

# HI-FI WORLD

JANUARY 2018

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JANUARY 2018





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Chord Signature Range  
Hi-Fi World Dec 2015



*"Sarum T is a product that demands to be heard, by cables sceptics and advocates alike"*

Chord Sarum T Range  
Hi-Fi+ May 2017

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**CHORD**<sup>TM</sup>  
COMPANY



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Paul Rigby, Jon Myles, Martin Pipe,  
David Tull.



**O**utstanding products still exist. The way Technics recently re-engineered the motor of their SL-I200G Direct Drive turntable is one shining example. Nowadays, Direct Drive motors are used everywhere and Technics could have bought one in. Or they could have asked Hanpin of Taiwan or a Chinese supplier to do 'em a cheap deal on a big order. Instead they have

designed entirely their own dedicated turntable motor, platter and all else using the latest materials and technologies, all built in Japan.

We had to be impressed at Hi-Fi World. Our measurements revealed a performance unmatched elsewhere. What more could you ask for than one of the world's top CE companies to apply this much investment and dedication to a hi-fi turntable. Unsurprising then that the Timestep Technics SL-I 200GR should receive one of our World Awards for 2017. Simply outstanding.

Similarly, Chord Electronics could have taken the easy and obvious route to producing digital replay products, but instead they took the hard way, designing the crucial digital-to-analogue convertor chip in-house. Few companies in the world are able to do this and – better – our measurements show that Chord's convertor is ahead of almost all others. Outstanding is the only way you can describe such successful effort. No wonder Hugo 2 gains a World Award for 2017.

And finally, on the issue of unique and outstanding technologies dedicated to the art of high quality audio reproduction I come to Martin Logan and their fabulous XStat electrostatic loudspeaker panel. Loudspeakers remain the most contentious subject in audio, but where most manufacturers put drive units in boxes, Martin Logan offer a solution that's quite different. Their Classic ESL9 was a stunning product that moved the art of audio ahead in 2017. Again, here's a unique and technologically outstanding product that fully deserves a World Award for 2017.

I hope you enjoy our annual World Awards issue that brings you the best of what you can buy and enjoy today – and may be classic tomorrow.

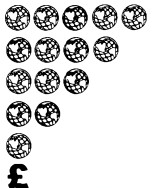
**Noel Keywood**  
**Editor**



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## verdicts



**OUTSTANDING** amongst the best  
**EXCELLENT** extremely capable  
**GOOD** worth auditioning  
**MEDIOCRE** unremarkable  
**POOR** flawed  
**VALUE** keenly priced

## 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.



## ELECTRONIC MAGAZINE

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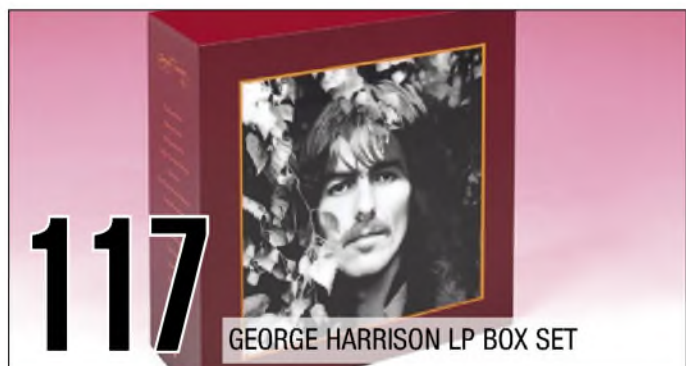
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# Tellurium Q®

10 products of the year and most wanted components in just 2 years by preserving relative phase relationships in a signal



## Introducing the new award winning Black II speaker cable

"Tellurium Q have surpassed themselves here. It is often said that all cables colour the sound of a system to some extent, but the Silver Diamonds do it to a lesser extent than any other product I've heard so far."

John Myles, HiFi World

"If you're looking for a major jump in your system's performance, I'd suggest buying a pair of these instead of considering a hardware upgrade. Before you write this advice off to cable delusion, expectation bias, or the recent Mercury retrograde phase, please take note: I have never said this in TONE's 11-year history"

Jeff Dorgay, Tone Audio

"Well, I have just stumbled upon a speaker cable that I'm very tempted to put in a class of its own"

Mono & Stereo



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== TQ ==



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# news

## BACK TO THE FUTURE

McIntosh continues to roll out new amplifiers – and the latest one looks something special.

It's the iconic American company's first valve/transistor hybrid with a retro design based on the legendary McIntosh MC275 vacuum tube amplifier.

The MA252's pre-amplifier stage uses two 12AX7 and two 12AT7 valves (tubes) housed inside stylish protective cages. The amplifier's output stage is a direct-coupled solid-state amplifier that delivers 100 watts per channel into 8 Ohms speaker and 160 watts into a 4 Ohm load.

There are two unbalanced and one balanced input as well as a moving magnet phono stage. Other features include bass and treble tone controls as well as a full range sub-woofer output.

Also included is McIntosh's proprietary Power Guard technology which monitors the output signal for signs of overdriving and makes real-time micro adjustments to the input signal to prevent clipping.

The amplifier is on sale now priced at £4500. Look out for a review in these pages soon and for more information contact McIntosh's UK dealer Jordan Acoustic at [www.jordanacoustics.co.uk](http://www.jordanacoustics.co.uk)



## DEVIALET POWER BOOST

Innovative French company Devialet has boosted the performance of its entry-level wireless Phantom loudspeaker.

The distinctive-looking unit has had its already substantial power boosted by 60 per cent to 1200 Watts from its previous 750 Watts.

It comes courtesy of Devialet's patented ADH2 (Analogue/Digital Hybrid) technology – a combination of Class A and Class D operating in parallel where the former sets the voltage output while the latter provides most of the current.

Despite the upgrade the price remains the same at £1290. For more information and to book a demonstration at one of Devialet's dedicated showrooms log-on to [www.devialet.com](http://www.devialet.com).

## KEF SPOTIFY

KEF has added Spotify Connect capability to its standmount LS50 wireless loudspeakers.

It means owners can stream Spotify's entire library of over 30 million songs direct to their 'speakers'. The facility is activated via a firmware update and once the Spotify app is downloaded to a tablet or smartphone it acts as the remote control.

The new feature adds to KEF LS50's already impressive connectivity list which includes DLNA streaming, Tidal integration and Bluetooth as well as stereo analogue, optical and USB Type B inputs. For more information log-on to [uk.kef.com](http://uk.kef.com).





## WHARFEDALE SURROUND SOUND

Anyone looking for surround sound on a budget should check out Wharfedale's latest package. Its new DX-2 system consists of front and rear satellite 'speakers, a compact centre channel and an active subwoofer – but costs just £449.95. An extra £99.95 will buy another pair of loudspeakers for those wishing to expand to 7.1 sound.

The satellites measure 19cm x 12cm x 12cm (HxWxD) and can be either wall or stand mounted. They incorporate a 19mm silk dome tweeter and 75mm mid/bass driver with a woven polypropylene cone in a closed-box design. The DX-2 Centre incorporates the same silk dome tweeter flanked by two 75mm mid/bass drivers in a 12cm x 31cm x 12cm (HxWxD) cabinet.

Finally, the WH-D8 subwoofer combines a 200mm long-throw bass cone with a 70 Watt amplifier. Peter Comeau from Wharfedale's parent company IAG said "The DX-2 incorporates elements from Wharfedale's award-winning loudspeakers to deliver a high-value package that is not only a delight in the home, but also extremely enjoyable to listen to. Modern movie soundtracks are exceptionally demanding, but we've made sure that this package is tailor-made for the job." Further information at [www.wharfedale.co.uk](http://www.wharfedale.co.uk).

## CHORD POLY

Chord has launched the Poly - a dedicated add on unit that adds streaming and DLNA capability to its award-winning Mojo headphone amp/DAC.

Costing £499 the Poly can stream music from UPnP devices such as NAS drives, and it also features Apple AirPlay and Bluetooth. A microSD card slot with unlimited capacity offers local playback of stored files.

The Poly slots into the digital connection on the Mojo with output via the latter's two 3.5mm output for headphones or connecting to a hi-fi (with a 3.5mm to two RCA adaptor lead). Once connected the Mojo's main features all remain operative - including coloured buttons indicating sample rate up to 784kHz for PCM digital files, as well as DSD 256.

We had a good listen to the Poly during its official launch at The Goring Hotel in London's Belgravia and it sounded rhythmic, punchy and extremely detailed - perfectly complementing the already impressive Mojo. Watch out for our full review coming soon. Go to [www.chordelectronics.co.uk](http://www.chordelectronics.co.uk) for further information.



## IFI NANO BLACK LABEL

Speaking of the Chord Mojo - specialist component maker iFi has the product firmly in its sights with the new Nano iDSD Black Label high-resolution headphone amplifier and DAC.

Priced at £200 it features a Burr Brown DAC capable of replaying tracks up to 32bit/384kHz as well as DXD and DSD256 files plus MQA material.

iFi says the amplifier section has 10 times the power of the likes of an iPhone 6 so is suitable for in-ear headphones as well as more demanding over-ears.

With a 3.5mm line-level output as well as two headphone sockets the Nano iDSD can be used as part of a traditional hi-fi system as well doubling as a portable device with a claimed 10-hour battery life.

There's an analogue volume control and two filter options are also employed - Listen which iFi says provides best sound quality and Measure which (as the name suggests performs better in pure measurement tests).

We have one on the test bench now so see a forthcoming issue for our comprehensive review. More details are also available at [ifi-audio.com](http://ifi-audio.com).



## DENON ENVAYA

Denon has unveiled three new Bluetooth loudspeakers in its Envaya range.

The Envaya, Envaya Mini and Envaya Pocket. The Envayas are designed for both indoor and outdoor use and feature Bluetooth aptX. Battery life is between 10 and 13 hours.

The Envaya has two channels of 13 watts each, the Mini 2 x 8.5w and the Pocket by 2 x 6.5w.

The Envaya Pocket costs £90, the Envaya Mini £130 and the Envaya £170. For more details visit [www.denon.co.uk](http://www.denon.co.uk).







## COMPACT CABASSE

High-end French manufacturer Cabasse has introduced a new compact floorstander using technology trickled down from its flagship L'Océan and La Sphère loudspeakers.

The Murano Altos features the BC13 co-axial tweeter/midrange driver from the L'Océan which is fitted with a new aluminium waveguide to integrate with the twin 17ND36 bass drivers that in turn are smaller versions of the honeycomb membrane woofers developed for the La Sphères.

The Murano Altos come housed in a cabinet measuring 102.6cm x 27.5cm x 37.5cm (H/W/D). Price is £8000. Find out more at [www.cabasse.com/en](http://www.cabasse.com/en).

## CLEAN MACHINE

Looking to keep your records clean? Meet Project's VC-S MkII. It's an update to the original VC-S and features vacuum technology which dries the record in two rotations after the cleaning fluid has been applied.

Upgrades to the former model include lower-noise motor with dual-directional rotation which is said to give deeper cleaning in the record grooves, and the stainless steel clamp has also been redesigned.

The Project VC-S MK II is available now priced at £350. For more information go to [www.project-audio.com](http://www.project-audio.com).



## CABLE BOOSTER

Active anti-resonance damping material is not a phrase you hear everyday - but it's a key ingredient in Furutech's new NCF Booster.

The £329 device is a cable holder designed to lift loudspeaker leads off the floor to help reduce interference and optimise alignment between connectors and sockets. The NCF goes a stage further by using NCF's Nano Crystal 2 Formula (NCF) which is a resonance-damping material designed to eliminate static and micro vibrations in the cable to allow a purer signal.

Apparently the NCF Booster proved so successful on its Japanese launch that initial stocks sold-out to industry insiders before they even reached retailers' shelves - forcing the company to ramp up production for its international launch. For more information visit [www.furutech.com](http://www.furutech.com).



## METER MAGIC

Retro volume meters have a certain style as McIntosh amplifier lovers will tell you. But in a pair of headphones?

Yep, that's the big selling point of Meters Music's new OV-1B over-ears. Don a pair and anyone nearby will be able to tell just how loud your music is thanks to VU meters on the side.

The OV-1Bs are also wireless with noise-cancelling built in and aptX HD support. They are priced at £330. Visit [www.metersmusic.com](http://www.metersmusic.com) for more details.



## SAINSBURY'S VINYL

First it helped boost the vinyl revival by stocking LPs. Now it's going a step further by launching its own record label.

Who? Sainsbury's. Yes, the supermarket chain has joined forces with Saint Etienne songwriter/producer/musician Bob Stanley to launch a series of albums. They'll come under Sainsbury's Own Label imprint and be available in all of the company's 168 stores.

The first two releases are compilation albums entitled 'Hi Fidelity - A Taste Of Stereo Sound' and 'Coming Into Los Angeles - A Taste Of West Coast'.

They combine familiar tracks including Mike Oldfield's 'Tubular Bells' and Al Stewart's 'Year Of The Cat' with more esoteric material like The Flying Burrito Brothers' cover of The Rolling Stones' 'Wild Horses'.

They also come in striking modernist artwork sleeves inspired by the work of Sainsbury's in-house design studio of the 1960s and 70s which will please fans of retro-looking covers.

Sainsbury's Head of Music Pete Selby, said: "Our customers' love of vinyl shows no sign of abating so, alongside the classics albums, we want to offer our shoppers something they won't find anywhere else. Our exclusive Own Label records have been carefully tailored towards the inquisitive, cultured tastes of our customers so we're confident that they'll love the sound of our new releases and our ever increasing vinyl range."

Prices and release dates are yet to be announced. Sainsbury's has already sold almost 300,000 vinyl albums to date since stocking LPs alongside its groceries with Fleetwood Mac's 'Rumours' being the best-seller with over 12,000 units sold.

Speculation that future releases could include tracks from Bread Zeppelin and The Stone Roses remained unconfirmed at the time of going to press.



The new 800 Series Diamond  
didn't get better by chance.  
It got better by change.  
868 changes to be precise.

**Bowers & Wilkins**

[bowers-wilkins.com](http://bowers-wilkins.com)





# ★ HI-FI WORLD AWARDS 2017



**E**very year Hi-Fi World reviews scores of products and accessories - ranging from the budget to the decidedly high-end.

Our extensive listening tests and comprehensive technical measurements using state-of-the-art equipment means we can give you a unique insight into everything from DACs to amplifiers, streaming products and cables.

Inevitably, some products impress us more than most due to their overall performance. So here is our annual Hi-Fi World Awards, highlighting the best components we have heard over the past 12 months.

#### AWARDS 2017

BEST LOUDSPEAKER  
BEST AMPLIFIER  
BEST HI-RES PORTABLE  
BEST DAC  
BEST NETWORK PLAYER  
BEST TURNTABLE  
BEST CARTRIDGE  
BEST WIRELESS SPEAKER  
BEST LOUDSPEAKER CABLE  
BEST HEADPHONES

#### WINNER

p12  
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 **BEST  
LOUDSPEAKER**

MARTIN LOGAN  
CLASSIC ESL 9

Reviewed: October 2017 issue

**R**arely does a loudspeaker come along that seems to redefine the very essence of hi-fi. But that's just what Martin Logan's Classic ESL 9 electrostatics achieved when arriving in our listening room.

Boasting a large version of the company's fabulous XStat electrostatic panel atop a passive bass cabinet, these loudspeakers have tremendous dynamics and a see-through quality traditional box loudspeakers simply cannot match.

Indeed, Noel Keywood believed they were arguably the best loudspeaker he had ever heard saying "A thoroughbred tuned to a high state of ability these are loudspeakers worth hearing. They offer a sound far different to most else. Stunning is the word that summarises them. I walked away dazed but in no way confused as to their abilities".





## ★ BEST AMPLIFIER

# DEVIALET EXPERT PRO 220

Reviewed: October 2017 issue

**F**rench firm Devialet caused a stir when it introduced its first amplifier some seven years ago based around an innovative ADH (Analogue/Digital Hybrid) architecture - a combination of Class A and Class D amplification operating in parallel where the former sets the output voltage while the latter provides most of the current.

Since then it has steadily revised the technology: the Expert Pro 220 takes things to a new level. With both digital and analogue inputs (including both MM and MC) plus 220 Watts of power into 6 Ohms it is an engineering tour-de-force with masses of power and a sublime sound.

With 'Never Known' from The Durutti Column's 'LC' CD, Vini Reilly's simple guitar riff had air and space around the chords, the reverb washing gently in the background. The vocals - barely audible through many an amplifier - were intelligible and haunting.

Add in the fact that the '220 looks superb with a case carved out of a single block of aluminium and it all adds up to a deserved winner.



# ★ BEST PORTABLE HIGH-RESOLUTION PLAYER

## COWON PLENUÉ 2

Reviewed: December 2017 issue

Portable digital audio players have come a long way in recent years – and this new Cowon is the best we have come across.

Measurement showed it out-performs just about all other players out there – even most mains-powered hi-fi digital converters.

For top specs Cowon have used an interesting new DAC chip from AKM of Japan – the 4497EQ that gives fabulous results, in conjunction with Texas Instruments' SoundPlus amplifiers that drive the headphones via a standard 3.5mm stereo jack socket or a 2.5mm balanced output.

There's 128GB of on-board memory that can be supplemented by a plug-in 256GB microSD card while most major file formats are supported.

Most importantly it sounds superb with a full-bodied smoothness allied to a class-leading level of insight. This is one player able to reveal unheard details in even the most familiar of tracks.





## ★ BEST DAC

# CHORD HUGO 2

Reviewed: December 2017 issue

**U**nlike most firms who use off-the-shelf chips for their DACs Chord design their own digital-to-analogue convertor. It means Hugo 2 has internals no other DAC has – and it sounds like it.

Different is the word. Pressing the Play button on an Astell&Kern AK120 portable digital player, connected in optically, Hugo 2 raced off the line with Fleetwood Mac's 'Go Your Own Way' (24/96).

Mick Fleetwood's bass line was resolved conspicuously well in terms speed and drums were firm and powerful centre stage: Hugo 2 comes over as fast paced – and super sharp in its timing.

Rock tracks confirmed Hugo 2 is strongly about pace, insight and timing – and gripping to hear. It has fine high-frequency resolution and strong top-end bite, cornet in Duke Ellington's 'Stomp Jones' rasping out with firm projection.

Put simply Hugo 2 is a wonderfully hewn product that looks great, feels great and delivers a vivacious sound, succinct and full of detail.



★  
**BEST NETWORK  
PLAYER**

**AURALIC ARIES**

Reviewed: June 2017 issue

**T**he Auratic Aries is the ideal way to add high-quality streaming capabilities to your existing system for the relatively wallet-friendly price of £1495. Simply attach the Aries to a digital-to-analogue convertor or a DAC-equipped amplifier via its AES/EBU, coaxial or Toslink outputs and it will replay music at up to 24bit/192kHz resolution from computers, NAS drives or other DLNA, UPnP compatible servers in the house.

Alternatively, there's a USB input and output which will accept up to 32bit/384kHz files (if you happen to have any) plus DSD64, 128 and 256.

Playing music heavy with ambient and spatial atmosphere such as Kraftwerk's live opus 'Minimum- Maximum' it delivered expansive, three-dimensional musical images.

This ability to present a clear, detailed reproduction of the music came through on any genre played through the Aries – be it pop, rock, classical, chamber or whatever. And, of course, the better the file quality and DAC you choose to run it with the more impressive that performance becomes.





# ★ BEST TURNTABLE

## Timestep Technics EVO SL-1210 GR

Reviewed: August 2017 issue

**T**imestep takes Technics latest budget Direct Drive turntable and sprinkles magic on it. Upon the basic deck a new arm is fitted: a Rega-sourced, Michell tuned UK arm suitable for all cartridges (MM and MC). Also, a small, external linear power supply replaces the original internal switch-mode unit and an Oyaide platter mat is an option.

The result is a revelation. Our sharp sounding and messy cut of Valerie by The Zutons was tidied up nicely, background stick work having intriguing rearward presence, whilst drums had a lovely firm, dimensional thwack to them. You can detect the stability of a Technics in what is razor-sharp metronomic timing, especially obvious with Rock using synthesisers, such as the Scissor Sister's 45rpm 'Ta Dah' LP.

Fitted with an Audio Technica AT OC-9MLIII or Ortofon Quintet Black, both high quality but not-so-expensive moving coils, what you get with this package is exceptional sound quality from LP at an affordable price.



# BEST CARTRIDGE

## AUDIO TECHNICA 700 SERIES

Reviewed: December 2017 issue

Can a moving magnet cartridge get close to a moving coil costing many times more? Audio Technica's three new 700 Series models show that they can.

The VM740, '750 and '760 cost between £196 and £522. It's a lot for a moving magnet cartridge but you get breathtaking sound quality – close to moving coils costing thousands.

Noel Keywood said "The near perfectly flat response does translate in practice to a feeling of natural and smooth balance, yet at the same time there's absolutely no sense of warmth in the sound: it is just crystalline clear and very forthright. I was more than impressed by what Audio Technica have achieved here. The sheer projection of fine upper treble was extraordinary".

They also track well, produce far less distortion than all rivals and sound sparkingly clean, clear and forthright.





# ★ BEST WIRELESS LOUDSPEAKER

## DEVIALET GOLD PHANTOM

Reviewed: June 2017 issue

**N**ot content with making the award-winning Expert Pro 220 amplifier, Devialet has also used its ADH (Analogue/Digital Hybrid) technology for its wireless loudspeaker.

Undeniably different looking, the Gold Phantom is prodigiously talented. The cabinet is hermetically sealed to withstand the 4500 Watts of power provided by the internal ADH2 amplifier section which is claimed to be good for a very high 108dB sound pressure level at one metre. In addition to the side-firing woofers there's forward-facing titanium-domed tweeter hidden behind a patterned grille, surrounded by an annular midrange driver.

The proprietary DAC will accept file sizes of up to 24bit/192kHz while there's also Bluetooth, Apple AirPlay and Spotify Connect compatibility.

Sound-wise the Phantom is clean, controlled and powerful. Bass is a standout - having a palpable presence when you turn the volume up. In terms of dynamics there's little to touch it at the price..



★  
**BEST  
LOUDSPEAKER  
CABLE**

**CHORD SARUM T**

Reviewed: November 2017 issue

It's rare that something truly different comes along in the world of loudspeaker cables – but Chord's new Sarum T is just that.

The reason? It uses a material called Teylon for its dielectric - which, under a different name, is used in the military and aerospace industries to ensure signal integrity at all operating temperatures.

Many cables impart a particular character on the music but the most impressive thing with the Sarum Ts is the absence of just that. It means the performance comes to the front with no smear or sense of constriction. Everything seemed improved once plugged in – from timing to instrumental cohesion.

Only the very best 'speaker cables do that and these warrant a place among that elite group.

They are easily as good as some much more expensive rivals, being open, uncoloured and superbly natural – letting you hear the sound of your amplifier and loudspeakers as they should be.





