fi World is a magazine with opinion informed by advanced measurements...

- We listen and measure
- Expert opinion from a team of renowned writers
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**Information**

Developer	audio web publishing ltd
Category	Entertainment
Updated	6 Dec, 2014
Version	1.0
Size	9.0 MB
Rating	Rated 4+
Family Sharing	Yes
Compatibility	Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch. This app is optimised for iPhone 5.
Language	English

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**Onkyo's free app for mobile devices makes controlling the C-N7050 a breeze.**

product. Resolution was good and there was plenty of detail within the sound.

Moving onto streaming, some high-resolution tracks got even better. The basic sonic character remained the same, but the C-N7050 has more than enough resolution to show the advantages of higher bit rate files. Kairos 4Tet's 'Everything We Hold' (24bit/44.1kHz) had tremendous definition, the piano sounding rich and full while the bass lines dug deep whilst never sounding overblown or boomy. Marc O'Reilly's husky voice was also particularly sonorous and came across with real emotion.

Some of the arrangements on this collection are particularly complex but the Onkyo is adept at conveying the dynamic contrasts of the individual musicians, keeping a firm hold on the rhythm and never allowing the sound to become congested.

All this was using the Onkyo through the excellent Creek Evolution 100A integrated amplifier, which at close to £1500 is almost four times the price of the Onkyo. But at no time did the latter component seem outclassed. Indeed, pair these two together and you have the basis of a thoroughly engaging CD/network streaming system for less than £2000.

Admittedly, there are standalone CD players and network streamers that ultimately offer more drive, depth and outright detail, but they'll invariably cost you a good deal more

and also sacrifice the one-box convenience of the Onkyo.

Turning to internet radio, the N-C7050 pulled in the usual range of thousands of stations via vTuner. As ever here, sound quality very much depends on the bit rate of the channel being listened to, but I experienced no drop-outs during extended use (probably helped by that wired connection) and the function is a seriously good way of discovering new music.

Finally, using an iPhone to stream music to the C-N7050 via the Onkyo app was fuss-free and extremely convenient. Yet again, the absolute quality will very much depend on what you have stored on your device, but it works very well.

### CONCLUSION

The Onkyo N-C7050 really does defy expectations at its price. As well as an assured CD player it also opens

### A COMPLETE SYSTEM

If you have an ageing CD player you are looking to replace and fancy combining silver disc replay with network music then the Onkyo could be the ideal solution.

CD replay is as good as it gets at the price - but just as importantly the N-C7050 offers an ideal entry point into high-resolution streaming.

Used as a main source the Onkyo is capable of being matched with amplifiers costing a significant amount more. Alternatively, simply slot the N-C7050 into an existing CD-based system to take advantage of its networking capabilities.

As an example, I tried the Onkyo with a Creek Evolution 100A amplifier and Epos K1 standmount loudspeakers - sum total £2250. For that you get an exciting, involving sound and the flexibility of choosing CD, computer, network or smart device replay. Alternatively you could substitute the Creek for something like the Exposure 3010S2-D reviewed elsewhere in this issue and which is also outstanding value for money. Exactly what hi-fi should be in this day and age.

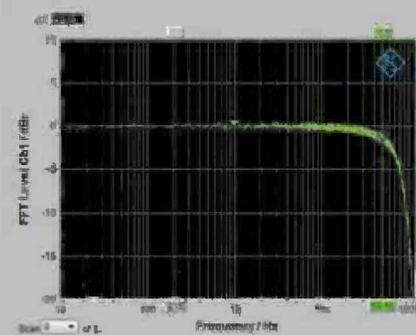
Alternatively, if you are content with your present system but fancy adding a streaming option then the Onkyo will do it for you at an entry-level price but with a sound that could go head-to-head with a number of much more expensive options.

the door to high-resolution streaming via NAS drives, computers and smart 'phones. All this for the bargain price of £350. In short, there's very little to beat it at the moment.

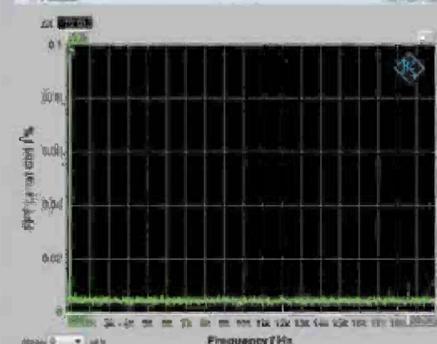
### MEASURED PERFORMANCE

Frequency response of the Onkyo C-N7050 reached 50kHz with a high resolution 192kHz sample rate signal from the USB memory key input, so it

#### FREQUENCY RESPONSE



#### DISTORTION 24bit



well exploits high sample rate.

Distortion at -60dB with 24bit was very low at 0.04% and noise low too. As a result EIAJ Dynamic Range measured a high 115dB – a very respectable figure – and the Ethernet input gave the same result, so the C-N7050 well exploits hi-resolution digital.

Distortion was low with CD (i.e. 16bit), measuring 0.21%, and frequency response flat to 21kHz as expected, typical results from CD where quantisation noise sets limits to distortion and dynamic range. Output was 1.94V, as expected from a CD player.

The C-N7050 gives very good results from both CD and hi-res digital. NK

**Frequency response (-1dB)**  
24/192 4Hz-50kHz

<b>Distortion</b>	<b>24bit</b>
<b>0dB</b>	<b>0.003%</b>
<b>-60dB</b>	<b>0.04%</b>
<b>Separation (1kHz)</b>	<b>101dB</b>
<b>Noise (IEC A)</b>	<b>-113dB</b>
<b>Dynamic range (EIAJ)</b>	<b>115dB</b>
<b>Output</b>	<b>1.94V</b>

**ONKYO N-C7050**  
**£350**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

#### VERDICT

Excellent sound from hi-res. streaming, CD playback and internet radio – all at a price of just £350. Superb.

#### FOR

- lively presentation
- high-resolution streaming detail
- price

#### AGAINST

- basic display
- no wi-fi option

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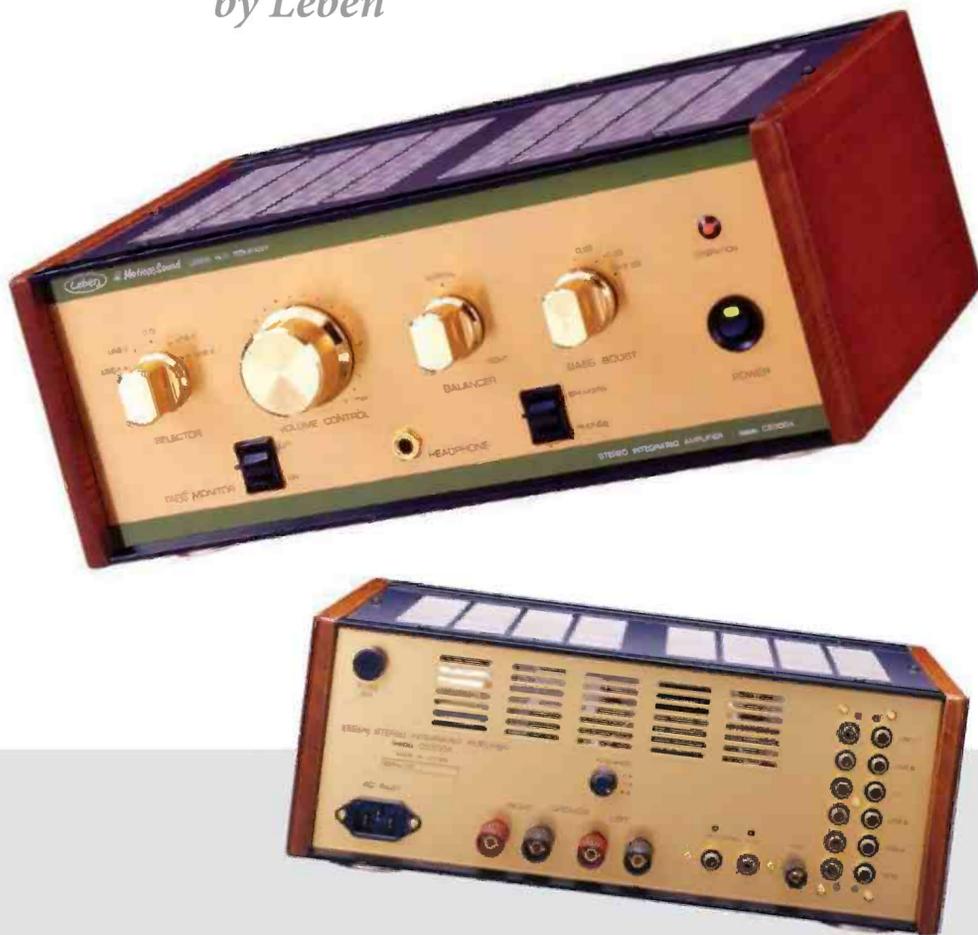
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by *Leben*

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# DR | power amplifiers

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by *Naim*

Following the development of Naim's now reference Statement amplifier Naim has re-engineered its complete range of classic amplifiers, 'trickling down' the Statement high power DR regulator technology and NA009 output transistors.

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# Custom fit

**Jon Myles gets a hearing upgrade as he is measured up for a pair of Noble Audio's bespoke, custom-fit in-ear monitors.**

**I**f there's one growth area in the hi-fi industry then it's quality earphones. The market has exploded since the rise of the iPod and the growth of listening on-the-go and has only been fuelled by the ever-increasing number of high-resolution portable music players such as those from Astell&Kern and FiiO. After all, if

The advantage is obvious; the earpieces are sculpted to exactly match the shape of your ears, meaning better noise isolation, a more comfortable fit and better sound quality. No various ear tips to choose from, no pushing the 'phones into your ear for a better fit – just a set of monitors that fits perfectly, moulded to all the unique nooks and crannies of your ears. So, when offered a pair of Noble K10 custom in-ear monitors (CIEMS) for review I naturally jumped at the chance.

Now, these are not your normal set of 'phones. Designed by qualified audiologist Dr John Moulton and his team at the US-based Noble Audio company, the K10s feature 10 (yes 10) drivers per side. And to get the bespoke devices custom-fit

you're paying top dollar for a high-res player, you want a high-definition set of 'phones for it.

Hence the number of in-ear monitors with multiple drivers costing anything from a few hundred pounds to a few thousand. But if you really want to get the best from your earphones there's only one way to go – custom fit. Already commonplace among performing artists and sound engineers, these are now becoming increasingly popular with audio enthusiasts.



**Gisele carefully syringes the silicone-based material into Jon's ears (above) while below he bites down on a plastic plug to prevent his mouth moving while waiting for it to set.**



**Two elements are mixed together to create the material used for making the ear moulds.**



to my ears means a visit to another renowned registered audiologist – Gisele Flower. Gisele operates Aid2Hearing from her base in Whetstone in North London, as well premises in Harley Street and through home visits.

Dubbed the Musicians' Audiologist, Gisele's clients include Kate Bush, Take That, S Club 7, Labyrinth, Laura Doggett (she of Broadchurch music fame) and The



Once the material has set, the mould is removed from Jon's ears all ready to be sent off to Noble Audio in America to be shaped into a set of custom-fit, bespoke earphones.



**An audiologist and a music lover. Gisele at home with her collection of thousands of CDs.**

Vamps, amongst many other well-known names from the music business, as well as a host of recording and sound engineers. In fact a trawl through Gisele's Twitter feed resembles a veritable Who's Who of the music industry. They come to get custom in-ear monitors and sound protectors made on the eve of major tours or for studio work.

So it's no surprise that when Noble Audio was looking for its first UK facility it plumped for Gisele. After all, if you are spending up to £1850 on a pair of custom-fit earphones it's best to go to a professional with more than 15 years

experience in the business.

And – as luck would have it – my ears give Gisele the ideal opportunity to display her full range of talents. Mainly because they were not in the best of shape on the day. One look down my ear canals proves this.

"There's a lot of wax in there" says Gisele. So much for my cleaning them that morning in preparation for the visit.

"Did you use cotton buds?" Mmm, yes. Apparently that was a bad idea. A very bad idea.

"You should never do that" says Gisele. "It impacts the wax and can push it hard against the eardrum which means it can't vibrate properly, which means your hearing is affected".

That diagnosis is proved by a subsequent hearing test where a series of tones is played through a pair of headphones to test my hearing range. One ear is significantly worse than the other and neither is particularly good. Luckily there's a solution. A quick phone call from Gisele and I'm ushered into another specialist to have both ears suctioned to clear the offending wax.

It's a miraculous feeling. After a few short minutes I can actually feel the offending material being sucked from my ear canals. It's akin to the feeling you get when your ears pop on a flight and sonic clarity returns. Back in Gisele's consulting room and a follow-up hearing test shows a better response and clears the way for the moulding of the bespoke-fit earpieces – which is the real clever bit.

"Everyone's ears are essentially individual" explains Gisele. "They are

all a slightly different shape. The ear canal, for example, has a little kink in it but they all vary in size".

So the only way to get a custom fit is to inject a specially-made silicone-based, high-viscosity material into both ears and wait for it to harden. It sounds uncomfortable but actually isn't. Just a little undignified, though, as you also have to bite down on a little piece of plastic to ensure your mouth doesn't move while there's green gunk protruding from your ears.

You also cannot hear a thing. Total silence. I can see Gisele's mouth moving but cannot detect the faintest sound.

The process finished and Gisele is holding a pair of perfectly-formed replicas of the inside of my ear in her hand, ready to be sent off to Noble Audio in America to have the CIEM shells shaped by their technicians before I receive the finished product back in about eight weeks. A pair of earphones shaped, sculpted and designed to fit my individual ear shape.

All in all, the process has taken less than two hours – and that includes a professional hearing test as well as having all that pesky earwax removed. What's more the checkover actually means I can hear more clearly than I have for months. Actually that alone is akin to upgrading one of your favourite pieces of hi-fi equipment in terms of sound quality.

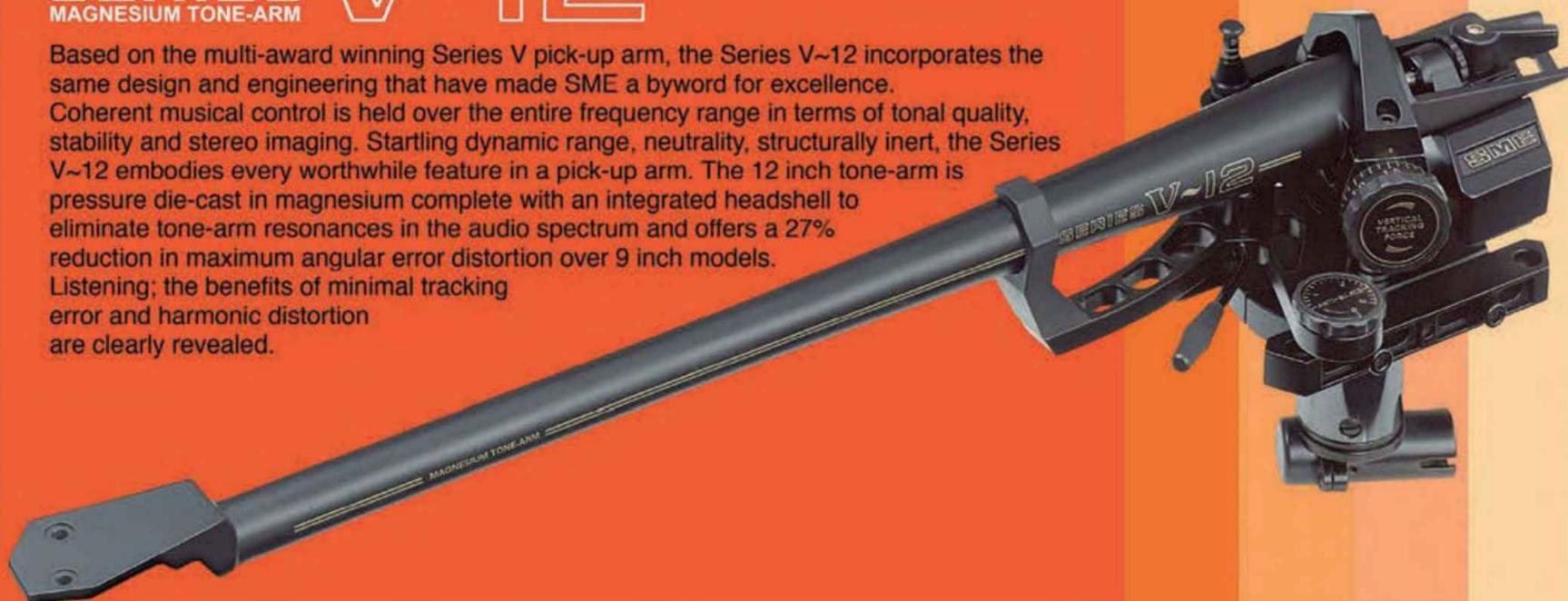
But then, of course, there's the custom-fit earphones to come. How do they sound? Read the exclusive review in next month's Hi-Fi World to find out.

#### CONTACT

Noble Audio's earphones range from £230 to over £1850. Aid2Hearing's custom-fit option costs from £150 including dispatch of the moulds to America, return receipt and import duties. For more information log-on to [aid2hearing.co.uk](http://aid2hearing.co.uk) or telephone 0771 8899025.

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**H**ere's your chance to win up to 5 metres of Black Rhodium's Samba VS-1 loudspeaker cable, reviewed in our April 2015 issue. Read the review excerpt below and answer the questions.

"Another take on the successful Samba cable, the VS-1 uses the same 19 strands of 13-gauge silver-plated copper conductors insulated in thick silicone rubber and terminated with Graham Nalty's Legacy GN-1 rhodium-plated banana plugs. The VS-1 in the name relates to a vibration stabilising device in the shape of a hefty machined metal weight clamped

halfway along each cable.

Again the leads are gently twisted together to ward off RFI/EMI, while positive and negative signal flows are connected in opposite directions which Black Rhodium claims helps lower the noise floor.

Whatever effect the vibration stabilizing is having, the Samba VS-1 is a step up from the Iris. It retains the same essentially open nature but adds an extra element of sparkle to the top end. The leading edges of the notes on Pierre Bensusan's exquisite guitar playing have real presence and bite while the music is laid out in a wide and expansive soundstage.

Bass control is also excellent, the funky beats of TV On The Radio's

'Seeds' going cavernously low. These cables seemed to help the relatively low-powered Class A Sugden amplifier keep a tight grip on the loudspeakers' bass drivers so there was real punch to the music.

The VS-1 also excels in instrumental separation, meaning complex music never sounded cluttered or blurred. At £599 for a terminated 3-metre pair the Samba would make an excellent cable upgrade to many a decent system – especially for those looking for a detailed, open sound without losing any rhythmical flow".

For a chance to win this great prize, just answer the four easy questions at right. Send your entries on a postcard only, by 7th August 2015 to:

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## QUESTIONS

**[1] How thick is each strand?**

- [a] 1mm
- [b] 0.5in
- [c] 13-gauge
- [d] thick as a brick

**[2] What do they "ward off" ?**

- [a] evil spirits
- [b] cosmic radiation
- [c] MP3s
- [d] RFI/EMI

**[3] What do they add to the top end?**

- [a] element of sparkle
- [b] dull sound
- [c] vivid lift
- [d] screech

**[4] What went 'cavernously low'?**

- [a] angry elephant
- [b] banana plugs
- [c] Sugden amplifier
- [d] 'Seeds'

**entries will be accepted on a postcard only**

**MAY 2015 WINNER: TEAC CD-P800NT CD/NETWORK PLAYER  
Mr A. Currie of Renfrewshire, Scotland**

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## LETTER OF THE MONTH PRIZE



**KEF Q100 LOUDSPEAKERS**

**Visit our website at [www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) or send your emails to [letters@hi-fiworld.co.uk](mailto:letters@hi-fiworld.co.uk). Letter of the month wins a pair of KEF Q100 loudspeakers.**

Answers by: **NK** - Noel Keywood; **JM** - Jon Myles; **PR** - Paul Rigby; **MP** - Martin Pipe; **RT** - Rafael Todes.

For more advice see Letters from earlier issues at [www.hi-fiworld.co.uk/letters](http://www.hi-fiworld.co.uk/letters)

**A pair of KEF Q100 loudspeakers are on their way to JON MALCOLM Letter of the Month winner in our July 2015 issue.**

## Letter of the Month

### INTO THE STREAM

Hi. I am girding my loins to take my first step into HD and streamed music and would appreciate some advice. My current CD system comprises a Chord Blu, DAC 64 second generation, Chord SPM 2600 amplifier and Tannoy TD8 speakers. I am looking at purchasing HD files from various sources and using the Tidal service for CD quality streaming using a Windows based laptop with a standard USB output.

I am interested in the Chord Hugo TT or QBD76 as I want sound quality that's commensurate with my Blu. What are the key points I should be aware of to optimise the sound quality of this sort of configuration?

Also, is there any advantages sound wise to using a NAS, and what are the limits of using a USB connection to the DAC? I intend to take a 1 week free trial of Tidal and demo some equipment, so are there any other comparable products I should try?

This whole area is a moving minefield and I want to try to future proof my approach as much as I can.

Thanks for your help.

**Dean Marshall**

Here's a small secret for you. The Chord Hugo DAC immediately raised the prospect, I thought, of a larger mains-powered version. I put this to Chord some months



**Chord's new high-end DAC, named DAVE – meaning Digital to Analogue Veritas in Extremis, no less! Find out more in our reply to Dean Marshall.**

ago and they wouldn't say it wasn't in the pipeline! Well, at the High-End Show, Munich 2015, it was announced, name: Dave. This prosaic title is actually an acronym for XXX, meaning I wasn't there and don't know, but Jon Myles was and explains below! **NK**

Hi Dean. The interestingly-named Dave (standing for Digital to Analogue Veritas in Extremis – or, in English, Digital to Analogue Truth in Extremity) is Chord's most advanced DAC to date and is actually a successor to the DAC 64 and QBD76. To give you an example of its complexity the DAC chipset has no less than 164000 taps and there are 166 DSP cores on the

proprietary Watts Transient Aligned (WTA) filter. I haven't heard it as yet but in theory it should surpass your Blu. It's slated to cost around £8000.

As for Tidal, I can assure you it's very good indeed with a sound quality comparable to CD and over 25 million tracks currently. Interestingly, Oppo has just announced the service will be integrated into its excellent range of Blu-ray players which would be one option you might consider and obviate the need for using a computer - simply take the digital output from the Oppo straight into your DAC. You would also have the option of streaming high-resolution files to it from a NAS drive – which I find much more convenient. **JM**

## NAIM OVATION

My history of hi-fi starts in 1978 with a Hitachi music centre. Sounded better than anything I had ever heard! Thirty seven years later I still remember good sounds (rose tinted glasses at the ready). Using mainly Linn and Naim since then, with a smattering of Musical Fidelity and recently Audiolab, I have achieved what I believe is a balanced (if not ultimate) system.

I visited my hi-fi shop recently - Audio T in Brighton - in order to change some speaker cables. Having asked about the system hooked up, I was offered a demonstration. Thirty years of listening to hi-fi and music could not prepare me for what I was about to hear.

We, as recipients of your opinions regarding hi-fi, read and digest your remarks and comments regarding various equipment and draw our shortlist accordingly. This is, after all, what we read your opinions for isn't it?

Reviews of the latest high-end equipment often has me asking a couple of questions.

Firstly, is the result relative to the cost and secondly, would a poorly reviewed piece of high-end (and high cost), equipment still comfortably outperform better reviewed but cheaper alternatives? This does not seem to be an angle any hi-fi mag seems to address.

I have not had the pleasure of time to answer the second question. Also, the problem will always be compounded by advancing technology which has to be considered when making any observations.

However, I can answer, with confidence, the first question. As long as each piece of equipment purchased is compatible with the other pieces of equipment and room size/dynamics are taken into account, I now know that cost and performance is indeed relative.

The system I had the pleasure of listening to was an all-Naim system with a total cost of £50,000. If ever anybody reading this has the opportunity to hear for themselves a similar system, do it without hesitation.

To say I was blown away by what I heard would be an extreme understatement. As hi-fi and music make up a good deal of my life, I would argue that it was life changing. Nothing else would come close to the all-enveloping musical experience I had listening to that system. My current system still sounds perfectly acceptable and still, on occasions, stirs my soul.

However, it will never shake it to its



**A big Naim system like this one blew Bob Young away. "It was life changing", he says.**

core as I experienced on that day and because of that, my new determination is to one day achieve hearing that system again in my home - that is of course providing budget hi-fi technology has not overtaken it ten years from now!

**Bob Young  
Eastbourne**

Hi Bob. Reviewing hi-fi makes me realise that good sound comes in many flavours and it is difficult to be adamant about good/better/best. At the same time qualitative differences do exist – here's an example. I love big Tannoy DC10 Tis and Martin Logan Summit X hybrid electrostatics, both of which I think are wonderful loudspeakers – but they don't sound the same and I couldn't say which is best. So best if I describe the differences and let you/readers decide which one is most likely to suit your expectations, tastes and room.

Budget systems – let's say £2k all in – can be very, very good. Well chosen high-end systems can be better, but often are idiosyncratic, as much a creation of their designer's views on what constitutes good sound quality, as anything else. I don't always agree; others might.

Having said all that, a reader did

recently ask us to put together some budget, mid-price and high-end systems and next month we will be assembling a budget system that can do everything, as a whole feature. Listening to a lot of products in-house, Jon Myles and I have confident views on all this and I think you may like the result. We will cover mid-price and expensive systems later.

And on Naim I wondered what loudspeakers were being used in your Naim demo so phoned Audio T Brighton. They told me they were most likely PMC fact.12s, but could have been Naim's own Ovator 400s, both of which they have on demo.



**PMC fact.12 loudspeakers, liked and commonly used in demos by Audio T, Brighton.**

They were driven by NAP300 power amps, from a 252 preamp. **NK**

Hi Bob I'm delighted you were so impressed with the Naim system. Unfortunately, you don't say exactly what components were being used but - by the cost - I'd say something from the higher end of the company's range with either their own Ovator loudspeakers or ones from sister company Focal.

Not everyone gets on with the brand's sound but as a dedicated Naim user myself I can honestly say that for sheer visceral punch, dynamism and overall musical communication there's little that comes close. Their products also seem to have tremendous synergy so those qualities only tend to grow the more Naim units you slot into a system. Let's hope you get to bring that Audio-T set-up home one day.