# ★ BEST HEADPHONES

## FOCAL UTOPIA

Reviewed: August 2017 issue

**F**ocal uses beryllium in the drive units of its Utopia headphones - just as it does in some of its high-end 'speakers. The properties of this rare-earth metal make it ideal for audio transducers. It's three times as stiff as titanium, yet is considerably less dense. As a result, it has a fast sound-conduction speed.

This translates to a fantastic sound. It doesn't matter what sort of music you're listening to - orchestral, heavy rock, opera, electronica, jazz or the (difficult!) spoken word, whether analogue or digitally-sourced, the Utopias will get you closer to the performance.

They are also superbly built and comfortable to wear even for long periods.

Martin Pipe said "These headphones are the best transducers I've heard - speakers or headphones. Reference-class all the way, once heard you'll be satisfied with little else".



**FOCAL | CLEAR**

A year after Elear and Utopia, the latest addition to Focal's high-end headphone line is built around a new generation of full-range 'M'-shape dome speaker. Clear headphones reveal the tiniest details of musical creation. Made in France, Focal continues its quest for absolute sound with this new reference headphone. Clear promises listening worthy of the best loudspeakers.

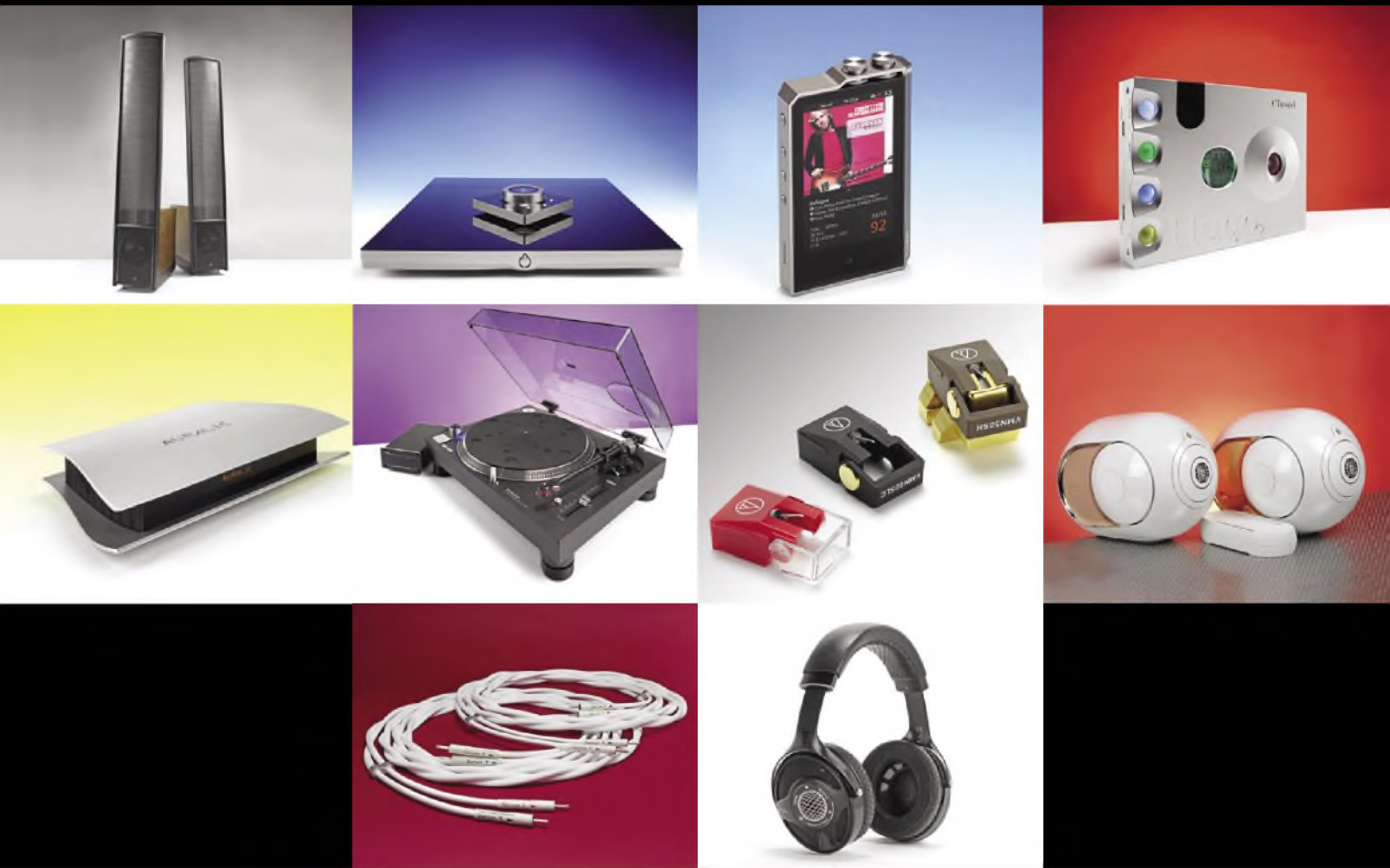
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# Hi-Fi World 2017 Awards

## ORIGINAL REVIEWS



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# A True Classic

**Noel Keywood thinks Martin Logan's Classic ESL 9 electrostatics could just be one of the best loudspeakers you'll ever hear.**

**W**hat Martin Logan's new Classic ESL 9 loudspeaker offers is a large version of the company's fabulous XStat electrostatic panel,

atop a passive bass cabinet of some sophistication. This is a big hybrid then with acoustic muscle behind it – but it is pure. The sound you get comes from your amplifier, be it transistor or valve, not from an anonymous Class D slave amp driving the bass units.

This is fine by me. And I presume it is why Martin Logan append the term Classic. Their bigger hybrids use active bass bins making them bigger, heavier and less under user control, sonically speaking, in the important lower midband; we're thinking 'pure' here, not powered. It's a configuration that resonates better with me because we use high quality amplifiers able to drive electrostatics – and the Classic ESL 9s without Class D slave amps in the way better revealed the qualities of our drive amplifiers. They also sound more cohesive being driven by one amplifier, rather than a Class D and something that may sound quite different, such as a valve amp via the XStat panel.

The Classic sits just above the ESL-X that we use as in-house references. Replacing one with the other was a



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surprise – they look little different but don't sound it. I have grown used to the ESL-X as a revealing review tool and a wonderful experience, so I was a bit taken aback that the Classic ESL 9 is an obvious step up in terms of acoustic punch; seemingly a small size increase has produced a disproportionately large quality increase.

This 'speaker offers a big electrostatic experience – the feature that struck me immediately when first listening – from an assembly little visually larger than the ESL-Xs. Early on I jumped up, grabbed a tape measure and found the XStat panel has been subtly increased in area by making it a tad wider (9.2in). It still looks tall and slim, but it has gained extra acoustic power without having the overwhelming visual presence of models such as the Renaissance ESL 15A I reviewed in our July 2016 issue.

So the new ESL 9 Classic is a further subtle re-working of the Martin Logan approach to making an electrostatic that fits the home – but one also aimed more toward purists than those who crave high power bass. Having said that, the bass bin is bigger and more ambitious in design, as I will explain later.

That, I hope, gets this new loudspeaker into context. If you are intrigued but uncertain about its see-through XStat electrostatic panel, it uses a sheet of thin Mylar film (think Clingfilm) sandwiched between perforated panels that carry a high electrostatic charge. They are insulated – so the cat is safe.

Music is applied to the sheet of film at thousands of volts after being stepped up by an internal transformer and this causes it to vibrate, producing sound. It's an unusual and somewhat esoteric drive system – but it works wonderfully, giving superb clarity and insight, no colouration and minimal distortion.

When Peter Walker of Quad unveiled the first practicable working electrostatic in 1957 Gilbert Briggs of Wharfedale said he and other manufacturers "agreed to change into black and meet at the workhouse". The electrostatic could do things other loudspeakers just could not do and they feared for their futures.

Luckily for Quad's rivals, it also had problems that limited usage, namely it couldn't go very loud, produced weak bass and was insensitive so needed power. It also came as a big, oblong panel likened to a radiator.

Martin Logan have overcome

these problems, whilst also teasing far more out of the basic electrostatic drive unit by using advanced materials and clever design techniques. In particular the see-through appearance – sound travels out unobstructed. The Classic ESL 9 offers a large XStat panel of 405 square inches area that gives it plenty of acoustic push. It is a single drive unit with smooth output that covers the audio band from 20kHz all the way down to 400Hz, eliminating the phase issues of conventional multi-way loudspeakers.

The lower cabinet works from 400Hz downward. Martin Logan ease



***A forward firing 8in bass unit with aluminium cone is tuned to well match the XStat electrostatic panel above for 'speed'.***

the sonic transition between 'sluggish' box bass cabinet and fast electrostatic panel – something that afflicts hybrids – by having a two-part bass chamber.

The front bass unit uses an 8in aluminium cone driver in a sealed enclosure to give a fast sound, measurement showing it works down to 60Hz only, to avoid high cone excursion and associated distortion. So the front firing 'bass unit' has been optimised to match the XStat panel, but this doesn't include the sharp change in radiating pattern between

box bass and open baffle electrostatic.

The rear facing bass unit is an altogether different beast. It sits in a reflex ported chamber and peaks around 60Hz to add a bit of speed to bass, whilst the port outputs lower frequencies down to a very low 20Hz. The cabinet is able to produce subsonics then – if not with any great force from an 8in unit except in longish rooms (18ft) that have a main mode around 30Hz that will amplify low bass through resonance.

The Classic ESL 9 has a much stronger XStat panel support frame than the ESL-X – and I don't recall seeing a frame like it on earlier models. It uses thick, rigid vertical aluminium bars, tied together at top by a similar cross-piece. The result is a very rigid frame with clean-cut outlines and a sharp appearance. I also suspect it improved sound from the XStat panel. The Classic ESL 9 was well built and finished all-round in fact, giving it a quality feel.

Electrostatic panels have to be powered, so they need a mains connection. This one comes with external wall-wart power supplies, one for each loudspeaker. Each has a slim, black power lead 300cms long that plugs into the loudspeaker, feeding it 15V at 0.4A. This is stepped up internally to provide a high voltage charge to the outer, insulated stators.

Amplifier connection is via bi-wire terminals with removable mono-wire links. This allows the XStat panel to be split from the bass unit for those who wish to use separate cables from the amplifier (bi-wire) or possibly separate amplifiers for bass and treble. For sonic coherence they should be identical amplifiers, since this is a loudspeaker that reveals amplifier differences rather more than most.

The subject of amplifiers – and of hi-fi systems in general – crops up with the Classic ESL 9. A big electrostatic panel like this puts a large value (2µF) capacitor across the output terminals of an amplifier, impedance drops to 2 Ohms or so above 10kHz, drawing strong current. Crossover distortion rises, typically causing transistor amps to sound 'hard' and suffer glare, made worse by the electrostatic's revealing nature. Amplifier choice is critical and many big transistor power amps just don't suit, turning hard and clattery, even coarse.

Quad's big power amplifiers are purposed for electrostatics and work

well but I used the 2 Ohm output terminal of our McIntosh MC152, also purposed for electrostatics. Valve amplifiers are the best match and as always I did most of my listening through our Icon Audio Stereo 30SE that, being single-ended, lacks crossover distortion and shrugs off electrostatics as a difficult load.

**SOUND QUALITY**

The sources I used were hi-res digital from an Astell&Kern AK120 player optically linked to an Oppo BDP-105D player acting as a DAC as well as CD from this player via the same internal ESS Sabre32 DAC. The Oppo fed a McIntosh MC152 power amplifier direct (no preamp) or similarly an Icon Audio Stereo 30SE single-ended valve amplifier.

I also span LP from our Timestep Evo modified Technics SL-1210 Mk2 turntable fitted with SME309 arm and both Ortofon A95 and Cadenza Bronze moving coil pickup cartridges, working through an Icon Audio PS3 all-valve phono stage.

Generalising, the big panels of the Classic ESL 9 sounded obviously 'brighter' than those of our ESL-X loudspeakers – and that's because they radiate more sound power due to larger area. Martin Logan's XStat panels get more challenging as they get bigger – and these are big, make no mistake about it, at 5ft tall. You get more 'push' though, and I noticed straightaway stronger dynamics from the Classic ESL 9 than most else. I suspect the rigid XStat frames help here as the sound was tighter and better defined than the little-smaller ESL-X and – by any standard – brutally revealing. You would have to hear a Classic ESL9 before buying it as it buries all else for revelation and because it lacks the warmth of a box loudspeaker by nature of its big, open electrostatic panel. The ESL-X is gentler! In a nutshell then, the Classic ESL 9 is vastly revealing but powerfully pushy.

The one-piece XStat panel has no phase changes to upset violin and this was very evident with Nigel Kennedy playing 'Massenet's Meditation' (CD) where his instrument took big, clear form high up in front of me having a wholeness and solidity you don't hear from multi-way speakers. Imaging from electrostatics is always pin sharp but the Classic ESL 9s were not only sharp in outline but solid in centre stage form too.

The only effect that caught



*The rear 8in aluminium cone bass unit works in a chamber loaded by a slot-port at floor level. Bi-wiring is possible. A small d.c. power input and blue LED are sited here too.*

me here was that as bowed cellos produced lows the image moved downward a bit at left and right, something I had not noticed before. But then I had not noticed a gently plucked acoustic bass either – but I did here because the forward firing bass unit integrates well and has excellent resolution in itself.

As always, Martin Logan's see-through XStat panel has a crystalline clarity about it – completely devoid of colour or overhang that little else can match. It teased out every fine detail in Nigel's performance to a degree where I held my breath. This loudspeaker is a riveting, dramatic listen.

The new bass cabinet integrates well with the XStat panel. For the most part I was little aware of differences between the two, largely because the box possesses little colour or boom, coming over as dry and tight – an important factor. These speakers don't have the conspicuous bass of the powered models

– instead showing better subjective integration whilst also reflecting the qualities of a good drive amplifier.

Interesting then that with bass-heavy material like Lady GaGa's 'Bad Romance' and 'Monster' (CD) the low frequencies sounded tight and controlled even through our Icon Audio Stereo 30SE, whilst McIntosh's MC152 was exemplary. However, with this CD the XStat panel dominated; bass was powerful but came from low down and was a lesser part of the song than I am used to. The Classic ESL 9's giant panel throws out so much power it dominates and can sound overwhelming – but not always.

My view changed completely moments later when I turned to the Astell&Kern AK120 portable and played Fleetwood Mac's Dreams (24/96 from analogue master tape). Now, suddenly, all was in balance. Mick Fleetwood's kick drum had power and punch, bass was speedy yet controlled. The performance was seemingly better integrated in itself, leaving me wondering whether I was hearing digital production problems in Lady GaGa's music that box loudspeakers mask. Source quality becomes a big issue with these 'speakers – sometimes a disconcerting one.

Underlining this was my discovery of some midband hardness – a small amount of glare – to the 24/96 Fleetwood Mac files from their LP Rumours. I have never heard this before. Puzzled, it took our best all-analogue LPs to convince me this had nothing to do with the big XStat panels, but was a quality of the digital Rumours files derived from analogue master tape. In other words, I was now hearing problems of the transfer to digital, perhaps limitations in the analogue-to-digital convertor (ADC) used by the studio.

All of which is to note that the Classic ESL 9s are wonderful for reviewers like me or perhaps studio producers who want to hear every fine nuance and detail – but they can be a brutally revealing sonic experience if the source material is less than perfect.

However, when I played Neil Young's re-mastered (all analogue) After the Goldrush LP, or Mark Knopfler's Kill To Get Crimson, also all-analogue I believe, these 'speakers delivered a sound that stood head and shoulders above all else. As a 5ft high line source they set up a huge sonic canvas with smoothly

cohesive yet sharply-defined images, have a sense of see-through clarity you cannot get from box loudspeaker, and mine detail like it was gold. Little comes close. This is a loudspeaker for the arch enthusiast, or professional.

That these LPs sounded so good is no coincidence because both artists are known for their production standards; their LPs well reflect this. In my experience there is plenty of good vinyl around nowadays and no shortage of music to play; top quality CDs such as our high dynamic range

Dali music sampler discs also span well through the Martin Logans, but over-produced and upwardly compressed Rock didn't fare so well.

**CONCLUSION**

The Classic ESL9s are arguably the best loudspeaker I have ever heard, frightening me at times. They were also challenging, even by Martin Logan standards, when playing poor recordings.

A thoroughbred all the same, tuned to a high state of ability, these are loudspeakers worth hearing. They offer a sound far different to most else. Stunning is the word that summarises them. I walked away dazed but in no way confused as to their abilities.



*Strong aluminium side bars support the electrostatic panel, their strength and rigidity adding to the loudspeaker's dynamic punch.*

**JON MYLES WRITES...**

Like other Martin Logans, the ESL 9s need acclimatising to when moving from traditional box and cone loudspeakers.

The presentation is radically different – but in the best possible way. Midrange and treble especially float free of the panels and project into the room with a lifelike presence that few other loudspeakers can match.

With Sinead O'Connor's 'Nothing Compares 2 U' the range and vocal inflections are laid bare in a way that makes the hair on the back of your neck stand up. If anything, this new model sounds a little sharper in the higher registers than other Martin Logans I've heard – but not so much as to be unduly harsh. Instead it's evidenced in a little more bite to the leading edges of notes.

Driving them with the exceptionally open Devialet Expert Pro 220 accentuated this and the ideal match proved to be an Icon Audio Stereo 30SE valve amplifier with its slightly lush sound bringing out the best in the Martin Logans.

The new bass cabinet is also better integrated with the electrostatic panel above, bringing a healthy dose of low-end power but crucially being speedy enough to marry with the clarity of the midband and treble.

Playing my favourite test track of James Blake's 'Limit To Your Love' – with its deep bass overlaid by a simple piano melody and plaintive vocals – showed just what these Martin Logans can bring to a song. The bass thundered but never dragged, while the piano sounded full-bodied and totally realistic. Even pushed hard the 'speakers remained composed throughout where other more traditional box models might start to complain.

Put simply, the ESL 9s are a rare treat and one you should make the effort to hear.

**MEASURED PERFORMANCE**

Frequency response of the Classic ESL 9 Classic smooth but steadily falling output across the audio band. In a conventional (box) loudspeaker with dome tweeter this would give a warm sound balance, but the large-area 9.2in wide XStat electrostatic panel produces far more high frequency sound power than a small-area dome tweeter, so this roll-off is subjectively necessary to balance out the 'speaker, to prevent it sounding bright. It will not sound mild or warm in spite of what the response seems to suggest.

The XStat panel offers smooth output over a wide range of forward heights and angles, avoiding the beaming and phase cancellations flat panels suffer. It gives a consistent tonal balance to listeners moving around a room, or seated off-axis, and also covers a very wide frequency range of 400Hz up to 20kHz.

The bass cabinet extends output from 400Hz down to 25Hz. The front and back drivers work in-phase to give a normal monopole radiation pattern. The front driver in its own sealed enclosure handles the lower midband and upper bass only, working from 400Hz down to 70Hz.

The rear drive unit extends output

from 70Hz down to 25Hz, mostly through the slot port. Subsonics are possible but their power will be limited, since the rear drive unit, chamber and port are relatively small, equivalent to a stand-mount loudspeaker in volume terms. Our third-octave response of pink noise shows low frequency output is strong down to 100Hz and peaks by +5dB below 100Hz, suggesting the 'speaker has prominent bass. However, in use it does not; the big XStat panel generates so much acoustic power at high frequencies because of its massive radiating area that the two balance subjectively.

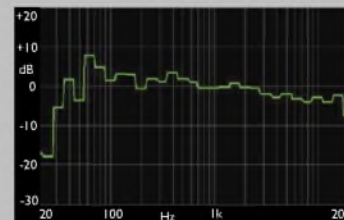
Sensitivity was high at 88dB from one nominal Watt (2.8V) of input, so amplifiers of 40 Watts or more will deliver high volume.

Our impedance analysis shows a resistive characteristic across most of the audio band, including the bass region where most loudspeakers peak and become reactive. The ESL9's smooth impedance aids bass current delivery, improving bass quality. As always with electrostatics though, impedance falls to a very low 1 Ohm at 20kHz, which may be a problem for some amplifiers when playing music with strong treble very loud.

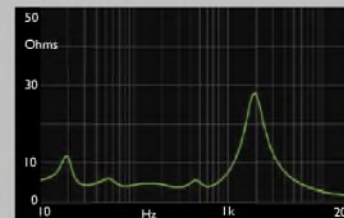
The Classic ESL 9 measures well in all areas. Its big electrostatic panel has smooth output across the audio band from 400Hz up to 20kHz but has been tailored not to overpower at high frequencies. The bass cabinet works down to a low 25Hz, for deep bass. Being sensitive as well, low power amplifiers of 40W suit. Measurement shows superb design and effective execution all round.

NK

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# Gallic Charm

The new Expert Pro 220 from innovative French company Devialet could be the only amplifier you'll ever need, says Jon Myles.

Devialet set the cat amongst the pigeons with the launch of its original D-Premier amplifier just over seven years ago. Here was a sleek, silver, undeniably modern-looking amplifier that resembled no other on the market. It offered prodigious output from the company's patented ADH technology (Analogue/Digital Hybrid) - a combination of Class A and Class D amplification operating in parallel where the former sets the output voltage while the latter provides most of the current.

With both digital and analogue capability (including MM and MC), the option of customising inputs and the promise of future software upgrades, the D-Premier proved an immediate

hit with both critics and listeners alike.

Since then Devialet's Paris-based engineering team has worked steadily to refine that original model, the latest iteration being their Expert Pro series.

There are four models on offer, the 220 Pro on review here being the second up in the range and costing £6990 (the flagship 1000 Pro comes in at £22900 with the entry-level 130 Pro at £4990). The model numbers all refer to power output, the 220 offering a claimed 220 Watts per channel into 6 Ohms (see Measured Performance).

On the outside the Expert Pro 220 differs little from the original D-Premier, having a svelte 40mm x 383mm x 383mm (H/W/D) chassis

carved out of a single block of aluminium and finished in a gorgeous dark chrome that simply screams class. The matching remote is also a thing of beauty with a smooth, rotary control atop its shiny square base.

Inside though, things have changed considerably. The ADH section has been improved with new Class A and Class D amplifiers, there's an upgraded power supply while the thickness of the copper on the circuit boards has been doubled.

On the rear there's a selection of configurable analogue RCA analogue and digital Toslink and co-axial inputs, balanced digital AES/EBU, as well as an ethernet network and USB computer connections. The digital connections will accept file sizes up to 24bit/192kHz with USB taking



32bit/192kHz as well as DSD. Wi-fi is also incorporated, so the amplifier can accept music from NAS drives, computers, tablets etc.

All analogue line level and phono sources go through a Texas Instruments PCM4202 analogue-to-digital convertor, while the main DAC circuit utilises a PCM1792 chip from the same company.

Finally, the 220 also features Devialet's proprietary SAM technology - which matches the amplifier's response to the specific loudspeakers being used (see separate panel for full details).

## SET-UP

Setting up the Expert Pro 220 involves a visit to the Devialet website and logging into the Configurator section. This allows you to assign the inputs to digital, line or phono, tailor the bass and treble, use the SAM set-up for your 'speakers, as well as a host of other features including start-up volume and maximum output.

With the Phono input you can further specify MM or MC cartridge, make of cartridge, the RIAA curve, sensitivity and resistive/capacitive loading - of which there are 256 combinations available.

All this information is then downloaded to an SD card which slots into the back of the amplifier and transmits the settings internally.

If that all sounds complicated, fear not. Once into the Configurator making changes is simple and it's a matter of a few minutes to get everything how you want it. Turntable users who often change cartridges could also maintain a number of SD cards with different settings to slot in and out as needed.

## SOUND QUALITY

Some hi-fi traditionalists have looked at the Devialet and balked at its apparent complexity. That's a pity because this is an extremely accomplished amplifier in spite of all that technology at its heart.

First off, it is massively powerful so capable of driving just about any loudspeaker. But that grunt is allied to Class A finesse - the very essence of a steel fist in a velvet glove, if you like.

In that respect the Expert Pro is akin to some of the best McIntosh amplifiers I've heard although the sonic signature is very different.

Essentially, the Devialet is extremely clean, clear and open - giving a wide window onto

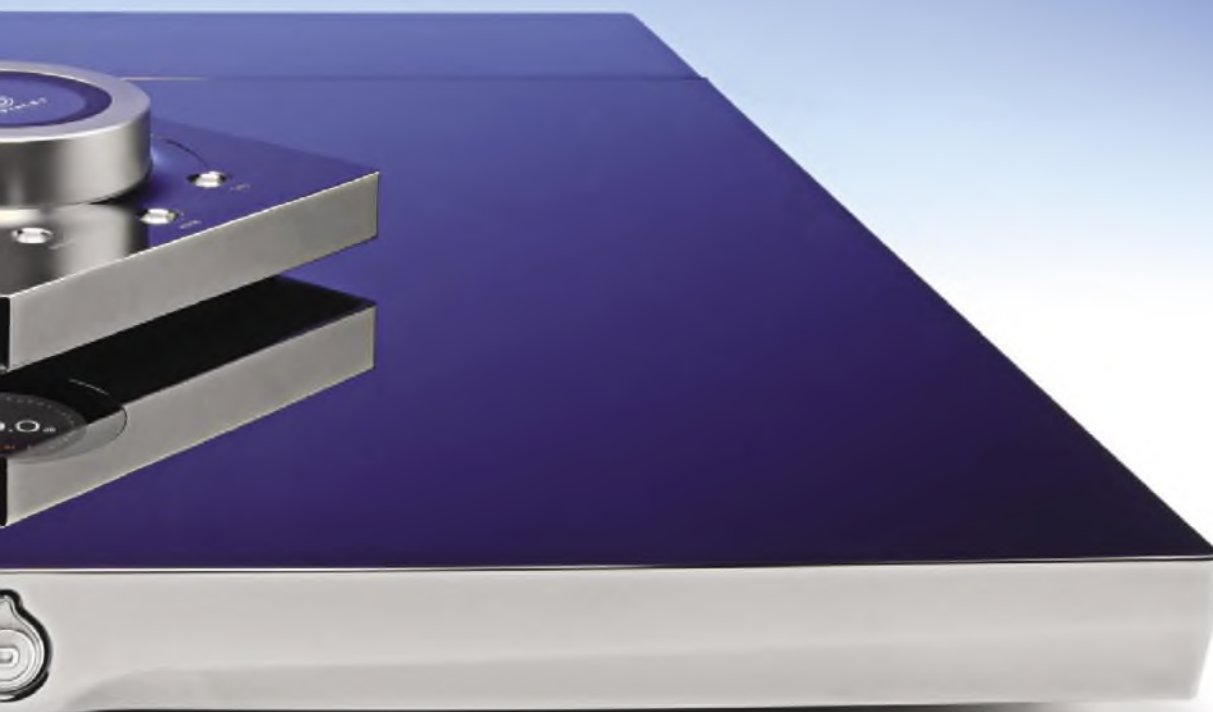
recordings and letting the listener hear deep into the mix.

Listening to Echo And The Bunnymen's 'A Promise' (24/96) through a pair of Spondor's new D9 loudspeakers the sliding bass line was exceptionally firm, laying down a solid foundation for Will Sergeant's chopping guitar chords above. Ian McCulloch's wailing vocals were pitched perfectly, the Devialet capturing every nuance of his distinctive phrasing.

Every element of this track was laid bare before me - not in a clinical, cold fashion but simply in a way that let me appreciate what each musician was doing.

It was the same with streaming the San Francisco Symphony's superb rendition of 'Marsch' from Alban Berg's 'Three Pieces For Orchestra' (24/96). It's a powerful, majestic piece and the Devialet brought home the full scale of the work with the horns, trumpets and trombones all clearly set out in their exact place - the amplifier also bringing out the full impact of the two sets of timpani.

On completing the work Berg is alleged to have said, "There had to come a day when we could hear how a chord of eight notes really sounds in the brasses". Well, here I certainly



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could. The power of the Devialet also meant I could turn the volume up to wall-shaking levels without any strain from the Spondors.

Also, I turned on the Spondor D7 profile in the amplifier's Speaker Active Matching (SAM) setting. It was just a few days after Spondor's MD Philip Swift had delivered them and he'd been enthusiastic about the benefits of Devialet's SAM technology.

Suffice to say he was correct. With SAM switched in the bass had a firmer, deeper presence on the second part of Fleetwood Mac's 'The Chain'. The impact was almost physical in its low-end power, bringing a visceral quality to the music.

But, as mentioned, the Devialet is not all about power. It also has a beguiling lightness of touch with more gentle, music. With 'Never

Known' from The Durutti Column's 'LC' CD, Vini Reilly's simple guitar riff had air and space around the chords, the reverb washing gently in the background. The vocals - barely audible through many an amplifier - still whispered quietly and were intelligible and so much more haunting.

The amplifier's resolution also meant its timing was uncannily accurate - nothing was lagging or temporally out of kilter in the signal.

I tried the same track via LP with an Ortofon Cadenza Bronze MC cartridge and the results were very similar - probably due to the fact that the signal is going through an ADC first before the amplification stage. However, there was a noticeable absence of surface noise and a totally quiet background throughout.

But this is essentially true of all the Devialet's inputs and with whatever music you are playing. It doesn't matter if it's deep bass, orchestral brass sections, solo guitars or gentle vocals - this amplifier handles them all with a smoothness but sense of reserved power that makes you believe nothing can disturb it.

In fact, I'd say the only limiting

***Internally the Devialet Expert Pro 220 is superbly constructed with new circuit boards and improved amplifier sections.***

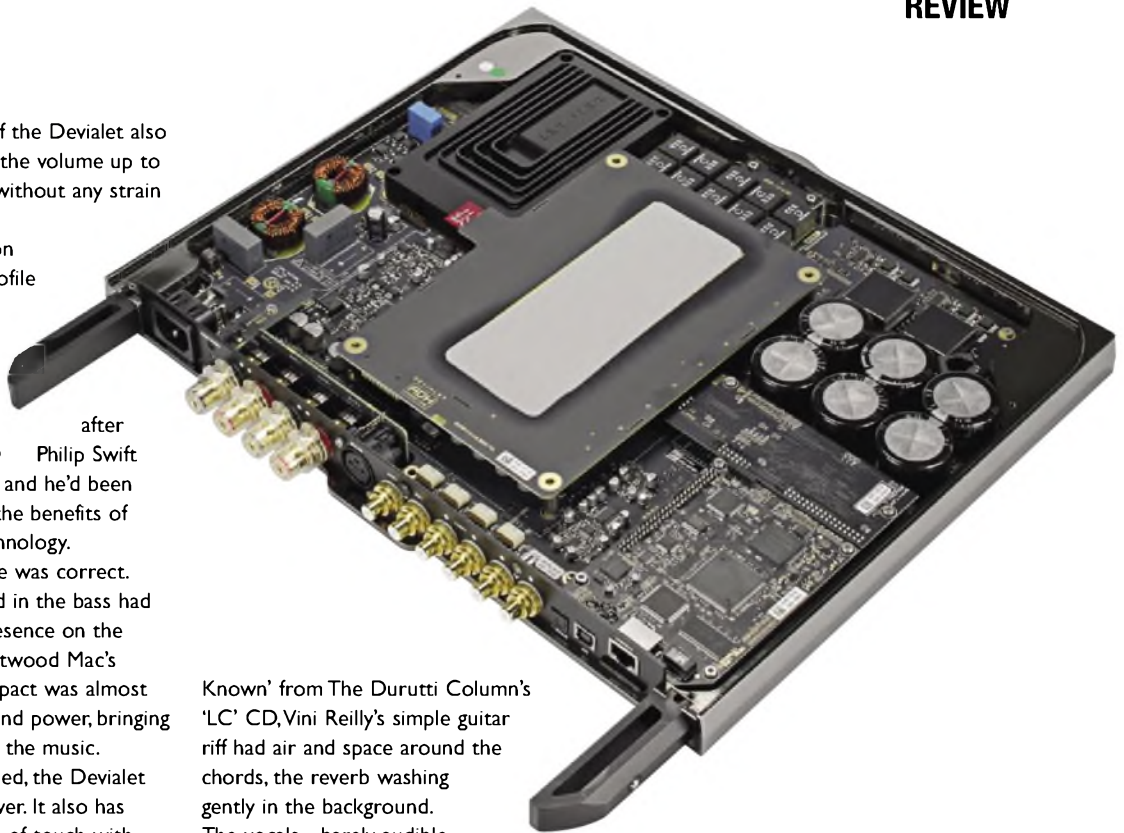
factors are likely to be your loudspeakers or sources. As such this is an amplifier that could prove the core of your system for years to come while you upgrade around it. Which is a very sensible way to spend your money.

**CONCLUSION**

The Devialet Expert Pro 220 is a triumph of ingenious engineering harnessed in the pursuit of excellent sound and 21st century flexibility. If you like to hear your music just as it was recorded, you'll love this amplifier.



***The Devialet's remote control is machined from a solid block of aluminium with a volume control on the top....***



***...Alternatively there's a free app for Android and Apple smartphones which replicates all the functions on the remote control.***



***Inputs on the back of the Devialet include analogue, digital Toslink and coaxial as well as AES/EBU. A USB connection also allows for file sizes up to 32bit/192kHz as well as DSD.***



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**SPEAKER ACTIVE MATCHING**

One stand-out feature of the Devialet is SAM - or Speaker Active Matching. Essentially it is a sophisticated DSP programme which the company says processes the musical signal in real time so the sound pressure reproduced by the 'speaker matches exactly the one recorded by the microphone. Essentially it is acting on phase and time domain errors induced by the design of the loudspeakers to produce a cleaner sound.

Devialet also factor in variables such as maximum driver movement and voice coil temperature to act as a 'speaker protection measure.

And in practice it works. With the Dynaudio Excite X38s bass went lower and was also firmer but with no sense of overhang. There was palpably more power on offer. Devialet claim switching on SAM gives a bass output of 19Hz from these 'speakers compared to 37Hz without on Massive Attack's 'Angel' (see <https://en.devialet.com/sam-ready-speakers/page/dynaudio/dynaudio-excite-x38>).

I played the same track and have no reason to doubt those figures. But it wasn't just with the bass depth of Massive Attack that SAM made a difference. Even acoustic jazz and female vocals benefitted with the firmer foundation giving higher frequencies more definition.

At present there are some 794 'speakers in the SAM database - ranging from the likes of the budget Monitor MR2 bookshelf to the £200,000-plus Wilson Audio Alexandria XLF - with more being added all the time.

Users have the option of having SAM on or off - but can also alter the amount of processing being used on-the-fly until the required level is found.



*An SD card slot on the rear allows users to configure the amplifier to personal taste.*

**MEASURED PERFORMANCE**

The Devialet Expert 220 Pro amplifier has complex output protection circuits that pull power down after around 0.5 seconds. Within that time, tested with 0.2 sec sine wave bursts, power measured 144 Watts (34V) into 8 Ohms and 290 Watts into 4 Ohms. Driven continuously the figure fell to 72/144 Watts, due to protection, and the case became hot. Into 6 Ohms, burst power is 190 Watts, slightly below the 220W figure quoted but not a consequential shortfall.

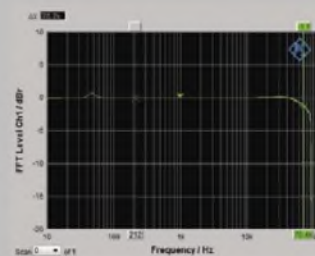
Distortion of the output stage, from a full level (0dB) 24bit digital input, measured a very low 0.001% in the midband into 4 Ohms, rising little to 0.07% at 10kHz (see our analysis), with odd order components - low. With a -60dB digital input, at -60dB output (34mV) distortion measured 0.06%, also very low considering this includes the whole amplifier. Dynamic range measured 111dB - impressive.

Frequency response through the digital input stretched flat to 73kHz, as our analysis shows, from a 192kHz sample rate digital input via QED Quartz glass optical cable - very wide.

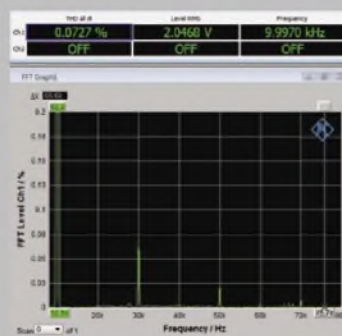
The MM phono stage overloaded

at a low 16mV in, where 30mV is a common and sensible minimum to avoid occasional overload on peaks from a high output MM cartridge like an Ortofon 2M Red. A 5.7mV input provides full output,

**FREQUENCY RESPONSE**



**DISTORTION**



near enough right. RIAA correction was accurate, giving flat frequency response, but with the 'Ortofon 1974' setting of our review sample a warp filter rolled off bass below 100Hz, measuring -1dB at 40Hz. This is enough to give a slightly light bass quality. Noise was high at -62dB where -76dB is common, but since MM cartridges produce more thermal (Johnson) noise than most transistor inputs the -62dB figure will not be obvious, but better is easily possible.

The Devialet Expert 220 Pro measured very well through its digital inputs but the Phono stage could easily be better. **NK**

**Power 144 Watts**

**DIGITAL**  
**Frequency response 4Hz- 73kHz**  
**Distortion (24bit, -60dB) 0.07%**  
**Separation 85dB**  
**Dynamic range 111dB**

**PHONO**  
**Frequency response 40Hz- 20kHz**  
**Distortion (1kHz) 0.2%**  
**Separation 88dB**  
**Sensitivity 5.7mV**  
**Noise -62dB**  
**Overload 16mV**

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**OUTSTANDING - amongst the best**

**VERDICT**

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**FOR**

- clean, accurate sound
- bass depth
- flexibility
- design
- speaker matching facility

**AGAINST**

- needs time to master all its facilities

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# Portable Punch

Noel Keywood says the Cowon Plenue 2 is probably the best high-resolution portable player on the market at the moment.

**H**igh resolution portable digital audio players (DAPs) offering better sound than CD are all about tech. spec. Astell&Kern set the trend when they came up with their

ground breaking AK100. Cowon fight it out with them and others for top spot in an expanding market. Here is their latest and greatest player, the Plenue 2. It out-performs just about all other players our measurements show – and even most mains

powered hi-fi digital converters – by quite a margin. So you may be interested, even if its £1100 price tag seems steep.

What Cowon offer here is a pocketable music player that weighs a solid 192gms but is wonderfully crafted and rigid. It will not go into a shirt top pocket like the AK100, but it will go into most other pockets and places. Easily portable then, if not featherweight.

For top specs Cowon have used an interesting new DAC chip from AKM of Japan, the 4497EQ, that gives fabulous results in the Plenue 2, in conjunction with Texas Instruments SoundPlus amplifiers that drive the headphones though a standard 3.5mm stereo jack socket, or alternatively a 2.5mm balanced output jack socket – more of which later.

As well as acting as a portable player, Plenue 2 can also be configured to work with the USB output of a computer, acting as a DAC/headphone amplifier. Or it can be used as a hi-res CD player able to feed a hi-fi system. It has an optical S/PDIF digital output within the 3.5mm headphone socket that can be connected into an external mains powered DAC; I used it with an Audiolab M-DAC+ in this mode, in addition to headphone listening.

On-board there is 128GB of memory, that can be supplemented by a plug-in 256GB microSD card. Supported music file formats are WAV and FLAC of course, all Apple formats such as AIFF and ALAC, and the usual compressed formats such as WMA and MP3. Talking super hi-res, Plenue 2 can also play DXD (352.8/384kHz), and DSD (64/128) in .dsf and .dff file formats. I was a little surprised however that acting as a DAC working from a Mac running Sierra, 192kHz output sample rate could only be accommodated in 16bit (!), which is a bit surprising. For full







**The Plenue 2 has both a standard 3.5mm unbalanced headphone jack and a small diameter 2.5mm balanced output, only usable with headphones having a balanced connecting lead.**

24bit resolution 96kHz sample rate is the limit. Today, 192kHz is expected.

When acting as a DAC the screen times out and goes blank, with no indication of volume unless awakened by pressing Start, even though power is being received over USB making this unnecessary – slightly irritating.

Our review sample came set up volume-limited for hearing safety, for EU territories. To measure and use the player to its full potential I re-configured it by deleting its system folder and re-booting, then output increased from 0.3V to 2V (+16dB) as claimed in its specs. (reviews must state its configuration to be meaningful).

This is a touch-screen player with an on-board accelerometer to change screen orientation. Upright it gave cover artwork, but on its side defaulted to a peculiar graphic – a tad disconcerting. The accelerometer only worked properly with the player upright and not an angle, making it seem sticky. The user interface wasn't the easiest to use or the best I have encountered but these things are a matter of acclimatisation and it was

decent enough with bright clear graphics and fast response times.

Cowon provide a massive range of JetEffect7 sound effects (Flange, Club, Feel the Wind, Mild Shore, Fierce Ferret...), a Normal setting and four User settings with ten-band graphic equaliser and two related 'Modes' (don't ask).

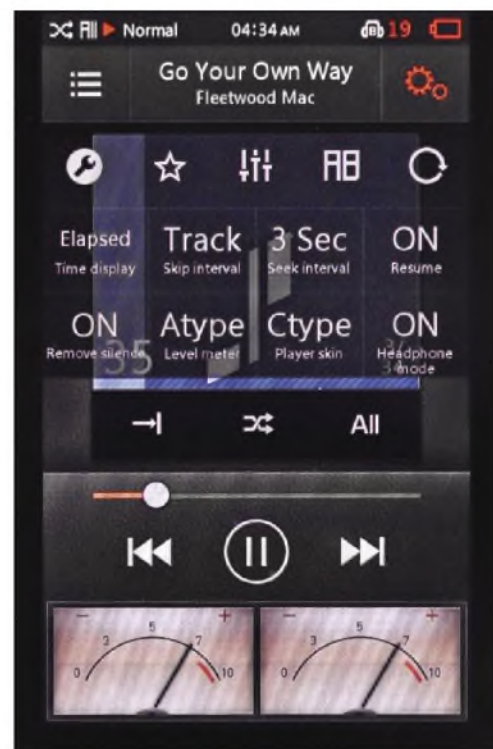
The AKM DAC chip comes with built-in filters and Cowon use them, offering six different settings: Short delay sharp, Short delay slow, Sharp, Slow, Super Slow, Low dispersion short delay. Often, such filters have minimal effect and that's the case here with hi-res, but with CD the Slow filters have a very big effect, rolling off treble fast above 8kHz. Slow filters also give a clean impulse response free from ringing, as Audiolab note and our measurements confirm, and that was the case here – in line with Cowon's diagrams for Slow roll off and Super Slow roll-off. With harsh CD tracks these filters are well engineered to offer sonic amelioration.

Two big, sturdy spin wheels adorn the top face, one programmable to change various



**Two spin-wheels at the top control volume and allow access to the various menus.**

functions (filters, JetEffect etc), the other (right) to control volume over 140 fine steps. The player's bottom face carries the output jacks and here there is a 2.5mm four-pole balanced output jack that effectively feeds earpieces separately, without a shared earth. To use this you must have 'phones with independent inputs, usually configured as separate leads to each earpiece. They must either share a miniature 2.5mm jack plug or, most commonly, connect into an adaptor lead (not supplied). My experience here is that you get a slightly faster, more concise sound but also 2.5mm jack plugs are so small and fragile they break in a strong wind. Adaptor leads with XLR



**The large touch screen provides a host of options when playing back tracks - including two retro-looking power meters!**

plugs exist, so analogue can be fed to an amplifier's balanced inputs, but usually it is better to feed a player's digital output into an external mains powered DAC. With the Plenue 2 however, that DAC must be a good one to match the player's own abilities.

Battery life is quoted as 8 hours with charge time of 3 hours – reasonable in view of the high-quality chip sets used and fast A9 Cortex CPU.

## SOUND QUALITY

This is a player that can hold its head up high in the sound stakes: think

Come Together  
The Beatles  
FLAC 192 kHz 24 Bit

4/5

4:16

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big, rich and silky smooth with a wonderfully capacious delivery. It isn't as fast and hard in its leading edges as an Astell&Kern, but I heard a sound that beckoned me in immediately. Plenu2 has massive sophistication, it coddles with its sense of warmth but deep insight; Bob Dylan sat in a big space at a centre stage microphone singing 'Rolling Stone' (DSD64), organ and tambourine at far left, the jangling of the tambourine's cymbals perfectly clean and clear, strummed guitar at far right.

With the sense of organic presence DSD can maintain from old analogue recordings, this was a track that rolled out of the Plenu2 with an air matched by little else I felt.

The same sense of full-bodied smoothness and ease greeted me with Marta Gomez singing 'Lucia' (24/96) and here I heard right into her small intonations, that was captivating – and almost worryingly better than I have heard before. Worrying was that another track from CD that I played earlier via iTunes from a CD rip had the noise swishing of a crude tape noise reduction system I had never heard before; the Plenu2 is something of a revelatory player – but as always when you hear more it isn't always good!

For the most part I used 'Short delay sharp' filter that gives very specific transients from strummed guitar strings in Diana Krall's 'Narrow Daylight', for example. Funny to say, but the Plenu2 is so gentle, full and easy it doesn't need much help from filters. It is, all the same, dynamically powerful and gripping, plucked guitar strings stabbing into my ears from Philips Fidelio XI headphones.