One word of warning, though. If you do, the chances are you'll be hankering after Naim's flagship Statement amplifier next - and that's £125,000! **JM**

**NEW TUBES**

*I'm at a point where I think I want to upgrade my system. At present I use a Conrad Johnson PV14L feeding into a pair of Naim 155XS power amplifiers which drive my Monitor Audio GR60 speakers. My primary source is now a Novafidelity X40 which has replaced a Njoe Tjoeb CD player.*

*The Novafidelity offers unparalleled convenience and ease of access to my music library but it lacks the verve and fun of the Njoe Tjoeb. I'm hoping that different amplification may be the key to recapturing some of that lost sparkle but I need some sage advice. There is a superb synergy between the Conrad Johnson and Naim combination, and I would like to continue with a valve preamplifier and a solid state power amplifier but I wonder if there may be merit in a whole different approach. My budget is flexible but I don't think I want to go much past the £5,000 mark. At a push I would consider new speakers but they would need to be of equal size to fill my sitting room.*

**Jon,  
Sheffield**

Your Monitor Audio Gold Reference GR40s have real verve and life and well suit your Naim power amps I feel, and a valve preamp in front is a superb idea, adding air and space into the sound.

What you need, I believe, is a



**Cambridge Audio's new Azur 851N network player has a digital output that can feed a valve powered DAC, like the Quad PA-One reviewed in this issue.**

streamer with valve output stage, much like the Njoe Tjoeb in configuration. Thinking out loud, I see a streamer in front of me with a digital output, feeding an external DAC with valve output stage – and that could be the Quad PA-One I review this month, an impressive device. A good, new streamer with digital output that comes to mind is the Cambridge Audio Azur 851N, reviewed in our July 2015 issue. Just connect it up digitally to the PA-One and take the Pre-out of the latter to your Conrad Johnson PV14L.

This combo comes well within your budget and you get a valve powered headphone amplifier as well. You do not get the hard drive storage capacity of the X40, but you do get solid-state storage on front and rear mounted plug-in memory keys. The rear key acts as permanent storage in effect, whilst the front key can be swapped over as required. I hope that works for you Jon - it will be a nice system I feel. **NK**

**DIGITAL DIFFICULTIES**

*Bearing in mind that I am 63 years old, useless at maths and called Technosatan by my children, can you answer a couple of questions that have bugged me for a few years now?*

*FLAC etc. How can any form of*

*compression possibly be lossless? Surely, only analogue is truly lossless?*

*Upsampling...how can upsampling improve sound? If something is recorded at 16/44.1*

*Also, years ago, when you first wrote about computer audio, you said that CDs should be ripped at no more than x 4 speed. Is that still the case or are drives so much better now?*

**Charly Beagrie.**

No problem Charly, these are peculiar issues. Lossless compression 'compresses' the digital code by re-writing it in more efficient form. There is a standard algorithm for this that reduces data sent by 50%, giving a 2:1 reduction in both stored data and transmitted data rate. No data is lost when the signal is re-assembled as standard PCM, unlike MP3 etc.

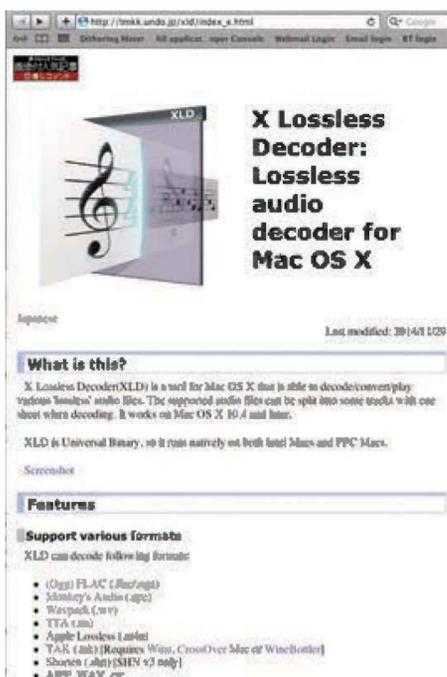
Analogue isn't quite truly lossless, by the way. Very low level information can be buried beneath the noise floor, suggesting it is lost. Or so the common argument goes. I am not so sure. Using synchronous averaging, which came available in 1984 on our Hewlett Packard HP3561A spectrum analyser and was, I believe, developed for radio astronomy, non-synchronous noise can be almost eliminated, so if the brain/ear are capable of this – and Colin Cherry's

'cocktail party effect' suggests it is – then the ear can hear down a long, long way. It's an interesting subject! You can read more on Wikipedia.

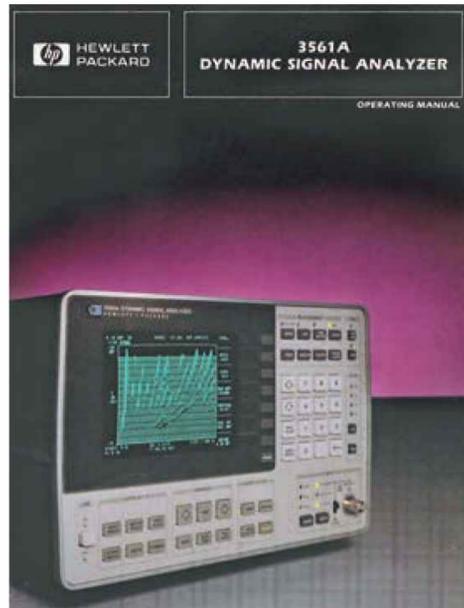
On upsampling, there is no intrinsic improvement in quality and I can sort-of verify this common view from my own experience. However, upsampled data can be better filtered before being turned to analogue and this potentially offers benefit by reducing unwanted alias products (i.e. rubbish) appearing in the output of the digital device (e.g. CD player). However, if you rip a CD to a computer and then upsample you may well feel it sounds subtly smoother and tidier. In fact what is happening here is that the data is being digitally re-clocked and this improves sound quality; the up-sampling bit is here of no consequence. I have ripped CD to computer and found it does sound better. I have then converted it to 24/96 in Audacity and heard no improvement at all. You can try all this for yourself, because ripping software is free - see XLD. It will upconvert and/or compress too.

There are now ways to quality check a rip, again see XLD. This makes the ripping process less sensitive, but in any case I find that today's drives cope with audio data rates fairly easily. You can run a check on a file after ripping it if you wish, by cross referencing against an on-line database. **NK**

Hi Charly. As Noel says, FLAC simply compresses the digital music file without throwing away any



**A simple, free but superb way to rip and process CD, XLD is for Macs. For PC, dBpoweramp is a common alternative.**



**This once-popular audio analyser could see below noise. Can humans do the same?**

information, unlike MP3, making for more efficient storage and transmission. Whatever device is replaying the file then expands it to its original form – so a 24bit/192kHz music file, for example, retains all its information when compressed to FLAC but just in a smaller package.

Other audio file formats such as WAV do not compress the information and so take up greater storage space. Some people have claimed that they can hear definite differences between FLAC and WAV when streaming music but to my ears they sound exactly the same. **JM**

### CABLE MATTERS

I have just read with interest Jon Myles' article in the July issue concerning the need to experiment with cabling and to not assume that the more expensive will necessarily sound better. My recent experience with speaker cables certainly supports what Jon says.

In the process of gradual system update/box reduction I last year moved over to a NAS set-up by replacing my Linn Kairn pre-amp and Genki CD player with a Naim NAC172 XS pre-amp / streamer. This somewhat overlooked but excellent Hi-Fi World recommendation suited me perfectly as on audition it sounded more like my well-loved Kairn than the latest Linn streamers do(!), as well as allowing me to play my vinyl via my LPI2/Linto.

I am now looking for a stereo power amplifier up to the £2000 mark to replace my superb-sounding JAS-upgraded Musical Fidelity XA50 monoblocks.

Following an unsuccessful trial of a Naim NAP200, local dealer Peter Tyson's ever helpful Mark Benson loaned me a Linn Majik which again didn't really suit me - but this trial proved fruitful for an

unexpected reason, which brings me to the main point of this missive.

Some years ago I had settled on jumpered/single wired Kimber 8TC speaker cables to accompany my then Tannoy M20 Gold MkIIs, following the common recommendation that it is better to single wire with 'better' cable than bi-wire with lesser stuff. These cables were therefore now connected to my more recently acquired IPL S2TLMs, but as they were only 1 metre long the Linn Majik loan had included a 3 metre bi-wired set of Linn LK400 cables. To my surprise, with my XA50s/IPLs the £12 per metre LK400s sounded better than the £65 per metre 8TCs. They were more 'natural', with better top-end refinement, bass dynamics and general coherence. LK400 cables are usually considered only in the context of full Linn set-ups, and I simply would not have thought of them under other circumstances.

While Tysons are now on the lookout for a within-budget used/ex-dem Linn Akurate power amp for me to try, all I can say is that I am currently enjoying my music as the permanent owner of a set of LK400s. Jon's findings certainly support my own - there's more to this cabling lark than simply throwing money at it!

**David Deeks**

I absolutely agree David! The importance of cables is often overlooked and just because one costs more than another doesn't mean it will be better or, indeed, suit your own system.

Interestingly, I was talking to one manufacturer recently who said they no longer like to rate their cables in terms of price but instead on how the individual ranges sound, to give buyers more of an idea of what they can expect in their individual set-ups. After all, what I look for in my equipment might not be the same as someone else.

Unfortunately, despite what some say, the science of cables is still not completely understood which is why experimentation is always the best policy. **JM**

### BACK TO BLACK

Back in early 1992, you very kindly gave away a four track Mary Black CD with an issue of Hi-Fi World. I have since lost that CD in a move to the States. I am not after another copy as such, all I ask is, what tracks were on that CD? I have her first five albums, and I am keen to see which songs got me into her music in the first place.



**Cables: controversial because they change the sound, but no one knows why. In fact, both high-rate digital and low-level analogue signals need very good transmission paths – and this means good cables and good connectors too. Gold plated pins help.**

I saw Mary Black play at the Dominion Theater several months after that particular issue of HFW and it was a very enjoyable concert. The acoustics were splendid, and she sang like a pro.

Incidentally, in your November 1991 issue, HFW did a cassette deck group test. One of the models raved about was a JVC TDV-541. I bought one on the back of the review and was bowled-over by its sound quality, ability to hit +10 db with record levels using a decent TDK/Fuji/Maxell and as much as anything, it's pitch stability. Astonishingly, that deck still works today. If only I had more of a use for it still.

Cheers,  
**Bernard Gibbes**

Hi Bernard. I was going to list them for you, but our artwork in the April 1992 issue says it all better. **NK**

**LET'S HAVE UNIT!**

I note your excellent intention to provide what seems to be regular articles on carefully matched systems. I can't wait to read them! I hope you will include the Martin Logan Electromotions in one system with suggestions for suitable transistor and valve amplifiers. I am interested to know how valve amps compare using modern HD streamers and DACs as sources.

Also, you have never tested the Naim Superuniti. I hope you will (perhaps in a selected system). This is the best hi-fi purchase I have ever made (after the Quad ESL63s). It is such good value when you consider how much a similar separate Naim streamer, DAC and amplifier would cost. Also, the Naim control app is brilliant and is now available on Android as well as Apple.

The Superuniti is superb with the Quad ESL63s so it should be a good match with the Martin Logan Electromotions?

Stone Audio near Poole report on-line that the Naim Superuniti and Martin Logan Electromotions are two of their best sellers. Do they partner well? I hope you will consider this pairing for a system review.

I hope when you review a system you mention other possible combinations at a similar price and include notes on the main differences between the combinations. This may be even more helpful for readers who can get to hear some items but not others.

Best wishes,  
**Mike Tartaglia-Kershaw**

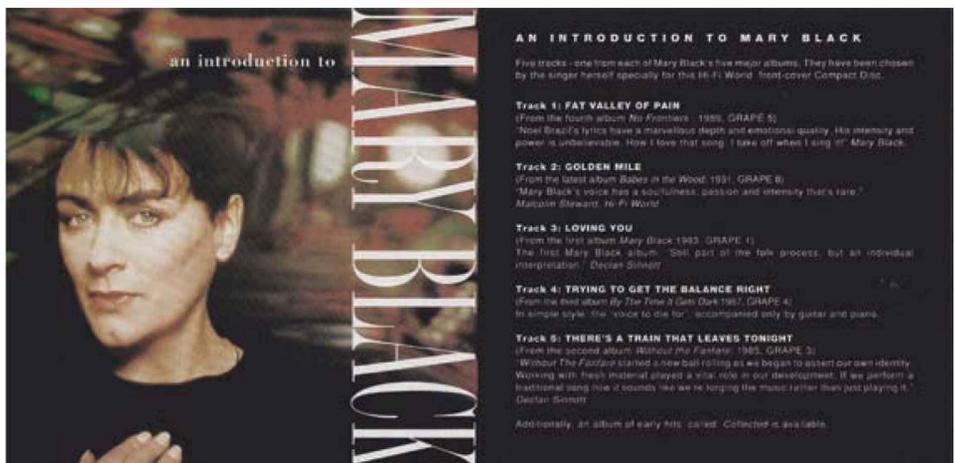
Hi Mike. We can ask Naim for a Superuniti and try pairing it with Electromotions, because I have a pair chained to the floor at home. If they want them back, just bring bolt cutters! I should in truth inspect piggy bank and consider the

Summit X. However, I am aware that the Electromotion is very popular because of its small profile and, for an electrostatic, low price - and quite right too. The only issue I have found over long term use is that bass quality from the small, unremarkable bass bin is - er - unremarkable, unless you use a really good transistor power amplifier to grip the cones. The problem that then arises is that the amplifier must do justice to the super-revealing electrostatic panel and here we get into subjective difficulty. The Electromotion panel is a tad bright and forward, making it very critical of amplifier quality, and it careers down to 1 Ohm at 20kHz which induces crossover distortion. Some amps cope; many don't. The ones that do cope are usually expensive, but Exposure, Creek and Naim come to mind as likely pairings.

I would expect Naims to work in one sense, because they are smooth and they are also easy going. However, their low damping factor may well result in mediocre bass quality. A McIntosh MC152 power amplifier is with us for review and this, I am sure, will suit the Martin Logans, but at £4995 it is a tad pricey for a £2499 loudspeaker. You can see the difficulties here – even valve amps aren't perfect in this role – but it is an interesting challenge we can surely rise to. **NK**

**POWER DOWN**

Your magazine just gets better and better. I love the space and time you and the team give to replying to letters. I think I learn more from this than the articles (well almost). I think you could publish all the letters and replies as a 'hi-fi encyclopedia'. I only wish they were all indexed and cross referenced! I have even started re-reading old issues just for the replies to questions (sad, I



**Our Mary Black sampler CD, from the April 1992 issue. "What tracks were on that CD? I have her first five albums, and I am keen to see which songs got me into her music in the first place", says Bernard Gibbes.**



**Naim's Superuniti.** "This is the best hi-fi purchase I have ever made – after the Quad ESL63s" says Mike Tartaglia-Kershaw.

know). As a result of this I read your marvellous reply to Mark Pearce (Power Games, October 2011, pp38-39). This reply describes the power required from an amplifier to reach specific sound pressure levels at a given sensitivity. I think you should print this as an inset in every edition to remind readers that hi-fi isn't just about power.

I would also enjoy a fuller article covering a range of typical speaker sensitivities. I have been a hi-fi lover since I was 15 (I am 63) and I have never seen this issue explained so simply and clearly.

It has made me far more open to considering lower power amplifiers in future. I think we all yearn for more power when this is not always needed. For many years I have used a Quad 77 amplifier but yearned for a Quad 606/707/909 power amplifier. Then I bought the Naim Superuniti which, on paper, is of similar power to the Quad 77 but it sounds more powerful. Then I realised it was not all about raw power but how the power is delivered, and how the separate pieces of equipment work together in a room.

Perhaps this balance of power and sensitivity could be one theme in your upcoming 'well matched system' reviews? Best wishes,

**Mike Tartaglia-Kershaw**

The following table indicates the peak input in watts used in the Royal Festival Hall, compared with the same records at home, to produce approximately the same impression of sound intensity at the ears. It is quite clear that vocal solos and similar items seldom touch one watt under normal domestic conditions.

Item	Peak power in watts	
	R.F.H.	Home
Glass breaking ... ..	20	10
Tugboat sounds ... ..	30	10
Organ: Bach Toccata ... ..	60	5
Organ: Stanley Suite ... ..	4	1
Audiophile: Dance music on 8 in. speaker (RJ) ... ..	10	2
on 3-speaker system ... ..	5	1
Bach Aria: Kathleen Ferrier... ..	5	1
Chorus and Orchestra: Sea Symphony ... ..	50	4

**What Gilbert Briggs, founder of Wharfedale, had to say about power and loudness, in his book High Fidelity, published 1956. Illuminating stuff for tugboat captains – and the rest of us, even today.**

experience, long ago, was that amplifiers with big power output sounded like that: sturdy, meaty and muscular. That's a generalisation that arguably still holds true, but some amplifiers sound powerful even when they are not – and Audio Research hybrid valve amps wonderfully illustrate this. A 40 Watt VS Li60 will seemingly blow you across the room – it has cojones like few others. Its power spec looks under-whelming, if not to Gilbert Briggs who had much



**An amplifier that sounds powerful even though it is not: the Audio Research VS60. It's a hybrid in fact, with solid-state pre-amp feeding 6550 output tubes. Well worth hearing.**

Readers letters are fascinating and I wish we got more quite frankly – postbags full of e-mails. We enjoy and value your e-mails. To us they are not a nuisance. So I will say to all our readers: please write in!

On power, you do have to be careful, just as you say. My

to say on this some time ago - see our insert.

As you say "it is not all about raw power but how the power is delivered". Amplifiers can "sound powerful" even when they don't have that much power in them. **NK**

### WRONG R?

Having been a dabbler in audio electronics for about 50 years and a subscriber to your magazine for about 20, I was pleased to see constructional articles appearing again.

I can attest to the quality of the Sowter transformers described in David Lord's article in the June issue, having used them in my own phono pre-amp and those of two of my friends. The June article, however, caused me to check the manufacturer's specifications for my Ortofon Rondo Bronze cartridge as the input resistance in David's LT1028 circuit seemed to be too high.

Sure enough, Ortofon recommend a load of 10 to 200 Ohms. Assuming the inverting input of the op amp to be a virtual earth (due to the negative

# Letters On-Line!

You can now read our Letters on-line, from the last issue back to March 2010. That's a treasure trove of information and advice to our readers, as well as a fascinating catalogue of reader's systems and views. There's mountains of buying information, all just a click away on your computer or i-Pad. Have fun!

You can reply to Letters using the e-mail link at the top of the page -



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Just go to [www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) and click on Letters in the left hand menu list, under the FEATURES category. This will take you to the individual months of issue. To see the full list set the 'Display' drop-down list to 'All'.

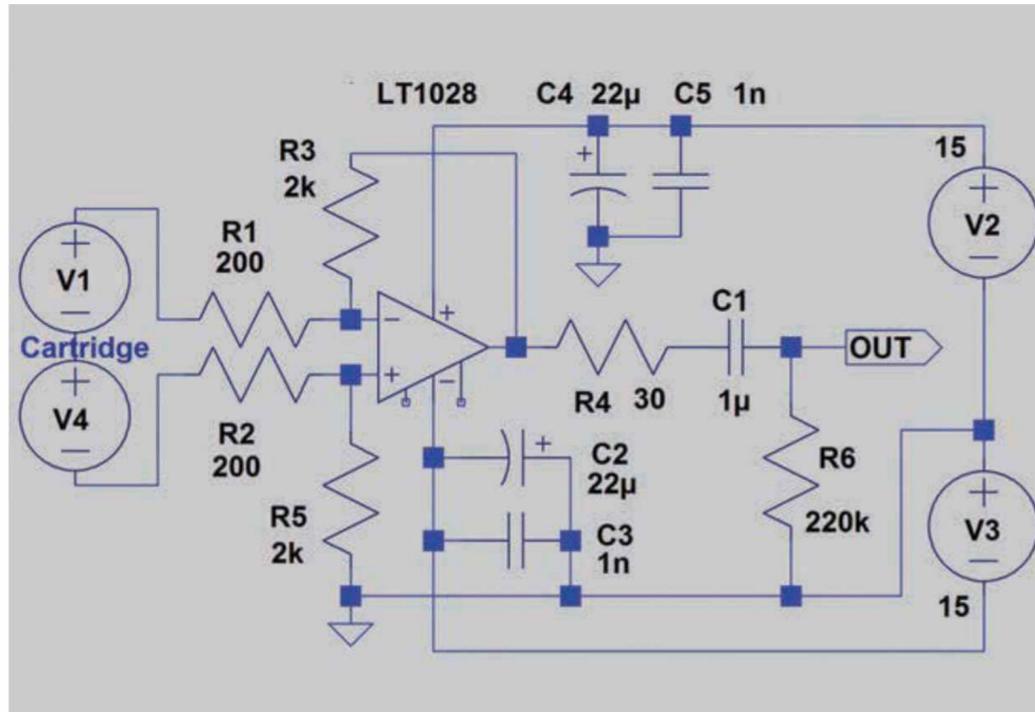
feedback), and the input impedance of the non-inverting input to be infinite, the impedance seen by the cartridge is  $R1 + R2 + R5$  ( $200 + 200 + 2k$ ) = 2400. The circuit might better match most moving coil cartridges if the following values were used:

$R1$  100  $R2$  9.09  $R3$  1000  $R4$  90.91

The 90.9 (1%) & 90.91 (0.1%) resistors are available from Farnell.

This would also have the advantage of equalising the loading of the + & - cartridge leads, thus improving the common mode (noise rejection) and may even make it possible to remove C6. Perhaps David would care to comment on this?

**Michael Ford**



**Fig 11 from A Matter of Balance, p89, July 2015 issue. The input impedance is wrong, says Michael Ford.**

Hello, Mike. Having looked out some of my old notes, the impedance presented to the cartridge when connected to an op-amp in differential mode as shown in Fig 10 of my article is to all intents the sum of the two resistors in series with the inputs, i.e.  $r + r$ . I have further checked with someone who is much more expert than myself, who confirms this is the case. So the input impedance of my phono pre-amp is around 68 ohms (because I have deliberately omitted the other input resistor to the non-inverting input of the AD797 as it serves no useful purpose in this application). If you or anyone else wants to increase the impedance to 100 ohms, simply change the 68 Ohm resistor to 100 Ohms. This will slightly reduce the overall gain, but not by much and there is plenty in hand anyway.

So far as my head amp is concerned, the input impedance is 400 ohms – which I accept is rather higher than is usually recommended by MC cartridge manufacturers, if not quite as high as you had thought. The Ed suggested to me earlier that it would be worth changing the input resistors of the head amp to bring the impedance down to around 100 ohms and perhaps also slightly improve the noise performance. I have therefore given this a try since writing the article, with 47 ohm resistors for R1 and R2, and a corresponding reduction in R3 and R5 from 2k to 470 ohms to keep the gain at  $\times 10$ . I can confirm this works fine, so I commend this change to you if you want to ensure the loading is within the range of values specified for your cartridge.

If your experience follows mine, I doubt if you will be able to dispense with the 47pF cap, C6 (nor with C4 in my phono pre-amp, which serves the same purpose). An alternative might be to place a small cap across the inputs to the op-amp, but I haven't tried this.

If you decide to experiment in this area, I would recommend you check for oscillation with the actual pick-up lead and cartridge you are going to use plugged into the unit: I have found this is what causes these very sensitive circuits to oscillate at HF. And of course be careful not to turn up the volume and perhaps blow your tweeters with a blast of inaudible signal!

Two further bits of advice: it's a good idea to use star earthing when building these units; and keep the turntable earth wire separate from the pick-up lead screens. Hope all this helps. **DL**

Hi Michael. The input impedance usually used for moving coil (MC) cartridges is 100 Ohms. This has become a de-facto standard – and it makes sense. The moving coil generator, by its nature, must have few coil turns and therefore it is of low resistance and low output. Resistance is usually in the 1 Ohm region, maximum. If you use a factor of 10 to come up with a suitable load value, 10 Ohms will do, but loading the generator also, in theory, affects tracking ability (short a generator and it locks up). A 100 Ohm load has no impact on output level and generator performance and so is a sensible value. It also results in low

input resistance and low Johnson (thermal) noise.

These days I play safe and use LTSpice, from Linear Technology of the USA, to sort out the properties of a network, with virtual earths and all, to assess values such as input impedance. It is quick and correct, always bearing in mind that drawing errors or incorrect model properties can foul things up, by a small or large degree.

In this case, LTSpice tells me the Head-amp (Fig 11) has an input R of 400 Ohms, and the Preamp (Fig 10) has an input R of 68 Ohms – just as David says; R5 is not in circuit as far as the signal input is concerned. Check this for yourself by downloading free LTSpice and drawing up the circuits. It is now available for Mac, as well as PC. However, the (original) PC version is easier to use (cough) than the recent Mac offering.

The PC version is idiosyncratic but very clever once you understand it, and a great tool for anyone like yourself – and myself! – to validate circuits. It gives a complete picture of working conditions, shows equalisation accuracy of David Lord's pre-amp and also calculates input noise values.

I put David's circuits into this programme, to make them available for print and also to check their effectiveness without having to build anything.

Even better still, LTSpice circuit models exist for a wide range of valve amplifiers – and both transformer and valve Spice models exist in plenty. Heaven! **NK**

# Blue For You

**Jon Myles checks out two new portable Bluetooth loudspeakers – including one you can take into the shower!**

If there's one area of the audio market that seems to show no sense of slowing down it's the portable Bluetooth 'speaker sector. It seems no month can go by without new products appearing in the shops – from the cheap and cheerful to the more up-market varieties.

It's not hard to see why. While undoubtedly not the ultimate in high-fidelity replay, current Bluetooth is now a world away from the often flaky, glitch-ridden transmission standard that bedevilled users on its initial launch. And what's to dislike

about the ability to stream music from a mobile 'phone, tablet or computer to a loudspeaker you can move from room to room or even take into the garden and down the park?

As both cassette tapes and CD showed, convenience can be just as important as absolute sound quality when it comes to music consumption.

So no wonder we are seeing an increasing number of models on the market – including the two new ones here; Cowon's SP2 and the rather innovative Swiss-designed Neo2Go

which boasts the ability to be used in the shower (seriously – it's waterproof).

## **COWON SP2**

Korean company Cowon made its name producing portable digital media players and headphones – but the SP2 is its first foray into the world of portable Bluetooth 'speakers.

Priced at just £69 it's a classy-looking product with a rounded white plastic shell curving around the black 'speaker grille at the front. A circular rubberised dial on the top



of the unit houses the volume and playback controls, while inside two front-firing drivers are powered by a 2 Watts per channel amplifier. Sturdy rubber feet on the base means the unit sits securely on whatever surface it's placed on, without bouncing around.

On the back are the on/off switch and a micro-USB port for charging (with a claimed 10-hour battery life) while other features such as NFC pairing, aptX compatibility and hands-free calling are also present and correct.

### SOUND QUALITY

Used at a moderate volume and the Cowon doesn't perform badly. It's smooth through the midband and treble and manages to push music beyond and above the limits of its casing.

Barb Jung's vocals on 'Stockport To Memphis' had a pleasingly atmospheric tone while the understated backing was crisp and clear; Simon Wallace's piano and Hammond organ being surprisingly well defined.

Push the sound level up, though, and the Cowon begins to show its limitations. There's precious little bass on offer which means dance or rock tends to lack any propulsive thrust or definition. Indeed the likes of Leftfield's 'Rhythm And Stealth' comes out sounding positively anaemic.

There was also a tendency for the cabinet to begin to vibrate along with the music once you go past around 70 per cent on the volume dial. Turn it down a bit and stick to gentler music and the Cowon can make a pleasant sound – but it's not likely to set the

world alight.

Spend a little more on something like the £100 Damsen Vulcan (see

review Hi-Fi World July 2015) and you'll get significantly superior sound.

### CONCLUSION

Ultimately the Cowon SP2 is let down by a poor bass performance and lack of absolute volume. Used within its limitations it's not bad but there are better units out there for not very much more money.

### NEO2GO

By their very nature portable Bluetooth 'speakers' are designed to be taken virtually anywhere (the clue's in the name) – but there's not many you'd happily, or safely, use in the shower.

Which is where the Neo2Go comes in. As well as being waterproof it also comes with a suction cup for attaching to tiles, walls or whatever surface takes your fancy.

Available in a variety of colours and costing £69.99, the Neo is a circular design measuring 100mm

x 100mm x 32mm (HxWxD) and weighing in at 0.13kg. The rubberised surround incorporates the power, pairing and volume controls, as well as a micro-USB charging port and a receive button to take in-coming telephone calls.

Inside is a single active 'speaker driver surrounded by a passive radiator to augment the overall frequency response. Despite being relatively lightweight it's actually a reassuringly sturdy unit while the suction cap gave a firm grip on even the smoothest of surfaces.

### SOUND QUALITY

Not only is the Neo2Go immensely practical, it's also immensely enjoyable. There's surprising volume on offer considering the size – and the overall presentation is nicely balanced.

Playing the Leftfield tracks again and there was more bass on offer than via the Cowon. No, it's not significantly deep but it was well-rounded and bouncy. The mid-band and treble also had plenty of sparkle, meaning there's a good sense of detail.

Interestingly, the Neo actually performs better when attached by its suction cup to a wall instead of being just placed on a table. Used against tiles in a shower the sound had more depth and vibrancy and was easily loud enough to overcome the noise of running water.

Battery life was a useful 12 hours, meaning the Neo can easily go for a couple of days before charging.

### CONCLUSION

The Neo2Go is a fun product with a good sound for the price. It's waterproof case is no mere gimmick and adds a decidedly useful feature. For listening to music wherever you fancy – even in the shower – it's hard to beat.



### COWON SP2 £69



**GOOD - worth auditioning**

#### VERDICT

A decent portable Bluetooth 'speaker, hampered by a poor bass performance and lack of outright volume.

#### FOR

- nice design
- clean midband and treble

#### AGAINST

- weak bass
- low volume

### NEO2GO £69.99



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

#### VERDICT

An extremely good-sounding little Bluetooth 'speaker that also comes with the advantage of being waterproof. Definitely recommended.

#### FOR

- waterproof
- sturdy build
- nice sound

#### AGAINST

- nothing at the price

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# New tune



**Martin Pipe tunes into Mitchell and Johnson's DR-201V VHF/DAB tuner.**

**A** couple of years ago I had the honour of reviewing the DR-201V from Sansui – a brand that meant a lot to many '70s and '80s audiophiles. The DR-201V was a combined DAB/DAB+ and FM tuner based around high-tech 'software-defined radio' (SDR) techniques. Interesting, yes, but it also suffered from sound-quality issues on the FM front. But what's this? Another DR-201V tuner. And this one does DAB/DAB+ and FM too!

It even looks suspiciously like the Sansui model – although this one is from Mitchell and Johnson, a relative newcomer to the audio world. My investigations led to a phone call from Paul Mitchell – one half of the firm's founding partnership. He told me that they were behind the attempted relaunch of Sansui

but the brand's owners wanted an unsustainable amount of money for continued use of the name. So Sansui was out, and M+J was in...

The firm's 'sound thinking' also extends to an integrated amplifier/DAC, CD player and streamer. Among the planned additions to the range are a preamp and power amp and an innovative pair of headphones.

They may look the same, but there are key differences between the Sansui DR-201V and the new M+J. Yes, the finish is slightly better and you get a solid handset that will also operate other M+J products. But the most noticeable change is the inclusion of a Bluetooth audio facility which will enable you to wirelessly-stream music from your smart device. The M+J DR-201V is based around SDR but instead of the Sansui's Gyro module you'll find the newer Frontier

Silicon Tuscany FS2230-TB.

This device, a few square-inches of circuit-board, essentially IS the DR-201V! Amongst other things it contains the 2.4GHz Bluetooth receiver, the Band 2/3 VHF receiver, the complex slice of DSP that magically-transforms radio frequencies into FM and DAB digital audio, and even the DACs that follow this process. Its common VHF aerial input is brought out to an 'F' connector on the rear panel. The FS2230-TB illustrates just how far radio technology has evolved in recent years.

M+J's contributions, casing apart, are the (linear) power supplies, a Cirrus chip that converts the I2S digital audio data from the FS2230-TB into S/PDIF format (optical and coaxial sockets lurk, alongside analogue audio outputs, on the rear panel) and the inevitable microcontroller. The latter looks after the 2x16 character fluorescent display and user controls (three routes here – front-panel basics-only, the handset or rear-panel RS232). But most of the work is done by the module; indeed, there's a lot of empty space inside this tuner.

On the front panel a Mode

**Both optical and coaxial digital audio output are provided as an alternative to analogue. A single aerial socket serves both VHF/FM and DAB.**



button toggles between Bluetooth, VHF/FM and DAB while a prominent knob covers analogue tuning and the selection of DAB stations.

As an alternative to the tuning knob, stations can be found with a handset-invoked 'auto-scan' function. A FM-only menu function forces this to stop only when it finds a 'strong' signal. Presets provide quick access to 'favourite' stations; the DAB and FM modes each get ten. You can switch from stereo to mono to kill the hiss from weaker FM stations, but as before no control over IF bandwidth is offered.

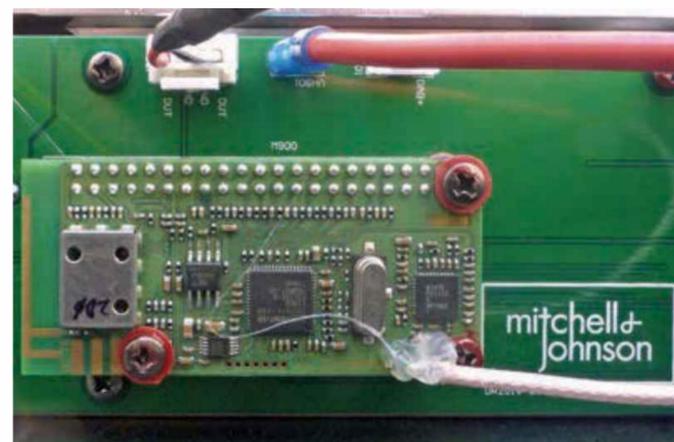
An 'info' button calls up any available information from RDS FM

is to blame. Using the optical feed instead eliminated the problem.

The good news is that in sound quality terms, the DR-201V outshines the Sansui – certainly in terms of its FM section. It's noticeably smoother, with a tonal response of greater balance. DAB also fared well. Switching between Radio 3 FM and its 192kbps DAB simulcast during those marvellous evening concerts revealed that the latter is capable of a distinctly-wider soundstage. I also noted an increase in spaciousness and finesse, although 'burbling' artifacts were occasionally noticeable.

It may seem an odd thing to say, but FM sounds more natural with an external DAC! That's because the FM demodulation process is carried out digitally, and you can feed the stream to a DAC that's of better quality than the rather cheap ones fitted to the FS2230-TB module. Do so – even with the modest DAC built into the AI-301DA – and you'll hear significantly more musical detail and insight.

An external DAC also benefits DAB listening, but the sonic limitations of low-bitrate (128kbps

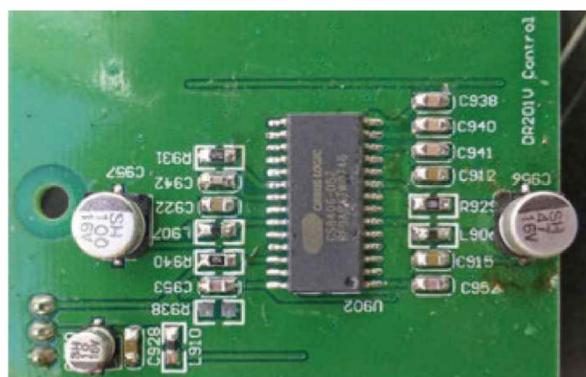


**This circuit board is the clever 'software-defined radio' (SDR) module responsible for most of the DR-201V's functionality.**

mp2) broadcasts are laid bare. The Bluetooth feature is easy to use and nice to have, but musicality is sacrificed for such convenience.

### CONCLUSION

Although somewhat more expensive than its Sansui predecessor, you do get remote control, a better FM sound – provided you have a decent aerial – and a handy Bluetooth function. The future-proof DAB function is, as before, excellent – especially with an external DAC. Very good value then.



**This Cirrus CS8406 chip is needed to convert the SDR module's digital audio data into standard S/PDIF signals.**

broadcasts or DAB stations. The usual DAB 'extras' (e.g., signal, error and multiplex info) are of course available. Meanwhile, Bluetooth transport controls enable you to select next/previous tracks and pause playback. Note that Bluetooth and FM radio are – like DAB – available on the digital outputs, in 48kHz/16 bit PCM format.

### SOUND QUALITY

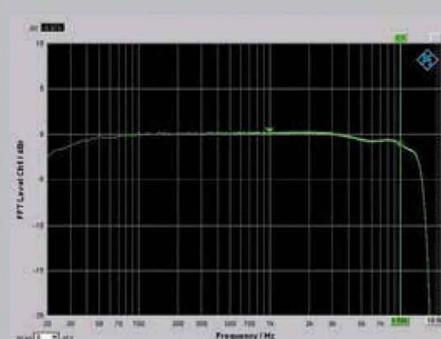
Before we go any further, I should make one thing clear. If you want FM in clean stereo, you'll need a decent rooftop aerial. Don't rely on the piece of wire supplied with the DR-201V unless you can comfortably see the transmitter mast! This tuner seems to be rather insensitive compared to older and (largely) more traditional designs from the pre-DAB era. With stations like BBC Radio 3, 'mush' could be more evident without a proper aerial.

I also noted that when I plugged a piece of suitable equipment (like an M-Audio Microtrack 24/96 or Benchmark DAC2 HGC DAC) into the coaxial digital output socket, DAB-reception dropouts became frequent and annoying. Some kind of 'interaction', maybe? One hopes that a fault with the early review sample

## MEASURED PERFORMANCE

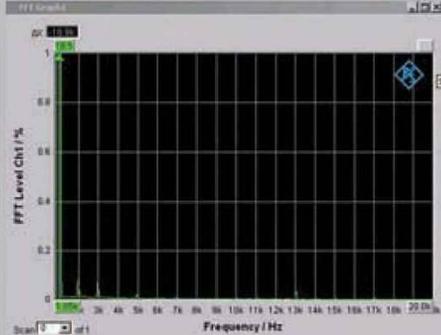
The Mitchell & Johnson DR-201V VHF tuner is a Software Defined Radio where the aerial signal is converted to digital and radio stations selected in the digital domain. SDR radio gets ever better – and this one is interesting. Basic audio performance was surprisingly good in places, with distortion extremely low at 0.1% from full modulation (i.e. max volume) down to zero. Frequency response was flat too, our analysis

### FREQUENCY RESPONSE



### DISTORTION

THD all	Level RMS	Frequency
0.1289 %	405.51 mV	0.9921 kHz
OFF	OFF	OFF



shows, rolling down gently above 10kHz, but it still reached 15kHz - good for VHF/FM. Pilot tone rejection at 19kHz was complete, measuring -108dB.

The only slight let down was a best noise performance of -60dB on stereo and to achieve this the DR-201V needed no less than 4mV from the aerial – a very strong signal by any standard. Most tuners need no more than 1mV.

The DR-201V is very insensitive then, that is unless it is switched to mono, when suddenly it works well down to 38µV. So this tuner is likely to be hissy on stereo but relatively quiet if used in mono, and 'forced mono' is an option – likely fitted for good reason.

Output was on the low side at 400mV but this is enough to drive all amplifiers to full output all the same, albeit with volume turned up.

The DR-201V provides a very good performance in stereo providing it gets a very strong aerial signal, otherwise it must be used in mono to avoid hiss. **NK**

Frequency response	32Hz-10kHz
Stereo separation	53dB
Distortion (50% mod.)	0.1%
Hiss (CCIR)	-60dB
Signal for minimum hiss	4mV
Sensitivity	
mono	38µV
stereo	700µV

## MITCHELL AND JOHNSON DR-201V £300



**EXCELLENT - extremely capable**

### VERDICT

FM has an uncertain future, and Bluetooth is a sonic compromise. But the DR-201V admirably fulfils its key role of DAB tuner

### FOR

- very easy to use and well-made
- fine DAB and fair FM performances
- digital output (48kHz/16-bit) available from FM and
- bluetooth as well as DAB

### AGAINST

- FM section insensitive in stereo mode
- lacklustre Bluetooth sonics
- user interface suffers from 'lag'

Mitchell and Johnson  
+44 (0)845 643 5064  
www.mitchellandjohnson.com

# WORLD STANDARDS

Your guide to the best products we've heard that are currently on sale in the UK...

## TURNTABLES

**FUNK FIRM LITTLE SUPERDECK** 2013 £110  
Funk's entry-level turntable offers excellent value. Superb speed stability and an appealing sonic performance make it a true bargain.



**AVID INGENUUM** 2013 £800  
Great bass response and upper midrange detail allied to clarity and a fleet-footed delivery makes this a must-hear at its price-point.

**INSPIRE MONARCH** 2012 £3,970  
A startlingly musical performer with blistering speed and dynamics allied with smoothness, sophistication and purity of tone..



**PRO-JECT 2 XPERIENCE BASIC+** 2012 £600  
Seriously confident, assured and capable vinyl spinner. More than capable of getting the best out of your record collection.

**ROKSAN RADIUS 5.2** 2011 £1,450  
Although getting expensive, the latest Radius is a highly grown up package with a flowing yet engaging nature; a fine package.

**ACOUSTIC SIGNATURE STORM** 2011 £3,612  
An excellent high end design with a smooth, solid, open and lyrical sound and razor sharp styling and build.

**FLETCHER AUDIO OMEGA .5** 2010 £3,699  
Charming high end turntable that's a fitting testament to the late Tom Fletcher.

**PALMER 3** 2010 £3,750  
Eccentric hand built high end turntable with a pleasingly smooth, sweet and lucid sound.

**E.A.T. FORTE S EVO 12** 2010 £4,750  
Excellent premium price turntable with power, precision and passion aplenty, but relaxed and easy going by nature too. Great value package with the Pro-ject Evo 12" arm option.

**DR FEICKERT WOODPECKER** 2010 £3,445  
Elegant deck with great low frequency solidity, coherent soundstaging and a precise midband.

**AVID DIVA II SP** 2010 £2,599  
New twin belt drive and power supply make this a more commanding performer although there's a substantial price hike. Speed, dynamics and detail are hard to beat anywhere near the price.

**NOTTINGHAM ANALOGUE HYPERSPACE** 2010 £2,390  
Deliciously spacious, lyrical and beguiling sounding turntable, but lacks ultimate grip.



**LINN LP12SE** 2010 £3,600  
Surely hi-fi's most iconic turntable, the legendary Sondek goes from strength to strength. New Keel subchassis and Radical DC motor add precision and grip to one of the world's most musical disc spinners. Expensive, though.

**INSPIRE ECLIPSE SEV2 12** 2010 £2,349  
Finely engineered, smooth and detailed sounding deck offering valuable twelve inch tonearm compatibility.

**REGA RP1** 2010 £225  
Pleasing sound, fine build and ease of set-up and use make this a great first 'real' hi-fi turntable.

**BRINKMANN BARDO** 2010 £5,845  
Unique high end direct drive turntable with amazing grip and focus, albeit not the most romantic of natures.

## TONEARMS

**ORIGIN LIVE ENCOUNTER MK3C** 2012 £1,745  
Origin Live combines carbon fibre and ebony to marvellous effect in its new 12-inch arm. Creamy and rich in presentation, the Encounter delved deep into the mix for a satisfying listen.



**REGA RB202** 2012 £198  
Replacement for the venerable and much-loved RB251. Three-point mount design serves up a taut and detailed sound.

**HADCOCK GH-242 EXPORT** 2010 £793  
Consummately musical, lyrical sounding tonearm, but needs the right turntable. Excellent value.

**FUNK FIRM FXR II** 2010 £1,175  
Clever reworking of the ubiquitous Rega platform, the FXR II gives a wonderfully musical, almost unipivot like performance.

**ORIGIN LIVE ONYX** 2011 £450  
Easy, smooth, creamy nature that reminds you why you're listening to vinyl in the first place. Essential audition at the price.

**SME 312S** 2010 £1,750  
Twelve inch magnesium alloy armtube plus SME V bearings makes an impressive transcription tool with an insightful yet composed sound. Superlative build completes the age.



**ORIGIN LIVE SILVER 3C** 2010 £599  
Excellent mid-price tonearm with a clean and open yet lyrical sound.

**AUDIO TECHNICA AT-F3/III** 2010 £189  
Great value entry level moving coil with detail and grip you just can't get from similarly priced moving magnets.

## PHONOSTAGES

**PRO-JECT TUBE BOX DS** 2013 £425  
Compact MM and MC phonostrage with valve output circuit and a big sound.



**IFI IPHONO** 2013 £350  
Multi EQ phono stage from British manufacturer that punches well above its weight. Substantial bass and open midband.

**TIMESTEP T-01MC** 2013 £995  
New, minimalist phono stage that sonically punches well above its weight.

**LEEMA ACOUSTICS ELEMENTS**

**ULTRA** 2012 £1,199  
Smooth and detailed sound with the ability to accommodate most modern cartridges. Exceptional value for money.

**WHEST AUDIO PS.30SE** 2011 £4,500  
Amazing incision and grip, the Whest manages to eke out information from low-level phono signals to an almost microscopic level.

**CARTRIDGES**

**REGA CARBON** 2013 £35  
Budget price for a competent and musically coherent-sounding cartridge with a fairly unflappable nature.

**ORTOFON 2M 78** 2013 £80  
Well thought-out mono, standard groove version of respected 2M series of cartridges. Detailed sound with low surface noise.



**BENZ MICRO ACE SL** 2012 £595  
Smooth, lucid and full-bodied, award-winning, hand-made cartridge from Switzerland.

**VAN DEN HUL DDT-II SPECIAL** 2011 £995  
Long-established cartridge from Holland with an open and dynamic sound.

**BENZ MICRO WOOD SL** 2010 £945  
Highly finished Swiss moving coil that plays music with riflebolt precision.



**ORTOFON CADENZA BRONZE** 2010 £1,350  
Smooth and engaging high end MC with a slightly warmer and more relaxed presentation than its superb bigger brother.

**ORTOFON CADENZA BLACK** 2010 £1,650  
Ultra incisive, transparent and dimensional moving coil with grip and punch aplenty.

**ORTOFON CADENZA BLUE** 2009 £1,000  
Musical, out of the box sound, allied to real finesse, makes this a great do-it-all high end moving coil.

**PREAMPLIFIERS**

**MING DA MD7-SE** 2012 £1,520  
A valve preamplifier with an open, effortless sound and a big soundstage. It has plenty of gain so will accept any source and drive any power amp. A real beauty.



**ICON AUDIO LA-4** 2011 £800  
Uses early 6SN7 triodes for liquid sound. Has plenty of gain and a remote control into the bargain.

**DPA CA-1** 2010 £2,650  
Excellent solid-state preamp with a meticulously detailed and propulsive sound, but a deep velvety tonality.

**MF AUDIO CLASSIC SILVER** 2010 £4,500  
One of the best preamplifiers we've heard any price, this transformer-coupled marvel does very little wrong. It's powerful, clean and open yet delicate. Its sound is unmatched at or near the price.

**INTEGRATED AMPLIFIERS**

**ICON AUDIO STEREO MKIIIM** 2013 £1,500  
Excellent starter tube integrated with plenty of detail and an expansive soundstage. Revised 2013 model features easy bias meter for even easier set-up.



**ARIAND PRO845SE** 2013 £1499  
Pure single-ended valve magic. Low-powered but immediately gorgeous, easy-going yet forcefully dynamic at the same time. At twice the price it would still warrant the entrance fee.



**CAMBRIDGE AUDIO AZUR 651A** 2012 £450  
Dual-mono construction and meaty toroidal power supply combine to produce a rich, mature sound that produces sonics far beyond its price point.

**NAIM NAIT 5SI** 2013 £925  
Naim's fabled entry-level integrated amplifier is updated to si status. Retains Naim's superb musicality with an extended bandwidth and smoothness.

**PRIMALUNA PROLOGUE** 2013 £2,349  
Fabulous pure, organic, liquid sound from this 40 Watts per channel valve amplifier. Slightly light bass is the only drawback.

**CANOR TP-134** 2013 £2,495  
Great build quality sonics makes for hassle-free, sophisticated valve amplification. One of the great bargains in audio.



**NUFORCE IA-18** 2013 £2,899  
Class D amp from undoubted experts in the field with bags of detail, clean sound and fantastic imaging.

**CREEK EVOLUTION 50A** 2013 £750  
Flexible, friendly design marked by transparency and dynamism. Best new value-for-money standard.

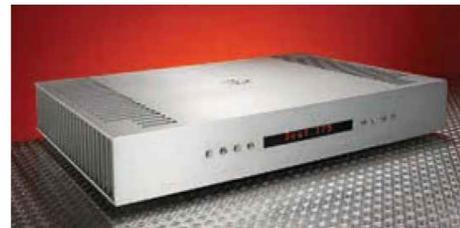
**BURMESTER 032** 2012 £11,500  
Undeniably expensive - but if you treasure a large yet subtle presentation with plenty of air and space around the performers then the Burmester will provide. Also built to last a lifetime.

**ICON AUDIO LA-4 MKIII** 2012 £1,100  
Vintage 6SN7 valves provide liquid sound with plenty of gain. Comes with remote control for added convenience.

**EXPOSURE 1010** 2012 £425  
Entry-level integrated from Exposure has excellent upper mid-performance with an almost valve-like sound.

**CAMBRIDGE AUDIO A851 A** 2012 £1,199  
Feature-packed amplifier that turns in a mightily accomplished performance offering power allied to superb levels of finesse and detail.

**DENSEN B-175** 2012 £5,500  
Stylish, minimalist-designed amplifier which offers a combination of low frequency power and higher frequency finesse.



**VTL IT-85** 2012 £5,100  
Valve-encrusted integrated with a surprisingly strong bass kick and a sense of passion and emotion that drags you into the music.

**CYRUS 8A** 2011 £1,250  
Trademark shoebox-sized Cyrus integrated now offering 70Watts per channel. Majors on insight and clarity without sacrificing an ounce of musicality.

**QUAD II CLASSIC** 2010 £4,500  
Beautiful retro styled integrated amplifier with a subtle, supple sound - although needs matching to speakers that are easy loads.

**SIM AUDIO MOON 600I** 2010 £5,750  
Sturdy build, useful facilities and a wonderfully relaxed, seamless and even-handed sound will win this many friends.

**MUSICAL FIDELITY AMS35I** 2010 £5,999  
One of the best high end integrations we've come across, this combines hear-through transparency with musical get-up-and-go.

**DPA CA-1** 2010 £2,650  
Stylish, minimalist-designed amplifier offers a combination of low frequency power and higher frequency finesse.

**DARTZEEL CTH-8550** 2010 £16,500  
Charismatic and quirky high-end solid-state integrated amplifier with superb sound and a charming visage.

**POWER AMPLIFIERS**

**AUDIO RESEARCH VS175** 2013 £7,498  
Powerful, fast valve sound that makes everything else look weak at times. Needs careful matching but well worth the effort.

**ICON AUDIO MB845 MKIIM** 2013 £5,999  
Offering 120Watts from big 845 valves the Icon Audio offers power right down to low frequencies providing massive dynamics and bass swing yet always remaining easy on the ear.

**QUAD ELITE QMP MONOBLOCKS** 2013 £1,195 (EACH)

The proverbial iron fist in a velvet glove. Plenty of power but delivered with an assured and confident nature. Smooth on top and easy on the ear but can rock out when needed.



**TELLURIUM Q IRIDIUM** 2012 £4,800  
Single-ended Class A solid-state with a beautifully smooth, transparent and three-dimensional sound. All the refinement of a good valve designer but with a tighter and firmer lower end.



**QUAD PLATINUM STEREO** 2013 £2,495  
The best solid-state amplifier yet from Quad. Combines power, poise and control with superb authority.

**CHORD SPM 1200 MKII** 2013 £8,200  
Stunning looking amplifier with masses of grunt and a clean, detailed delivery that combines power with precision.

**MUSICAL FIDELITY AMS50** 2010 £7,000  
Mighty, assured high end full Class A integrated proffering icy clarity allied to real musicality. Lacks the lucidity of the best tube amps but redeems with power and punch.

**XTZ AP-100** 2010 £520  
Decently smooth yet usefully muscular, this power amp punches way beyond its price point in sonic and value terms.



**ICON AUDIO MB845 MKII** 2010 £5,500  
With 120W from big 845 valves right down to low frequencies, this power amplifier has massive dynamics and bass swing, yet is easy on the ear.

**AUDIO RESEARCH VS115** 2012 £5000  
Oodles of power with enormous punch. Rafael Todes found the Audio Reserach provided "shock and awe" while retaining incredible smoothness and texture.



## LOUDSPEAKER FLOORSTANDER

**QUADRAL PLATINUM M50** 2013 £3,150  
A superbly engineered loudspeaker combining low-end authority with midband detail and a clean spacious treble. Very few to touch it at the price.



**QUAD ESL-2812** 2013 £6,500  
The latest incarnation of Quad's classic design is better than ever. Brilliantly open and natural with a cohesive quality that puts conventional box loudspeakers in the shade.

**TANNOY PRECISION 6.4** 2013 £2,399  
Clear, forward sound with great projection. Need little power to go loud and have superb fit and finish into the bargain.



**SPENDOR SP100 R2** 2013 £6,495  
Retro looks but a sound that's hard to match. Spendor's 12" bass unit provides massive of low-end grunt with a room-filling sound.