With Benjamin Grosvenor playing Chopin's 'Nocturne No5' (24/96) his touch on the piano's keys was revealed, where before I have heard – I now realise – the outline of what was happening. In this low-level recording I was getting close to full volume at times, so running the Plenu2 at EU safe levels here wouldn't be practicable.

With Fleetwood Mac's 'Go Your Own Way' (24/96), a track I use regularly as a Rock comparison, the sense of a big open and atmospheric soundstage, with forensic insight into vocals and upper frequencies remained but as always with portables there was some loss of power behind drums that connecting up to a mains-powered Audiolab M-DAC+ though the Cowon's optical

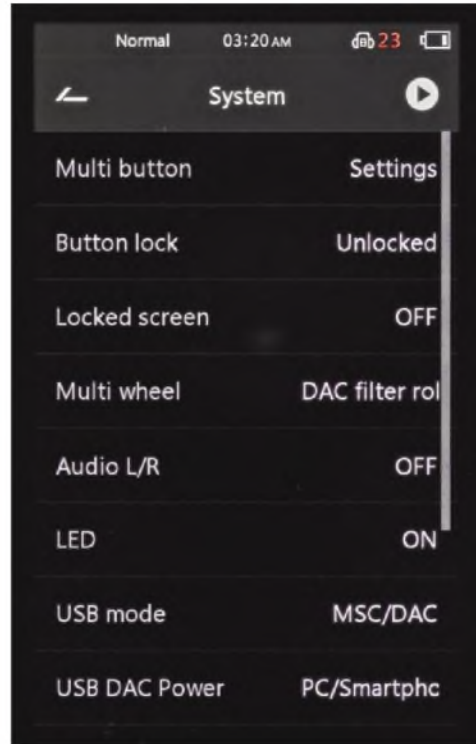
digital output restored.

Battery powered devices rarely if ever manage a great sense of subsonic push though; this is an observation rather than a criticism.

**CONCLUSION**

This is the most insightful player I have heard to date; at times I was almost embarrassed to hear things I felt I should have known existed. Plenu2 is supremely smooth too – a very easy listen. It isn't somnambulant, coming over as well-paced and sharp in timing – but never sharp in treble quality. I was irritated by its accelerometer that didn't seem to know up from down so the screen was too often 90 degrees out of kilter; it would be better removed.

This apart though, in sound quality and build terms, it is definitely about the best player going.



**Settings and control functions are easily managed by the comprehensive main settings screen.**

**MEASURED PERFORMANCE**

Both the 3.5mm headphone jack output (unbalanced) and the 2.5mm (balanced) gave 2V maximum as claimed, but initially only 300mV due to volume limiting in EU models. The System folder had to be deleted to bring up non-EU spec on re-boot. Although 300mV is loud through most headphones, it may be insufficient for some models – and it does substantially reduce measured

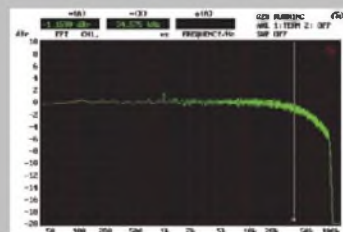
dynamic range (-16dB). At 2V the Plenu2 gives the same output as a CD player and can be used as one (like most portable players), powered by an external 5V supply.

Dynamic range was a massive 123dB from both headphone outputs – way above most portable players and even mains powered hi-fi DACs and such like. Noise was commensurately low and so was distortion, measuring just 0.01% at -60dB with 24bit resolution digital – again better than most mains powered hi-fi DACs. Distortion at full output measured a low 0.0003%.

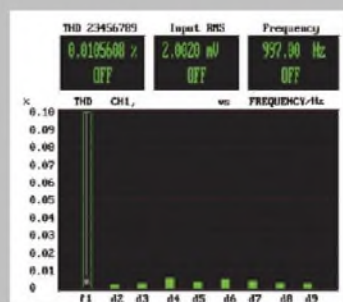
Frequency response with 192kHz sample rate PCM digital measured flat to 34kHz (-1dB) before a slow roll off to the 96kHz upper theoretical limit our analysis shows, so the player will sound tonally even.

The Cowon Plenu2 offers one of the best measured performances available from any player and even tops most hi-fi equipment. **NK**

**FREQUENCY RESPONSE**



**DISTORTION**



<b>Frequency response (-1dB)</b>	4Hz- 34kHz
<b>Distortion (24bit, -60dB)</b>	0.01%
<b>Separation</b>	98dB
<b>Dynamic range</b>	123dB
<b>Noise</b>	-120dB
<b>Output (unbalanced/bal)</b>	2V/ 2V out

**COWON PLENU2**  
**£1,100.00**



**OUTSTANDING - amongst the best.**

**VERDICT**

A well built and versatile portable with superb sound quality, if with an occasionally frustrating user interface.

**FOR**

- pocketable
- multi purpose
- great sound

**AGAINST**

- erratic screen orientation
- volume limited (EU only)
- no 2.5mm adaptor

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# The Right Chord

Noel Keywood tries out Chord's new Hugo 2 desktop DAC - and rates it as one of the best he has heard.

**O**ur Rohde&Schwarz spectrum analyser – the world's best – tells us quite clearly there are two genuinely impressive DACs in this world – and one of them I am reviewing here. It's the new Hugo 2 from Chord Electronics (UK). The other? ESS (USA). So you'll be reading this review then if you are interested in getting an inside view of what the Hugo 2 offers, especially with its new filter set. OK measurement isn't everything, if it was I would not choose to use a valve amplifier in this review but it does say much about the level of design engineering – and what to expect in sound quality terms.

If you want a portable DAC, Chord Electronics Mojo is the one. Hugo 2 is a slightly more ambitious version, not 'portable' but 'transportable' – meaning you can carry it from place to place easily enough and it can work from internal rechargeable batteries for up to 7 hours, or a mains supply.

With measurements of 131mm x 100mm x 23mm, and a weight of 450gms Hugo 2 will hardly go into a shirt's top pocket but it fits the trouser pocket of cargo trousers however if, like me, you use them to house a small electronic workshop. You can then use Hugo 2 on the move, but it is purposed more for a home hi-fi of some sort – as an adjunct to a computer, as a hi-res

digital preamp with volume control feeding a power amplifier, or perhaps as an upgrade for an ageing CD player with digital output.

Chord Electronics have always made stylistically bold products and Hugo 2 is all of this. It comes in a bullet-proof machined aluminium billet, with contours not found elsewhere – that's why it feels good and looks it too. The Hugo 2 logo and Chord name are deeply engraved in, so no surface graphics that rub off here. The case is bomb proof and beyond easy degradation all round.

Pressing the on-button I was met with a blaze of light! Pull this out on a bus or train and it will catch attention, since all its many spherical rotary controls are



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illuminated in different colours. Also, internal sensing logic scans inputs for signal and feeds the data back as a colour light display, both in the spherical buttons and through the central window into an internal light display. Hugo 2 puts up a great multi-coloured and changing display, according to what it is doing – but you have to read the handbook to interpret!

So Hugo 2 isn't your average dull box, with miserable graphics and low design input. It is audacious in style and its face to the world. It has plenty of basic ability too. There are optical and electrical digital S/PDIF inputs, plus a USB input, the only wrinkle being the electrical S/PDIF is through a 3.5mm jack socket instead of the usual phono socket – and no lead or adaptor is supplied. Also, this is a two channel digital input selected as Coax 1 / Coax 2 on the remote control and can accept two 384kHz dual-data lines for 768kHz sample rate from a suitable source. I used a simple 3.5mm stereo jack-to-phono socket lead – available from Maplins – to find that on the remote control Coax 1 is left channel and Coax 2 the right channel. The optical input works up to 192kHz measurement confirmed so will work with Astell&Kern players and such like.

Bluetooth with aptX is fitted, allowing wireless connection to a mobile phone or portable player (DAP) similarly equipped.

There are stereo analogue line outputs through the usual phono sockets, and both 3.5mm and 6.3mm

(1/4in) jack sockets for headphones.

A small external wall-wart power supply connects via its own microUSB input socket. Unfortunately, it is unmarked and only distinguished by a microUSB plug so may well get lost amongst all the others unless a Hugo label is stuck on. The unit works from 100V-240V mains input and provides 5V/2A out through a 1.7m (slightly less than 6ft) cable. This is a cheap switch-mode supply – Audiolab and Oppo fit big linear supplies, for better sound quality, albeit in non-portable, mains powered, ESS equipped converters. They are competitors if transportability is not needed.

Hugo 2 comes with a small remote control with all functions selectable, including filters and volume. There are four filters, identified as Incisive Neutral – the reference position – and Incisive Neutral with high frequency roll off.

Then at a lower multiple of the sampling frequency there's Warm and Warm with roll-off – more of which later in Sound Quality.

The fun volume control, a rolling ball that changes colour with level and remembers its setting at shut down, can also be locked out (fixed output). Volume is adjusted before the output amplifiers and full digital level (0dB) will cause overload if volume is turned right up, an unusual situation. The volume control button lights up white to warn of



**Internals are neat and tidy with (centre) Chord's own DAC circuit designed by Rob Watts.**

this; you can't use full volume with rock albums compressed up to full level, which most are to sound loud. Because full output is so high, this is very unlikely to happen in real life use, except possibly if running into a preamp with volume turned down, but in this circumstance Hugo 2 should be set to fixed output.

There's a crossfeed (X-PHD) facility to give a more out-of-head loudspeaker listening experience, with four settings: off, light, medium and heavy.

Hugo 2 accepts conventional digital (PCM) up to 768kHz and DSD up to eight times sample rate (DSD512) – ahead of most else.

**SOUND QUALITY**

Hugo 2 has internals no other DAC has – and it sounds like it. 'Different' is the word. Pressing the Play button on my Astell&Kern AK120 portable digital player, connected in optically, Hugo 2 raced off the line with Fleetwood Mac's 'Go Your Own Way' (24/96). Mick Fleetwood's bass line was resolved conspicuously well in terms speed and drums were firm and powerful centre stage: Hugo 2 comes over as fast paced – and super sharp in its timing. Almost weird to hear music speeded up, for that is what Hugo 2 seemed to do with this up-tempo track.

A selection of hi-resolution



**Illuminated buttons mean the Hugo 2 presents a riot of colour to the user.**

# SPENDOR

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DESIGNED FOR YOU.







**The Hugo has 3.5mm and 6.3mm headphone sockets, plus analogue output and coaxial and optical digital inputs.**

Rock tracks confirmed Hugo 2 is strongly about pace, insight and timing – and gripping to hear. It has fine high frequency resolution and strong top-end bite, cornet in Duke Ellington's 'Stompy Jones' rasping out at me with firm projection. I am used to ESS Sabre32 DACs that are big, fulsome and rich sounding; Chord Electronics offer a polar opposite here – an immediately impressive and engaging one. Hugo 2 has a lighter air, the music is strongly lit. It is fast, exciting and quite obviously ahead in its sonics.

Intense high frequency detail and insight is a small revelation; I was hearing things here I don't normally

hear. But I was hoping for a filter like Audiolab's optimally damped designs that could remove the glare from some recordings; Queen's 'Under Pressure' (24/88.2) was succinct but light-ish in hue – and switching in the filter options made little difference. Only the most severe Red option had perceptible impact and although it dulled things a bit, it didn't provide the sense of improved stage composition I had hoped for. Switching through the filters at all sample rates, from 44.1kHz (CD) up to 768kHz (from a Mac running Sierra) made no difference here (and, out of interest, 768kHz offered no benefit over 96kHz, using Philips

Fidelio X1 headphones).

Classical fared well, with orchestras firmly presented, slow plucked bass in Richard Strauss' 'Don Quixote' (24/96) having convincing solidity and body, whilst violins of the Berliner Philharmoniker stretched wide across a broad soundstage, coming over as well lit and vivacious. Selecting X-PHD (crossfeed) interestingly added bulk and atmosphere to the Minnesota Orchestra playing Rimsky Korsakov's Snow Maiden, if contracting the stage slightly; it was a small but quite enjoyable change of presentation that suited classical well.

Bluetooth connected immediately to my iPhone (using code 0000), but the Bluetooth input must be first selected. Running 24/48 files showed all the basic qualities heard through USB and S/PDIF, with a slight loss of inner detail due to Bluetooth's music compression system.

**CONCLUSION**

Hugo 2 is a wonderfully hewn product that looks great, feels great and delivers a vivacious sound, succinct and full of detail. It comes over as fast-paced and tightly timed. With a wide range of inputs and an ability to cope with them all superbly it is one of the best DACs at its price point.

**MEASURED PERFORMANCE**

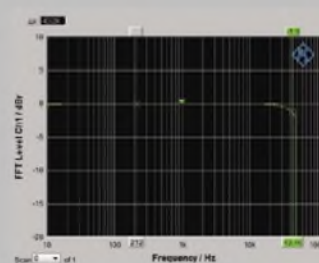
The optical digital S/PDIF input (via a QED glass optical cable) worked to 192kHz, as did the electrical input. Frequency response with a 192kHz sample rate signal reached 43kHz before rolling away to the theoretical upper frequency limit of 96kHz, as our analysis shows, this being achieved with either orange or white filters. With the red or green filters roll-off was earlier, if with slightly curtailed frequency response reaching 21kHz. The roll off is sufficient to give a subtly 'easier' sound.

Fed CD (16/44.1k) frequency response ran flat to 21kHz with either orange or white filters or was very slightly softened by the red/green filters, by -1dB at 20kHz.

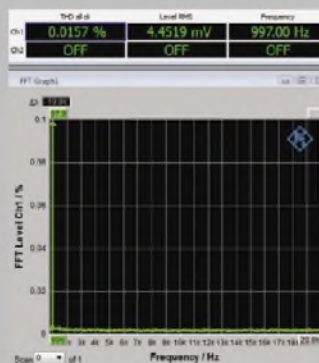
Dynamic range via the headphone output nudged 124dB with the output level control set to avoid overload – a figure higher than all others, except ESS who manage identically. With volume turned to max the Hugo 2 measured 140dB dynamic range – monstrously high. This would be achieved only with low level digital recordings where volume had to be turned right up. Whatever,

Hugo 2 offers the highest dynamic range available today, of any DAC – worldwide.

**FREQUENCY RESPONSE**



**DISTORTION**



Distortion was negligible at 0.013% with a -60dB, 24bit digital input, as our analysis shows. There are no visible distortion harmonics, even in this high resolution analysis. With CD the figure was 0.2%, limited as always by 16bit quantisation noise.

Output from the headphone and Line outputs measured a very high 4.7V, dynamic range and distortion figures being identical.

The USB input gave a marginally better result to S/PDIF, dynamic range measuring 125dB, distortion at -60dB 0.009% and bandwidth flat from 4Hz to 43kHz.

The Hugo 2 produced excellent measured figures in all areas. Its filters are fairly subtle in effect though. **NK**

<b>Frequency response (filter white)</b>	<b>4Hz- 43kHz</b>
<b>Distortion (24bit, -60dB)</b>	<b>0.013%</b>
<b>Separation</b>	<b>102dB</b>
<b>Dynamic range</b>	<b>125dB</b>
<b>Noise</b>	<b>-123dB</b>
<b>Output (Line/H' phone)</b>	<b>4.7 / 4.7V</b>

**CHORD ELECTRONICS HUGO 2 DAC £1750**



**OUTSTANDING - amongst the best**

**VERDICT**

A technically advanced transportable DAC that looks good, feels it and sounds superb – fast yet punchy.

**FOR**

- solid build quality
- visually arresting
- clean, fast sound

**AGAINST**

- lacks warmth
- ineffective filters
- cheap mains supply

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# Stream Supreme

**Auralic's Aries wireless streaming bridge blends ease of use with reference quality sound, says Jon Myles.**

Sometimes a company's products sneak up on you over a period of time. Take Auralic, for example. Yes, I'd heard of their innovative streaming devices and had my interest piqued but never quite managed to get around to requesting one.

But then they began popping up in more and more systems being used at hi-fi shows and for product launches – partnered with the likes of Naim, Linn, McIntosh and other respected brands. What's more, the sound being produced was pretty engaging.

So it was obviously time to end the wait – hence the arrival of the Auralic Aries wireless streaming bridge in the office.

Which immediately begs the question: what exactly is it? And the answer is it is a way of adding high-quality streaming capabilities to your existing system for the relatively wallet-friendly price of £1495. Simply attach the Aries to a digital-to-analogue convertor

or a DAC-equipped amplifier via its AES/EBU, coaxial or Toslink outputs and it will replay music at up to 24bit/192kHz resolution from computers, NAS drives or other DLNA, UPnP compatible servers in the house. Alternatively, there's a USB input and output which will accept up to 32bit/384kHz files (if you happen to have any) plus DSD64, 128 and 256.

What's more the unit will also give its owner access to internet radio as well as the ability to stream CD-quality content from the likes of Tidal and Qobuz. Apple AirPlay is also built in.

Hence the term wireless streaming bridge; the Aries in essence acts a gateway between all your stored digital files or streaming services and the hi-fi, which must have digital-to-analogue conversion as no DAC is built in. Control is via the supplied remote or, more conveniently, the free Lightning DS app (iPad and iPhone only at present) which delivers album artwork, playlists and other features.

The unit itself is divided into two parts – the bridge itself which is a slim box measuring 2.7" x 9.8" x 7.8" (H/W/D) with curved plastic casing and a three-inch OLED display at the front with an accompanying off-board power supply. The latter deserves special mention - this is no off-the-shelf switch-mode unit but a carefully crafted linear PSU featuring Auralic's own Purer-Power technology which utilises filtering circuits in the form of large storage capacitors as well as high-speed, low-noise, low-impedance, multi-stage regulators.

Inside the main unit are two FemtoClocks (one for the USB, the other for all other digital outputs) plus dual-band Wi-Fi connection and there's also the option to go wired via an RJ45 connection on the rear. Auralic says the whole concept is designed to deliver an extremely low-noise, low-jitter input to the





*Inside the Auralic uses two FemtoClocks (one for USB, a second for all other inputs) to reduce jitter.*

featured search function also makes seeking out specific content simple.

So while the Aries boasts some impressive technology, initial set-up and operation should be no problem for even the most computer-phobic of users.

**SOUND QUALITY**

The Chord 2Qute DAC can be ruthlessly revealing of sources and so is an ideal reviewing tool. Plug in an inferior source and you'll soon realise it.

Not with the Aries, though. From the first notes of Daft Punk's 'Random Access Memories' (Studio Masters Edition - 24bit/88kHz) I was struck by just how detailed, crystal-clear and thoroughly engaging the sound was.

There's an exceptionally low noise floor which means instruments

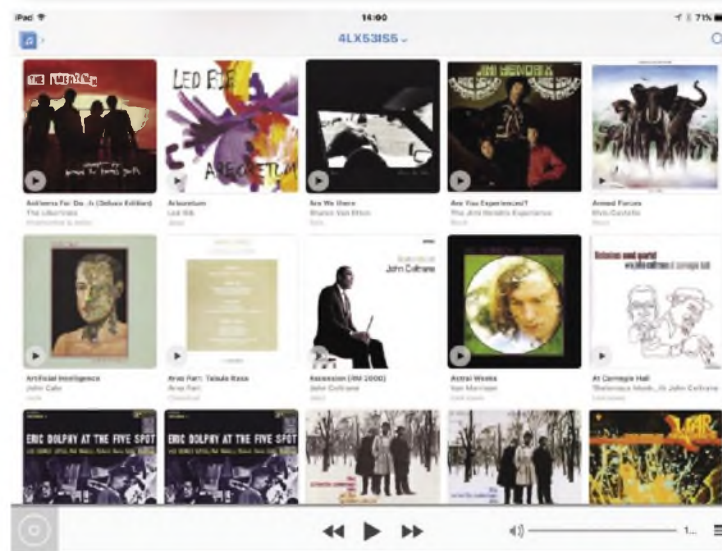
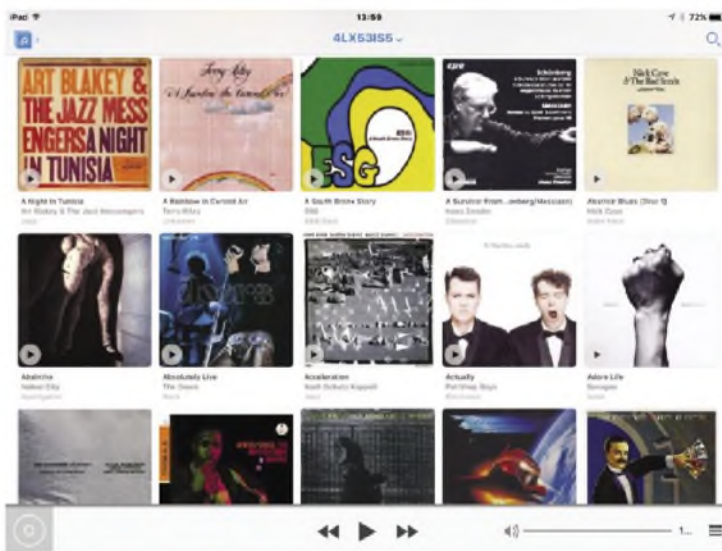
DAC of your choice, coupled with an easy to use interface.

**SET-UP**

Credit to Auralic for making the Aries and its Lightning DS interface a pain-free set-up experience. I downloaded the app to an iPad, connected the unit to Chord's excellent 2Qute DAC via a QED Reference Optical Toslink cable and was up and running via a Naim Supernait 2 amplifier in minutes. The app found my digital files on both NAS drive and computers and indexed them with artwork genre and other metadata in less than two minutes – impressive speed for 1300 albums' worth of data. Switching between tracks was also impressively speedy while accessing the likes of Tidal and Qobuz merely involved typing in my name and password once, after which it is automatically remembered.

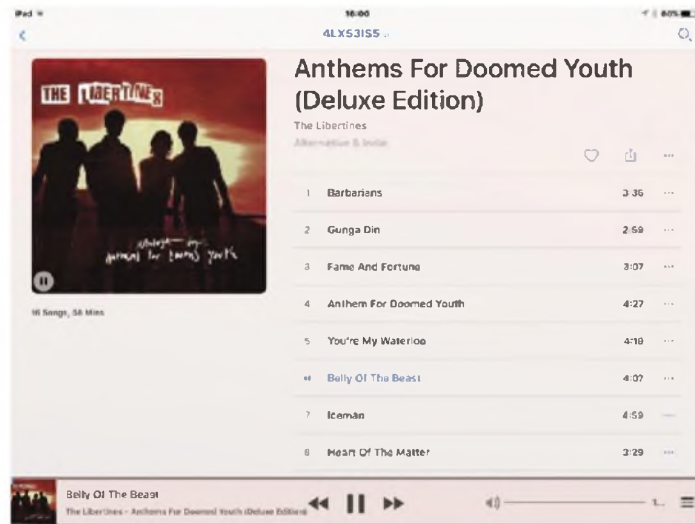
Throughout the review period I tried the Aries on both wired and wireless connections and never experienced any dropouts even when streaming 24bit/192kHz files via the latter – something which is not always a given.