**QUADRAL ORKAN VIII AKTIVS** 2013 £6,200  
Active loudspeaker with tight, powerful bass, perfect accuracy and detailed treble from a ribbon tweeter.

**CABASSE PACIFIC 3 SA** 2013 £11,500  
Superb speaker which resolves a vast amount of detail. Needs top quality source to be at its best.

**SONUS FABER VENERE 2.5** 2013 £1,198  
Great bass, superbly neutral midband and musical authority to spare make this a great introduction to the Italian maker's range.



**WHARFEDALE AIREDALE CLASSIC** 2013 £24,995  
Classic name and styling allied to 21st century cabinetry, crossover and drivers to produce a class-leading loudspeaker. Just make sure you have the room!

**AURUM WOTAN VIII** 2012 £2400  
A supremely well-balanced loudspeaker. Clean and detailed with great treble and a real sense of presence. A big, bold sound from a relatively compact cabinet.

**EPOS ELAN 35** 2012 £1,200  
Enthralling loudspeaker with prodigious bass power, detail and depth. A 93dB sensitivity means it works well with lower-powered valve amplifiers.



**USHER DANCER MINI-TWO** 2012 £3,500  
Fitted with Usher's own diamond-coated tweeter, the these loudspeakers glisten with detail while the massive cabinet delivers deep, powerful and controlled bass. Offer great sound from a price-tag half that of some rivals.



**MARTIN LOGAN ETHOS** 2012 £6,698  
Matches Martin Logan's XStat electrostatic to a powerful subwoofer to provide extended, powerful bass with dramatic sonic purity. Demands careful partnering to give of its best.

**PMC TWENTY.24** 2012 £3,100  
Stylish, detailed and thoroughly enjoyable, the PMCs have the deep bass of a transmission line with the heart of a mini-monitor.



**SPENDOR A3** 2012 £1,295

Fine little floorstander with a smooth, natural mid-band and even tonal balance. Ideal floorstander for smaller rooms.

**Q ACOUSTICS 2050i** 2012 £525

A large floorstander at a budget price. Offers high sensitivity and big sound and has very few flaws for the price.

**SPENDOR ST** 2010 £5,995

This classy sounding, superbly presented big floorstander will appeal to those seeking high end sonics with subtle looks.

**VIVID V1.5** 2010 £6,000

Breathtaking transparency, superlative coherence and dizzying speed make these one of the best standmounters ever made - providing you like their 'studio sound'.

**B&W 800D** 2011 £18,000

B&W's statement floorstanders are a veritable study in hi-tech design. They deliver depth and definition with breathtaking speed and authority. Expensive – but endlessly impressive.

**GERMAN PHYSIKS LIMITED 11** 2011 £7,800

Don't be fooled by the austere looks; this is a superbly enjoyable omnidirectional speaker with a wonderfully fast, expansive sound.

**ECLIPSE TD712Z/2** 2011 £5,100

Flawed genius, and wilfully so. These loudspeakers don't do everything well, but what they can do is profound and enthralling; rhythms, dynamics and soundstaging.

**MAD MY CLAPTON****GRAND MM** 2010 £3,599

Distinctive coaxial standmounters with wonderful soundstaging, bright lucid midband and true musical insight.

**REVOLVER CYGNIS GOLD** 2010 £15,000

Vast in scale with effortless dynamics and an easy, barrel chested bass, these big bangers are great for lowish power tube amps. Large room needed!

**TANNOY DEFINITION DC10T** 2010 £5,000

Wonderfully wide and open, super fast and amazingly engaging to listen to.

**LOUDSPEAKERS STANDMOUNT****MARTIN LOGAN MOTION 15** 2013 £800

Folded Motion tweeter gives a taste of Martinn Logan's electrostatic sound in a standmount. Very different from the standard mini-monitor and all the better for it.

**ACOUSTIC ENERGY 301** 2013 £425

Clean, crisp delivery with a good level of detail. Bass performance belies their size.

**WHARFEDALE DIAMOND 122** 2013 £280

Builds on the success of previous Diamond ranges with better bass, more detail and a much greater sense of scale.

**USHER DANCER MINI-X** 2013 £2,450

A highly-accomplished standmount speaker from Usher with outstanding sound and great build quality.

**KEF LS50** 2013 £800

Supremely musical mini-monitors which sound much bigger than they look.

**WHARFEDALE DENTON** 2012 £500

A beguiling mixture of retro looks with modern, high-technology drive units. The Denton has an easy-going, big-hearted sound with just a touch of warmth that should appeal to many listeners.

**PMC TWENTY.21** 2012 £1,375

Transmission line loaded standmount with a big box sound from a compact cabinet. Punches well above its weight.

**PARADIGM SHIFT A2** 2012 £658

Well-developed and hugely enjoyable active loudspeakers with distinctive looks and a big, bold sound.

**TRIANGLE COLOUR** 2011 £500

Taut, dynamic and immensely musical. Design, fit and finish comparable to models costing significantly more.

**MY AUDIO DESIGN MY 192** 2011 £1,350

Mini-monitors with an exceptionally smooth, spacious and refined sound that beguile and excite in equal measure.

**Q ACOUSTICS 2020i** 2010 £165

Great little bargain-priced standmounts with a friendly, fun yet surprisingly refined sound. Hard to better for a pair of starter loudspeakers.

**ACOUSTIC ENERGY NEO 1 V2** 2010 £225

Civilised sounding speaker with fast and tuneful bass.

**XTZ 99.25** 2010 £640

Disarmingly open and refined at the price, these standmounters bring unexpected civility, refinement and insight to the price point. Exceptional value for money.

**MY AUDIO DESIGN MYCLAPTON SE**

2010 £3,299

Powerful, dynamic, musical yet refined, this unconventional point-source design yields dramatic sonic benefits.

**ELAC BS243** 2010 £1,000

More transparent and spacious than they've a right to be at this price, these refined mid-price standmounters represent top value.

**ACOUSTIC ENERGY AE1 CLASSIC**

2006 £845

Brilliantly successful remake of an iconic design; not flawless, but surely one of the most musical loudspeakers ever made.

**HEADPHONE AMPLIFIERS****EPIPHANY EHP-02** 2012 £99

PP3 battery-powered portable gives great sound quality at an almost giveaway price. Happy with the output from an iPod or CD player, the little epiphany is a true bargain.

**GRACE M903** 2012 £1,980

A top-quality DAC and headphone amplifier in one. Shines a bright light on even the finest detail.

**ICON AUDIO HP8 MKII** 2012 £550

Offering a clean, open soundstage, the HP8 MKII valve-based headphone amplifier provides precision and detail over the entire sound spectrum.

**MUSIC FIRST PHONE BOX** 2012 £276

Brings a big stage, plenty of detail and rich, deep colours to the sonic spectrum.

**FIDELITY AUDIO HPA 100** 2011 £350

Great little headphone amplifier with a lively yet refined and open sound.

**CREEK OBH11** 2010 £150

Designed specifically for low to medium impedance (300ohm – 3000ohm) headphones the little Creek has a marvellously well-judged sound. Slightly lean in the bass but none the worse for it.

**GRAHAM SLEE NOVO** 2009 £255

Eminently-capable, dynamic headphone amplifier with a great sense of timing. Crisp, clear treble and warm midrange gives an involving sound.

## SYSTEMS

**LINN KIKO** 2013 £2500  
Great looks and good sound make the Linn Kiko one of the best all-round entertainment systems available today.

**PEACHTREE AUDIO IDECCO** 2012 £1000  
Excellent sounding iPod dock, impressive DAC and fine amplifier section make this an excellent one box style system.

**LINN AKURATE DSM** 2012 £16,250  
A technological tour-de-force of a system, largely due to the DSM preamplifier. The Akurate system has enormous ability plus a smooth sound.

## CD PLAYERS

**REGA APOLLO-R** 2013 £550  
Rega comes up with a cracking CD player again. Tremendous detail and an easy, unforced sound at all times. Few bells and whistles but made up for by its superb sonic ability.

**CAMBRIDGE AUDIO AZUR 651C** 2012 £450  
Mature, rich presentation from this budget CD player. Cracking audiophile entry point for any digital fan.

**CHORD RED REFERENCE** 2012 £15,000  
A unique and massive engineering exercise that could well be the best CD player available. Chord's Pulse Array DAC technology produces a musical experience like few others. This is a true reference player.



**SUGDEN A21SE** 2012 £2,480  
Class A amp with fantastic sound quality producing hard, sculpted images, deep detail and tight bass. Just don't expect disco-like sound levels!



**ESOTERIC K-03** 2012 £9495  
Superb high-end silver disc spinner that is beyond criticism. Devoid of its own character but has a flawless presentation.

**XTZ CD-100/11** 2012 £400  
Stunning CD player for the price that will give players costing three times as much a decent run for their money. Well-built, great sound and bags of features.

**CANOR CD2+** 2012 £3100  
Musically coherent and tuneful valve-driven CD player from Slovakia. Lovely liquid sound.



**DENSEN B-475** 2012 £5,950  
Ice-cool, luxury-designed two-box player with sublime sound quality. Could be the only CD player some people will ever need.

**EXPOSURE 101** 2012 £395  
Detailed player with fine sense of timing should be an automatic entry on any demo list at this price.

**ELECTROCOMPANET EMP-1/S** 2011 £4,650  
Epic in scale, lavish in tone and exuberant in its musicality - this is a memorable SACD spinner. Quirky in operation and modest in finish, though.

**AUDIOLAB 8200CDQ** 2011 £949  
Inspired CD player and DAC with price-performance ratio like no other. Capable of matching designs costing much more.

**ROKSAN KANDY K2** 2010 £900  
A charmingly musical performer at the price - this is a surprisingly sophisticated CD player for the money.

**MARANTZ SA-K1 PEARL** 2010 £2,500  
Finely-honed, affordable high-end silver disc spinner; this has a musical lucidity that's unexpected at this price.

## TUNERS

**CAMBRIDGE AUDIO AZUR 651T** 2010 £299  
Value-packed Am/FM/DAB and DAB+ ready tuner. Precise and detailed with excellent resolution of spoken word.

**CREEK DESTINY 2** 2010 £675  
Creek's tuner expertise shines through in the Destiny 2. This AM/FM receiver is wonderfully three-dimensional and smooth.



**MAGNUM DYNALAB MD-90T** 2010 £1,900  
Exceptionally able, but commensurately priced, audiophile tuner that cannot fail to charm.

## DACS

**TEAC UD-501** 2013 £699  
Feature-packed DAC with benefit of DSD playback. Superb sound means little to touch it at the price.



**CHORD QUTE HD** 2013 £990  
Superb build quality and exceptional sound from this compact unit. Boasts the ability to handle DSD direct via USB and has an exceptional soundstage. One of the best DACs you can buy.

**AUDIOLAB Q-DAC** 2013 £400  
Stripped-down version of Audiolab's M-DAC loses some features but retains much of the sound making it a veritable bargain.

**AUDIOLAB M-DAC** 2013 £600  
Excellent sound, a comprehensive feature count and impressive flexibility make the Audiolab a stand-out product at its price. A range of filter options is the icing on the cake.



**ANTELOPE ZODIAC GOLD/VOLTIKUS** 2013 £3,095  
DAC/preamp/powersupply combination majors on detail but has a remarkable un-digital sound. One of the best at its price.



**CHORD QUTE HD** 2013 £990  
Superb looks and seriously good sound make this little DAC a winner. Both 384kHz and DSD capable meaning it is also future-proofed.

**EXPOSURE 2010 S2** 2013 £810  
Superb performance from the USB input and various filter options make this a truly flexible DAC with great sound.



**NAD M51** 2012 £1500  
A sweet-sounding treble coupled with complexity and tonal depth makes for a rounded and smooth performer. HDMI functionality adds to the NAD's all-round value.



**REGA DAC** 2012 £498  
Lovely sound characterised by dimensionality and strong pace. Among the best at its price and destined to become a digital classic.

**DCS DEBUSSY** 2011 £8000  
DCS's bespoke 'Ring DAC' circuit gives a beautifully-fluid, almost analogue sound that encourages long listening sessions. Not cheap but worth every penny.

**METRUM OCTAVE** 2011 £729  
Unique two-box digital-to-analogue convertor with great sound at a great price. Cuts upper treble, though.



**NAIM DAC** 2010 £1,995  
Superb high-end digital convertor with a probing, punchy and farnesically-detailed sound.

## NETWORK PLAYERS

**CHORD DSX100** 2013 £7500  
Chord's proprietary DAC circuit shines in their top-of-the-range streamer. Hear-through clarity with a sound rich in detail, dynamics and soundstage.

**NAIM NAC-N172 XS** 2013 £1650

A pre-amp/DAC/streamer package provides a taught, rock-solid presentation with a tonally rich midband and a superior sense of rhythm.

**SANSUI WLD+2012** 2012 £350

Offering great value for money with a variety of input options the Sansui was a deserved Hi-Fi World Award-winner in 2012. Few can match its ability at the price.

**CAMBRIDGE AUDIO NP30** 2012 £399

Budget offering from Cambridge offers a great introduction to network streaming.

**CYRUS STREAM X** 2012 £1400

Gorgeous sound quality even from compressed digital music. New control app makes everyday operation a doddle.

**MUSICAL FIDELITY CLIC** 2012 £1250

Smooth and easy on the ear but possessed of a big, bold sound that remains clean and airy at all times. Clear, colour display makes navigation a breeze.

**NAIM NDX** 2011 £2995

Clean, incisive and very detailed sound with Naim's traditional pace and timing make this one of the best network music players around.

**PRO-JECT STREAM BOX RS** 2013 £1095

Unusual valve-based streamer/preamp with variety of inputs and a lovely liquid sound. Not the most detailed but compensates with sheer musical verve.

**NAIM ND5XS** 2012 £2175

Great sound quality with traditional Naim heft. A wonderful DAC with full 24/192 handling. Only the display could be better.

**QUAD PLATINUM DMP** 2013 £2495

Comined CD/network player has all the usual Quad elements but with added zest and detail that brings life to everything you care to play.

**DIGITAL SOURCES****ASTELL&KERN AK120** 2013 £1,140

It's small - but packs a punch. Plays digital files up to 24/192, packs 32gb of memory (expandable up to 96gb via MicroSD cards) and has massive dynamic range with negligible jitter. Good enough to replace a CD in most systems.

**ASTELL&KERN AK100** 2013 £569

Portable high-definition digital player with fabulous sound quality.

**NAIM HDX** 2009 £4,405

Interesting one-box network-enabled hard-disk music system that gives superb sonics together with impressive ease of use.

**PORTABLE SPEAKERS****BAYAN SOUNDBOOK** 2013 £149.99

Superb design and great sound make for one of the best portable Bluetooth speaker/radios on the market. Not the cheapest - but worth every penny.

**IRIVER IBA-50** 2013 £69

Big, warm sound with plenty of volume and clean at high levels. Muscular sound compared to many rivals.

**CABLES****MAINS CABLES R US NO.27** 2013 £95

Offers a sprightly pace with a precise nature. Fast performance enhance frequencies and beautifully etched detail.

**BLACK RHODIUM LIBRA** 2013 £100

Opens up the sound stage and offers a significant upgrade to a basic power lead.

**TELLURIUM Q BLUE POWER** 2012 £399

This power cable is not cheap but is worth every penny. Top quality, high resolution and fine value.

**BLACK RHODIUM TWIST** 2012 £71/3M

Twisted to fight off radio frequency, the Black Rhodium speaker cable is easy on the ear with a fine sense of clarity and focus. A remarkable performer at the price.

**TELLURIUM Q BLACK** 2010 280/3M

A deep, dark, velvety performer that's nevertheless highly musical, it represents excellent value as mid-price cables go.

**HEADPHONES****PHILIPS FIDELIO X1** 2013 £270

Aimed firmly at the upper end of the market, these are super-accurate 'phones that can shame many a loudspeaker. Hear them before anything else.

**B&W P3** 2012 £170

Beautifully presented headphones from the loudspeaker specialists. Feed them a good quality source signal and they reward with excellent sound.

**YAMAHA HPH-MT220** 2013 £150

Purposed for indoor monitoring yet light and comfortable enough to be used on the move. Excellent sound quality marred only by a slight warmth to vocals.

**ONKYO ES-HF300** 2013 £180

Detailed and fast sound with good bass and finely-etched treble. Have great presence without colouration.

**SENNHEISER HD700** 2012 £599

Tremendously fast with a strong, focussed, lower-frequency range and a firm bass punch.

**JAYS V-JAYS** 2010 £49

Wonderful little budget over-ear portable 'phones with a clean, smooth sound to beat the best of the rest at the price.



*traditional philosophy*  
*modern design*



## *Triode 25*

### *Class AB Push-Pull amplifier*

*The Triode 25 is a Class AB Push-Pull integrated amplifier that utilises four EL34 tubes in the output stage for increased power output from a valve design. It can operate in two modes (Triode and Pentode) and has a switchable feedback level to suit the sound performance of any system. The additional manual bias adjustment ensures long-life and optimum performance from the supplied valves.*

*On top of four Line level inputs, the USB Type-B input is DSD compatible and can also handle studio-quality 32-bit/384kHz audio files.*

*The Triode 25 offers a perfect combination of tradition and modernity.*

# Special Sonata

**Black Rhodium go to great lengths to reduce microphonic effects in their latest interconnects – and it pays sonic dividends, says Jon Myles**

**B**lack Rhodium's latest range of loudspeaker cables made a big impression on us when we put them under test earlier this year.

From the relatively entry-level Iris to the higher end Solo DCT++ they impressed with their clarity, overall musical flow and sense of detail.

But one of the stars was the mid-range Samba VS-I, which uses a proprietary vibration damping mechanism designed by company founder Graham Nalty. In essence it consists of metal clamps attached to each run of cable which are engineered to reduce microphonic effects in the wires that can lead to increased distortion.

Now Black Rhodium has extended that same technology to its interconnects in the shape of the Sonata VS-I. Coming in at £400 for a 0.5m RCA or balanced XLR stereo pair (other lengths are available – each additional 0.25m costing around £50), the Sonata VS-I is sturdily constructed yet flexible enough to bend around awkward edges.

At its centre are a pair of silver-plated copper cores for positive and negative signal flows, connected in opposite directions - which Black Rhodium maintains provides the lowest noise floor. They are twisted together to reduce surface area and so help reject RFI/EMI interference from radio, wi-fi and mobile 'phones – a growing problem in our modern environment.

Low dielectric loss PTFE insulation is employed for its low distortion properties, while a low microphony layer separates the internal insulation from the outer

screen in an attempt to dissipate any small voltages that may be generated by the cable flexing or vibrating as the charge passes through.

The Graham Nalty VS (Vibration Stabiliser) clamp is a heavy block of metal secured to each interconnect halfway along, by a small screw. Loosen the screw and you can reposition them along the cable – and it's worthwhile experimenting here. Between various amplifiers and CD players I found moving the stabiliser nearer to one component or the other produced subtle but audible differences in the sound.

## SOUND QUALITY

It's obvious some serious thinking has gone into the design of the Sonata VS-I – and it shows in the sound.

Like the Samba VS-I 'speaker cables which impressed me so much, the Sonata VS-I impresses with a clean, unsullied sound that majors on extended treble and a firm, controlled bass.

On John Coltrane's 'Interstellar Space' Rashied Ali's cymbal work shimmered, having real presence, while the improvised tenor saxophone lines were portrayed with no hint of grain.

All that work on minimising distortion within the cables seems to have worked as there was no sense of smear to the music. This translated into a remarkably well-defined soundstage which was both deep and wide, instruments rooted in their own space.

Moving to Led Zeppelin's 'Whole Lotta Love' in high-resolution (24/96) bass lines had forceful impact – the clean signal delivery seeming helped the amplifier dig just a little bit deeper. It was also extremely tuneful with none of the indistinct boom that some cheaper interconnects produce.

Not surprisingly, these traits meant the Sonata VS-I was also adept at unravelling the details in even the most dense of recordings. Playing The Jesus And Mary Chain's 'Psychocandy' it was easy to pick out the individual guitar parts amidst the sonic squall of feedback.

Not that just rock music benefited. There was also a greater air of atmosphere and detail on solo female vocals. Sinead O'Connor sounded deliciously delicate and heartfelt on 'Peggy Gordon', the Black Rhodium cables illuminating her exquisite phrasing.

## CONCLUSION

Some people may balk at paying £500 for an interconnect – but in practice the Black Rhodium Sonata VS-I's proved they were worth every penny. What's more they were effective in a variety of systems, managing to bring extra clarity and definition to relatively low-cost systems as well as high-end combinations. These are cables you should definitely audition.



**BLACK RHODIUM  
SONATA VS-1 £400  
(0.75M PAIR)**



**OUTSTANDING - amongst the best.**

### VERDICT

They make a big difference to any system, bringing greater clarity and definition, allied to taut bass.

### FOR

- clear treble  
- firm bass  
- reduced smear

### AGAINST

- not the cheapest

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# Munich 2015

**Munich's High-End show was once again heaven for hi-fi enthusiasts. Jon Myles and Mark Osborn report for Hi-Fi World.**

**T**he hi-fi world descended on Germany again for one of the highlights of the year – Munich's High-End Show. Once again the various halls of city's MOC exhibition centre were packed, over all four days of the show.

Chord unveiled a new flagship DAC named Dave featuring the latest iteration of Rob Watts' proprietary FPGA based digital processing. The cost will be £8000 when Dave goes on sale later this year.

Tannoy also previewed a prototype of its new supertweeter. In a nod to the company's illustrious

heritage the unusual shape is based around one of its legendary microphones.

But it wasn't just British companies making a splash. Swiss high-end electronics brand Soudation were making fabulous sounds with 'speakers from America's Magico, while there were scores of product launches from new companies based across Europe – including Italy, Poland and Denmark.

Also gratifying was the age range of visitors, with young and old alike descending on the MOC to enjoy the show. As always, it was impressive – and fun.



## FOCAL POINT

One of the highlights of the show was the joint launch by the combined Naim and Focal operation of a new range of amplifiers and loudspeakers. Why a highlight? Because they were sounding very good indeed.

Focal's Sopra No1 and No2 standmount and floorstanding 'speakers feature a new tweeter design allied to re-engineered bass and mid cones. The No1 uses a 16.5cm composite mid/bass driver, which has a newly developed mass-tuned surround said to improve the unit's top end performance. The tweeter is made of Beryllium and feeds into a small chamber which then vents through a damped horn which is said to add smoothness to the top-end.

The larger No2 is a true three-way which adds two dedicated bass drivers to the mix. Both products should be on sale in the UK shortly.

Naim has also trickled down some of the technology used in its £125,000 flagship Statement amplification system into its (rather more affordable) range of Classic power amplifiers. That means new transistors and the addition of Naim's Discrete Regulator (DR) technology to the NAP 200, 250, 300 and 500 units. The DR is said to give a smoother, more stable power delivery.

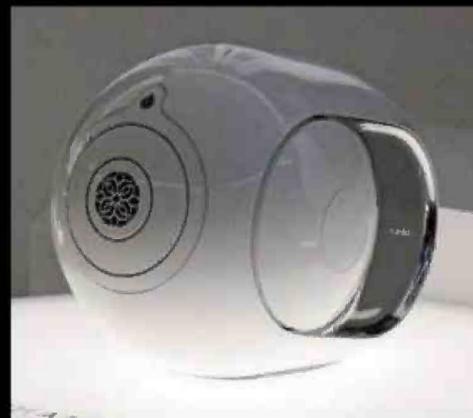
Importantly, existing users of the NAP 250, NAP 300 and NAP 500 power amplifiers will also be offered the option of upgrading to the latest specifications – although prices are yet to be confirmed.



*Tannoy gave a peek-preview of its new super tweeter - styled on a classic microphone.*

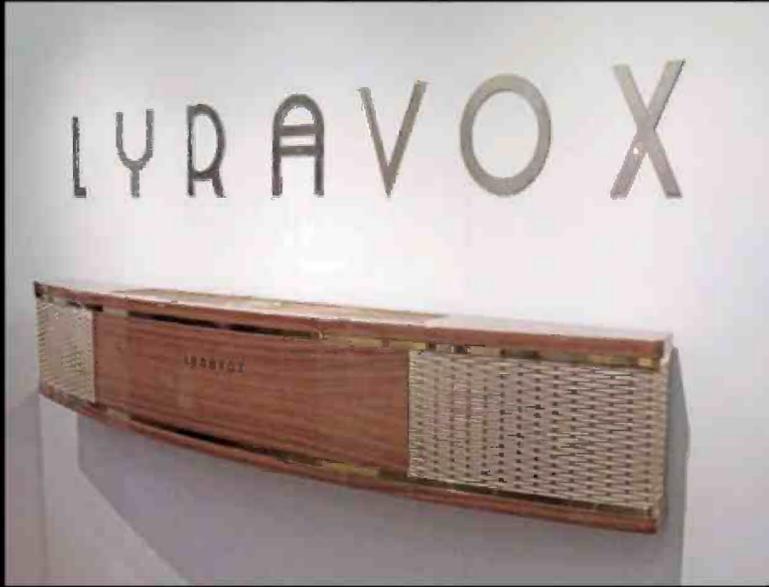


*Bespoke Audio Company was showing off its superb custom-built passive pre-amplifiers. Purchasers get the chance to specify looks and features. Watch out for our review soon.*



*Devialet's innovative Phantom loudspeaker was making a good sound.*

## FEATURE



*Retro-style but modern sound from Hamburg-based Lyravox with its handsome Stereomaster all-in-one unit featuring CD, streaming and 'speakers.*



*Britain's Creek Audio gave a sneak preview of its new CD player/DAC which will be hitting the shops later this year.*



*Pro-Ject's top-of-the-range, high-end Signature 12 turntable.*



*As well as the latest in hi-fi, in-car entertainment was also on the agenda – Burmester showcasing its system for Porsche.*



*Record cleaning specialist Klaudio had impressively complex equipment on show. They take LP seriously in Germany.*



*Even the street names had a musical theme - this one in tribute to a certain jazz great!*



*YBA from France was demonstrating its new media streamer, with wired and wireless connectivity.*



*New from Hong Kong manufacturer Dared was this valve phono stage. Priced at \$1500 it should hit the UK soon.*



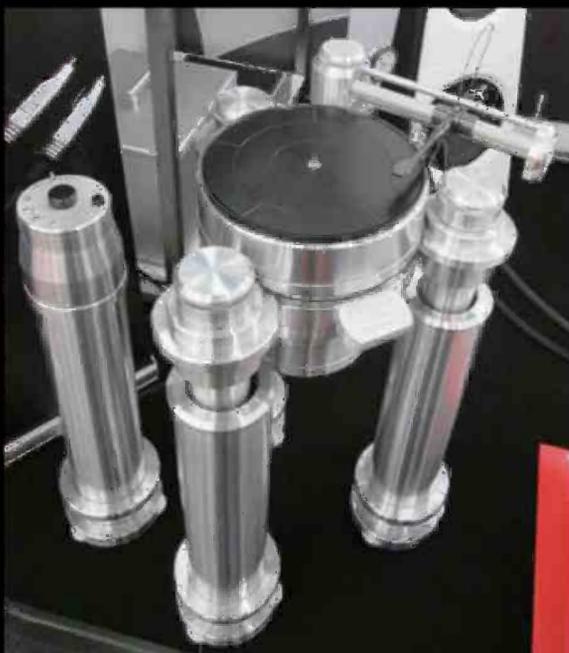
*Sounddeco from Poznan in Poland was exhibiting its awesome-looking Sigma 'speakers.*



*Looking like something from a sc-fi film – but sounding good – were these Nime 'speakers from Italy.*



*Italy's Diapason caused a stir with its beautifully-crafted Dynamis loudspeaker.*



*Vyger's massive turntable features high-pressure air bearings for the platter. Really!*



*Swiss-based high-end manufacturer Soultion produced one of the best sounds of the show*



*Over from Denmark was new audio company Ambitious Audio Design with its new standmount 'speaker. Expect a UK launch soon.*



*Leicester's Icon Audio had the humungous MB81 power amplifier on show - which helped heat the room!*



*ATC's special edition EL150 sounded as good as it looked.*



*Pride of place on the Oppo stand went to its new HA-1 headphone amplifier, DAC and pre-amp.*



*Graham Audio had the forthcoming BBC-licensed LS5/8 on display.*



*Dominating one area of the hall was this giant horn!*



Steven Rochlin of *Enjoythemusic.com* does a good Lou Reed impression as he checks out Mark Levinson's 400 Watt No 536 monaural power amplifier on the Harman Luxury Audio stand.



Vinyl fans were well catered for with a number of different stalls across the show – all well patronised.



Clean power – from Isotek's giant Evo 3 Genesis and Super Titan mains conditioners. Ideal for a really high-end system.



Harbeth's stand was particularly popular – the company showcasing its full range of loudspeakers to appreciative visitors.



Audio Solutions' top-of-the-range Vantage loudspeaker uses Egyptian papyrus for its mid-range drivers.



The innovative Fozgometer from Musical Surroundings. An electronic meter designed to set azimuth of any cartridge you choose. Watch out for an exclusive *Hi-Fi World* review in next month's issue.



Bluetooth with a difference. Once Audio Design's wireless horn-loaded Su loudspeaker features hybrid valve/solid state for 60 Watts of power, as well as line input and Bluetooth. Oh, and it looks absolutely gorgeous!

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WHAT HI-FI? SOUND AND VISION AWARDS 2013  
STEREO AMPLIFIER  
BEST OVERALL  
ROKSAN CASPIAN M2

WHAT HI-FI? SOUND AND VISION AWARDS 2013  
CD PLAYER  
BEST OVERALL  
ROKSAN CASPIAN M2

**ROKSAN • CASPIAN M2 • CD / AMPLIFIER**

The M2 amp boasts 85wpc and five line inputs while the matching CD features a 24-bit DAC plus dedicated power supplies for the outputs.



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Amplifier with DAC that supports iPod USB and Bluetooth audio streaming. Includes four analogue line-level inputs and a phono input. The RCD-12 CD player is an ideal partner.



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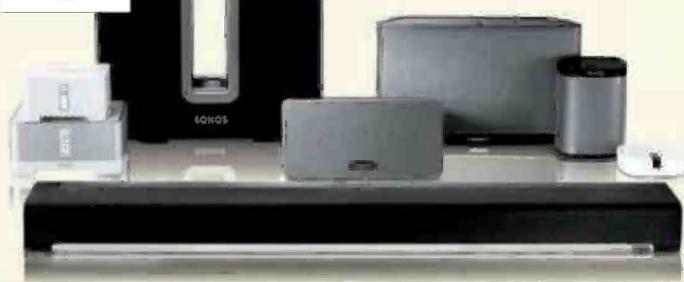
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GLOSS  
BLACK  
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# Smart Thinking

**Oppo's latest DAC and headphone amplifier can transform the sound of your smartphone, says Jon Myles.**

**O**ppo made its name producing top-quality multi-format silver disc players, including the BDP-105D Blu-ray player that has become one of our references.

Now the Chinese company is moving into the popular portable player field. The first evidence of this came with the launch of the £1000-plus PM-1 headphones which feature planar magnetic drivers. They were quickly followed by the more affordable but similarly-equipped PM-2s. Then came the HA-1 headphone amp/DAC to pair them with – a £1200 unit very much positioned for desktop or hi-fi rack use.

But what to do if you fancy a decent DAC/headphone amplifier to pair with your mobile device? Well, welcome the Oppo HA-2. Because make no mistake, this device is definitely positioned to get the best sound possible out of smartphones – whether they be of the Android or Apple variety.

As such it's beautifully engineered but has been designed to withstand the stresses and strains of being pushed and pulled out of pockets/handbags or whatever else, while offering easy functionality and a price of just £259.

More importantly, though, is that inside is the low power mobile version of ESS outstanding Sabre32 DAC; it handles PCM files up to 32bit/384kHz as well as DSD 128. That's rather impressive when you consider the size of the Oppo.

For the HA-2 measures just 68mm x 157mm x 12mm – putting it at around the size of an iPhone or Samsung – and weighs 176g. It has a rounded aluminium casing covered by a stitched-on leather covering.

On the right-hand side sit three buttons. One controls a battery check level and also gives access to the ability to charge mobile devices, while below





**The top of the unit houses the on-off/volume control as well as a line-in and out socket and the headphone jack. The stitched leather cover looks like a case - but is non-removable.**

there is a bass boost and a gain switch that can be set to high or low depending what headphones you are using.

The top houses a line-in/out socket as well as the 3.5mm headphone jack and the rotary volume control; the bottom has a USB-A socket for Apple devices and a USB micro-B for Android 'phones as well as a small slider switch to select input and output options.

Oppo supplies Lightning to USB-A, USB-A to micro-B and micro-B to micro-B cables inside the box. There's also the company's proprietary VOOC mains plug that will give a 75 per cent charge in just 30 minutes and a full refresh in 90. Alternatively, charging can be done via the traditional USB input.

Finally, you get a pair of heavy-duty elastic bands to lash the unit securely to your smartphone which,



**The supplied rapid-charging plug brings the battery level to 100 per cent within 90 minutes, a 75 per cent charge taking just 30.**

undoubtedly, gives you a good idea of exactly how it's expected to be used. As, too, does the fact that there's no digital optical input – which rules out using the Oppo with devices such as Astell&Kern's portable players.

**SOUND QUALITY**

Charged up, strapped to an iPhone6 Plus and playing a variety of high-resolution and standard Red Book tracks, there was no doubt the Oppo HA-2 is extremely impressive.

The soundstage is realistic, powerful and – most importantly – a step-up from the often weedy and less than stunning resolution of

an iPhone. Plugging in a pair of Final Audio Design's outstanding Heaven VIII earphones resolution gained extra authority.

Listening to Miles Davis's 'In A Silent Way' there was an expansiveness and depth that took me aback. Imaging was also spot-on, Davis's trumpet not just echoing in my ears, but seeming to surround and float around my head.

Switching from the Final Audio IEMs to a pair of AKG over-ears the Oppo retained its same sonic character, showing it has the power to drive whatever pair of cans you choose.

In fact, the Oppo manages to dig out more low-end definition and tunefulness than many more expensive headphone amplifier/DAC

combinations I've encountered.

But it doesn't do so at the expense of refinement. Instead it has the ability to bring extra quality to your mobile music collection.

I got evidence of this when playing The Police's 'Every Breath You Take', bass and vocals taking on a richness and tonality I'd not have expected from a device this size.

**CONCLUSION**

The Oppo has the ability to transform the sound of your mobile 'phone. You'll add to the size of the device and its weight, but if that doesn't matter then it is harder to better at the price.

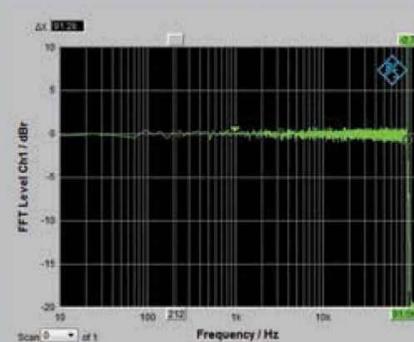
**Side controls consist of battery level button (which also allows the Oppo to be used for charging an iPhone), bass boost and a gain setting for different headphones. On the base are a slider switch for selecting input and output options plus the USB sockets.**



**MEASURED PERFORMANCE**

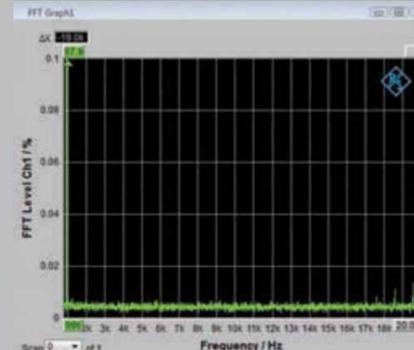
Frequency response of the Oppo's headphone output reached 91kHz with a high resolution 192kHz sample rate signal from the USB input, so it exploits high sample rate fully in terms of

**FREQUENCY RESPONSE**



**DISTORTION**

THD at 0dB	Level 99dB	Frequency
0.0380 %	1.9414 mV	997.00 Hz
OFF	OFF	OFF



bandwidth. Maximum acceptable sample rate is flagged as 384kHz on a Mac, no less.

Distortion at -60dB with 24bit was reasonably low at 0.09% and noise low too. As a result EIAJ Dynamic Range measured a creditable 111dB – a respectable figure for a portable, if not up to mains powered devices.

Switched to low output (L) maximum output was 840mV; switched to high (H) this jumped to a very high 2.7V – enough to drive even the most insensitive phones very loud.

The HA-2 measured well in all areas, being capable of very wide bandwidth a good dynamic range with high resolution 24/192 digital. **NK**

Frequency response (-1dB)	4Hz-91kHz
24/192	24bit
Distortion	0.0006%
0dB	0.09%
-60dB	92dB
Separation (1kHz)	-110dB
Noise (IEC A)	111dB
Dynamic range	0.8/2.7V
Output	

**OPPO HA-2 £259**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

**VERDICT**

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**FOR**

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- price

**AGAINST**

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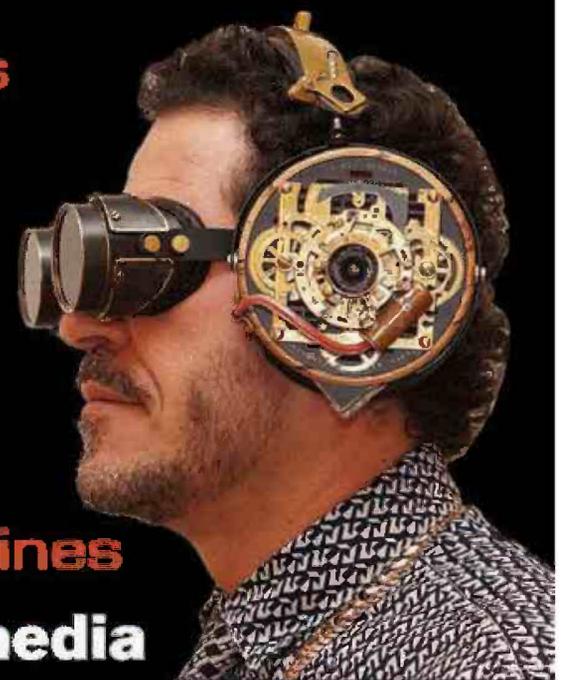
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# "Should Concorde go to the top of any noise chart as an everyday example of loud?"



Noel Keywood

**S**o how loud is a tugboat? I was bemused by Gilbert Briggs – founder of Wharfedale loudspeakers – use of one as an example of Loud: see Letters, page 39. What I was looking for when researching my reply to this letter was a diagram of the loudness of sounds. I have it in a book that was, I recalled, written by Briggs who was good at providing simple explanations and helpful diagrams showing such things. I didn't find it but instead came across the earlier table we publish that refers to tugboats and London's Royal Festival Hall. Significantly, the book, *High Fidelity*, was published in 1956.

The chart I recall had a starting gun in it as an example of loud, stating its Sound Pressure Level in decibels, or dB. Then there was a road drill...and so it goes on. But there was no tugboat; I'd remember if there was one because it seems like a rare experience for the average reader of such a book to relate to, unless they spent a lot of time rowing around busy harbours.

But when I thumbed back to the opening pages of *High Fidelity*, I saw it was first published in 1956. And it refers to the Royal Festival Hall, beside the River Thames – built 1951. Aha! I think a picture is building up here of a grand new symbol of post-war modernity, the RFH, and likely surrounding icons of commerce and noise generation shall I say, in this case a Thames tugboat. You can see them in old films and I remember from my childhood an oil painting in our lounge of cargo ships moored against a dockside, with a dirty tugboat, smoke billowing from its funnel, in the background.

This was a gritty depiction of the time, of London's docks and trade through them, which in the 1950s was still important and meaningful.

Hence the tugboat as an icon of loudness in *High Fidelity*. But things were to change.

Technology rapidly moved on: ships were displaced by aeroplanes. And especially by the world's fastest civil airliner Concorde, upon which I worked whilst studying electrical engineering in the 1960s. If ever there was a machine that generated "high volume" this was it. It is difficult to say how loud Concorde was, because you have to define distance – and no one was going to get close to it at take off! I heard it at take off and landing and it was more than loud – it was shattering. A published figure of 119dB (<http://www.flightglobal.com/pdfarchive/view/1976/1976%20-%200286.html>) is very loud, but doesn't describe what you hear. I'd guess Concorde was much louder than this, around the 130dB mark.

Gilbert's steam-driven Thames tugboat had been displaced, 20 years later, by a new marvel touting military gas turbines, aided by re-heat. Britons might have gurgled with delight – as I did – but Americans and others around the world objected to this racket. Noise became political.

It stayed that way too. Concorde was probably the height of noise production, created with no sensitivity to its impact. But the world pushed back and Concorde was duly reined in, forced to cut the racket in as far as possible by reducing power after take off – as airliners are forced to do today I notice, even though they have become much quieter.

You may think this talk about aircraft noise is a bit off-topic, but it isn't. In fact the parallel can be taken further and it involves Gilbert Briggs own speciality: loudspeakers. They move air like a jet engine and they too produce a racket when too small. Distortion is much greater in small cone (6in) than large cone

loudspeakers (12in) and this, I have found from measurement, is a fixed relationship, a certainty. A good big'un is always best when it comes to moving air and that is the case both with loudspeakers and sub-sonic jet engines; notice the massive diameter of a modern 747 engine and the absence of those ripping sounds of turbulent air that smaller military jet engines produce.

Should Concorde go to the top of any noise chart as an everyday example of loud? Er – no. It has gone, like the tugboat. Both were examples of their time, and the world has moved on. Since Concorde and the rise of noise research it has become a (slightly) quieter one too. Sound pressure level meters are now cheap and portable – Maplins sell one for £50 – so anyone can complain about noise. High sound pressure levels cause hearing damage and noise exposure over time (noise dose) is an understood health issue nowadays. It is also a social issue, as the arguments about a third runway at Heathrow airport in London illustrate.

So what should go to the top of a modern noise chart? I haven't seen a starting gun for a long time and since you can get shot for carrying a water pistol these days, I think I know why! A tugboat means little to anyone and Concorde is a fading memory.

My noise chart would have a local No 6 bus at top – a hideously noisy machine. Happily, such vehicular horror stories are slowly being phased out too. Electric buses and cars are with us now and their silence is a welcome relief.

Tugboats and Concorde were symbols of their time, partly defined by the noise they made. These days if you want to hear them again it's no problem because a big loudspeaker can produce close to 120dB. Just make sure there's no one around at the time! ●

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# "Songwriting is not just where the money is, it's the source of power"



Paul Rigby

**A**s a singer, it's all very well being the one that the crowd adores, screams at and triggers tears of joy and yearning. I'm sure it's rather nice to be recognised in the street (sometimes), to be featured in newspapers and national magazines. It must be flattering, to some extent, as a teenage pop sensation of – what, eighteen years shall we say – to have your opinion sought on subjects as broad as the state of the economy and current fashions.

But...apart from the (so called) lucky few, if that's all that you offer – singing that is – how do you actually earn a living? For the lucky few, there's the regular concerts and the personal appearances. Fine, as long as the public want to see you. Then what?

That's when many singers, would-be singers and people who couldn't sing a note realise that the real jam is not to be earned by singing the songs. It is to be found by writing the things. That's where the big money lies.

You ask Paul McCartney or Bob Dylan or Elton John or many other very wealthy people out there who have earned the majority of their wealth from the royalties accrued from their songs.

Now, don't get me wrong. Money isn't everything and songwriters are often not in the business of penning ditties for profit. But it does help pay the gas and electricity bills at the end of the day.

Moving to more artistic endeavours, the great thing about being able to write your own songs, good songs, songs that others want to hear, means that, firstly, you don't have to employ someone to do it for you.

You don't have to 'make do' with someone else's inspiration, either.

You know what I mean. You

sing a song. It's nice but, well, it's not really you. It doesn't come 'from within' and have that special, personal quality that the greatest compositions exhibit.

Create your own songs, however, and often they derive from your own experiences, your own feelings, your own loves won and lost and your own yearnings and ambitions. Hence, you sing those same songs with passion which actually improves your performance and makes people sit up and pay attention.

More than that, if you can't sing in the first place or you have had enough of singing and want to retire to tend that lawn and the roses, then you can still be 'working' without having to leave your house. Marvellous.

In addition to that, if you write a song and it turns out that the song – although good – is not really something you want to sing, then you can give it to another vocalist to sing. You're able to spread your ideas and passions via more than one mouth (and it's yet another revenue stream too).

Lennon & McCartney were famous for that sort of thing but other people were successful too, including Lee Hazelwood who wasn't particularly known for his singing so roped in the likes of Nancy Sinatra to boost the vocals for his own works. He also wrote for the likes of B.B. King, Dusty Springfield and Ann-Margret (see 'Califia: The Songs of Lee Hazelwood' on Ace).

More pertinent were three well known singers who also wrote for others. One or two who might surprise you: Neil Diamond, Randy Newman and Bo Diddley.

Bo Diddley's songwriting talents for others might be the biggest surprise. 'Who Do You Love' was written for Ronnie Hawkins & The

Hawks. A savage rendition, it had top quality backing. The Hawks would, of course, evolve into The Band.

Other outfits who sang Diddley ventures included Captain Beefheart, Dr Feelgood, the New York Dolls and Pretty Things (check out 'Bo Diddley Is A...Songwriter' via Ace).

For Randy Newman, he wrote songs before he found his own voice. For him, the songs came first, as it were. In 'On Vine Street: The Early Songs of Randy Newman' (Ace), you'll hear his songs sung by the likes of The O'Jays, Scott Walker and Frankie Lane. A right old mixture of artists.

Neil Diamond was exactly the same, writing songs for Lulu, Deep Purple (yes, them), Cliff Richard (from the sublime...) and Billy Fury. More can be found on Ace's 'A Solitary Man: The Early Songs of Neil Diamond'.

Just to add a bit of spice, sometimes you stumble across recognised songwriters who surprised you by performing.

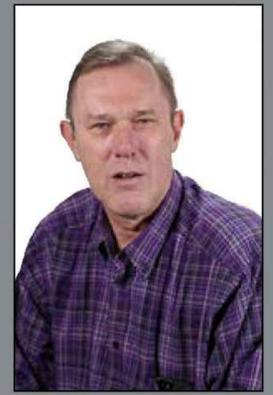
Tony Hatch, a sublime British songwriter, was one of those. Responsible for a string of top-quality songs for the likes of Petula Clark, Scott Walker, Jackie Trent, Jack Jones and Sarah Vaughan, Hatch also fronted outfits like Tony Hatch & The Satin Brass or The Tony Hatch Orchestra to play music of his own, although in a slightly more formal mode (as seen on 'Man Alive: Colour My World: The Songs Of Tony Hatch' via Ace).

So as you can see, in musical terms, songwriting is not just where the money is, it's the source of all power too.

The singer is, in many ways, just a pawn, a spokesperson there to deliver a message. As a songwriter, you can choose who is the most effective person to act as messenger. It's wonderfully manipulative. ●



# “Apple Music has the potential to become something of an unstoppable behemoth”



Jon Myles

**J**ust when you thought things might be getting better, something comes along that knocks your expectations into a cocked hat. I refer to the media tsunami that surrounded the launch of Apple's new Music streaming service.

The tech giant's announcement was a surprise to absolutely nobody, having been anticipated for months. The only real question to be answered was exactly what date the service would launch and its pricing.

On the former we now know the date will be June 30 and as to price it will cost £9.99 a month for access to 30 million songs, live 24-hour radio and an artist-led social media platform; or £14.99 for a family plan which gives access for up to six people.

What was depressingly absent from the hoop-la that followed the announcement, however, was any real discussion of the sound quality of the tracks being offered. There had been some hope that Apple may pitch its entry into the streaming market at a higher bit-rate than some of its rivals in an effort to promote it as a better quality service. But no, it's going to be a hobbled 256kbps just the same as iTunes – which is actually lower than the 320kbps that Beats Music was offering before Apple acquired the company for \$3 billion to form the basis of its Music service.

You might have thought that with industry heavyweights such as Jimmy Iovine and Trent Reznor closely involved with the new service, something better may have been offered. Indeed, in his previous incarnation as the frontman of Nine Inch Nails, Reznor was never slow to criticise record companies for ripping off their customers. Well, offering low bit-rate streaming for

£10 doesn't strike me as particularly great value for money.

Ironically, the Apple announcement came just a few days after Oppo announced it was to integrate the Tidal streaming service into its highly-regarded range of Blu-ray disc players. Existing owners will be able to upgrade their units via a simple firmware upgrade to be made available on the Oppo website.

Obviously, this didn't get quite the attention in the mainstream media as Apple Music (well, it didn't get any actually) but is undoubtedly a much more welcome development. The reason being that Tidal – owned by Beats founder Dr Dre's fellow rapper Jay-Z – streams the majority of its content as CD quality Flac files. Admittedly, a subscription costs £20 a month – but it only takes a few seconds of listening through a decent network player to realise how much better it sounds than the likes of Spotify and Rdio.

In a recent coup Tidal also became the first streaming service to offer all six of Led Zeppelin's classic studio albums with Jimmy Page working on special remasters to ensure the best possible sound quality. Listening to these is a great experience – and evidence that high-quality streaming is actually a viable option. Suddenly, the thought of paying £20 a month for access to over 25 million CD-quality tracks doesn't seem that bad – apart from my one nagging reservation that you never actually own the music.

Of course, some will say the lower quality of the Apple alternative doesn't really matter when most of the content will be streamed to iPhones, iPads and their Android alternatives. But that's missing the larger picture.

Apple Music has the potential to become something of an

unstoppable behemoth in the same way iTunes ushered in the age of music downloads. With hundreds of millions of iPhone and iPad users around the world and Apple Music set to be built into all future iOS upgrades, the service could well eclipse all its rivals put together in a matter of months.

And with the £14.99 family package option it could mean whole generations of youngsters will get their first taste of listening to music through Apple's lower-quality offering. Which strikes me as sad.

For years many vinyl lovers railed against CD for what they perceived as its sonic limitations. Now, with 21st century technology, we have high-resolution downloads which show just how good digital replay can actually sound.

Yet if the medium of choice for the mass market consumption of music becomes streamed 256kbps files, then even some of the earliest CD players from the 1980s will start to seem positively high-end in terms of sound quality.

If there's any reason for optimism, though, it's in the likes of Tidal and other lossless streaming music services such as Quboz. And, perhaps perversely, the predicted gigantic success of Apple Music. For if the service does manage to Hoover up the majority of the market then its rivals will have to look at ways to differentiate themselves or face extinction.

And what better way would there be than offer higher quality files for customers? Perhaps at even higher resolutions than standard CD?

So my expectations took a knock when I learnt about Apple's new streaming service; the notion of quality wasn't in there. But, thinking about it, the best may be yet to come. ●



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"It remains to be seen what will become of the BBC during the next five years"



Martin Pipe

The BBC, our licence-funded public-service broadcaster and an internationally-revered British 'brand', is rather more than just a clearing house for (and publisher of) video and audio material commissioned from third-party producers. But some would like it to be reduced to this role. Those who advocate a market-based approach disagree fundamentally with the very concept of public-service broadcasting a la Beeb, and would love it to be stripped of most of the privileges that make the organisation what it is.

They feel that the £145.50 licence-fee is a 'TV poll-tax' that gives 'Auntie' an unfair advantage and that the BBC – which they frequently-accuse of increasing irrelevance, profligacy, inefficiency and left-wing bias – should be funded via alternative means. The BBC should, they argue, compete in the marketplace for talent, income and viewers – as does the PBS (Public Broadcasting System). The latter is the BBC's closest equivalent in the US – a nation that is usually held up as a shining example of free-market principles at work. But the US broadcasting market is, of course, much much larger than the UK's.

PBS is independent, and not for profit. It gives US viewers unencumbered by UK-style TV licensing a chance to see some flagship British programmes. In the UK, though, PBS is perhaps best-known for the long-running Sesame Street children's programme. PBS gets some money from US government agencies. Most of its income, though, takes the form of donations from private individuals and corporations, in addition to fees paid by its affiliate 'member' stations (i.e. indirect funding via sponsorship and 'messages' – adverts in all but name! – between the programmes).

The US is, however, behind us in other ways. The UK has already flogged off its ex-TV UHF spectrum to the highest bidders. In early 2016, the US will witness a considerably more complex 'incentive auction', which is being masterminded by its FCC (Federal Communications Commission) government agency. The idea is to 'buy back' spectrum from broadcasters, for commercial redeployment to the increasingly bandwidth-hungry communications industry.

And that's an illustration of where radio and TV seem to be heading. Instead of conventional 'broadcasting' – i.e. everyone tuning into the same programme as it is broadcast in real-time – we're moving to 'narrowcasting'. Viewers/listeners will be able to watch what they want, and when they want. And technology – not least of which is wireless streaming over communications networks – is making it happen. Look at the rise of streaming services like Netflix, Spotify and the BBC's own iPlayer. Between them, they offer an unprecedented amount of choice.

In time, the only 'shared experiences' could be news, live cultural events and sporting tournaments. Currently-protected crown jewels like Wimbledon and the FA Cup final are obvious examples of the latter. But we shouldn't forget the Radio 3 Proms concerts that are enjoyed by so many. Without the protection offered by the BBC's public-service principles, though, some or all could – in theory at least – move to a pay-per-view basis.