The Lightning app has specific display screens for the various functions on offer – be it Library mode when playing from digital sources such as NAS drives or computers, Streaming for the likes of Tidal or Qobuz, AirPlay from enabled devices or internet radio. A fully-



*Auralic's Lightning app brings up full album artwork for all music on your network.*





**The Lightning app for iPhones and iPads makes browsing through albums and selecting tracks quick and easy.**

take on extra vibrancy. Listening to the guitar part on 'Giorgio By Moroder' the notes had added bite at the start, but also their decay lasted a little bit longer which translates into a sense of hearing a real instrument at work.

Playing music heavy with ambient and spatial atmosphere such as Kraftwerk's live opus 'Minimum-Maximum' it delivered expansive, three-dimensional musical images. Through a pair of Neat's little Iota Alpha floorstanders – no slouches in producing a panoramic soundstage – the music extended further into the room with a wider spread left to right. Lack of jitter also meant timing was excellent with a crystalline quality to Kraftwerk's electronic melodies.

The ambience of venues also comes through; I could hear the

differing acoustics of the various halls where the recordings were made.

This is ideal for lovers of classical music as it's easy to accurately place the position of the instruments even with the largest of orchestras. On a DSD recording of Rimsky-Korsakov's 'Scheherazade' (Fritz Reiner/Chicago Symphony Orchestra) the solo violin part had tremendous resonance and body while the woodwinds were suitably full-bodied.

I was continually impressed at how the Aries managed to pick

musical pieces apart so I could distinctly hear each individual instrument – but without sounding clinical. Instead it retained the energy and excitement of even the fiercest tracks I threw at it. On Jesus And Mary Chain's 'Never Understand', for instance, the feedback was no longer simply a sonic squall but became a rising and falling melodic line that propelled the song along with



**The off-board linear power supply features Auralic's own Purer-Power technology with large capacitors to filter out mains-borne interference.**

fearsome intensity.

This ability to present a clear, detailed reproduction of the music came through on any genre I played through the Aries – be it pop, rock, classical, chamber or whatever. And, of course, the better the file quality and DAC you choose to run it with the more impressive that performance becomes.

**CONCLUSION**

As digital devices go, the Auralic Aries has to be considered one of the best on the market at the moment. Plugged into my system it took the streaming experience to another level – with more detail, more depth and more clarity to everything I played. If you want to hear your stored files at their best (whatever the resolution) I'd say it's almost an essential purchase.



**Digital outputs are AES/EBU, optical and co-axial as well as USB for file sizes up to 32bit/384kHz as well as DSD.**

**AURALIC ARIES £1495**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

**VERDICT**

A wireless streaming bridge that extracts the last ounce of detail from digital music files and boasts an excellently designed user interface. Its £1495 price makes it something of a bargain.

**FOR**

- detail
- high-resolution and DSD streaming
- low jitter
- intuitive set-up
- ease of use
- price

**AGAINST**

- Apple iOS only app

Auralic  
www.auralic.com



**Technics launch a budget version, the SL-1210GR, of their new Direct Drive turntable – and Timestep tune it up. Noel Keywood listens.**

# Better Direct

**I**f you want to spin LP perfectly, for 40+ years a great way to do it was with the Technics SL-1210 Mk2 Direct Drive turntable – price around £650.

The production machinery wore out and the motor became

outdated, so last year Technics introduced the technologically sophisticated SL-1200G and GAE limited edition as replacement. With a bigger motor came a bigger price – £3000.

Recently, they announced a

simplified and less expensive version, the SL-1200GR (silver), price £1300. Here's a look at the new GR, but upgraded by Timestep of the UK to become the Evo SL-1210GR (black). Yes, it's all very complicated and confusing, which is why I have just



laboured through all the editions, colours and names, as a prelude to set the stage.

The promise here is of a technologically sophisticated 21st century Direct Drive turntable from Technics we can all afford, but in tuned Evo form without unwanted bits, because as standard the Technics GR comes with a prosaic arm and on-board switch-mode power supply, both of which raise audiophile eyebrows. But let me cover the new GR first before looking at Timestep's improvements.

Back in 1972 the Technics Direct Drive motor was revolutionary. Technics came up with one of the first electronically controlled low speed motors, one that could hold perfect speed. Tough and reliable, they built it into a turntable aimed at DJs – Saturday Night fever and all that. Variable speed and a standard 1970s pattern S shaped arm, found on budget belt drives like Pioneer's PL-12D of the time, were part of its package appeal. An orange strobe light illuminating the platter's edge markings added visual interest and a pop up cue light for DJs working in the dark was a useful aid. Quick start and stop, triggered by a large square on/off switch underlined the unit's functionality.

But to audiophiles the original SL-1210 Mk2 had limitations. It's arm was simple in construction and outdated, surpassed by Rega and SME for example. The platter was necessarily lightweight, in order to start and stop quickly. This was a benefit to DJs but a drawback to audiophiles, because it was structurally resonant. And the plinth was also light and lively. All the same, we've used a Timestep upgrade of the original SL-1210 Mk2 for some years now because it is utterly reliable and holds both accurate and rock steady speed, which we must have when reviewing. Ours is equipped with a lovely SME309 arm in order to carry cartridges under review and has the external power supply you see with the Evo GR model here. So we know the breed well.

It was Japan's electronics industry of the time (early 1970s) and the emergence of the transistor that led to the development of the Technics motor by Matsushita, using early servo-control technology. But that was long, long ago. Nowadays it is all done on a silicon chip and such motors are used everywhere, including your washing machine that turns slowly forward, then backward, then moments later cranks up to

1400rpm; it's driven by a massive BLDC, or brushless d.c. motor.

With so much demand, BLDCs have become the norm and technologically very sophisticated, used as servo-motors in aircraft, in disc drives of all sorts and what have you. That's why the 40+ year old motor of the SL-1210 Mk2 could, underneath the hood, be improved. However, performance has always been exceptional, way better than belt drives in terms of speed accuracy and stability.

Hence the new-in-2016 Technics SL-1200GAE turntable. Beneath the platter sits a massive twin rotor motor with enormous starting torque, allowing the use of a much heavier and more rigid brass and aluminium dual layer platter. But again this suits DJs more than audiophiles used to watching a belt drive crank up to speed whilst the tea is being made. Now Technics have introduced a less expensive GR version that I first saw earlier this year at the Sound&Vision Show, Bristol (UK) 2017. Underneath, it uses a smaller and simpler single-rotor motor, closer in mechanical topology to the original motor. If anything the SL-1200G motor is over kill for hi-fi use and, our measurements



**The long slide control alters speed by +/-8%, with a central zero and circular quartz-lock button to select 33, 45 or 78rpm exactly. Speed adjustment range can be doubled to +/-16% by pressing a small rectangular button.**

show, is actually a little worse than the cheaper GR – who would have believed it!

Peering closely at Technic's spec for the new SL-1200G/1210GR (silver/black) I spot the subtle differences. The single rotor motor has less torque, 2.2kg-cm instead of 3.3kg-cm, and a lighter one-piece die cast aluminium platter of 2.5kgs, compared to the 3.6kg brass/aluminium platter of the SL-1200G. Yet both have a quoted Wow & Flutter figure of 0.025% and a start up time of 0.7secs to 33rpm. All these changes make a big difference to weight however: the SL-1210GR weighs 11.5kgs whilst the SL-1200G weighs 18kgs.

So that gets the new Technics into perspective. Timestep take this package, remove the arm, fit a new arm mounting plate and provide an external linear power supply, as well as tune the plinth with new mat etc, as options. Recent price increases have put SME out of the cost frame here, so the Timestep Evo version gets a Michell TecnoArm, which is a modified Rega RB202. Part of the mod process is to drill the arm tube to disperse resonances; moths have nothing to do with it.

So in Timestep's Evo package you get a Rega sourced, Michell tuned UK arm suitable for all cartridges (MM and MC), a small, external linear power supply replacing the original internal switch-mode unit, a Oyaide platter mat option, all adding to the basic Technics offering.

The SL-1200GR has three speeds: 33,45 and 78rpm. Each is adjustable, using the slide control you can see at right on the plinth. At the central detent of this control however, the turntable speed-locks to a quartz crystal reference – and this is quite important. It prevents speed-wander, which in turn reduces wow. The turntable runs at the correct speed always, and variation in speed from wander barely exists. Direct Drives without speed lock can wander and traditionally have done, although this is abating as chip-based frequency sources become more stable.

A rotary On/Off switch sits atop the stroboscope pillar at left, and switching on triggers the blue strobe

light that shines on the platter's edge.

The plinth is solid and heavy, made from BMC (bulk moulding compound). Dimensions are 453mm wide, 173mm high with dust cover on but closed, and 372mm deep. The spring-assisted dust cover hinges upward and space is needed above the turntable to accommodate this, as always, or it can be removed.

The Rega RB202 arm is a one-piece casting with tapered arm tube of exceptional rigidity, integral bearing hub and rigid but light fixed head shell. That means you don't get the convenience of a removable head shell, instead getting lower moving mass and better sound from the unitary structure. Michell add silver wiring and drill the tube to further improve sound quality. Timestep supplied ours with a Denon DL-110 high output moving coil (MC) cartridge but are happy to fit any or no cartridge.

Feeding the motor and electronic

supply that does not, by its nature, produce radio rubbish. It is housed in a small, solid metal case with IEC mains input and XLR output. The turntable has a fixed power lead, 2ft long, terminated in a matching XLR plug that pushes in and locks.

### SOUND QUALITY

I used the Evo GR with an Icon Audio PS3 valve phono stage, driving both a McIntosh MC152 power amplifier and alternatively an Icon Audio Stereo 30SE single-ended valve amplifier, into Martin Logan ESL-X hybrid electrostatic loudspeakers. The system was fed by an Isotek Evo 3 Mosaic mains regenerator.

The Denon DL-110 I am unfamiliar with – and I got a big surprise here. Priced at an almost frighteningly low £200 it's a high output moving coil designed to be used through an MM input – and this is how I used it. Immediately I was struck by a very solidly wrought



**The Michell TecnoArm is based on a Rega RB202. Michell fit their own counterweight assembly, secured by a hex bolt and matching key. The lift/lower lever has little clearance beneath it, making use slightly awkward.**

circuits of the SL-1210GR is an on-board switch-mode power supply, used because there's limited space in the chassis and switch-modes can be made small. Also, they accept 110V-240V at 50Hz or 60Hz, so work anywhere. However, switch-modes radiate radio-frequency rubbish and the SL-1200GAE unit is unshielded – unfortunate.

It has been removed by Timestep, to avoid possible interference into a sensitive pickup cartridge and lessen noise. Instead, power now comes from an external Timestep linear

sound stage where instruments had a firm presence, so whilst Neil Young sang After the Gold Rush in front of me (new all-analogue re-master pressing) the piano behind him had massive scale and sat in an open and natural acoustic. At times I heard some congestion on vocal peaks that sounded like the tracking limit was being approached – a common problem with high output MCs – and upper treble was reticent; the '110 lacks sparkle. I duly changed it for an Ortofon 2M Black MM and was chastened to hear the





**The strobe light now shines blue against the machined platter markings. At top is a rotary on/off switch. The GR retains the same large start/stop button of its predecessors.**

flatter sound stage of a typical MM, if better defined higher frequencies and more confident tracking too. All the same, the Denon was so clear, dimensional, solid in its imaging and smooth that I soon unbolted our 2M Black and went back to the DL-110; it really is a very good cartridge, with great strengths tempered by a few weaknesses.

Our sharp sounding and messy cut of Valerie by The Zutons was tidied up nicely, background stick work having intriguing rearward presence, whilst drums had a lovely firm, dimensional thwack to them. The ability to make sense of 'difficult' tracks is always heartening to hear and the DL-110 in the TecnoArm managed well here.

The SL-1210GR for its part was rock steady in pitch, with no sense of wateriness or wavering of tone, as you might expect. I also felt this unit had a slightly darker tonality than the GAE, in spite of its lighter plinth and platter, likely attributable to the heavy rubber platter mat on our review sample.

The strings of the Weiner Philharmoniker playing Mozart Symphony No35 (Decca re-master by Project) were blurred over by the stylus of the 110 but otherwise the orchestra had impressive dimensionality and vivid presence before me, between the X-Stat panels of our Martin Logans. All the same, I'd had enough after a while and fitted our Ortofon Cadenza Bronze MC cartridge to see what the turntable could do with a refined MC free from limitations.

Now – suddenly – I was in business! Re-spinning After The Goldrush, Neil Young moved a few

steps forward toward me. There was clear resolution of fine vocal intonations and conspicuously more detail all round. The strings of the Weiner Philharmoniker had a sheen to them and I could discern individual instruments, rather than a homogenous blur.

The SL-1210GR with TecnoArm now started to show what it could do. With such resolution I heard from the TecnoArm an mild accentuation of upper midband frequencies that gave forceful detailing and sharply defined images on the sound stage. It's an arm that best suits softer sounding cartridges than the Cadenza Bronze I feel, a Quintet Black being more appropriate in this price bracket, although a Cadenza Black would be even better. Otherwise, I would veer toward fitting a more neutral Rega RB303 or, with deep pockets, an SME309.

Since the lower torque motor of our SL-1210GR had absolutely no cogging at 6.6Hz, unlike the more expensive GAE, and even better

speed accuracy and stability as result, it was hardly surprising that it should sound smoother and darker in tonality, but just as rock stable as its more expensive stablemate. You can detect the stability of a Technics in what is razor sharp metronomic timing, especially obvious with Rock using synthesisers, such as the Scissor Sister's 45rpm Ta Dah LP that I span.

### CONCLUSION

The Michell TecnoArm is forward and detailed in delivery and is well suited to the smooth Denon DL-110 cartridge Timestep fitted to our review product. The main drawback of this cartridge is a budget stylus of limited resolution.

Fitted with an Audio Technica AT OC-9MLIII or Ortofon Quintet Black, both high quality but not-so-expensive moving coils, what you get with this package is exceptional sound quality from LP at an affordable price.

### PRICE LIST

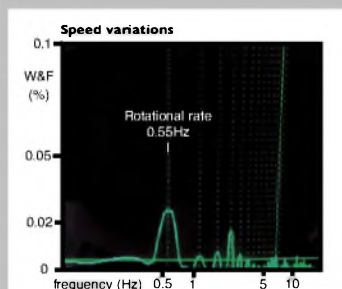
Technics SL-1210GR	£1299.00
Michell Tecnoarm	£677.00
Arm mounting plate	£90.00
Timestep HE III PSU	£450
Fitting etc	£200.00
<b>Total</b>	<b>£2716.00</b>

### MEASURED PERFORMANCE

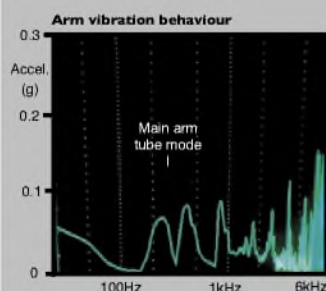
There was negligible speed error, as always with the quartz-locked reference used by the Technics motor. A 3150Hz test tone measured 3153Hz – negligible error. Better, it held this value rather than wandering up and down in frequency like belt drives.

Speed variation was minimal when using a carefully centred DIN 45 540 test disc (no other disc is suitable). There was fractionally more wow (0.05%) than

#### SPEED VARIATION



#### ARM VIBRATION




the SL-1200G (0.04%), likely due to the lighter platter, but with DIN weighting applied both have a fantastically low 0.04% total Wow&Flutter figure. With Japanese JIS weighting, this value fell to 0.025%, exactly as Technics claim in their specs. and beyond most other turntables.

Our spectrum analysis of wow and flutter components up to 20Hz shows also that where the SL-1200G we tested in the September 2016 issue had a small amount of flutter around 6.6Hz (0.55Hz rotational rate x 12 pole motor), our review SL-1200GR had nothing at all here. In other words, it had none of the talked about 'cogging' of a Direct Drive. Not even one smidgen of it – and was actually a little better than the more expensive SL-1200G in terms of flutter, likely because the motor has less torque and therefore less influence on the rotating inertial mass of the platter – a fascinating outcome.

Vibrational modes in the TecnoArm were fairly well suppressed our analysis from a B&K accelerometer fitted to the headshell shows. **NK**

<b>Speed error</b>	<b>0%</b>
<b>Wow</b>	<b>0.05%</b>
<b>Flutter</b>	<b>0.02%</b>
<b>Total (DIN wtd)</b>	<b>0.04%</b>
<b>Total (JIS wtd)</b>	<b>0.025%</b>

**TIMESTEP  
TECHNICS EVO GR**  
  
**OUTSTANDING - amongst the best**

**VERDICT**  
 A tweaked Technics Direct Drive and tuned arm that together give superb results from LP.

**FOR**  
 - sound quality  
 - adjustable speed  
 - 78rpm

**AGAINST**  
 - mediocre stylus  
 - all manual  
 - no removable headshell

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Can a moving magnet cartridge get close to a moving coil that costs much more? Audio Technica's three new 700 series models show they can, thinks Noel Keywood.

# Magnetic Attraction

If you want more than just basic sound quality from LP, choice thins out with conventional (moving magnet) cartridges, Ortofon dominating with their Shibata tipped 2M Black (£450). Now Audio Technica

have stepped into this little-contested region of the market with no fewer than three new 700 Series cartridges, the VM740, '750 and '760, prices ranging from £196 to £522. It's a lot of money for a moving magnet cartridge, but you get breathtaking

sound quality I found – close to moving coils costing thousands.

In listing these new models I left off their suffixes for the sake of clarity. Their full titles relate to the biggest difference between them, the stylus. The least expensive VM740ML



has a MicroLine stylus shape, the next up is the VM750SH that has a Shibata shape, and finally comes Audio Technica's flagship model, the VM750SLC with Special Line Contact stylus. Because the stylus assemblies share a body you can upgrade from '740 to '760 if you so wish, perhaps when a tip wears out. Nothing else changes, including the tracking force, so the arm does not have to be re-adjusted.

The new ATs surprised me by being both simple and a bit outdated in some ways, yet very specialised in others. Both Ortofon and Goldring have moved to the use of captive nuts to ease fitment – a convenience I have become used to. After testing Goldring's budget but excellent V magnet E Series in our October 2017 issue – likely made by Audio Technica – I was expecting these new ATs to have a similar arrangement, but not a bit of it. Fitting was a fiddle, not for cack-handed or faint of heart. It was mildly challenging in fact, for reasons I will explain. What you get here are brazenly specialised designs, measurement revealing accordingly

"The near perfectly flat response does translate in practice to a feeling of natural and smooth balance...it is crystalline clear and very forthright"

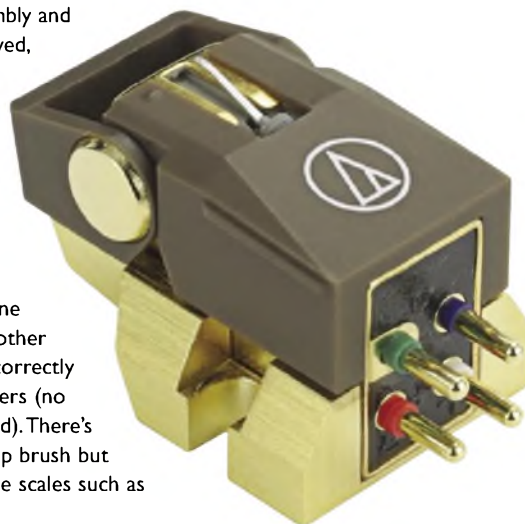
unusual properties, suggesting the designers have knowingly pursued technical perfection above all else.

We were sent a VM750SH (that is directly pitched at Ortofon's 2M Black with Shibata profile stylus it would appear), plus replacement

styli to downgrade to VM740ML or upgrade to VM760SLC. These cartridges come in Audio Technica's traditional plastic case, held onto a plastic headshell-like carrier by a single screw. A small orange-coloured slider must be pushed sideways to unlock the assembly and the cartridge removed, using a supplied small screwdriver. Also supplied are a set of fine headshell leads, three pairs of screws (short/medium/long) and two pairs of nuts, one pair hexagonal the other pair circular and incorrectly referred to as washers (no washers are supplied). There's also a small stylus tip brush but no plastic downforce scales such as Ortofon supply.

Prior to fitting this cartridge its stylus assembly must be removed by pulling it upwards, something that is unique to Audio Technica because of its unusual V magnet arrangement –

The VM Series have a rigid 8gm alloy body with mounting lugs and Audio Technica picture fixing screws pointing upwards in their instruction leaflet so as to place those hexagonal nuts on the headshell's top face – unsightly.



**The stylus housing sits over the fixing lugs and obstructs them, making screw length critical.**

**It pulls upward for removal and when replaced must be fully seated against the body – not easy to ensure.**

However, inserting screws pointing downward as is common raises an issue I encountered: screw length is critical, to avoid obstructing the stylus assembly. In our SME 309's removable headshell the medium length screws were too long, preventing the stylus assembly bedding down fully. The short screws were too short, so I used our own (brass) screws. The hexagonal nuts supplied do not fit the recesses either; only the 'washers' do this. All of which is to point out that fitment is a fiddle; you may need to get a dealer to do it.

With the gold-anodised cartridge body installed it's time to connect up – and the pins are colour coded to assist. With a body weight of 8gms and recommended tracking force of 2gms the 700 series will suit all arms. However, these are specialised cartridges and really need something decent like a Rega or better to perform at their best.

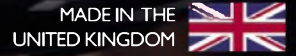
Measurement showed all three cartridges (stylus assemblies) tracked superbly at the recommended downforce of 2gms, so the 1.8gm minimum figure is practicable for those who prefer as little force as

but not mentioned in the rather brief instruction sheet; there is a diagram but it could be better. Whilst I have owned and used ATs over decades and know this stuff, I wonder about newcomers. And these days fitment has become easier than this.



**Tiny cylindrical magnets sit just in front of the stylus hinge, lessening losses and improving dynamic contrasts.**

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- Airplay Connectivity
- Micro SD Card Storage



possible. However, long contact tip shapes apply less pressure to the vinyl than small-contact-area ellipticals so 2gms will do no harm, even if it does seem high compared to the 2M Black's low 1.6gms. Grooves are damaged by mis-tracking; there's little wear whilst the tip maintains contact with the groove due to lubricants in the vinyl and an effect known as plastic deformation where the vinyl springs back after pressure is removed.

The stylus assemblies have an integral swing-up guard – useful in some ways, not in others. The guard's front conceals the stylus beneath the cartridge body, frustrating accurate cueing into a groove, and these assemblies can vibrate, slightly degrading the sound



**The flip-up stylus guard is convenient, but it obscures the stylus.**

– that's why high-quality moving coil types have removable covers. However, since fitting a removable cover can cause damage, they have limitations too. No one has solved this conundrum, except Shure with their damped stylus brush in the M97xE.