Now that we have an outright Conservative government, with a Culture Minister who has revealed his opposition to licence-funding, it remains to be seen what will become of the BBC during the next five years. We should not forget that the BBC's

ten-year Royal Charter – which sets out its public responsibilities and guarantees its independence – is due for renewal next year.

Another aspect of the BBC could also be under threat. This is the research and development department arm of the BBC (BBC R&D). BBC R&D has won Queen's Awards for Innovation, thanks to the numerous contributions to the broadcasting world it has made over the years.

Hi-Fi World readers have BBC R&D to thank for (amongst other things) the famous LS3/5a 'mini-monitor' speakers – originally developed by BBC engineers for use in outside-broadcast units. Its design was then licensed to several manufacturers. Today, BBC R&D is active in around 50 different projects – in conjunction with university departments and private-sector firms. A fair cross-section was being demonstrated at a recent two-day BBC 'Sound: Now and Next' event.

The technology on show was never short of fascinating including variable-length on-demand radio programmes, a Raspberry Pi-based open-source Internet radio, distributed production over IP networks and an investigation into the timbral differences between microphones.

Click presenter and musician LJ Rich also hosted a series of lectures and discussions giving an insight into how audio content is made.

The first day's programme began with an illustrated talk by world-renowned soundlife recordist Chris Watson, who also treated us to some of his astounding field recordings – as used in world-class BBC programmes like Frozen Planet and The Life of Birds.

They demonstrated how, even in a visual world, sound is of critical importance. ●

Randy Crawford



Raw Silk

RANDY CRAWFORD

Raw Silk  
Pure Pleasure

Crawford has the pleasure of owning one of the most distinctive female singing voices of all time, a voice that shot to fame with the jazz outfit The Crusaders and the single 'Street Life', released in 1979. This solo effort, originally issued via Warner Bros, was issued in that same year and is one of her best, offering a perfect song selection.

Her general performances are impeccable. She allows the song to dominate, to flower and to stand on its own two feet. She never does what many jazz/soul/R&B vocalists do: kill it with vocal acrobatics.

And she's capable too and you know it. All that restraint makes her performance all the better.

This album has a slight analogue warmth. While there's plenty of detail on offer, the upper mids are not open to the sky. That is, there's no tremendous treble insight off the back of a struck cymbal while

Crawford's vocal delivery is rolled off a touch.

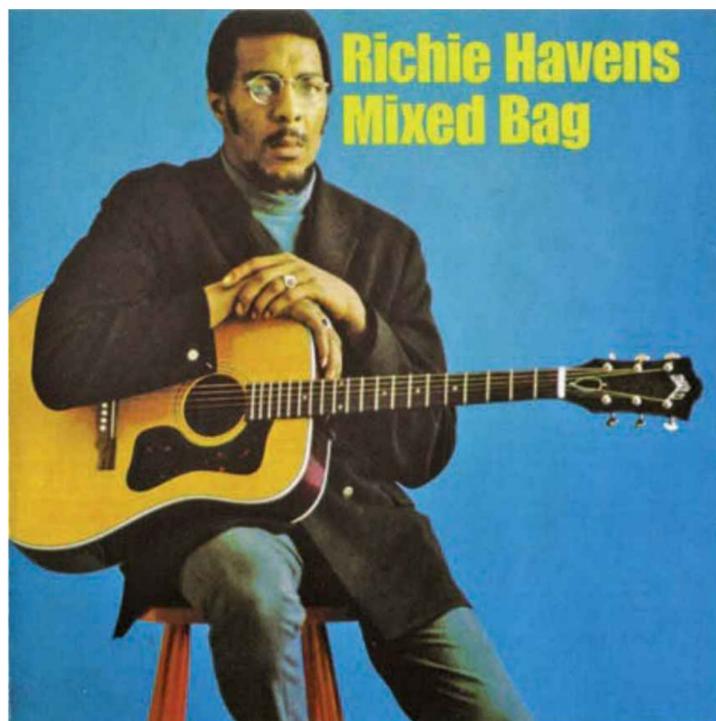
None of this serves as negative criticism, as such. What we have here is an 'authentic sound' of a time and a place. In this case, the late seventies. There's a golden glow around the entire production.

That's enhanced by the bass-heavy electric piano and the forward nature of the bass guitar. Crawford's album is here to reassure and comfort.

In effect, this mastering tone helps the singer to give us a cuddle. There is tonal variation to excite the ear, though. Brass inserts add upper mid flare, for example and Crawford's own voice has enough variation to keep you interested at all times.

Also look out for other Pure Pleasure releases this month from Jimmy Weatherspoon ('Spoon's Life', 1980); Lionel Hampton ('Newport Uproar!', 1968) and Etta James ('Deep In The Night', 1978).

# AUDIOPHILE VINYL



RICHIE HAVENS

Mixed Bag  
Sundazed

Well, Sundazed has excelled on a pair of releases from Richie Havens this month. I'm concentrating upon 'Mixed Bag' here but the same sentiments can be drawn for the company's other Havens release 'Something Else Again' from 1968.

Like many other people, I first became aware of Havens from his explosive and energetic performance at the beginning of the innovative Woodstock festival film (he was the first act) and, in audiophile terms, realised that he would stretch the abilities of any studio he recorded within.

Part of the reason was the big noise that Havens produced. His guitar was set for open tuning while he barred chords with his thumb making his guitar a percussive instrument. Coupled with his gruff vocal, his presentation was mesmerising.

This album, his first, was

also his finest including the seminal 'Handsome Johnny' from Woodstock, one of the most revered of anti-war songs in which he dazzles and almost has to run to keep up with his guitar that seems about to fly out of his hands, heading directly for the horizon.

Sundazed has done its part to produce a top quality recording. To begin, the company has obviously used a set of original masters that are in pretty decent condition because the noise level on this (and 'Something...') are very low. On a finely tuned hi-fi, the LP screams at you to increase the volume to grab as much of the fine detail on offer.

Treble is not only finely etched but delicate and airy in nature while upper-mids provide enough space to be both informative and emotional, the Havens guitar 'talks' with as much gusto as the man himself. Dynamically, the recordings are impressive with a solid and weighty bass response.

**F**ans of British folk will have been struck by the release of three pieces of vinyl on Record Store Day. The first is the self-titled, first solo album from Martin Carthy (1965) that became a totem for folk and guitar players everywhere.

Next is Anne Briggs' incredibly influential self-titled album from 1971, a mixture of originals and traditional fare. Then there's this example from two members of the highly respected and, again, influential Copper family: major players in British folk.

Here, they sing songs collected by Peter Kennedy during the late fifties. These are story-telling snapshots of a lost time, told with a simple innocence and insight of the observer onto that well known foreign land, the past.

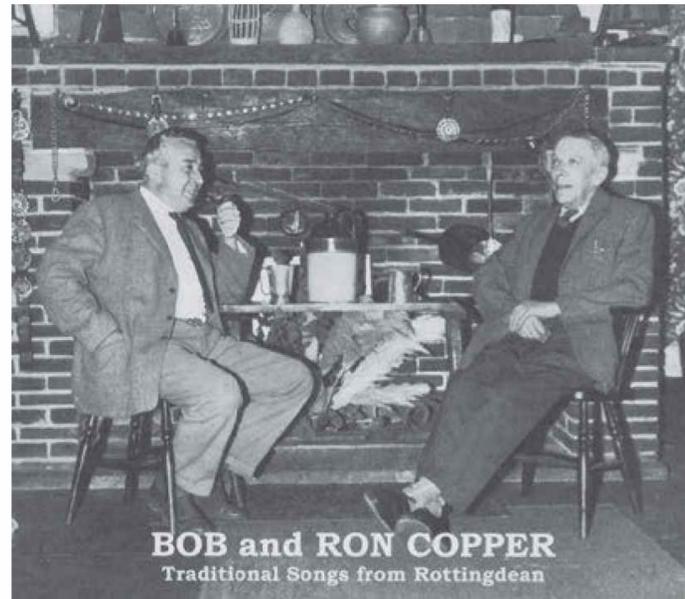
There are two aspects regarding the sonic capabilities of this LP. Firstly, Fledg'ling has done well to preserve the clarity of this stripped recording. This is an album

that features nothing but two voices. There are no instruments here, just two older men singing their hearts out. The voices are their own accompaniment. What you want and need, therefore, is a sonic environment that allows every subtle nuance to come forth. Every aspect of each harmony must be heard, every tonal variation and each pitch change must be tracked exactly. Any blurring or slurring just destroys the illusion and pops the magic bubble.

There is a slight disappointment – at least on my copy – in that there are one or two slight pressing glitches that cause minor distortions. Very irritating but hopefully other copies will be free of these issues.

Fortunately, the mastering is spot on. There is a space for each man to vocally roam with enough reverb to hold the end of each note.

In mastering terms, the release is a tour de force.



**BOB AND RON COPPER**

**Traditional Songs From Rottingdean Fledg'ling**

AUDIOPHILE VINYL

**O**riginally issued via the Italian outfit Dagored in 2007, this 1978 soundtrack backs an honest-to-goodness pure, patented Spaghetti Western riff with atmospheric guitars and taut percussion. The Italian title can be translated as 'The Cruel Ones' but it was also known as 'The Hellbenders' in English. The film itself surrounds the efforts of a Confederate officer after the American Civil War who wants to reorganise the South's forces and have another pop at the Union, but money gets in the way. Lots of it and in a coffin, would you believe. But what else do you expect of Spaghetti Westerns?

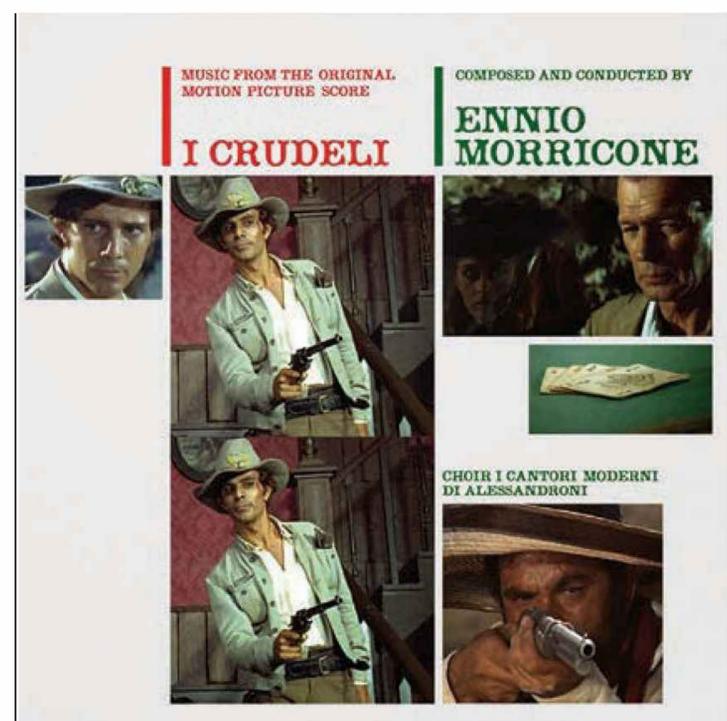
There is a certain epic grandeur about this LP that is helped by the open and airy nature of the upper mids. The prominent treble-infused cymbal trills give the recording an extra dynamic extension that is aided by the soft trumpet lead and the harmonic

vocals from a backing choir that add an engaging and effective 3D effect to the sound stage.

The experimental nature of Morricone's work always triggers unexpected time signatures as well as clashing instrumentation which demands a lot from any master. Often such masters are found hanging onto the tail of a Morricone LP as an unfortunate hunter might hang off the tail of a tiger. The lack of control is all too obvious.

Here, though, the master is both indulgent and expressive. Yes, there is sometimes a slight blooming in upper mid crescendos but nothing excessive or damaging.

What's important is the sense of freedom that the record encourages. It doesn't try to restrict the dynamic fun to be had. This is one of those multi-layered recordings in which you will be discovering new elements and aspects for months to come.



**ENNIO MORRICONE**

**I Cruдели Cherry Red**

# Maximum Exposure



**Exposure's new 3010S2-D now comes with the option of digital inputs – and also sounds better than ever, says Jon Myles.**

*The optional digital input board can be seen top right. Small but potent and well worth the price.*

**E**xposure amplifiers have a well-deserved reputation for punching well above their weight – and none more so than the 3010S2. A classically minimalist integrated featuring just volume and source select controls on the fascia plus six line-level inputs, it produced a healthy power output and became renowned for providing exceptional

value on a sound-for-your-pound basis.

But times move on and customers are increasingly demanding greater flexibility from their components – especially in an age when digital music replay is no longer just restricted to CD. So Exposure has responded with the updated 3010S2-D.

The D stands for the fact that the new 3010S2 has the option of allowing the buyer to have a digital input board fitted – which is built around a Wolfson WM8742 DAC chip and offers PCM replay at up to 24/192 resolution as well as DSD 64 via USB and BNC inputs.

In addition, you can also specify either an MM or MC phono-stage board to be fitted – meaning the new 3010S2-D can be configured to your exact requirements. In its basic form the 3010S2-D costs £1700. The DAC board will add an extra £375 while the phono-stage comes in at £240.

But these aren't the only

improvements to the original model.

There's also a new pre-amplifier section featuring discrete transistors and a redesigned power supply aimed at improving performance. And with 136 Watts per channel on tap the Exposure is easily able to drive almost any loudspeakers you pair it with.

Added to these features is an AV input for integration with a surround system while a pre-amp output also gives the option of powering an external power amp.

Not that you'd know this from the outside however – because the Exposure still retains its minimalist look. Which means the standard volume and selector rotary controls, power button and IR sensor. It looks good and purposeful and feels reassuringly well-built for the price.

## SOUND QUALITY

Slot the new Exposure into your system and you'll immediately get a great big smile on your face. For – like its predecessor – the 3020S2-D majors on musical connectivity.

The midband is very well resolved, bass sounds bouncy without being too



forward, while there is a good stage depth to the overall sound.

Playing Bjork's 'Black Lake' the Exposure had the ability to really dig out low frequencies. Some amplifiers struggle with this track due to its density but the Exposure seemed to take it in its stride. Not only that, it throws out an expansive soundstage. Vocals went way beyond the height and width of the speakers and had tremendous detail.

Switching to something a little more detailed such as Kraftwerk's live 'Minimum-Maximum' collection the Exposure captured the ambience of the various venues extremely well. Listening to the start of 'Autobahn' I could hear the atmosphere in the hall. Then, once the electronic bass kicked in, there was a realism and three-dimensionality to the sound that – while not exactly valve-like – certainly lacked the electronic edge of some other transistor designs. It was immersive and captivating – which is what a good amplifier should be.

Moving over to the 30102S2-D's digital input via USB on a MacBook Air running Audirvana Plus, it became obvious Exposure has not stinted on this aspect of this design.

Playing Daft Punk's 'Random Access Memories' via the digital input

revealed much greater depth, vibrancy and definition on the 88/24 download than a standard CD rip. Everything became more natural, crisper and had a greater sense of flow.

The start of 'Lose Yourself To Dance' sounded emphatically more sinuous and propulsive while the vocals and lower registers on 'Contact' displayed a silky smoothness that made the effort of connecting a computer to the Exposure worthwhile.

Staying with the MacBook and going through a selection of high-resolution tracks proved the Exposure's digital board is no slouch. Actually, it's very impressive. 'Man On The Moon' by REM (24/96) was very detailed. The leading edges of Peter Buck's guitar were not just highlighted, they positively rang. Similarly the bass took on better resolution than I get through silver disc. The only criticism to be made is that the DAC section seemed a little fussy about connections – a good quality cable being needed to get the best from high-resolution material.

And no, there's not quite the overall silky smoothness and outright definition you'll get from an outboard DAC equipped with something like the excellent ESS Sabre32 convertor –

but that costs much more. Instead, at its price the Exposure option works a lot better than I had expected and was a very tempting digital option.

With analogue alone the basic 3010S2-D is, at heart, an outstanding amplifier for the price. It gets on with the job in an inherently musical manner, managing to get the most out of all genres of music. It had the timing and definition to let me hear the interplay between individual musicians. With pounding rock or dance it raised itself to the task without missing a beat, having a propulsive thrust that was truly infectious I found.

It may not look the flashiest amplifier at the price, but it's the sound that counts and on that score the new Exposure scores highly.

### CONCLUSION

The new 30102S2-D is an excellent update of what was already a very accomplished integrated amplifier. It has depth, definition and detail, allied to ample reserves of power, while the addition of the optional digital board brings welcome flexibility. For the price it's a bit of a bargain.



*Exposure's remote does the job – but feels a little flimsy.*

## MEASURED PERFORMANCE

The Exposure 3010S2-D delivered 136 Watts into 8 Ohms and 240 Watts into 4 Ohms, so it has plenty of punch – a traditional strength of Exposures. A high damping factor of 48 ensures it provides good bass cone damping too, meaning tight bass quality.

Exposure roll off high-end frequency response – like Naim – output falling away above 25kHz. Although this is outside the audio band it will make the 3010S2-D perceptibly less shiny bright than wideband designs. With high frequency distortion comprising mostly second harmonic, the amplifier will have smooth, mild sounding treble.

Our review sample had no phono stage, but instead a digital input with a single S/PDIF electrical input via BNC, and USB. Both worked to 192kHz – but only just; a good cable was needed to support the high data rate, suggesting low input receiver sensitivity. Increasing test input from 1V to 2V helped, but you cannot do this with consumer equipment of course. Results were best at 44.1kHz and multiples of this sampling rate (88.2, 176.4), an EIAJ Dynamic Range value

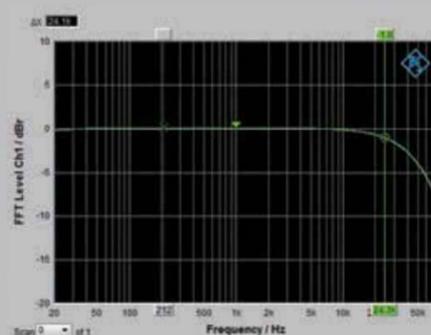
of 112dB being good, if not exceptional. Distortion at -60dB with 24bit was low at 0.06%, USB and S/PDIF giving identical results. Distortion with CD was as expected, measuring 0.23%. Analogue frequency response was curtailed to 25kHz by the amplifier section.

The 3010S2-D measured well, but the S/PDIF input was cable/ connector sensitive at 192kHz sample rate, if not at lower sample/data rates. NK

<b>Power</b>	<b>136watts</b>
<b>CD/tuner/aux.</b>	
<b>Frequency response</b>	<b>8Hz-24.3kHz</b>
<b>Separation</b>	<b>86dB</b>
<b>Noise</b>	<b>-98dB</b>
<b>Distortion (1W,10kHz)</b>	<b>0.13%</b>
<b>Sensitivity</b>	<b>300mV</b>
<b>Damping factor</b>	<b>48</b>
<b>Digital</b>	
<b>Frequency response (-1dB)</b>	<b>20Hz-25kHz</b>
<b>24/192</b>	
<b>Distortion</b>	<b>24bit</b>
<b>0dB</b>	<b>0.002%</b>
<b>-60dB</b>	<b>0.06%</b>
<b>Separation (1kHz)</b>	<b>98dB</b>

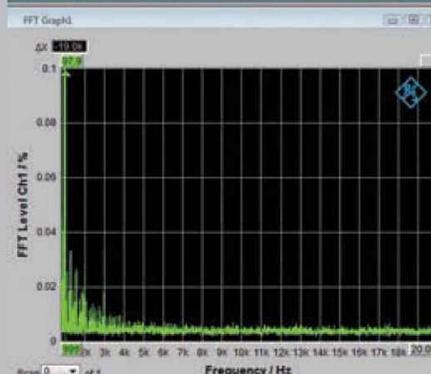
**Noise (IEC A)** **-110dB**  
**Dynamic range** **112dB**

### FREQUENCY RESPONSE



### DISTORTION 24bit

Ch1	THD all	Level RMS	Frequency
0.0610 %	224.19 mV	997.00 Hz	
OFF	OFF	OFF	



**EXPOSURE 3010S2-D £1700 (DAC BOARD £375, PHONO-STAGE £240)**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

### VERDICT

A no-nonsense integrated amplifier that has a sound quality which belies its relatively modest price. The addition of the optional DAC board adds to its flexibility.

### FOR

- punchy sound
- powerful
- detailed
- DAC and phono-stage options

### AGAINST

- insensitive digital input

Exposure Electronics Ltd  
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www.exposurehifi.com

# ortofon

accuracy in sound



# Q uintet

Since 1948 Ortofon have introduced nearly 100 different moving coil pick-up cartridges to the hi-fi market. Their latest models in this long and proud heritage are the Quintet Series.

All Quintet cartridges use the same ABS thermoplastic bodies and neodymium magnets, but each model in the range has its own sonic expression that reflects its status. From the well-rounded **Quintet Red**, through the smooth **Quintet Blue** and spacious yet dynamic **Quintet Bronze** up to the pure audio excellence of the **Quintet Black**, this series offers something for every discerning listener at a very attractive price.

The Quintet Series also includes a true-mono cartridge, for accurate reproduction of older mono recordings.



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### MITCHELL AND JOHNSON WAVE £39.99

As we all know, streaming music via Bluetooth is becoming ever more popular. After all, the convenience of being able to pump music from a mobile phone, tablet or computer

direct to a music system has obvious convenience.

But what to do if your audio equipment lacks Bluetooth connectivity? Enter Mitchell and Johnson's clever Wave Bluetooth adaptor.

A small unit not much bigger than a key fob, the £39.99 Wave plugs into any standard 3.5mm stereo jack and instantly adds Bluetooth capability to whatever it's connected to.

Pairing is simple via the small side button and in use the device was instantly recognised by a variety of gadgets – including both Android and Apple smartphones and tablets. The built-in battery is good for up to six hours of playback and is charged via a supplied micro-USB cable.

Plugged into a car stereo it was simplicity itself to stream music from an iPhone 6. Sound quality is also rather decent. Bluetooth may not be the highest resolution available but the Wave does a decent job of

making the most of the format.

On Nick Cave & The Bad Seed's 'Murder Ballads' there was a decent separation between the instruments while the vocals had a realistic bite and edge to them.

Moving the Wave to a rather better quality home system via a decent amplifier there was an appreciable increase in definition. Here the same tracks had more punch and drive while the overall sound was appreciably tighter. The Wave also has a handy operating range of up to 20 metres meaning it can easily be used across a large room while a built-in microphone allows for hands-free calling if desired.

All in all it's a handy little gadget if you are looking to add Bluetooth to an existing audio component at a budget price. **JM**

[mitchellandjohnson  
[www.mitchellandjohnson.com](http://www.mitchellandjohnson.com)]

# SOUNDBITES



### LINDY IEM-50X £49.99

Trying to stand out in the crowded in-ear headphone market isn't easy – especially around the £50 mark where much of the action is.

But German company Lindy may just have found the answer with their ingenious IEM-50Xs. The standout feature is a proprietary dynamic bass tuning system – where a rotary twist control on each earbud opens the rear chamber to add more depth to the low end.

Aside from that the Lindys look fairly standard, coming in a black with red trim with a flat, 1.2m tangle-free TPE cable.

Small, medium and large sized ear tips are also supplied to provide optimum fit for different users, while a handy carry case is also packed in the box.

Build quality is good for the price and in use the Lindys proved light and comfortable.

Sound-wise the IEM-50Xs are balanced towards the low-end like many other earphones at this price – but not excessively so. Opening the tuning control on bass-heavy tracks did bring a slight boomy quality to the sound but, conversely, it proved an attractive option when lighter music needed a little more depth.

The mid-band is relatively smooth and the Lindys have a decent top-end although it is slightly rolled-off.

Plugged into an iPhone 6 and Leonard Cohen's 'Almost Like The Blues' has plenty of kick and weight while vocals were clear and detailed. There isn't quite the absolute clarity you'll get from more expensive models but for less than £50 there's little to complain about.

Listening to Leftfield's eponymous debut album there was good dynamic contrast, the earphones managing to sound speedy when needed, without sacrificing depth or detail.

They also gain added marks for build quality. Unlike some headphones around this price the Lindys don't feel cheap or plasticky and are well able to stand the stresses and strains of being pulled in and out of pockets while commuting.

If you're looking for something slightly different in an earphone at this price, then the Lindys could be just what you are after. **JM**

[LINDY Electronics Ltd  
[www.lindy-headphones.co.uk](http://www.lindy-headphones.co.uk)]

# vinyl section

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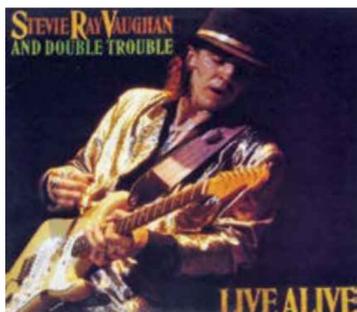
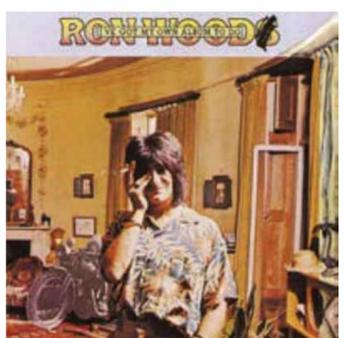
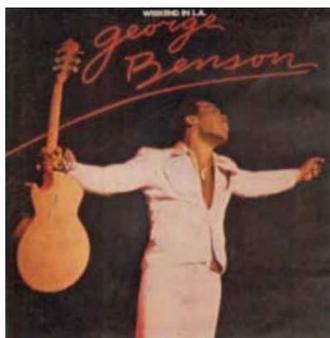
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**PRO-JECT RPM 3 CARBON 82**  
Mark Osborn heralds a great new budget deck from Pro-Ject.

**MUSICAL SURROUNDINGS NOVA II PHONOSTAGE 86**  
Paul Rigby is impressed by Musical Surroundings new, improved phonostage.

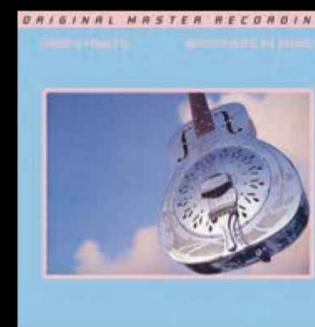
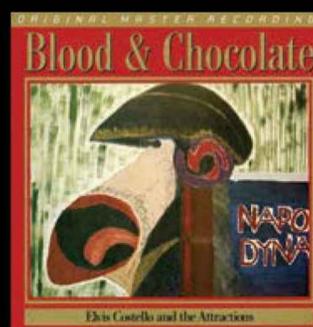
## news



### MO-FI DUO

Two releases from US-based Mobile Fidelity ([www.mofi.com](http://www.mofi.com)) include the gigantic 'Brothers in Arms' (1985) from Dire Straits featuring supreme pop songcraft from lead man Mark Knopfler.

Elvis Costello also teamed up with The Attractions and producer Nick Lowe to record the hard-rocking 'Blood & Chocolate' (1986): full of deliciously nasty songs.



### GUYS & GALS

From Music On Vinyl ([www.musiconvinyl.co.uk](http://www.musiconvinyl.co.uk)) is a range of new releases featuring solo male and female artists.

'Weekend in L.A.' (1978) was George Benson's Roxy Club live album in which his enthusiasm is high, the crowd are up and Benson is particularly soul-laden.

Despite the corny backing on Nina Simone's 'Single Woman' (1993), Simone's drama-laden, intense delivery saved the day for this romantic set.

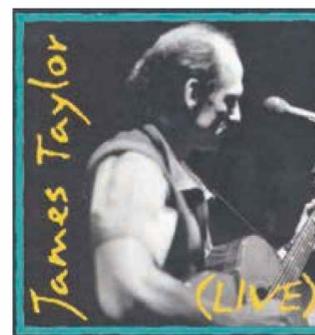
From 1968, 'Look Around', from Sergio Mendes & Brasil '66, was a great album drawing upon Brazilian talent of the time with that blockbuster hit single, Bacharach & David's 'The Look of Love'.

Featuring Rolling Stone man Keith Richard (without the 's') and Small Faces keys man Ian McLagan, Ronnie Wood's 'I've Got My Own Album To Do' was an excellent 1974 solo debut. Good humoured, swaggering with grinding R&B.

In the same ball park is Stevie Ray Vaughan's reasonable 'Live Alive' (1986), a double album showcase from his first three albums. Includes plenty of extended jams.

Up to date now and Calvin Harris' second LP 'Ready For the Weekend' (2009) is packed with hooks, energy and, intriguingly, a more sincere presentation, mixing pop with dancefloor.

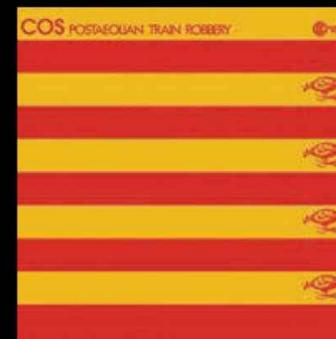
Also look out for James Taylor's '(Live)' (1993) which ranges way back from 1968 to 1991 with hits in-between. A solid release.



### WAH WAH DOUBLE

From innovative Spanish label Wah Wah ([www.wah-wahsupersonic.com](http://www.wah-wahsupersonic.com)) is the first solo outing from Aerial Kalma, the Pierre Henry-influenced 'Le Temps des Moissons' (1975). Mastered from the original tapes and adding two bonus tracks.

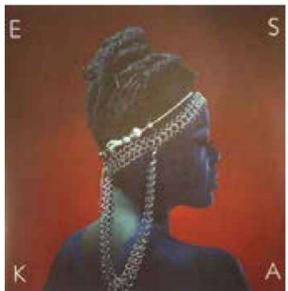
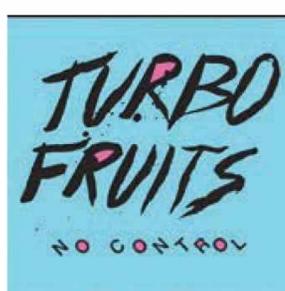
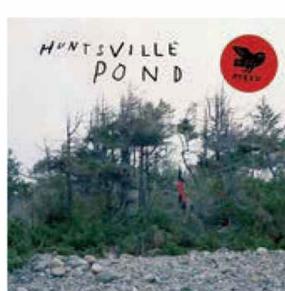
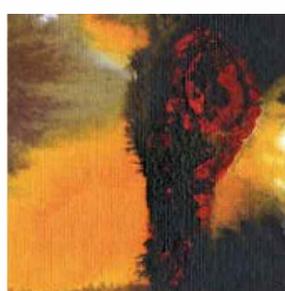
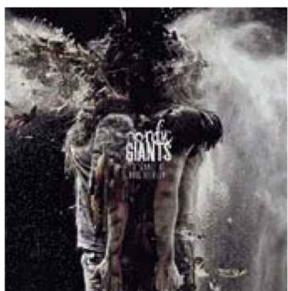
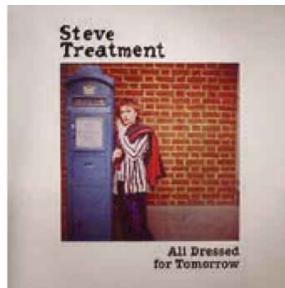
Cos' 'Postaeolian Train Robbery' (1974) is obscure proggy jazz from Belgium, inspired by the UK's own Canterbury prog scene. The first official LP release.



## SPEAKERS CORNER

From the German-based audiophile masters comes Antonio Carlos Jobin's 'Stone Flower' (1970), recorded by Rudy Van Gelder. It's –well – stunning. There is no other description. A quiet, jazz-infused bossa nova excursion. This is Jobin's own 'Kind Of Blue'. It's that good.

Also look out for Dave Brubeck and Gerry Mulligan's 'Compadres', debuting Brubeck's new quartet and showing that he could work it even without Paul Desmond, plus J.J. Johnson's 'J.J. Inc.' (1960), featuring a young Freddie Hubbard, on a good straight ahead bebop jazz set. Also Hank Garland's 'Jazz Winds From A New Direction' (1961) sees country session man Garland tackle sophisticated be-bop in his sleep. Gary Burton makes an astonishing debut.



## ...AND FINALLY

Right, lots to get through so settle down. Up first is 'Chicas: Spanish Female Singers Volume 2 1963-1978' (Vampi Soul; [www.vampisoul.com](http://www.vampisoul.com)), a double album of rarities featuring home-grown ye-ye, some soul, ska (!) plus other cultural infusions from abroad.

From Munster ([www.munster-records.com](http://www.munster-records.com)) is Steve Treatment's 'All Dressed for Tomorrow', rare punk from 1977-79 and backed by the Swell Maps!

Nordic Giants debut 'A Seance Of Dark Delusions' ([kscope](http://kscope.com); [www.kscopemusic.com](http://www.kscopemusic.com)) provides grand scale post rock. Big, epic, you need a ladder to see over the top of these songs.

Post jazz quartet Polar Bear's new LP 'Same As You' ([Leaf](http://Leaf.com), [www.theleaflabel.co.uk](http://www.theleaflabel.co.uk)) continues to blend styles but adds a dub-like groove. Detailed sonics and warming harmonic adventures.

Lost Dawn's new self-titled album ([Easy Action](http://Easy Action.com); [www.easyaction.co.uk](http://www.easyaction.co.uk)) shows their White Stripes influence. Blues-based with aggressive rock tones, there's a T.Rex vibe in there.

Offering rock, improv, electronica and more, Huntsville return with 'Pond' ([www.hubromusic.com](http://www.hubromusic.com)), casting soundscape portent on all who care to be enveloped within their multi-layered gigantism. They sound worried.

Seth Avett & Jessica Lea Mayfield 'Sing Elliott Smith' ([Ramseur](http://Ramseur.com); [www.ramseurrecords.com](http://www.ramseurrecords.com)). They do a great job in diluting everything Smith stood for into the consistency of semi-skimmed milk. Pass the Cornflakes.

Turbo Fruits' 'No Control' ([Thirty Tigers](http://Thirty Tigers.com); [thirtytigers.com](http://thirtytigers.com)) has a grunge-like drone rock that sounds akin to Hole with more facial hair. Decent start.

From Naim Edge ([www.naimedge.com](http://www.naimedge.com)) is Eska. Interesting. In fact, our Eska has an almost black Kate Bush quality about her. She's restrained and walks down unexpected paths.

Annabel (lee) appears with 'By The Sea... And Other Solitary Places' ([If](http://If.ninjatune.net); [ninjatune.net](http://ninjatune.net)) on this trippy, hoppy, jazzy, sample-rich vocal sequence. At times unsettling yet including pleasantly discordant vibes.

Porcupine Tree drummer Gavin Harrison's 'Cheating the Polygraph' ([kscope](http://kscope.com); [www.kscopemusic.com](http://www.kscopemusic.com)) is a big band jazz interpretation of PT ditties. Fun times and an innovative suite of interpretations.

Oslo girl band Katzenjammer (Propeller Recordings ([www.propellerrecordings.no](http://www.propellerrecordings.no))) offer country, folk, blues, pop and rock on 'Rockland'. Unfocused? Maybe but there's also a playful irreverence. Why should music always be earnest?

From Portico and 'Living Fields' ([Ninja Tune](http://Ninja Tune.com); [ninjatune.net](http://ninjatune.net)) takes jazz into deep waters, via foundation moving sub bass, distinctively haunting vocals and reverb-drench electronica. Dreamy.



# 3's the magic number



**Pro-Ject's new RPM 3 Carbon delivers high-fidelity vinyl replay at a bargain price, says Mark Osborn.**

**W**ith record shops and trendy record cafes springing up all over town – I feel hip again! – the vinyl revival is happening right now: there's no sign of a slow-down. How better than to celebrate this resurgence than with Pro-Ject's

budget RPM 3 Carbon turntable, price just £599 complete with fitted Ortofon Silver cartridge. This is a hi-fi turntable for beginners it would seem, but it will have broader appeal than that I believe.

With a sleek and minimalist style, there's no doubt this deck would be harmonious in any city penthouse

and wouldn't look out of place in a sprawling country pile either. Pro-Ject have been very canny in their choice of high gloss colours and open positioning of the drive belt, evoking childhood dreams of gleaming sports cars and intriguing mechanical devices.

Now normally, if I bring

something red and dripping with carbon fibre, the result is disapproval, conveyed by my wife standing arms folded, foot tapping with an obvious 'no-way – it's not happening' look. But not this time: the Pro-Ject RPM 3 Carbon slipped into my household without so much as a frown.

Assembly was a breeze, taking approximately 40 minutes. The unit isn't heavy: it weighs just 5.5 kilo net and the chassis balances on three pointed cone-shaped feet. Pro-Ject have also included an accurate, easy to use Vertical Tracking Force (VTF) gauge and 2-point cartridge alignment protractor.

The RPM 3 Carbon is instantly recognisable as belonging to the Pro-Ject family. It follows on from where the hugely popular Geni 3 left off, but with a number of improvements designed to control resonance from the base upwards. This includes use of a stainless steel axle and inverted platter bearing with ceramic ball, increasing the smoothness of rotation. The platter is turned from MDF, controlling resonance further.

The stand-alone drive motor comprises an outboard 15V AC synchronous motor smoothly driven by an ultra precision AC generator fed from a wall-wart DC power supply, such isolation from the mains supply improving speed stability – a sophisticated arrangement at the low price point.

The turntable reaches operating speed in less than a second and once spinning has plenty of torque. The 10in S-type arm tube looks stunning and is manufactured using a complex three-step heat treatment process involving aluminium, carbon fibre and resin under extreme pressure of 100 bar. To put the pressure of 100 bar into perspective, the average car or motorcycle tyre is inflated to 2-3 bar. This is an extreme amount of pressure and results in a strengthened arm tube, suppressing resonance to allow the use of a high-quality moving coil (MC) cartridge.

The cartridge supplied is an Ortofon 2M Silver, a budget special with silver wire and elliptical stylus. Quoted tracking force is 1.6-2gms with 1.8 recommended by Ortofon, but the 2gms maximum figure gave best results we found (see Measured Performance).

The rear counter-weight uses Project's TPE damping. The synergy

between the arm tube and counter-weight works by holding the eccentric weight firmly in position using the friction of the rubber mounting bush and hex grub screw. The hex grub screw is kept isolated from the arm tube in respect of the bush. As this is not a tight interference fit there is little-to-no chance of resonance between the arm tube and the counter weight due to the rubber damping. Unlike conventional set ups, this is a different approach to those that are mechanically bolted by hex grub screw, metal-to-metal, firmly in place to the arm.

album 'Everyone Loves The Sunshine' from which this track comes. With a long continuous synth note playing in the background, if your turntable lacks speed stability the musical context is completely lost here; in effect your turntable begins to re-write the piece – at which point I need to change the record!

Avoiding this little difficulty with belt drive in particular is not always so easy and it still happens on decks costing twice as much. By way of contrast the Pro-Ject RPM 3 Carbon exhibited impressive control. I would imagine there are not many



**The chassis, armboard and main bearing assembly rests on three pointed, cone-shaped feet for stability.**

VTF is adjusted by simply sliding the weight backwards and forwards. The magnetic anti-skate is infinitely adjustable between 1gm-4gm and super easy to use – I was even able to carefully adjust on the fly due to the stability of the deck.

### SOUND QUALITY

Cartridge lowered into the groove, I thought I would throw this deck into the deep end right from the get-go with an LP called 'Jazz from Hell' by Frank Zappa. It was 28 years ago I first listened to this: I wasn't ready for it then, nor was the system I played it on! Fast-forward to 2015 and it's a different story. With a complicated piece such as this, you need a deck that can handle the complexities and diversity with dexterity and steady timing simultaneously. Without this the information is misconstrued and interpreted as a mush of noises. Played right, this composition is a masterpiece – and to my surprise the Pro-Ject handled it very well indeed. I was off to a promising start!

Moving on, I spun Roy Ayres 'Hey uh-what you say come on', a track heavily infused with synth and harmonica. Both instruments had their own space and again the deck's speed stability really embraced the

decks able to compete at this level and price point.

Next up was Phil Collins 'Face Value' album. The obvious and well-known track here is 'In The Air Tonight'. The incredible build up wasn't lost and finally the drums kicked in with plenty of speed and surprise whilst their shape remained. believably life-like. In fact, all percussion instruments portrayed by



**The arm's rear counter-weight uses Pro-Ject's own TPE damping which holds the mechanism in place by using the friction of the rubber mounting bush.**



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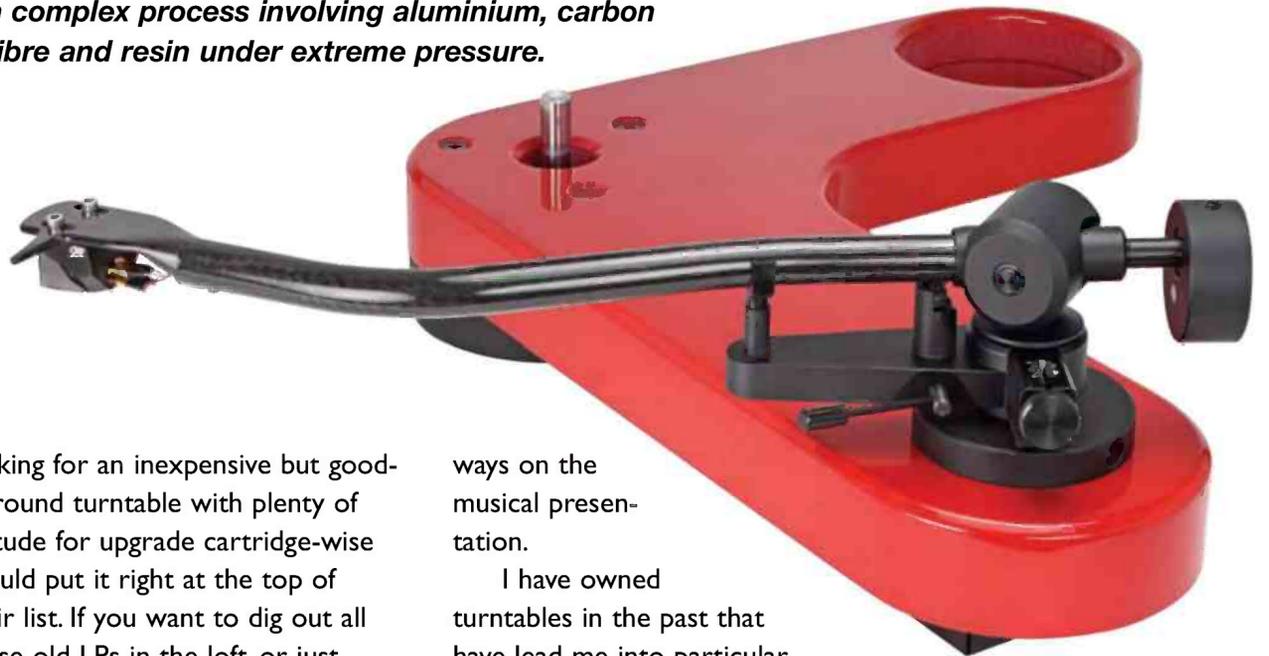
the RPM 3 played with a more-than-acceptable amount of realism, due to the strength, stiffness and damping of its carbon fibre arm.

The Project RPM3 was able to take me with Bob Marley & The Wailers to 'Babylon By Bus', a live album that immerses you in a fly-on-the-wall experience, or at times standing amongst the crowd. Bob Marley's voice delivered total emotion, and bass from the Pro-Ject was gracefully heavy, conveying the ambience of the concert plus the warts and all live recording.

Moving on to something very different, I spun a track from The Who's 'Quadrophenia' LP, 'I Am The Sea'. It had an engaging sense of weight; waves crashing against the shore took me to memories of Brighton. This sense of realism and the ringing guitar chords sounded superb – as they should. I was drawn into the rest of the album.

Feeling emotionally drained and coming out the other side I moved to Grassella Oliphant's album 'The

**The 10-inch S-shaped arm is manufactured using a complex process involving aluminium, carbon fibre and resin under extreme pressure.**



looking for an inexpensive but good-all-round turntable with plenty of latitude for upgrade cartridge-wise should put it right at the top of their list. If you want to dig out all those old LPs in the loft, or just enjoy collections appearing in car boot sales and charity shops, this is a great starting point. But it is also more than able to reveal the quality of modern, 180gm vinyl re-masters. Lovely.

This turntable gave a sonically even-handed representation of any genre of music. It reminded me of the importance of speed stability and how this alone impacts in so many

ways on the musical presentation.

I have owned turntables in the past that have lead me into particular genres of music because that's what sounded good on them. The RPM 3 Carbon didn't do this and is a good example of what a well designed, modern day turntable can achieve at this price point: it shortens the distance between quality levels and price. Which, seen another way, means the RPM 3 Carbon offers great value and is something of a bargain. I loved it!



**The stand-alone drive motor comprises an outboard 15V AC synchronous motor smoothly driven by an ultra precision AC generator fed from a wall-wart DC power supply.**

Grass Is Greener'. This is an instrumental number and the turntable was able to translate the percussive quality of 'Ain't That Peculiar' without it interfering with the rest of the performance.

### CONCLUSION

I would be reluctant to pigeon-hole Pro-Ject's RPM 3 Carbon as being entry level or otherwise after hearing it. It's simply a great turntable in it's own right. Available in red, white or black, build quality was excellent – as expected from Pro-Ject. Anyone

## MEASURED PERFORMANCE

After five minutes the Pro-Ject 3 Carbon achieved a good level of speed stability over a long period, wow measuring a low 0.15% from a centred test disc. Our analysis shows very little basic rate speed variation at the rotational frequency of 0.55Hz (33rpm) and the fact that speed was held tightly by a stable motor was the major reason for this; low

speed variation results in low wow. The DIN weighted wow and flutter figure was low for a budget turntable, measuring 0.12% with little of the expected variance from a simple, low cost drive system.

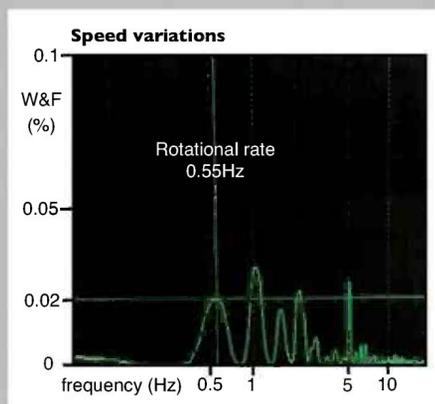
The fitted Ortofon 2M Silver cartridge measured like a 2M Black in its frequency response, having slight treble plateau lift and this will give it the same small sense of brightness but good detail the Black possesses. However, the Silver stylus is a simple elliptical and tracking was mediocre, the maximum 2gm VTF being needed to clear 16cms/sec in the midband and 63µm peak amplitude at 300Hz – unimpressive for a modern MM cartridge.

The carbon fibre arm has a first order bending mode at 260Hz and second order harmonic at 520Hz our analysis shows. It is quite stiff and should have a good low end performance, but is a tad lively in the lower midband.

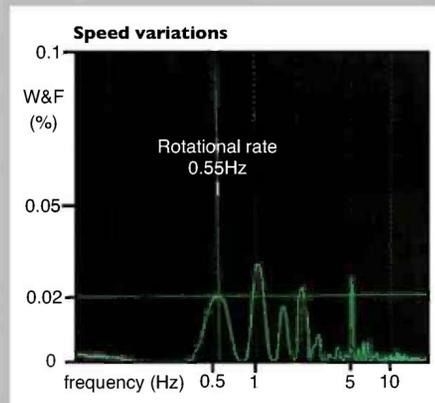
The Pro-Ject 3 Carbon turntable measures well for the low price, having especially good speed stability. Sustained notes will sound stable and pure. **NK**

<b>Speed accuracy</b>	<b>+0.1%</b>
<b>Wow</b>	<b>0.15%</b>
<b>Flutter</b>	<b>0.05%</b>
<b>Total W&amp;F weighted</b>	<b>0.12%</b>

### SPEED VARIATION



### ARM VIBRATION



**PRO-JECT RPM 3 CARBON £599**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

### VERDICT

A well-designed, elegant-looking turntable with fuss-free operation allied to sonically assured performance.

### FOR

- price
- good bass
- realism

### AGAINST

- awkward power switch

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# Hear The

**Musical Surroundings has released a new battery powered phono amplifier. Paul Rigby reviews the Nova II.**

**C**reated to fill a perceived price-point gap, designer Michael Yee approached Musical Surroundings President Garth Leerer with the idea for a new battery-powered phono amplifier, in 1999. That design has run through different models and design tweaks resulting in the new Nova II, which supports both MM and MC cartridges.

“We feature a smart sensing circuit” said Leerer. “Once the battery realises it's gone down to a far enough level, then it will actually switch to Charging mode. When it comes up to fully charged it goes automatically into Charged mode. From there, you can switch it to Play mode which means you internally disconnect the unit from the wall charger.”

This multifunction battery button is resident on the front panel with standard phono amp connections on the rear plus two sets of loading/gain DIP switches. The battery charges in three to six hours with a play time of around five to six hours.

Internally, the circuit design minimises noise while the battery

sits in a new clamshell container (the previous fitting was based upon a Velcro-based system) to both reduce noise and to fix it into the chassis for secure transport.

To test the Musical Surroundings phono amp I decided to run with the Trichord Dino Mk.3 phono amp with an external, separate ‘Never Connected’ power supply. In its own way the Nova II’s battery supply is also a form of ‘Never Connected’ so I thought that the comparison would make interesting listening.

Hooking up both the Ortofon 2M Black MM and Benz Glider SL MC as my cartridge references, I was happy to see a range of gain and loading settings to provide a more exacting match. For the Benz, I used a full 60db of gain and 243 Ohms loading.

## SOUND TESTS

I began by spinning the title track from the 1974 Ella Fitzgerald LP, ‘Take Love Easy’, a stripped production that features the acoustic guitar of Joe Pass as accompaniment.

The first impression of the Nova II, even before I placed the vinyl on the platter in fact, was just how quiet

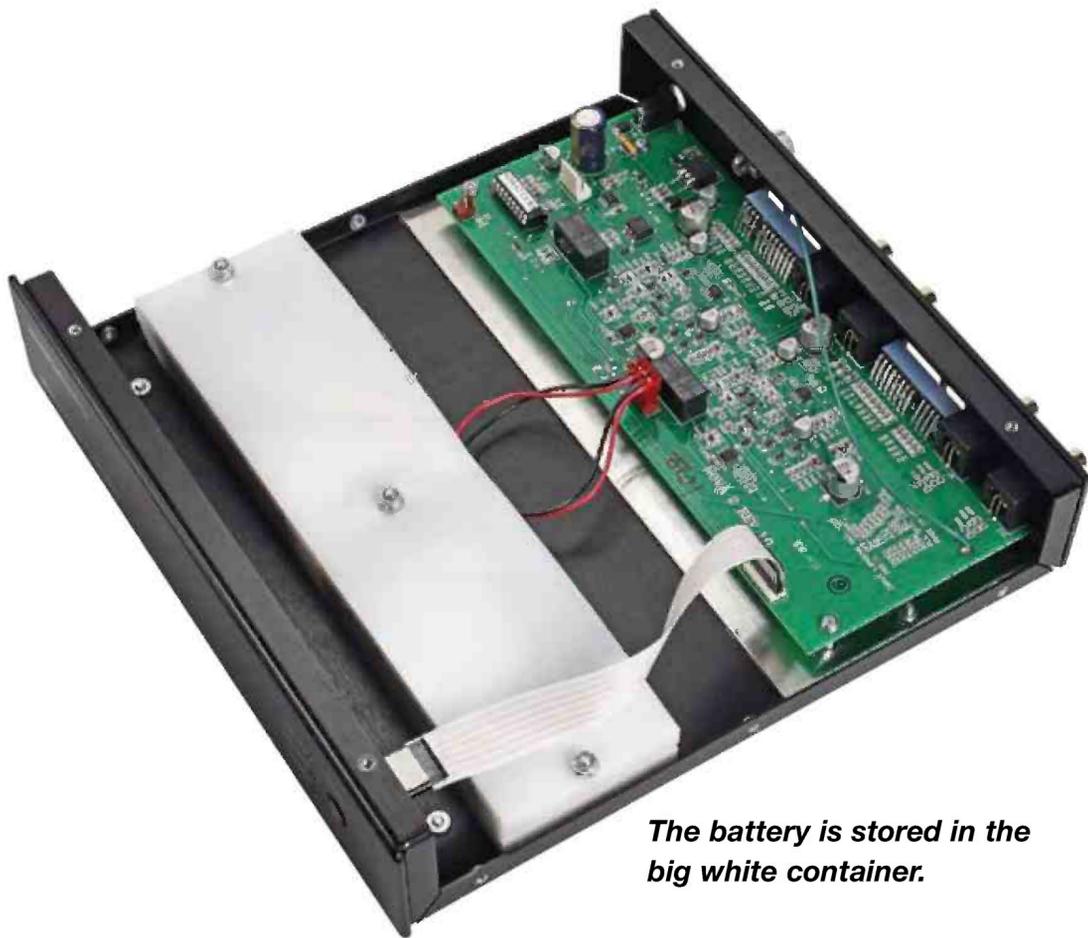
this phono amp was – even at full volume. I find the Trichord Dino with its Never Connected power supply very quiet but this unit takes silence to an extreme!