Finally, with regard to usage, these new ATs run very close to the LP surface; clearance is minimal. And there's good reason – it keeps distortion down. All three stylus assemblies produced less distortion than all others our measurements showed. That's why I said earlier that sound quality has been placed above other considerations. The stylus tip is difficult to see – I had to peer closely to get needle into groove with precision.

## SOUND QUALITY

For listening tests, I fitted the 700 body to our SME309 arm and changed stylus assemblies. The arm

was mounted on a Timestep Evo-modified Technics SL-1210 Mk2 turntable fed from its external linear supply. The phono stage was an Icon Audio PS3 (valve) feeding a McIntosh MC152 power amplifier and alternatively an Icon Audio Stereo 30SE single-ended power amplifier, driving Martin Logan Classic ESL9 hybrid electrostatic loudspeakers fed from an Isotek regenerated power supply. Each stylus was run in using a locked groove to burnish it.

As measurement suggested, the sonic differences between the three stylus assemblies wasn't great, so I'll generalise first to set the picture.

The near perfectly flat response does translate in practice to a feeling of natural and smooth balance, yet at the same time there's

absolutely no sense of warmth in the sound: it is just crystalline clear and very forthright. There is also a slight sheen up top due to obvious upper treble, mostly with the 760SLC.

Starting at the top with the 760SLC I was more than impressed by what Audio Technica have achieved here. The sheer projection, vivacity and resolution of fine upper treble was extraordinary. The tinkling bells preceding Jackie Leven's 'Inside This Clay Jug' had rich sonorous presence,

put a single magnet behind the hinge.

Playing the heavy and flat 180gm LPs of Mark Knopfler's 'Kill To Get Crimson' the 760SLC better illuminated the quality and dynamics within this recording against other LPs played beforehand.

In 'The Fish and the Bird' Knopfler's laconic drawl had well-hewn presence centre stage, sparse drum rolls punching out firmly in support. Surface noise was barely existent making silences convincing.

What I noticed with the 760SLC was that it had obvious bite, great high frequency separation yet seemed smooth with it all. It even made a good job of sorting out the Zuton's 'Tired of Hanging Around' that commonly sounds harsh. The 760SLC removed the muddle, simplifying things; it was harsh but cleaned up and more listenable.

Of the three, the 750SH ultimately struck the best balance I felt. It has less bite and top end presence than the 760SLC but wasn't less insightful. I heard no smearing or softening, just a slightly easier delivery with a less forceful top end. The de-emphasis of highs allowed lows to make their presence better known; my ear being less distracted. Bass lines now caught my attention, sounding firm and tight, if not large and fulsome.

And what of the VM740ML, the cheapy of the group? It had all the basic goodness of its more expensive stablemates but with the very merest trifle of a little softness, affecting delineation between instruments on

"I was more than impressed by what Audio Technica have achieved here. The sheer projection of fine upper treble was extraordinary"

jumping forward rather than inhabiting the background, as I know them with lesser MMs. Strummed guitar strings had plenty of bite, followed by rich twang.

As I noted in the Goldring E Series review (Hi-Fi World October 2017 issue) Audio Technica's V magnet arrangement puts the sensing element – twin magnets – in front of the cantilever hinge where sonic losses are lesser, where other MMs

the soundstage and events in the time domain. But this hardly mattered and was in some ways a saviour; the 740ML was the easiest of the three, yet still far ahead in its resolution of high-frequency information than a typical moving magnet cartridge. I can recommend it as 'best value', because the price difference hardly reflects its small loss of quality against the 750SH and 760SLC.

All three cartridges made sonic





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differences between LPs obvious: they have a wide dynamic palette that illuminated differences. 'Kill To Get Crimson' was more obviously a modern, high-quality recording well mastered and cut, strides ahead of hi-res through our big Martin Logan electrostatics that reveal all; my many re-masters, like Neil Young's

close, very close. MCs consistently have a tad more openness and stage depth, due to their low impedance/ low noise generators, but the many budget MCs around don't have the fine treble resolution and insight of the 700s here, since most come with mediocre styli, often sounding quite fuzzy up top. Also, good MCs

and a stylus that is considerably easier to fit, so better suits fixed headshell arms when it comes to the practicalities of attachment.

**CONCLUSION**

All three of Audio Technica's new top-of-range moving magnet cartridges – VM740ML, VM750SH and VM760SLC – perform wonderfully.

They track well, produce far less distortion than all rivals and sound sparkingly clean, clear and forthright. Differences between them are, surprisingly, minimal – being only tip profile, which in use introduces subtle sound quality differences best spotted by aficionados. That makes the least expensive '740ML easily best value. The 750SLC had a tad more ability and would be my choice, whilst the '760SLC is more for those that want its top end brightness – but it doesn't justify its price differential.

"All three of Audio Technica's top-of-the-range moving magnet cartridges perform wonderfully"

'After The Goldrush', still sounded impressive but earlier production standards and equipment were now exposed by these ATs.

Are they as good as moving coil (MC) cartridges? With tapered aluminium cantilevers and sophisticated stylus shapes all three get

like the Ortofon Cadenza Bronze I commonly use have better stated, stronger bass.

And Ortofon's Shibata tipped 2M Black? There's little in it here, the ATs sounding a little cleaner and clearer – a tidier sound if you like. But the 2M Black has captive nuts

**MEASURED PERFORMANCE**

Tracking at 2gms as recommended, all three cartridges cleared all tracking tests of CBS-STR112 test disc (300Hz) and B&K2010 test disc (1kHz). It is rare for cartridges to clear the top 25cm/sec track of B&K 2010, where low tip mass is important. None will mis-track and cause damage as a result, nor produce distortion on drums (high groove excursions) or vocal peaks (high accelerations).

Frequency response (JVC TRS-1007 test disc) of all three stylus assemblies was much the same, our analyses show. The green trace (outer grooves) shows no upper mid-band roll-off from generator losses suffered by cartridges of yore, so the 700s will not have a warm sound – not even a hint of it. A response like this ensures a forthright and projectional delivery with intense detail.

Upper treble remains smooth and peak free, but there is a small amount of lift in the top VM760SLC. Treble will be obvious, but not sharp in quality.

There was no loss on inner grooves either (red trace) – a tribute to the effectiveness of the profiles, all of which read short mechanical wavelengths perfectly. Inner groove dullness, muddle and distortion are minimised to a degree few other cartridges manage.

Output measured 5mV at 5cms/sec rms (3.5mV at 3.54cms/sec rms), a normal enough value, if on the low side.

Channel separation was also typical at around 24dB.

Distortion on lateral modulation was very low at 0.5% second harmonic – 1% is common. On vertical modulation an unusually low measured vertical tracking angle (VTA) of 18 degrees gave a theoretical distortion value of around 0.3% after modulation slant angle correction for STR-112 test disc – extraordinary. All three stylus assemblies produced lower distortion than all other cartridges by a large margin.

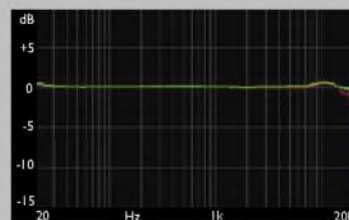
All three stylus assemblies produced similar measured results, and all were class leading. Only the flagship VM7560SLC differed by having a tad more high treble. **NK**

**Tracking force** 2gms  
**Weight** 8gms  
**Vertical tracking angle** 18 degrees  
**Frequency response** 20Hz - 20kHz  
**Channel separation** 24dB

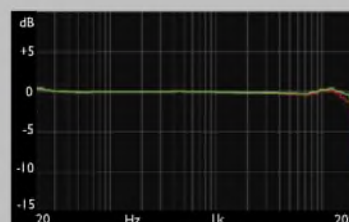
**Tracking ability (300Hz)**  
**lateral** 90µm  
**vertical** 45µm  
**lateral (1kHz)** 25cms/sec.

**Distortion (45µm)**  
**lateral** 0.6%  
**vertical** 0.3%  
**Output (5cms/sec rms)** 5mV

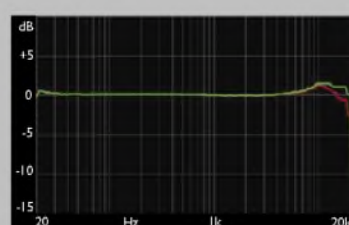
**FREQUENCY RESPONSE 740ML**



**FREQUENCY RESPONSE 750SH**



**FREQUENCY RESPONSE 760SLC**



**AUDIO TECHNICA VM700 SERIES**

**VMN760SLC STYLUS** £522

**VM750SH CARTRIDGE** £389

**VMN740ML STYLUS** £196



**OUTSTANDING - amongst the best.**

**VERDICT**

A brace of superb top-end MM cartridges, with low distortion and super clear sound.

**FOR**

- clear and detailed
- super low distortion
- bold dynamics

**AGAINST**

- difficult to fit
- easy stylus misalignment
- poor instructions

Audio-Technica Ltd (UK)  
 +44 (0) 113 277 1441  
<https://eu.audio-technica.com>

# Gold Standard

French firm Devialet's Gold Phantom active loudspeakers combine unusual looks with stunning sound.

**D**evialet first attracted serious hi-fi attention with its sleek, silver, luxurious-looking amplifiers. They employed something called ADH (Analogue Digital Hybrid) technology which connected a small, high-voltage class-A amplifier directly to the speaker with a parallel class-D stage providing the necessary current.

While the theory wasn't entirely new (many observers referenced Peter Walker and Quad's current-dumping circuit as a close cousin in terms of topology) its implementation was strikingly different in terms of detail and significantly more complex meaning the Devialet was unlike any other amplifier around.

A slew of glowing reviews and awards followed. But Devialet's engineers weren't content to rest on their laurels and decided they'd next turn their attention to loudspeakers.

Hence the Phantom – an active wireless loudspeaker which is again assuredly unlike any other around both in terms of looks and

operation. The Gold Phantom on review here is the top of the range – costing £2,190 per loudspeaker with an optional Treepod stand (see picture) available for £259 each.

That individual price is important as the Phantoms can be used individually, as a pair or even with as many as 24 in different zones around the house for multi-room operation. For the latter options it's recommended to add Devialet's Dialog hub (£249) which provides for easier set-up, adds a digital optical input and provides simple management of music streaming services such as Deezer, Qobuz and Tidal.

Looks-wise the Phantom is ovoid in shape – stylish and striking. The side panels feature 22-carat gold plated covers while each one weighs a hefty 11.4kg. The cabinet is hermetically sealed to withstand the 4500 Watts of power provided by the internal ADH2 amplifier section which is claimed to be good for a very high 108dB sound pressure level at one metre. In addition to the side-firing woofers there's a

forward-facing titanium-domed tweeter hidden behind a patterned grille, surrounded by an annular midrange driver.

The proprietary DAC will accept file sizes of up to 24bit/192kHz while there's also Bluetooth, Apple AirPlay and Spotify Connect compatibility. Control is provided by Devialet's Spark app which is available for Android, iOS, Windows and Mac OSX tablets, computers and smartphones. Like most applications of this sort it will enable you to see all files on your network with artwork, create playlists, access internet radio and streaming services and create various zones if you are using Phantoms in different zones.

Despite the complexity of the engineering involved in the Phantom, set-up and operation is simple with the Spark app. For this review I used a pair set up for traditional stereo operation (one dedicated left channel, one right) fed wirelessly with high-resolution material as well as being connected to an Oppo BDP-105D via an optical feed to the





Dialog hub. There is no analogue input and no inputs on the speakers themselves. Each one has a mains connection.

From unboxing to plugging in, connecting to the app and listening to music took just 30 minutes. It was then just a matter of determining placement – and it was quickly obvious that firing straight down the room was the optimum position for the smoothest response.

**SOUND QUALITY**

Looking at my listening notes a few words keep cropping up repeatedly; namely clean, controlled, powerful.

Starting with Joy Division's 'She's Lost Control' (24/96) the stark opening cymbal crack shimmered – and then Peter Hook's melodic bass line kicked in exhibiting a definition and absence of overhang I wasn't expecting. The low-end grip is exceptional so bottom octaves stop and start with tremendous clarity



**The Dialog hub wirelessly connects between two and twenty-four Gold Phantoms.**

with no evidence of the cabinet adding its own unwanted vibration to the sound.

To test this fully I queued up James Blake's 'Limit To Your Love' – a track that has swathes of sub-sonic information that can prove tortuous for even many large floorstanders. Sitting eight feet away from the Phantoms those sub-sonics punched me in the stomach in a visceral manner. This is how the track is meant to sound but no other loudspeaker at this size or, indeed, price has ever managed to do it for me.

The only worry was that when turning up the sound the side-firing woofers vibrated somewhat alarmingly so that if this was a traditional loudspeaker I'd be leaping up to reduce the volume to prevent damage. But there's nothing to worry about – this is what they're supposed to do and how they function (See

Measured Performance for a full explanation).

Away from that bass response (impressive as it is) the overall voicing of these Gold Phantoms is commendably even.

With a 24bit/192kHz file of Leonard Cohen's 'Hallelujah' the pitch and tone of his voice were played with total accuracy, enabling me to even hear his small intakes of breath between lines of the song.

As an experiment, I also tried using one Gold Phantom placed centrally in the room. Yes, it lost the stereo imaging and large soundstage that two provided but the overall performance was still impressive with that clean, tight, vibrant sound coming through again.

As such I could well imagine some people opting for a single Phantom in some smaller rooms and then going for a pair in larger listening spaces.

That's the flexibility this design offers and why as a package it works so well. You have an amplifier and

loudspeaker in one elegantly engineered combination whose good looks are paired with even better sound.

**CONCLUSION**

Devialet has produced something truly different with the Gold Phantom. In terms of dynamics there's little to touch it at the price but it also sounds refined and authoritative with the flexibility to be set-up wherever you fancy in the home. It really is a ground breaking product.



**The optional Treepod stand costs £249 and provides a firm base for the Gold Phantom 'speaker.**

**MEASURED PERFORMANCE**

The Gold Phantom is conceptualised as a pulsating sphere – think of a football pulsating to produce sound, albeit in larger form. The idea is to produce sound from a 'point source', something Peter Walker, founder of Quad, pursued a long time ago.

Point sources like the Gold Phantom produce focussed images and can be impressive, but making them work in physical form is challenging. Devialet have placed an annular midrange around the central tweeter, underpinned by a bass unit at either side comprising hemispherical drivers, forming an almost

spherical case.

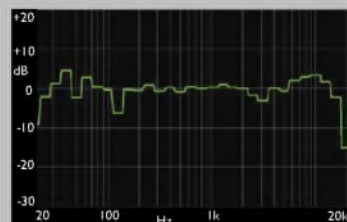
Our third octave analysis of pink noise, when on the low Devialet stand (top), shows smooth frequency response across the audio spectrum, from 70Hz to 6kHz. There's some treble lift on-axis of +2dB or so above 6kHz, but slightly off axis the Gold Phantoms measure flat so they are designed to fire straight down a room and not directly at listeners, at least for a truly flat and tonally accurate sound balance. Pointing them inward gives stronger treble, but only by a small amount, so these speakers will not sound dull, but nor obviously bright.

Bass ran flat to 30Hz when measured high above the floor to eliminate floor enhancement (bottom). Our published response of the speakers placed on the optional stands shows a small amount of bass lift – just enough to ensure obvious but not boomy bass. Although small, the Gold Phantoms run low all the same, producing strong beep bass, reaching right down to sub-sonics in the 20Hz-30Hz region. In spite of their small size then, bass will be strong, obvious and run deep.

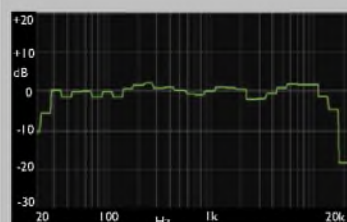
The Gold Phantoms are interesting in concept and have been heavily engineered to produce an accurate and effective final result, measurement shows. Although small, they will sound powerful, clean, detailed – and very focussed. **NK**

**FREQUENCY RESPONSE**

**On low Devialet stand**



**On high stand**



**DEVIALET GOLD PHANTOM £2190**



**OUTSTANDING - amongst the best.**

**VERDICT**

Innovative design combined with superb sound makes the Gold Phantom a standout loudspeaker/DAC/amplifier combination.

**FOR**

- dynamics
- ease of use
- flexibility
- bass response

**AGAINST**

- no analogue input

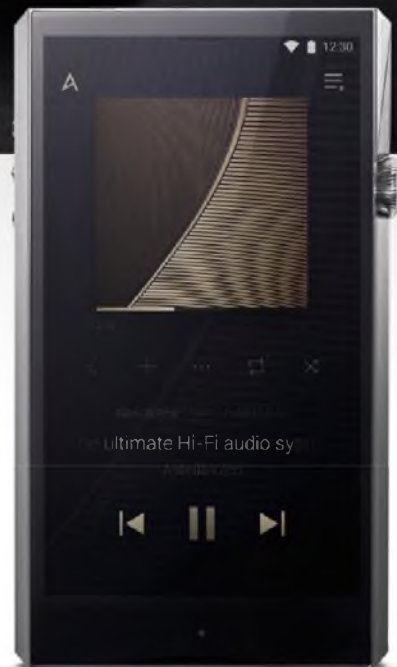
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# The T Factor

Chord Company's new Sarum T loudspeaker cables use proprietary insulation to produce a stellar sound, says Jon Myles.

**M**any things go into making high-performance loudspeaker cables; the conductors used, terminations, quality of connectors, screening and the dielectric all have a significant effect.

Of these, the latter is probably the least well understood – but they play a significant part in the whole equation. In essence their role is to reduce the signal leakage and so aid the accurate flow of information from the amplifier into your loudspeakers.

There are many types in use – from relatively cheap PVC to polyethylene, polypropylene and the more popular PTFE used in many higher grade cables. New variants are rare – so when a company such as Chord Cables with 32 years in the business comes up with one it piques interest.

The material in question is Taylon – which under a different name is used in military applications to secure signal integrity at all operating temperatures. Chord says this dielectric is only available to them and has been implemented across the whole new Sarum T range

– which also includes a digital cable and power lead at the moment.

It first surfaced as a component in the ChordMusic range – where the loudspeaker cables start from £3300. But the Sarum T start from £1800 for a 1.5 metre pair. Other important features are silver-plated oxygen free copper conductors, a heavy braid foil for shielding and a thick outer jacket.

The cables also come in twisted pairs and are hand-built in Chord's own plant in Wiltshire.

## SOUND QUALITY

I first heard the new Sarum T range during a visit to their Wiltshire headquarters. Compared to the previous Sarum cables they were impressive.

But with longer listening through my own system the step-change was dramatic in both dynamics and the extra musical information.

Plugging them into both a Naim Supernait 2 integrated amplifier and a Naim Uniti Atom all-in-one streamer/amp showed just how clear and open these cables are.

What was immediately noticeable is how natural they sound. Music flowed effortlessly

and instruments were given room to breathe. It's an effect that works from top to bottom – so big bass tracks like Led Zeppelin's 'When The Levee Breaks' had increased punch and authority, while gentler pieces such as Arvo Pärt's 'Spiegel im Spiegel' were put across with delicious delicacy.

Many cables impart a particular character on the music but the most impressive thing here is the absence of just that. It means the performance comes to the front with no smear or sense of constriction; I forgot I was listening to electronic components and transducers. Everything seemed improved – from timing to instrumental cohesion.

Only the very best 'speaker cables do that and these warrant a place among that elite group.

## CONCLUSION

£1800 might seem a lot for a loudspeaker cable but the Sarum Ts justify the price. They are easily as good as some much more expensive rivals, being open, uncoloured and superbly natural – letting you hear the sound of your amplifier and loudspeakers as they should be.



**CHORD SARUM T  
£1800 (1.5 METRE  
PAIR)**



**OUTSTANDING - amongst  
the best.**

### VERDICT

Proprietary materials and construction translate into a cable that can bring the best out of any system. Supremely open and unsullied, they can compete with rivals costing many times more.

### FOR

- wide bandwidth
- open, natural sound
- tonally accurate

### AGAINST

- nothing

The Chord Company  
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# ortofon

accuracy in sound



## PW/Ti

Per Windfeld worked at Ortofon for over thirty years, and during his time as Chief Engineer he became widely recognised in the industry as a true hi-fi visionary. The **MC Windfeld Ti** phono pick-up cartridge is a tribute to the myriad designs and technical developments Mr Windfeld oversaw prior to his retirement. Boasting a variety of true high-end features and components, this is an exclusive cartridge design built only for the high-end vinyl enthusiast.

At the heart of the MC Windfeld Ti lies a revolutionary customized **Selective Laser Melting (SLM)** manufacturing technology pioneered by Ortofon. The SLM process makes a **titanium core** for the cartridge, protecting all the carefully selected components for the pick-up system in a rigid, lightweight, vibration-free housing.

Those who choose to adopt the MC Windfeld Ti will experience the lifelike, dynamic and open sound, with exceedingly clear midrange. The MC Windfeld Ti remains **extremely musical** while paying close attention to micro dynamic details, with its delicate, but also **analytical nature**.



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# Utopia? Yes!

Martin Pipe is knocked for six by Focal's incredible uber-phones.

I've listened to many pairs of headphones over the years, but the Utopias from French speaker manufacturer Focal are the first I'm aware of to be accompanied by a health-warning. Nothing to do with the hearing-damage caused by listening at head-banging volume levels, but everything to do with the incorporation of beryllium into their drive units. The properties of this rare-earth metal make it ideal for audio transducers. It's three times as stiff as titanium, yet is considerably less dense. As a result, it has a fast sound-conduction speed. But it's not the nicest stuff to handle, being listed as a Class I carcinogen.

Focal understood the sonic benefits of beryllium and for some time has harnessed the substance to good effect in its speaker designs. Notably, the inverted-dome diaphragms of Focal tweeters – including those built into its flagship (£120,000) Utopia EM floorstanders – fashioned from beryllium.

As regards the material's effect on human health, Focal reckons that you'll be fine as long as you don't abrade, ignite, breathe in, touch or apply acid to one of its beryllium transducers.

It was a logical step for Focal to take their beryllium development, and use it as the basis of headphones. After all, in fundamental terms a speaker drive-unit is very similar to a dynamic headphone transducer. Hence the Utopias, which at current exchange rates sell for a cool £3,500. They're thus among the most expensive headphones in the world; maybe they should come with a wallet-warning too.

Like the speakers with which they're associated, the Utopias are

a cost-no-object statement of the art. Hardly surprisingly, they look absolutely gorgeous and exude luxury from every pore of their lambskin earpads. Even the box they arrive in makes it perfectly clear you're dealing with something special.

The 3m cable, which attaches to the cups by means of Lemo locking connectors, is rather substantial. It's terminated in a standard 6.3mm (1/4in) jack plug (i.e. unbalanced), although third-parties are already selling balanced cables for these 'phones. No 3.5mm adaptor is supplied for personals; to avoid stressing socketry, a 'trailing' adaptor is recommended.