In MC mode, once I increased the gain on my pre-amp a tad - necessary when compared to the Dino - I was immediately impressed by the clarity of the Nova II, highlighted by Fitzgerald’s voice. Her resonant and closely miked vocal can be prone to an element of bloom, even in subtle terms on the best of equipment, but with the Nova II the sense of clarity was overwhelming as her delivery was focused. Fitzgerald’s emotions spilled forwards during this balladic track.

More than that, Joe Pass’ easy going yet complex guitar sequences, which sat back in the mix, can also be liable to slurring as it merges into the background. The Nova II gave this instrument a sense of emphasis as the plucked strings retained a characterful sound, being tonally realistic.

Switching to a more dynamic and high tempo album and David Bowie’s ‘Low’ and the track ‘Always Crashing in the Same Car’. This is such a busy mix with layers upon layers of effects





**The battery is stored in the big white container.**

and instruments all varying what they do and when, throughout the track.

The problem is, on a poor hi-fi system, this track becomes a mass of noise. Pleasant noise but noise nevertheless.

On a good system, the instruments appear from their hiding place but the low noise output of the Nova II added a new dimension. Such was the busy nature of the music, the Nova II had me moving my head like a cat “didn’t I hear a snippet of guitar here?”, “There was an unusual synth noise there!” and “What was that? An electronic piano?”.

The clarity encouraged by

the Nova II provided lots of new information that was thrust upon my ear all at once. Upper mids and treble were so incisive, I realised that it was going to take five or six listens to take everything in while bass was

clean and characterful.

Lower frequencies brought a new sense of personality to the lower end adding, as confirmed by our test results, an extra rhythmic lift to the bass.

I turned to the eclectic 1970 production of Ananda Shankar’s Rolling Stones’ cover, ‘Jumpin’ Jack Flash’ from his self-titled album to listen in MM mode. Again, the enhanced clarity opened up the upper mids, revealing more synth sounds at the soundstage extremities while the guitar, along with the female backing singers, were both incisive and controlled.

**CONCLUSION**

The result of a long design evolution, the Nova II offers a mature product that provides top quality sound. Compact, well built with enough facilities to provide everything you need to make the most from your cartridge, the Musical Surroundings Nova II is one of the best phono amps in this price range that I’ve ever heard.

**DIP switches are used for “simplicity of the circuit path and the cost factor” said Leerer.**



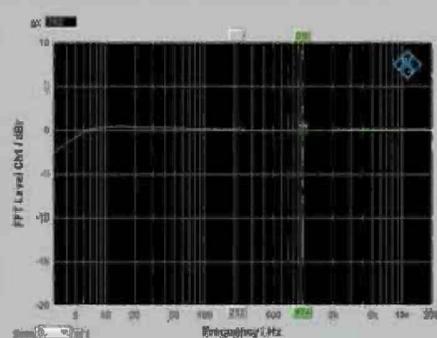
**MEASURED PERFORMANCE**

The gain figures of the Nova II were accurate, maximum gain of 60dB (x1000) being exact. Maximum output was limited at 3V, where 10V is common from mains powered phono stages. This limits input overload values by a factor of 3, or 10dB. Maximum gain is just enough for low output moving coil cartridges that typically deliver 0.5mV, the Nova II delivering 500mV from this input. Amplifiers with 400mV input sensitivity, a common value, will need volume to be turned right up. For high output MCs and MMs gain is sufficient and overload can be avoided by keeping Nova II gain down and amplifier gain up.

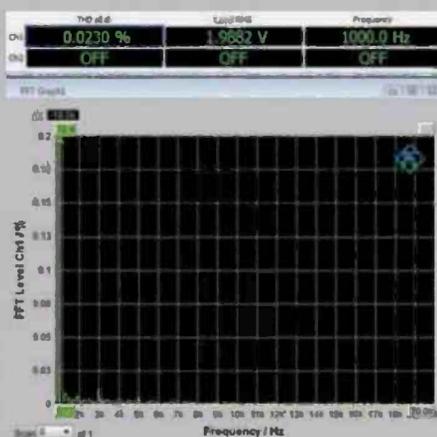
Distortion was low at 0.02% second harmonic, our analysis shows from 10mV in and 1.3V out.

Frequency response was interestingly tailored, our analysis shows. Slight bass lift has been applied – just enough to give subtle heft to the sound, without obviously affecting tonal

**FREQUENCY RESPONSE**



**DISTORTION**



balance. Otherwise, RIAA equalisation was accurate and the Nova II will come across as tonally balanced.

Noise was extremely low, measuring just 0.03µV (equivalent input noise, IEC A weighted). Total lack of hum helps, but hiss was negligible and it looks as if a special ultra-low-noise transistor input pair has been used, like MAT15.

The Nova II was craftily but knowledgeably tailored for excellent results, especially with MC cartridges where it is difficult to get noise low enough to match that of the cartridge.

**NK**

Frequency response	5Hz-20kHz
Separation	72dB
Noise	dB
Distortion	0.02%
Gain	x1000 (60dB) max
Overload	3V out

**MUSICAL SURROUNDINGS NOVA II £1,200**



**OUTSTANDING - amongst the best.**

**VERDICT**

A top quality phono amp that should be on anyone's demo list.

**FOR**

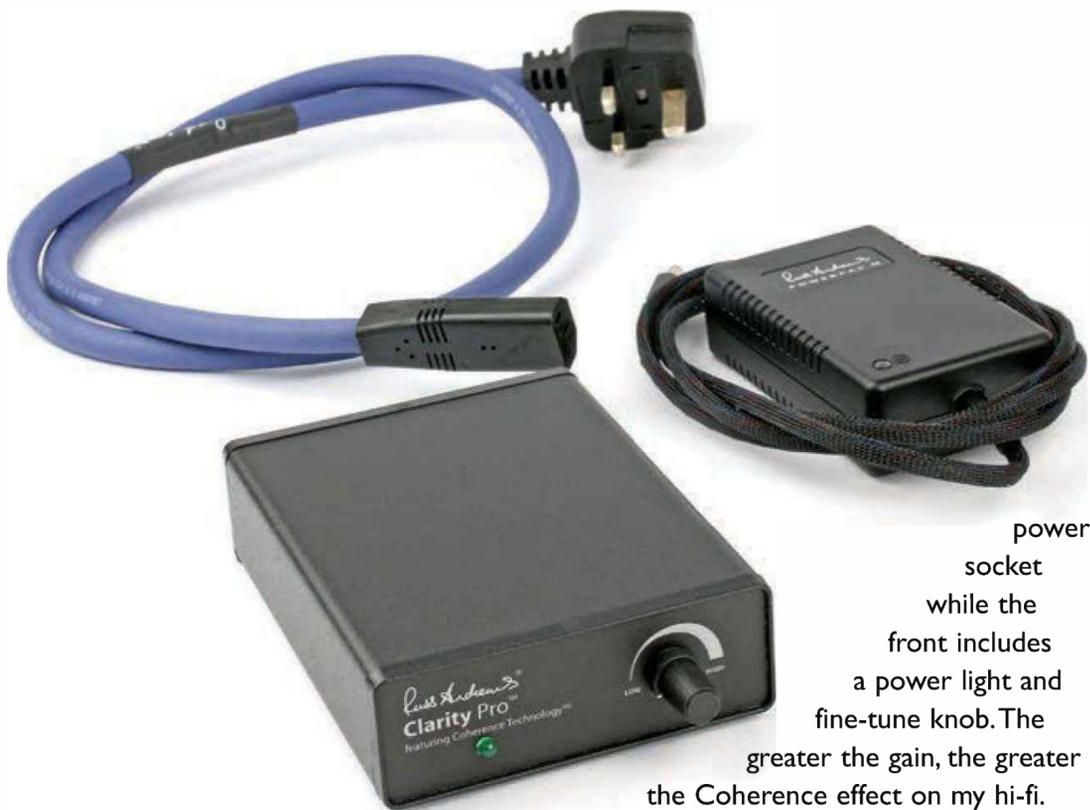
- overall sound quality
- build
- low noise
- easy to use

**AGAINST**

- no mono switch

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### CLARITY PRO £559

Using the mysterious Coherence Technology to “neutralise noise” in your system, Clarity Pro is not quite a mains conditioner in the Isotek sense of the word, it seems more active than that. Used for hi-fi or AV, my example arrived with an external PowerPakII (£106) power supply and PowerMax cable (£60). The rear of the Clarity Pro chassis features a

power socket while the front includes a power light and fine-tune knob. The greater the gain, the greater the Coherence effect on my hi-fi.

More significant changes can be afforded via an internal bank of DIP switches labelled 1-4. The higher the number, the greater the effect.

I played a variety of vinyl rock and jazz pieces. Changing the DIP switches to both ‘1’ and ‘2’ didn’t exhibit a noticeable enhancement. On ‘4’, I actually felt that the Clarity turned into a tone control, hardening the upper mids and giving them a slightly forward feel.

Position 3, with the fine tune knob at the 12 o’clock position did offer reverb enhancements in the upper mids. Turning the knob up to ‘full’, enhanced that effect, smoothing reverb but also ‘darkening’ it. The overall soundstage was also more airy and spacious which lightened the performance, giving it a sprightly feel while bass was smooth and punchy. A remarkable performance, considering that my system was already finely fettled.

Some users will dislike the rather aggressive ‘active’ nature of the Clarity system as opposed to the wholly passive system utilised by my own (although vastly more expensive) Vertex AQ technology, for example.

Nevertheless, for the price, the Clarity does a good job and will, for many budget and mid-range systems, prove to be invaluable in removing noise to enable your hi-fi to perform more efficiently. **PR**

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# SOUNDBITES



### ANALOGUE STUDIO SPIKE STAND BASE £12.99

You know, sometimes, hi-fi kit can just go too far.

Take spike support stands underneath a pair of speakers, for example. That is, the small discs that fit underneath the speaker support spikes.

There are plenty of ‘audiophile’ models out there that not only

support your speakers but purport to enhance the sound of the loudspeakers too, acting as complex isolation systems.

Trouble is, you pay for this sort of thing. Of that class, you’re looking at around £30 or (a lot) more for a set of four ‘feet’. So at least £60 for two stereo loudspeakers.

But there are occasions when all you want is a set of ‘shoes’ to place underneath spiked speakers that do nothing more than protect your precious floor: whether that be of the fancy parquet-type or old fashioned suspended wooden floorboards.

Maybe you just don’t want to see holes in your nice carpet. Do you really have to pay through the nose for that?

Analogue Studio has this requirement squarely in its sights.

Firstly, each set of four discs arrives in a low cost bubble pack. Each disc offers a low profile to help speaker stability.

I placed a pair of KEF Q55 floorstanding speakers on them and was happy to see that each disc has a deep dimple on the upper side to take a fair bit of spike which enhances the solidity of the final structure.

A final surprise was that, even with this basic system, sound quality was slightly improved (namely a reduction in midrange and bass bloom) when compared to the alternative of removing the spikes altogether and laying the speakers squarely on the floor.

The spikes do act as basic isolation points while the compact pad design means that they are not top-heavy or prone to sliding.

Good value for money and highly-recommended. **PR**

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# Four to the Floor

**In the first of a short Olde Worlde series, Martin Pipe revisits quadrasonics. Audio's shamefully decadent past, or an unfairly forgotten route to musical fulfilment?**

**I**n the beginning there was mono, a single 'point-source' of recorded sound (although some tried multiple speakers). Some of it impresses even today – witness the resurgence of interest in replaying 78s and mono LPs with the highest possible fidelity.

Following a considerable amount of theoretical and practical research, 'stereophonics' emerged in the mid-1950s. Listeners could now begin to recreate the experience of being at a live performance thanks to the image created by the two speakers in front of them. Classical and jazz fans - the first to enjoy the fruits of stereo - could identify specific musicians and their location in the orchestra or band and immerse themselves in the venue's unique ambience.

By the late 1960s, pop and rock acts were reaching new heights of creativity – stereo sound, alongside advances in recording technology, allowed them to start realising their artistic visions. And that meant sophisticated studio efforts, rather than the straight recreations of stage performances (which could always be sold to the record-buying public as 'live' albums).

Public interest in stereo and hi-fi was gaining momentum too, and a sales boom would follow early in the next decade. Compared to today, there were few distractions competing for spare time, and people took their music seriously.

Studio sophistication was improving in leaps and bounds; effects, synthesisers, mixers with more channels and tape machines with ever-greater numbers of tracks to bounce around.

You had 2-channel stereo in front of you, so why not 2-channel stereo behind you as well? You would, as a result, surround yourself with sound. Classical music would better-recreate the natural ambience through reproducing the effects of concert-hall reverberation. And the rock crowd would be given more creative freedom in terms of instrument/



***A comprehensive quad system built around a top-of-the-line Pioneer QX949 receiver. TEAC's A3440S four-channel reel-to-reel can be seen, as can a Technics SL1200 Mk3 turntable (equipped with a new Audio-Technica AT440MLb cart - (we'll discuss why in a future article!).***

***Between the receiver and the turntable is a JVC 'CD-4 demodulator', a device needed to play a specific type of quadrasonic vinyl record, that until recently was in the loft of editor Noel Keywood. Its significance will be discussed next month.***

vocal/effect placement.

As such a system was comprised of two front and two rear channels, it became known as 'quadrasonics'. A few variations of the term (quadrasonics, for example) also existed to confuse the consumer although, as we'll see, much worse was to follow! Recording engineers would mix albums down to a special four-channel master, as well as the standard two-channel one. By now, 16-track tape was commonplace in studios, with 24-tracks only around the corner. As a result, immersive quad mixes were possible.

This four-channel mix would be distributed on whatever format the industry would agree on. The first

quadrasonic system, introduced in 1969, was undoubtedly the best. This was a 'discrete' system that recorded each quad channel as a separate track on analogue quarter-inch reel-to-reel tape, usually running at 7.5ips. As a result, there was excellent separation between channels. Ironically, the first stereo records were offered to music-buyers on tape too.

The problem of this four-channel tape format, which became known as 'Q4', was its expense. Media and duplication costs were high; furthermore, the consumer was expected to shell out on a four-channel tape machine. And these weren't cheap. The best example of such a machine was Teac's high-end

A3440 – £750 (!) in 1976 – which enjoyed far more success as a semi-pro recording tool. Even the most affordable models sold for the same money as a really good cassette deck or turntable.

Q4 never really made an impact in the UK, but those seven-inch reels achieved moderate acceptance in the US, where disposable income was, of course, significantly higher. There, listeners were happy to shell out as much as \$40 for a Q4 tape. At the time, a typical LP sold for less than a tenth of that amount.

The reward was sound that could be breathtakingly good – examples include The Doobie Brothers ('What Were Once Vices...'), The Doors ('Best Of'), Enoch Light ('Future Sound Shock'), Black Sabbath ('Paranoid') and The Moody Blues ('Seventh Sojourn'). Some later releases were even encoded with Dolby B to all but banish hiss. But Q4 slowly faded away, for much the same reason reel-to-reel stereo all but disappeared as a distribution medium over a decade previously.

There was however more to quad tape than reels. In the late 1960s and early 1970s, motorists caught onto the endless-loop 8-track tape format as a means of escaping the tastes of radio DJs and playlist committees. Now they could enjoy their choice of music! Originally conceived with four stereo playback

Teac's A3340S was one of the better-known quad reel-to-reel decks. It offered a 15ips speed in addition to the 7.5ips that was commonly used for commercial Q4s (a tiny number of 15ips 'audiophile' Q4s, and a few 3.75ips tapes - incompatible with this Teac deck - were released). It was considerably more popular as a semi-professional four-channel recorder, thanks in part to the 'simul-sync' recording feature that allowed musicians to 'build up' songs one track at a time. In the 1980s, these machines could frequently be seen at gigs (and on TOTP!) providing backing tracks.

'programs', the format's eight tracks were in 1970 redeployed to offer an alternative - two quad playback programs.

Quadraphonic eight-track players, with the four speakers installed around the vehicle's cabin, were offered by car manufacturers and as aftermarket retrofits (specialist retailers, like the in-car department of Lind-Air in London's Tottenham Court Road, could arrange for your Cortina or Jag to be 'quadded-out').

The same machines could play ordinary stereo tapes, only switching to a fully-discrete four channels when they detected a special lug exclusive to 'quad-8' (Q8) tapes. Once again, Q8 was far more successful in the US – a nation of motorists – than it was here.

Much of the Q4 catalogue was also available in Q8 form - some quad material, meanwhile, was unavailable in any other form. If you wanted to, for example, listen to the astounding quad mix of Kraftwerk's 'Autobahn' a Q8 playback system was essential. Sadly, this much-prized Q8 wasn't distributed widely in the UK. Very occasionally, though, the reverse situation applied.

The EMI/Harvest Q8 containing Alan Parson's quad mix of Pink Floyd's 'Dark Side of the Moon', which was for some reason only sold in this country, was until recently the

only means of hearing it – i.e. spread across four discrete channels – as intended. Virgin specimens tended to change hands for enormous sums of money, thanks to its rarity. Thankfully, every Pink Floyd fan now can listen to this amazing version with modern equipment, thanks to the 'Immersion' box set!

The latter's sound quality trounces that of the original Q8, but that's no great surprise. Q8 was a pale imitation of Q4 in performance terms – thanks to its slower (3 3/4ips) speed and narrower tracks. Most releases sounded thin, compressed and lacked sparkle. Pitch instability tended to be problematic, and the cartridges

**Tascam started selling its four-channel Portastudio to aspirant musicians. Some Portastudio-type recorders (models with four simultaneous inputs and outputs) can be used to record and play quad.**



weren't particularly reliable either. Eight tracks were eventually ousted, in homes as well as cars, by the Philips compact-cassette. As

**Despite the claims of 'world' fame, the 'Grenadier' speakers from US manufacturer Empire - made for "modern four channel living" – seem to have been forgotten. They will instead forever be associated with advertising that featured groovy naked chicks! It was the early '70s, and that's how things rolled...**

# HI-FI WORLD

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The screenshot shows the Apple App Store page for the Hi-Fi World app. The page includes the following elements:

- Header:** "App Store > Entertainment > audio web publishing ltd" and a search bar containing "HI-FI WORLD".
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- Buttons:** "Get" button, "Offers In-App Purchases", "This app is designed for both iPhone and iPad", "Rating: 4+", "LINKS", "Privacy Policy", and "© 2014 Hi-Fi World".
- Details Section:** "Hi-Fi World" by "audio web publishing ltd". Tabs for "Details", "Ratings and Reviews", and "Related".
- Screenshots:** A row of five screenshots showing the app's interface on an iPhone. The first shows a magazine cover for "HI-FI WORLD" featuring an "OPPO BDP-105D" player. The second shows a "contents" page with various articles and prices. The third shows a "Paint It Black" article with a Chord cable. The fourth shows a "Hi-Fi World" article with a photo of a person. The fifth shows a "DECEMBER 2014" issue cover.
- Description:**

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- Information:**

Developer	audio web publishing ltd
Category	Entertainment
Updated	6 Dec, 2014
Version	1.0
Size	9.0 MB
Rating	Rated 4+
Family Sharing	Yes
Compatibility	Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch. This app is optimised for iPhone 5.
Language(s)	English

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it accommodates four tracks, why couldn't we have the cassette 'equivalent' of a Q4 tape? This was discussed but Philips rejected the proposal as the resulting tapes wouldn't be properly 'backwards-compatible' with mono and stereo machines. For a start, it would have been a 'single-sided' medium; turn the cassette over, and you would have heard your music 'backwards'! A conventional stereo player would have reproduced two of the four channels intelligibly on one side, and

track head specified for an early autoreverse deck. A C90 gave 45 minutes of 'one-way' recording; enough for an album.

In the mid-70s, JVC demonstrated the prototype of a cassette deck that would have accommodated Philips' concerns. This machine span eight tracks – two-side recording, as with all other cassette implementations – across tape that was a mere eighth of an inch or so wide. Dropouts, alignment issues and (despite JVC's ANRS Dolby-B 'soundalike') signal-to-noise ratios must have been horrific!

The ironic thing is that a few years later, Philips capitulated. A discrete four-channel, four-track system formed the basis of the 'Portastudio'. Introduced in the late 1970s, this was a budget cassette



**More prominent in the autocentric US than it was here, the 'Q8' - the quadrasonic rejig of the eight-track cartridge; quite a choice of music was available. Mains-powered players, like this JVC 1202, enabled you to enjoy stereo and quad eight-tracks on your home system. Akai sold a machine with recording facility that enabled 'true believers' to make quad tapes for the car!**



**'Reel' quadrasonics! This would have been one of the best ways of hearing soul-singer Al Green's 1973 album 'Livin' For You. It's a 'Q4' four channel tape, running at 7.5 inches per second. Q4 was the best of all consumer quad formats.**

the others 'in reverse' on the flip.

Had Philips given it the 'go-ahead', though, quad might have lived longer. Cassettes became incredibly popular, and you got the excellent separation of a discrete four-channel format. All that would have been required was the correct labelling on the retail package. I did hear of an enterprising individual who built his own in-car quad cassette player, using a four-

**WHAT YOU SHOULD KNOW ABOUT FOUR-CHANNEL STEREO**  
A non-technical guide from Pioneer



**In the UK, as in the US, Pioneer was a major Japanese backer of quadrasonics. Others with interests in this field included JVC, Technics, Sansui, Akai and Sony. Most produced guides that attempted to explain quadrasonics to potential customers in plain English.**

based home-studio recording system for musicians who were unable to afford mighty reel-to-reel machines like the Teac 3440. Well, them and Bruce Springsteen (who recorded his

classic 'Nebraska' album on one)!

Interestingly the Portastudio, which spawned numerous imitators and successors, was made by Tascam – the professional audio division of Teac. They ran cassettes at twice the speed for better audio but some supported the standard 'compatible' speed. Portastudio-type cassette machines able to input and output four channels simultaneously can of course also be used for quadrasonics. That's how our chappie with the DIY in-car player was able to record his quad LPs in the first place. Quad LPs? Yes - things were about to get complex...

**In the next part, we discuss how four-channel came to vinyl records**



**Not everyone could afford to shell out over \$1000 for a TEAC quad reel-to-reel, and so firms like Radio Shack (the US equivalent of today's Maplin) sold much cheaper models. Lacking TEAC features like 'simul-sync' recording and large reel capacity, the Japanese-made 'Realistic 494' sold for less than \$300. However, it did offer three speeds - and three heads, for off-tape monitoring. Even in 1973, though, \$300 bought a great turntable...**

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WANTED: AUDIO- Technica aluminium alloy S-shaped spare pipe for AT1100 tonearm (detachable) Tel: Toni 07971 953628

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**CLASSIC NAKAMICHI**  
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www.bowersandwilkins.co.uk

**ARKLESS ELECTRONICS**  
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# NEXT MONTH SEPTEMBER 2015 ISSUE

## EAT C-SHARP TURNTABLE

A glorious assembly of shiny aluminium parts in many forms, with carbon fibre plinth and tapered carbon fibre arm, the new EAT C-Sharp turntable is a treat for the eye. Spinning LP could hardly be more glamorous than this. But how well does it perform? Paul Rigby has a Benz Micro Glider in it right now and will report his findings in our September 2015 issue. Don't miss it.



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# NATIONAL HEALTH

## NATIONAL HEALTH

### ESOTERIC



"for National Health, it's almost as if the band was created to spite punk"

**N**o one talks about this band anymore. Why? This is prog rock but it's prog that might have been written yesterday. It has imagination and innovation and was always supremely musical – with a jazz underpinning that encouraged a number of interesting solos. The band was created at an odd time, just as punk hit its height in 1977. In fact, National Health founder member Dave Stewart did comment that his band was emerging amongst "...some of the most crass, simplistic, brutal, ugly and stupid music imaginable, in an atmosphere where an admitted inability to play one's instrument was hailed as a sign of genius".

It's just a pity that he wouldn't come off the fence and tell us what he really felt. For National Health, it's almost as if the band was created to spite punk. In fact, with a number of members of other Canterbury and post-Canterbury bands such as Hatfield and the North, Gilgamesh and Henry Cow, maybe it was.

In fact, the band was created by Dave Stewart of Hatfield and Alan Gowen of Gilgamesh. The initial idea was to merge the two groups into one entity. But that would have meant that you'd have a whopping great nine-member group so it was cut down, taking out guitarist Phil Miller and drummer and bassist Neil Murray (the ex-Colosseum man who would wander over to Whitesnake later on). Listening to the album, you'll also hear Hatfield vocalist Amanda Parsons adding low-key warbling. On the drums was Pip Pyle from Hatfield but, for a while, it was another top-quality drummer, a certain Bill Bruford of Yes and King Crimson. In fact, you can hear Bruford with National Health on a couple of recordings, namely a couple of demo tracks and radio sessions.

Bizarrely, Bruford couldn't continue as drummer because he was in Phil Collins' seat playing with Genesis, as well as attempting to form an all-star trio with Rick Wakeman and John Wetton! Bruford was replaced by John Mitchell, who stayed for several months but ended up playing just one gig, at Louveciennes in France. Oh, the tangled web of prog. Just to complicate things further, Stewart would

remain firm friends with Bruford, becoming a member of Bill Bruford's own band, Bruford, later on.

"There was a strong anti-establishment, rather hippy bias within the group, especially from the ex-Hatfield guys – less so with Bill Bruford, obviously" said Neil Murray. "I thought Dave Stewart wrote some very interesting 'songs'. The other guys' compositions had more areas in them which allowed more freedom. I enjoyed the memorable tunes and interesting arrangements. I think that the most English and cerebral portions of the music were the most successful".

"We made almost no money from gigs, and obviously had to spend a lot of time rehearsing, and luckily Dave was good at organising what tours that were possible, though by 1977 the audience for that kind of music had become pretty small".

The album is quite low-key in many ways. There's no great punch or rhythmic foundation to the piece which spans five extended tracks. It's thoughtful and contemplative and, at times, rather pastoral, allowing your mind to wander. In some ways, the album gives you an almost ambient sense of music, especially 'Brujo'. The multifaceted suites will be familiar to Hatfield fans, with its instrumental Canterbury sound at its most accomplished.

Despite the rather 'at ease' formula, you can still discern differences in tone and approach. Those songs written by Gowen differ from those written by Stewart.

There is no sense of tension, rivalry or clashing between each song, though. Each flows into another easily and without any apparent disharmony. It is obvious to the ear that this music has an easy organic flow through its twists and turns of melody, harmonics, rhythm, texture and timbre. Music this complex and densely varied, particularly in the rock realm, seldom feels light and breezy.

You can check out other Esoteric releases this month which will be of interest to fans of National Health, including Soft Machine's 'Bundles' (1975), Bill Nelson's 'Simplex' (2000), Aardvark's self-titled album (1970), Man's 'Reanimated Memories' (2015) and Pavlov Dog's 'Pampered Menial' (1975). **PR**

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