The pure-beryllium 40mm diaphragms of the Utopias have 'M'-shaped cross-sections, in pursuit of a planar wavefront, and are coupled to formerless voice-coils. 80-ohm impedance and a sensitivity of 104dB/1W (1kHz) are claimed; as a result, these headphones shouldn't be difficult to drive.

The high-tech transducers are built into circumaural open-back enclosures, meaning that your musical tastes could be shared with those in the immediate vicinity. That said, would you be happy wearing three-and-a-half grand's worth of headphones on the Tube?

The Utopias are rather heavy – nearly half a kilo, or 200-odd grams more than the Oppo PM3s I'm used to donning. Yet the leather headband, carbon-fibre yoke and luxurious synthetic/natural pads contribute to a design that's sufficiently-comfortable to wear for hours at a time. If you're lucky enough to afford these 'phones they'll draw you into extended listening sessions.

I tried the Utopias with various



gear, ranging from a FiiO X3 to a Prism Callia DAC driven by a Cambridge CXN streamer. It doesn't matter what you're listening to – orchestral, heavy rock, opera, electronica, jazz or the (difficult!) spoken word, whether analogue or digitally-sourced, the Utopias will get you closer to the performance.

In all these cases the results were simply breathtaking in terms of clarity, frequency extension, dynamics, layering, definition, imaging, percussive speed and the sheer lack of audible colouration. I also got much pleasure out of some binaural material (including the Rite of Spring from last year's BBC Proms (<http://bbc.in/2sB-HdBI>)).

These headphones are the best transducers I've heard – speakers or headphones. Reference class all the way, they should come with another kind of warning: once heard, you'll be satisfied with little else...



**FOCAL**  
**UTOPIA £3,500**



**OUTSTANDING - amongst the best**

**VERDICT**

The best headphones yet produced?

**FOR**

- jaw-droppingly accurate sound
- stunningly-built
- comfortable

**AGAINST**

- expensive
- heavy

Focal  
[www.focal.com](http://www.focal.com)



**Naim's new Uniti range includes a sophisticated storage device and excellent player, says Jon Myles**

# Total Uniti





"with Bjork's brooding 'Black Lake' the sound punched out of a pair of Spendor D9s with total authority and a wide, enveloping soundstage."

**T**here's no doubt that the original Naim Uniti was a ground breaking product for the Salisbury company. First introduced in 2009 it became an immediate best-seller and kick-started a trend for all-in-one units featuring a CD player, amplification, streaming and internet radio connection.

In the wake of its success Naim expanded the family with the likes of the UnitiQute and SuperUniti. The original Uniti was my first major Naim purchase and is still going strong after a recent service (well worth considering if you bought one of the first models).

Now, though, the range is changing – and it's not just a minor revision but a thoroughly new set of components. Naim say they have spent some

£3.7 million designing the products from the ground up with new components, software and improved circuits.

First off the production line are the two on view here - the Uniti Core and the Uniti Atom. Both are compact, half-width designs in Naim's traditional aluminium black casing but gone is the company's iconic green logo, to be replaced by an illuminated white version (which has provoked no end of comments on some internet forums).

### UNITI CORE

Taken in turn, the Core is a dedicated CD ripper/server that can store tracks including high-definition downloads, then stream them wirelessly to any computer with UPnP ability. It supports most popular file

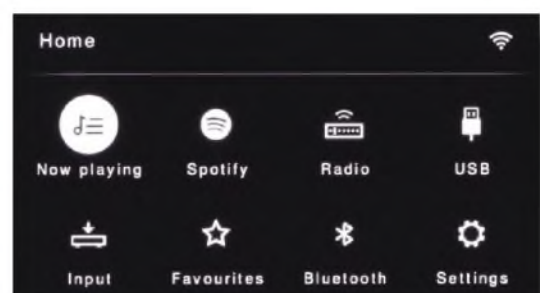
formats including WAV, FLAC, DSD, Apple Lossless, AIFF and AAC.

USB sockets are provided at front and rear for connecting other storage devices and there is also a digital S/PDIF output on the rear, meaning the Core can also be connected directly to your own existing DAC or integrated amplifier with digital inputs.

But it gets even more interesting with the Core. Shipped from the factory there's no internal storage fitted - giving the buyer the opportunity to specify the make,



*The solidly-built remote control is one of Naim's best yet.*



*Internet radio, Bluetooth, digital and analogue inputs are all available from the set-up screen.*



**A user accessible tray allows storage drives to be swapped in and out of the Core.**

model and size of disk fitted. This can be either a Hard Disc Drive (HDD) or Solid State Disc drive (SSD), and because of a slip-out caddy can be done yourself or specified at the dealer. As costs of storage keep falling this is a handy feature and also means

Inputs on the rear include two optical TOSLinks that accept 24bit/96kHz, a coaxial RCA (24bit/192kHz), USB and a single RCA analogue input with three selectable sensitivities (1v, 2.5v and 6v). There's also a pre-amp out for connecting an external power amplifier if you require a bit more drive for your loudspeakers.

If you'd prefer to supply music to the Atom wirelessly it supports UPnP devices such as NAS drives, Google Chromecast, Apple Airplay and Bluetooth aptX, as well as built-in support for Tidal and Spotify Connect.

If you're wondering where the wireless aerials are, they're hidden in

**Favourite radio stations**

- ☆ Naim Radio 320K
- ☆ Deep Vibes Radio
- ☆ Radio Paradise 320k
- ☆ Classic FM
- ☆ KCRW 89.9 HD2 Eclectic 24

**The Uniti Atom also allows users to access a full range of internet radio stations - a great way of discovering new music from around the world.**

control that first appeared in the £125,000 Statement amplifier. It's a gorgeous piece of engineering – a large, rotary dial with an illuminated outer ring that operates so smoothly and accurately it's a pleasure to use.

If you're sitting on the sofa, though, control is via a supplied remote or – as ever nowadays – a free app for Android and iOS. Naim was one of the first hi-fi companies to produce a fully-featured app and the latest version is among the best available. It provides access to all music on a network as well as internet radio stations, streaming services and playlists, as well as offering artist discographies and biographies.

**SOUND QUALITY**

Any new Naim Uniti product is going to be compared to those that have gone before - and here the Atom and Core combination is not wanting I found. The Core makes ripping and storing files easy, while the Atom is an insightful and



**The rear of the Atom has both digital and analogue inputs - although the latter is routed through an ADC (see Measured Performance for further details).**

if a drive fails it can be taken out and replaced.

Ripping from your CD collection is an easy matter – simply slot the CD in and the Core reads it, stores the music and also downloads album artwork. I tried 250 CDs with an average rip time of 4 minutes per disc, so if you have a large CD collection you'll need to dedicate some time to it, but they will all be stored in one location once done, alongside any high-resolution downloads.

**UNITI ATOM**

The Atom comprises a streaming device, DAC and amplifier, all housed in a 10cm x 25cm x 27cm chassis (H/W/D). The class A/B output amplification is derived from the company's Nait series of integrated amplifiers and is rated at 40 Watts per channel - although, as ever, this is Naim Watts (see Sound Quality for more on this).

a panel behind the heatsinks on the side and support both 2.4GHz and 5GHz frequencies.

The fascia features a 5" LCD colour screen for showing album artwork, where available. The top features Naim's latest volume



**The volume control on the top of the Atom is derived from Naim's flagship Statement amplifier.**



rhythmic amplifier/streamer.

Starting with Joy Division's 'She's Lost Control' the opening electronic drum pad crack had biting impact and when the bass came in was both deep and tuneful. In typical Naim fashion the amplifier punched the sound along but there was also a good deal of detail on offer.

On Philip Glass's 'Heroes Symphony' by the Bournemouth

Overall the sound was leaner than that of my resident Supernait 2 – but it did not lack substance. With Bjork's brooding 'Black Lake' the sound punched out of a pair of Spondor D9s with total authority and a wide, enveloping soundstage. There was a realistic tone to Bjork's subtle inflections and I could even pick out her intakes of breath between lines – something amplifiers at this price



The Core has ethernet, USB and S/PDIF digital links on its rear panel.

Symphony Orchestra (24/96) I could easily discern the layers of instruments – and track the individual musicians in even the densest of passages.

What also impressed me was the sense of control the amplifier exerts. At 40 Watts per channel it is not the most powerful amp at the price - but it didn't sound strained even when I pushed volume up.

often mask.

These characteristics stayed true no matter what form of digital input was used (streaming, Bluetooth, optical, coaxial). There was, though, a slightly warmer sound from the analogue connection with a touch less detail, probably due to the fact that the signal goes through an ADC first so there's an extra processing stage. It's a subtle difference though

## MEASURED PERFORMANCE

The Naim Atom amplifier produced 45 Watts into 8 Ohms and 72 Watts into 4 Ohms, enough to drive modern loudspeakers to very high volume. The output stage is a classic Class A/B, but was better than most in possessing a very stable level-related distortion (0.02%) pattern, free from high harmonics, even at 10kHz – classic analogue done well.

Sensitivity of the Aux input was low at 400mV, insufficient for low gain external phono stages. Low sensitivity usually gives a noise figure around -100dB but the Atom managed a mediocre -83dB. Frequency response showed why: it is hard band limited by an 24/48 input ADC that turns the Atom's analogue Line in to digital – and ADCs are a tad noisy. All the same, linearity was very good (i.e. low distortion) and overload high at 3V, so it will accept the analogue output of any silver disc player (2V).

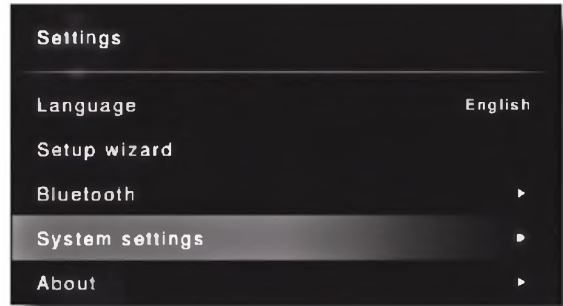
The digital (S/PDIF) input gave an unimpressive 106dB dynamic range with hi-res (24bit) digital, little better than

CD (102dB). Noise was again the issue here. Frequency response was again curtailed to 19kHz (-1dB) even with a 192kHz sample rate input.

The optical S/PDIF input was stable up to 96kHz sample rate maximum from a QED glass optical cable, glitching at 176.4kHz and 192kHz. The electrical (BNC socket) input accepted 192kHz without problem.

The Atom has been band limited through all inputs to give a classic smooth Naim sound and this is also why Class D has been avoided. The digital section is 'budget' in performance. NK

<b>Power (8 Ohms)</b>	<b>45W</b>
<b>Frequency response</b>	<b>3Hz-19kHz</b>
<b>Distortion (10kHz, 1W)</b>	<b>0.02%</b>
<b>Sensitivity</b>	<b>400mV</b>
<b>Noise</b>	<b>-83dB</b>
<b>Digital (S/PDIF/USB)</b>	
<b>Frequency response</b>	<b>7Hz- 19kHz</b>
<b>Distortion (24bit, -60dB)</b>	<b>0.1%</b>
<b>Separation</b>	<b>88dB</b>
<b>Dynamic range</b>	<b>106dB</b>
<b>Noise</b>	<b>-102dB</b>



System settings allows you to tailor the Naim Uniti Atom to your individual preferences.

and replay was remained impressively coherent.

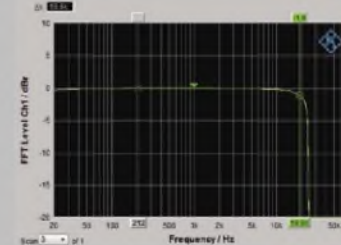
Throughout the listening period I had the Core on one side of the room and the Atom on my rack at the other end a good 12 foot away – and never once did the wi-fi signal drop out.

Put all this together and the Naim Uniti Atom/Core are a potent combination. Take a listen and you will be seduced.

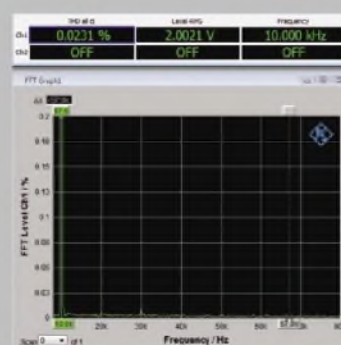
## CONCLUSION

Although these new Naim components can be used as standalone packages, put together they are a joy I felt. They are feature-packed yet easy to use and have a simply superb sound. If the original Uniti range was ground breaking these updates take everything to a new level.

### FREQUENCY RESPONSE



### DISTORTION



## NAIM UNITI ATOM £1999



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

### VERDICT

A compact amplifier/DAC/streamer whose small size belies its big, detailed and authoritative sound.

### FOR

- versatility
- clarity
- great timing
- ease of use

### AGAINST

- nothing at the price

## NAIM UNITI CORE £1999



**OUTSTANDING - amongst the best**

### VERDICT

Easy to use ripper/storage device that can hold all your CDs and high-resolution files.

### FOR

- compact
- accurate ripping
- wi-fi enabled
- automatically downloads artwork

### AGAINST

- nothing

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# Festive Quiz

Don the thinking caps as Jon Myles tests out your music and hi-fi knowledge with our annual festive quiz.

**1) Wharfedale loudspeakers was founded by -**

- a) John Logie Baird
- b) Alexander Fleming
- c) Gilbert Briggs
- d) Isambard Kingdom Brunel

**2) DAB stands for what?**

- a) Direct Audio Broadcasting
- b) Digital to Analogue Benefit
- c) Direct Amplifier Bias
- d) Digital Audio Broadcasting

**3) What was the name of John Lennon's first solo UK No. 1 single?**

- a) Imagine
- b) (Just Like) Starting Over
- c) Jealous Guy
- d) Whatever Gets You Through The Night

**4) When a loudspeaker tweeter is positioned between two midrange units is known as -**

- a) D'Appolito arrangement
- b) Co-axial placement
- c) Horn loading
- d) Nyquist balanced

**5) Naim founder Julian Vereker earlier had a successful career as a what?**

- a) Doctor
- b) Professor
- c) TV repair man
- d) Racing driver

**6) Focal are based in which French city?**

- a) Paris
- b) St Etienne
- c) Marseilles
- d) Lyon

**7) Which American engineer is credited with inventing information theory and laying the groundwork for the digital revolution?**

- a) Claude Shannon
- b) Benjamin Franklin
- c) Henry Ford
- d) Bill Gates

**8) ADC is an acronym for what?**

- a) All Digital Circuit
- b) Analytical Decryption Code
- c) Audio Decoding Control
- d) Analogue to Digital Convertor

**9) In what year was Apple's first iPod released?**

- a) 2001
- b) 1999
- c) 2003
- d) 1864

**10) Direct Drive and Belt Drive refer to forms of what?**

- a) CD player
- b) Turntable
- c) Amplifier
- d) Headphone

**11) Electrocompaniet hails from which country?**

- a) Norway
- b) France
- c) Sweden
- d) Spain

**12) Spencer and Dorothy Hughes founded which British hi-fi maker?**

- a) Arcam
- b) Quad
- c) Spendor
- d) Wharfedale

**13) In what city is the annual High End Show held?**

- a) Munich
- b) London
- c) Paris
- d) Calcutta

**14) Factory Records founder Tony Wilson was also a TV presenter on which channel?**

- a) Carlton
- b) LWT
- c) Granada
- d) Anglia

**15) What did Sony this year say it would reintroduce after having abandoned it in 1989?**

- a) Manufacture of vinyl records
- b) Production of cassettes
- c) The Walkman
- d) Reel-to-reel tape manufacture

**16) At what farm in Somerset is the annual Glastonbury Festival held?**

- a) Piggy Farm
- b) Old McDonald's Farm
- c) Devon Farm
- d) Worthy Farm

**17) Valves (tubes) are heated by -**

- a) Bunsen burner
- b) Swan matches
- c) gas
- d) electrical filament

**18) Loudspeaker sensitivity is commonly quoted as -**

- a) kW hours
- b) dB per Watt
- c) kilometres per hour
- d) Therms

**19) Which is a digital music code -**

- a) PCM
- b) ADC
- c) FM
- d) VDH

**20) How many grooves does one LP side have -**

- a) 556
- b) 1230
- c) 1
- d) 8

**21) Is sound created by -**

- a) air pressure waves
- b) electromagnetic waves
- c) gravity waves
- d) tidal waves

**22) Bluetooth is -**

- a) painful
- b) a Caribbean pirate
- c) short range wireless link
- d) a new form of vinyl

**RATE YOURSELF (CORRECT ANSWER - 1 POINT)**

**1-5 points:** Unimpressive. Did your school report ever say you must try harder?

**5-15 points:** A good score but some hi-fi revision may be needed.

**10-15 points:** You are approaching genius level but still have some work to do.

**15-20 points:** The Nobel prize for answering HIFI World's Christmas quiz awaits.

**ANSWERS:**

**1)** Gilbert Briggs **2)** Digital Audio Broadcasting **3)** (Just Like) Starting Over **4)** D'Appolito arrangement **5)** Racing driver **6)** St Etienne **7)** Claude Shannon **8)** Analogue to Digital Converter **9)** 2001 **10)** Turntable **11)** Norway **12)** Spendor **13)** Munich **14)** Granada **15)** Manufacture of vinyl records **16)** Worthy **17)** electrical filament **18)** dB per Watt **19)** PCM **20)** 1 **21)** air pressure waves **22)** short range wireless link



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# Mail



## LETTER OF THE MONTH PRIZE

**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 Quadral Argentum 520 loudspeakers.**

Answers by: **NK** - Noel Keywood; **JM** - Jon Myles; **PR** - Paul Rigby; **MP** - Martin Pipe; **DT** - Dave Tutt



### QUADRAL ARGENTUM 520

<http://www.quadral.com/en/loudspeaker/argentum-520>

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 QUADRAL RHODIUM 200 loudspeakers are on their way to Alasdair Beal, Letter of the Month winner in our December 2017 issue.**

## Letter of the Month

### STREAMING FROM VINYL

*In the last 18 months I have been digitising my vinyl collection onto a NAS drive. This has meant my current cartridge has clocked up a lot of hours usage. It still sounds good but gradual wear means I may not have noticed its performance deteriorate.*

*The current set up is Ortofon Kontrapunkt b mounted in an SME309 arm which in turn is mounted on a Gyrodec (full version with DC motor and HR PSU). Amplification is all valve with WD pre II, Phono II feeding a WD KAT 6550, speakers are customised KLS 9s.*

*As you can see I have been with*



**Ortofon's Cadenza Bronze moving coil (MC) cartridge. It is not "polite".**



**Moon MiND 180 streamer. "Adding the streaming system has been a great addition; I listen to a lot more music because it is available at the touch of an iPad and without fear of playing my current vinyl to death" says Bob Perry.**

*Hi-Fi World for some time. I am well pleased with this set up and it sounds very good with my musical tastes which are pretty wide, with rock and prog rock, blues, jazz and classical. Note I still purchase my music on vinyl, where I have the option.*

*So with a tired Ortofon Kontrapunkt b what do I do? Replace it with a new cartridge or do I get it overhauled and re-tipped? The obvious replacement option is the Cadenza*

*Blue, but wonder whether I should go to the Cadenza Bronze. I do have concerns that the Bronze may be a little polite in this all valve set-up, plus it has a lower output than the Blue.*

*The lower output normally would not be an issue except it affects my digitising process, currently I use a HRT Linstreamer+ as the ADT with a Mac Book and use Audacity software to process the files. The HRT produces digital files that are far cleaner than*



those that could be produced using the laptop's in-built sound card, but it has one drawback in that it is a fixed output so the recording level in Audacity cannot be adjusted so with a lower output the record levels will be lower and they are pretty conservative with current set up.

I apologise for the ramble but as it is not possible to be able to demo and try the cartridge options I would greatly welcome an opinion as to whether the Cadenza Blue is a significant improvement over the Kontrapunkt b or would moving to the Bronze will be a worthwhile option and will the lower output be noticeable. Do I play safe and go with the Blue or have my current cartridge refurbished and spend the saving on more LPs? I do have an absolute top limit of £1500 so the Cadenza Black is not an option.

Adding the streaming system has been a great addition; I listen to a lot more music because it is available at the touch of an iPad and without fear of playing my current vinyl to death, plus my wife can use it as she is not comfortable handling the Gyrodec or vinyl records.

For reference, my streaming system is a Synology NAS drive, Moon 180/ MiND streamer and a Chord 2Qute DAC. Most of my files are from my vinyl collection and are in 24/96 FLAC format, some are in 24/48 FLAC format. With various experiments I find that the 24/48 works very well for many LPs but for those that have been well produced and have good dynamics the 24/96 is well worth the extra file space. I still prefer to listen to the vinyl direct for serious sessions but to be honest I would be pushed to hear any real difference between a good vinyl record and its digital version in 24/96.

I also have a limited CD collection and CDs that have been ripped onto the NAS drive sound far better than when played on my ageing NAD 500s player even when using the Chord DAC.

Last year I replaced my speaker cables and this was a bit of a revelation. I discussed options with a local hi-fi dealer and he gave me three sets of cables on loan to play with for a few weeks. After one week it was pretty clear that there was only one set I could live with and those were Chord Signature Reference. I probably would have been OK with other options if I had not heard the Signature Reference, but after these cables everything else sounded as though they were strangling the system. Over a following week I swapped cables around and let other



**Chord Signature Reference cables - the only ones Bob Perry could live with.**

people listen without letting them know what cables were in use and every time they knew when the Signature Reference cables were in the system. This was not the outcome I wanted as needing six meter runs was a very expensive option, but even my other half said I could not have anything less in the system.

The lesson is, cables must be considered as a major part of the system and you should not restrict your system by not giving them due consideration.

**Bob Perry  
Stafford**

Hi Bob – and thanks for your observations, after careful experiment, about the difference good cables can make. There's still of lot of scepticism out there.

I suggest you replace the Kontrapunkt b with the Cadenza Bronze. It is far from mild mannered

or "polite" – that better describes the Black. The Bronze has a gentle almost honey-like high end sheen that makes it particularly attractive – especially in a valve system – which is where I use one. The Cadenza Blue was a tad too sharp up top for my tastes – and less couth.

I don't think you will hear or see in the recording meters any major loss of output as the generator system is the same. **NK**

#### RURAL PLEASURE

My query is about how to get the best out of a dedicated hi-fi room set-up. I am fortunate enough to be in the final throws of building our own new house in the lush, deep countryside of Co. Cork, courtesy of having a wife who hails from there and wants to return home!

The house is grand enough for us, though not so grand or quirky as to be expecting Kevin McCloud's visit anytime



**Regenerating power supplies such as Isotek's Evo 3 Mosaic Genesis give clean power under the worst conditions.**

soon! We have more than one living room and so, naturally, one of these will form a dedicated listening area.

The room plan in summary is 6.5m x 5m. One long wall hosts two windows. A fireplace (ornamental) is located at one end (i.e. on one of the shorter walls). The plan was always to place the speakers each side of this fireplace, firing down the room, with the hi-fi itself located on the adjacent long wall between the windows (for the purpose of being out of direct morning sunlight). Plenty of sockets are already in place by the windows.

The external, windowed wall is cavity construction with added internal 60mm internal insulated plasterboard and the outside wall has a 150mm stone facing. So, it is pretty thick and solid. The internal walls are standard block construction (no stud walls here!) and ceiling in this particular room is 2.85m high and of insulated plasterboard fitted to standard wooden joists - a loft exists above. Floors are concrete throughout the house and contain an underfloor heating system. This room will have engineered oak plank-type flooring approx 18mm thick, placed as a floating floor on top of the concrete. Note also that all rooms, including this one, are wired for ethernet with CAT6 and radio/TV aerial in case that is relevant in my questions.

So, enough about buildings and onto the hi-fi and my questions. I listen mainly to vinyl and all music types (except Country and Western) on a Michell Gyrodec turntable with SME IV arm and Ortofon Cadenza Black moving coil pickup cartridge. Phono amp is an Ayre P-5X Evolution and pre-amp is Xindak XA3200Mk11 (valve). Power amps are Croft Series 3 OTL - which are mono-blocked. Speakers are Spendor S9e linked with Townshend Isolda cables. Interconnects are various (Ecosse, Black Rhodium etc) and of decent but not OTL/expensive quality.

As much as I love the Crofts for their unrivalled openness and lush valve sound, we are still used to making our toast in a dedicated room called a kitchen rather than a listening room; these amps emit large amounts of heat which can make them unsociable in even the coolest of summers here in London - and despite cliches, Co. Cork is not really so much cooler than London (weather-wise that is).

Hence, I often use another pair of mono-block power amps: CI Audio D-100 (yes, technically totally different in character to OTL valves, but hey, variety is not a bad thing....) I do also listen to CD via a Wadia 302 (still the

best CD player I every heard and luckily obtained second-hand) and also FM radio (the FM signal is expected to be maintained longer in Ireland than in the UK - although the radio stations are arranged differently in terms of content - I will miss BBC on FM!).

So, my questions are:

1) With the speakers and hi-fi needing to be located in the room as I said, how should I approach the subject of speaker cable length? I estimate I will need at least 5m of cable run to reach the right hand speaker. The fireplace hearth means the cable could need to be routed around the front of the hearth itself (if visible there might be ways I could hide it).

2) What speaker cables of similar sound quality to the Isolda could I consider? Which ones are less impacted by longer

to help, being in built-up area in a small house prone to dirty-ish mains. But in our new house, in a rural setting where our nearest neighbours are about 80-100m away, is it OK to forget about the Isotek? The house is wired in such a way that the listening room is on a separate spur but shared with a downstairs bedroom/study where its likely the PC will be plugged. But that leads me to the next question...

6) On the other side of the fireplace wall is our garage. In this are various services - including a water pump (our own water well), ground source heat pump (for the hot water and heating) and a hot water/immersion tank plus all the heating system controls. Should I be concerned about any mains or airborne interference from all this equipment located the other side of a 450mm wall?

## Handel & Hendrix in London



Home - Photograph © Shutterstock - Hendrix Flat

The flat on the upper floors of 23 Brook Street was found by Jimi's girlfriend Kathy Etchingham from an advert in one of the London evening newspapers in June 1968 while he was in New York. He moved in briefly in July before returning to the United States for an extensive tour. He spent some time decorating the flat to his own taste, including purchasing curtains and cushions from the nearby John Lewis department store, as well as ornaments and knickknacks from Portobello Road market and elsewhere. He told Kathy that this was 'my first real home of my own'.

**If you are a Jimmy Hendrix fan, visit his flat in Central London - now part of the Handel House Museum, Brook Street, W1. It's a stone's throw from the hordes on Oxford Street.**

cable runs than others? My Isolda is 3.5m in length and will not reach for the right hand speaker..

3) With underfloor heating, would there be any issues? The temperature is nominally approx 27 degrees in the water pipes inside the concrete... and a few degrees lower at the wooden floor surface.

4) Any advice or tips on how to get the best out of this set-up. I currently listen to this same system in our London house in an upstairs suspended wooden floored room of approx 4m x 3m with 2.7m ceiling. So, I worry that in the new house, the system might suddenly seem 'lost' with much more power needed to achieve the depth of bass I am used to hearing from the Spendors....

5) I currently use an Isotek Mini Sub Gil power supply which always seems

7) Thinking of upgrading amps and/or speakers - are there any you would recommend? Perhaps the McIntosh power amps you are very keen on...

As ever, many thanks for keeping the magazine as interesting and relevant as always. And Noel - thanks for recommending I visit the Handel/Hendrix House; you did so when I last wrote into Hi-Fi World about the varying quality/weight of vinyl pressings a couple of years ago. Well worth a visit and one of the few places in the West End not completely over-run with hordes of tourists!

Vinyl quality by the way seems to have become more consistent. But some of the reissues on labels like Music On Vinyl I have found that although vinyl pressing quality is great - the sound is sometimes less dynamic and fulsome



than originals. *The Coral's Magic & Medicine* is a recent example.

Regards

**James Douglas  
Northwood  
London**

Hi James. The lush countryside of Co Cork sounds inviting – and a great place to listen to music without the crowd of neighbours you likely suffer in Northwood, on the outskirts of London. Just tell the cows to shut up at critical moments – and hope they understand!

With regard to 4), your Northwood room, at 4m (13ft) long, will give peak pressure at end walls at 43Hz, this being its lowest resonant mode. It has a volume of 32.4 cubic metres. A room this size is quite obviously 'bassy' and resonant (I know 'em well!).

Your Co Cork room is three times larger in volume at 92.6 cubic metres and this fact alone means it will be more damped and less lively sounding (due to increased air load). Its lowest (length) mode is 26Hz, which is subjectively very low. There's quite a lot of energy in modern music around 30Hz, from synths mainly, and your Spendors will be able to reproduce these frequencies, if not at any great volume.

Your new room will therefore be less lively, better damped and go lower. What's more, as the ceiling is not too high at 9.5ft you'll get a nice halo of sound from the reflected ceiling wave, giving a feeling of height to the stereo image between the speakers. Very high ceilings are a subjective disaster here. I am confident that your new room will sound fine even if Amroc suggests otherwise in its Bolt area diagram.

In my experience you need to damp down or diffuse wall and floor reflections in controlled fashion. Thick carpet on the floor works wonders and patterned rugs as wall hangings, or bookshelves damp/diffuse side wall reflections. If you can, treat yourself to massive floor-to-ceiling curtains that cover the entire window wall when drawn closed (usually with draw cords). Curtains like this not only provide sumptuous warmth and silence in a room, they also result in superb sound quality, damped and clean with no zing (flutter echoes). The simple and conclusive test here is to clap your hands with curtains open then closed: your ears will tell you all you need to know about the difference. If you are canny about it,

a beautifully furnished room can also be a great sounding one. And don't forget that Studiospares in North London stock both absorption and diffusion panels.

Forget about the Isotek? Not so fast... London has very well controlled mains supplies. Distant country locations are notorious for being the opposite, especially when long power lines are used by industrial or farm equipment. You may well need to consider using a mains regenerator like the Isotek Evo 3 Mosaic Genesis we are obliged to use to get the best from equipment under review. Our central London location offers a high and stable 243V mains supply, but it suffers terrible



**A classic VHF/FM tuner (Pioneer TX-9500). "No waiting for a PC to boot up, then the browser and the necessary VLC Media Player – then hoping that the stream will be okay" says Mike Bickley about Olde Worlde tuners.**

waveform clipping that generates 3% distortion with harmonics up to 1kHz. And that's good! This gets into amplifiers through mains transformer leakage currents to ground, not a phenomenon many manufacturers understand.

In Co Cork you may have a mains supply as clean and pure as the air and grass around you – but likely not! Be wary about this – and prepared to experiment to see what difference mains conditioning makes to the sound.

We like all sorts of amplifiers. Jon in particular likes Naim and I totally agree that Naim are masters of the analogue amplifier. But he also likes Devialet's latest amplifiers. We are impressed by the big, bold and deeply detailed McIntosh sound that is grippy and super-clean. Before departing for Ireland get into a London showroom and have a listen.

Isn't the Handel/Hendrix house wonderful. I've never quite got silly and kissed the floor of Studio 3 at Abbey Road, but to walk up the stairs and into the flat where Hendrix lived was a moving experience. And as you say, it is so easy to reach and not

besieged. Have fun in Ireland where the asphalt is less dense. **NK**

Hello James. As someone born in West Cork I'm a little envious of you heading there for what sounds a lovely and well-built house.

Looking at what you are planning and your concerns, I would always recommend keeping loudspeaker cables the same length even if one needs to stretch farther than the other. There are various reasons for this – but the main one is they retain the same qualities in terms of capacitance and resistance.

Your Isolda cables are decent and revealing but once you start looking at 4m and above there is always

the problem that the cables can be affected by RFI interference – and the longer they are the greater the problem can become. Therefore I'd recommend you look towards some shielded designs.

Consider QED's Reference XT40 or Black Rhodium's Breeze – either might suit you well. Another cable worth looking at would be Tellurium Q Black II. I think you'll find this a fair bit more revealing and natural than your Isoldas and it is very easy to route due to its flexibility.

In terms of the underfloor heating there should be no problem. That said, though, I think you might find your system sounds different in Co. Cork than it does in Northwood. Nothing to do with different countries but purely the fact that every time I've moved house it's taken me time to get my system sounding how I wanted it to. **JM**

### **BBC RADIO 3 PROMS QUALITY**

*I found Martin Pipe's extensive and detailed reply to the BBC's Anna Sweeney's response to my comments on the variation of sound quality during the 2017 Prom season an interesting read,*

and I'm sure that ultimately, FLAC and to some extent, AAC broadcasts will win the day.

However, I would like to make the following points. The FM tuner is very convenient, no waiting for a PC to boot up, then the browser and the necessary VLC Media Player etc. Then hoping that the stream will be okay. Don't get me wrong – I use a PC and DAC for audio use and find it very good. It is a pity that DAB is so poor, because it does offer the convenience of a radio tuner.

A friend of mine recently bought an Arcam Miniblink which although it uses Bluetooth to communicate with a tablet or laptop, is extremely capable. However, it doesn't handle FLAC, but does handle AAC, which I know is FLAC's poor relation for audio purposes. The Miniblink cost around £85 and it has got my friend listening to radio again, try getting a tuner or whatever for £85! Worth a review!

Regards

**Mike Bickley.**

Hi Mike. Yes, thanks for making the point that switching on a VHF/FM tuner simply brings in radio immediately, without obstruction. By way of contrast firing up a computer, opening windows and clicking on icons might seem modern/intelligent or whatever, but it isn't in human interface or time efficiency terms. What a pity that the amenable sound quality of broadcast VHF/FM and ease of use are not understood in a world obsessed with poorly designed and obstructive GUIs. **NK**

**OLD MEASURES**

In the December issue the review for the Spendor D9 floor standing speakers informs me that they are 3.7 feet tall. Could you kindly remind your reviewer

that we went metric in 1971, and if he must insist on using feet and inches let him do precisely that – abstain from the tomfoolery that is decimal inches. I had to use an online unit conversion to work out how tall these speakers were. I thought your magazine was supposed to bring enlightenment to its readership, not obfuscation!

Sincerely,

**Victoria K.**

Whoops, yes: this was a mistake – please accept my apology as Editor. We use Metric measure but often quote Imperial as an alternative for our older readers. Spendor quote D9 height as 1125mm and, when run through a calculator, that comes out at 3.7ft. Somehow the original metric data got lost, leaving dear old Imperial all alone.

Not only do those brought up on feet and inches think in those terms, America remains Imperial too. Hi-Fi World goes around the world and 3.7ft makes perfect sense to 325 million Americans, if not to 60 million Britons – some of whom may well be obfuscated. **NK**

**ASTELL & KERN AK100II**

Thanks for replying to my enquiry about my AK100II. Unfortunately I didn't explain myself too well. In addition to my AK100II I also have an Astell and Kern CD ripper which works fine when I rip a CD to the internal memory. But it will not rip to an installed SD card.

With help from Simon in my local hi-fi shop Loud and Clear in Edinburgh,



**Spendor's D9 loudspeaker – 3.7ft tall we said. "Tomfoolery" Victoria K said.**

I have found a work around. Within the AK100II menu system I am able to copy from the internal memory and paste to the installed SD card. I can then delete the CDs in the internal memory which frees up space so I can rip additional CDs to the internal memory. Whilst not ideal it is workable. Simon is still trying to get a definitive answer from the distributor, but if he is unsuccessful, I come down to the Bristol Hi-Fi show every February and will take it up with Astell and Kern on their stand.

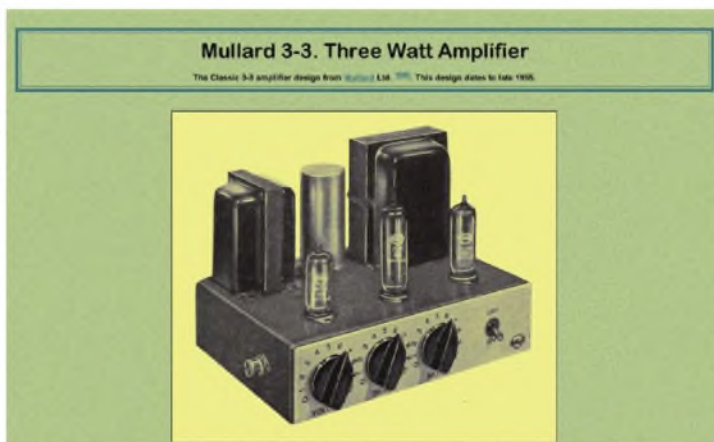
Thanks again for your help.

**Archie Hunter**

Hi Archie. It sounds like the Astell&Kern CD ripper has only the address of the internal memory and not the card port. Make sure you have the latest firmware as this sort of difficulty can be eliminated by firmware update.

However, the question that arises in my mind here is why rip CDs in this way? Would you not be better off ripping them into your computer from its silver disc drive (CD/DVD/etc) or from an external drive, using Windows Media Player, Exact Audio Copy or dBPowerAmp (all free)? Then simply transfer these rips to the player by plugging it into the computer, or transfer them to SD card using a stand-alone card reader that you can get from Maplins or your dealer perhaps for very little money. I'm sure Loud and Clear can help you out with any fine details, including leads and what have you.

**NK**



**The Mullard 3-3 valve amplifier was a simple 3 Watt single-ended design that gave a sweet, amenable yet engaging sound. It was popular with beginners and hobbyists.**





An Astell&Kern AK100 II portable digital player.

### I CANNOT DANCE

Thank you for Dave Tutt's excellent articles in the Hi-F World. I even understand them. I am now 82 years old – a product of the factory floor and an old fashioned drawing office. You may remember we had drawing boards, slide rules and pencils. Night school and home work. That's why I cannot dance!

The O.N.C. Electrical endorsement was Ohms law with bells on. Power factor correction anyone? Sorry for old memory but as my children inform me, I should be on social network – whatever that is. I feel that the world has passed me by.

Even some articles in Hi-Fi World about digital go over my head. Two years national service with the Tank Regiment taught me at 19 how to freeze my bits off on Luneburg Heath at midnight.

Sorry to sound like an old fart (as I am known at our local Rugby club) but will the digital age people know the thrill of buying a Mullard 3-3 amp kit from Henrys radio and building it? I remember the thrill even until this day. My sisters took offence when I connected the family Dansette through my 3-3 and into a Stentorian loudspeaker mounted on a board.

I was lucky to be seconded during my early career to an old Cossor radio engineer who was one of Watson Watt's assistants during World War 2. English Electric sent me on an internal 11 week electronic design course concentrated for 10 weeks on valves, switching, power supply design etc, and one week on those funny things called transistors. Electro-mechanical design appears to have vanished – or am I becoming a real old fart.

Regards and thank you,

**Pat Rickwood**

Hi Pat. Glad that I haven't made things too complicated so as to turn readers off. I have been told in

the past, when teaching the News Red Button services for my fellow technicians at the BBC that it was just too complicated to understand. So trying to make things at least a little acceptable and without too many head scratching sentences is my aim.

I too lament the mechanical and electromechanical design skills of the past. I also abhor the 'design-on-computer and hope it lasts a year' mentality. Fortunately, there are companies that pass muster at both mechanical and electronic design, we just have to ensure we support and buy their products.

Old fart? No! Make that concerned citizen – and no I can't dance either! **DT**

Hi Pat. Valve radios and Mullard amplifiers were a great way for the young of the time (1960s) to learn about 'modern technologies' of the period. The Mullard 3-3 in particular was a lovely design for everyday use – I built many of them for bemused friends and neighbours – and many people in audio had similar early experiences. There's a sympathetically designed website about this amplifier at [www.r-type.org/articles/art-003h.htm](http://www.r-type.org/articles/art-003h.htm) that you may enjoy, and you can read much about old valve amps on the internet these days of course. Duncan Amps ([www.duncanamps.com](http://www.duncanamps.com)) brings them into modern context by explaining how they can be analysed nowadays in computer programmes like LTSpice, where you can apply 450V without fear of death. **NK**

### HUMPHREY THE AMPLIFIER

After receiving much sage advice from you a year ago regarding my humming Jadis valve amplifier, I have returned with an update. The problem proved intractable in my hands so I called on the services of a very helpful chap called Dave Hunter of Classic Valve Amps in Nottingham. He normally deals with the guitarist community but is quite happy to look at the occasional piece of hi-fi. He diagnosed a failing ECC83 and replaced one of the KT120s at the same time.

Back in the system, the amp is now quite quiet with just some faint mechanical transformer noise. It deserves its new

name (hum free), as per the heading. I am experimenting with Blackburn Mullard as well as Chinese Golden Dragon '83s as I pursue the perfect tone.

Now we come to my free Garrard 401 that was lying around. This has been rebuilt by Dom of North West Analogue. A lovely job he made of it too! The arm, a vintage Micro-Seiki arm also received attention and the whole shebang was plonked into an Acoustand plinth. Looks great, doesn't it?

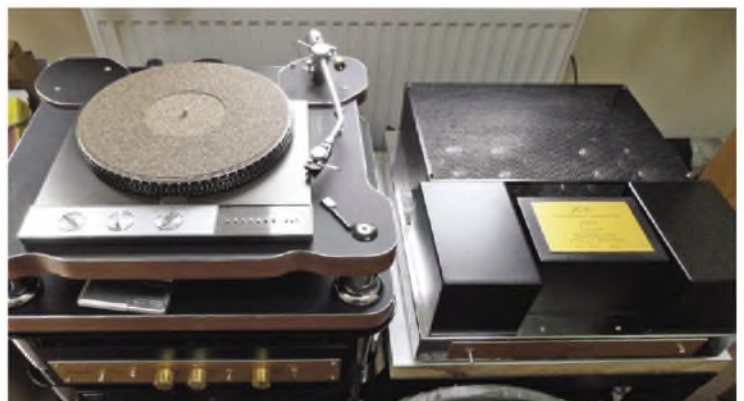
Now I understand why you have been banging on about Garrards all these years. I am a convert to its rock-solid delivery and pace (Ortofon 2M Bronze cartridge if you were about to ask). The plinth has room for a second arm, so at present I am considering the options at the £1000 mark. The NZ Wand and Nottingham Analogue unipivots, as well as several Origin Live arms are under my steely gaze. More suggestions from you are, of course, welcome.

The fortuitous arrival of a pair of Focal Electra Be 1027 speakers have really put some clarity into my system and I cannot remember it sounding this good. Halle'lujah! All the best.

**Geoff Wilton**

Hi Geoff. "Rock-solid delivery and pace" summarises the 401 nicely; it takes your breath away in this respect, a property that makes it viscerally exciting. Typical belt drives of yore were vague by way of contrast, if quite 'pleasant'.

With such a superb system you really should move up from the 2M Bronze. If you insist on MM then get a 2M Black, or alternatively one of Audio Technica's new 700 Series I reviewed in our December 2017 issue. An SME arm such as the 309 best suits, although it is above your budget. **NK**



Geoff Wilton's Garrard 401 turntable with Micro-Seiki arm, and at right Jadis valve amplifier known as Humphrey (hum free!).



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# Making Their Mark

**Two full-range drivers in a standmount loudspeaker? That's MarkAudio's Sota Cesti B. It's unusual but it works superbly, says Jon Myles.**

**B**y and large box loudspeakers follow a pretty traditional design. The size, materials and number of drivers may vary but whether sealed box of bass reflex the basic principles were laid down many, many years ago.

So it's always nice when something a little different comes along – as in the case of the MarkAudio Sota Cesti B on review here.

Out of the box they look little different at first. Peer closer though and you'll notice some unusual details.

For a start these 'speakers are handed. While the two drivers are arranged in the usual way, one above the other, the fascia has an

asymmetrical waveguide CNC-machined into it. With the guide facing outwards you get wider dispersion, while facing inwards gives a tighter, more focussed stereo image. I'd advise experimentation here as it's very much a matter of personal taste, and is influenced by proximity to side walls.

Then there's the drivers themselves. Instead of the usual mid/bass tweeter arrangement these are in fact two full-range units which differ only in size. The bottom is an 11cm Sota (State Of The Art) driver while the top measures 5cm.

Designed by MarkAudio founder Mark Fenlon and built in-house, they have a shallow cone profile and are constructed from an alloy. MarkAudio says that as the drivers are identical

in construction they have the same dispersion characteristics - which is not the case for a traditional cone mid/bass plus dome tweeter. This makes the use a low order filter much more feasible.

The drivers have long stroke suspension and are also extremely low mass, Mark himself saying he comes from the Colin Chapman/Lotus school of engineering where the mantra "Simplify, then add lightness" held sway.

The cabinet itself is constructed from high-density and measures 410mm x 230mm x 236mm (H/W/D) with each 'speaker weighing in at a healthy 8.5kg each (sturdy stands are recommended) while there's front firing reflex port to give more flexibility with positioning. Again this



has its own asymmetrical waveguide. A single pair of 'speaker binding posts adorns the rear and while our review pair came in gloss white, but black and red finishes are also available.

So, as you can tell from the above, the MarkAudio Sota Cesti B loudspeakers are certainly different from most cone and dome standmount loudspeakers. But how do they sound?

**SOUND QUALITY**

Careful positioning is crucial with these loudspeakers to get the sound that suits you best. MarkAudio confirms it has designed a lift into the high frequencies when the speaker is toed in towards the listener. This flattens out as the listening position moves 'off-axis' resulting in a more neutral treble.

They have also taken small amount of energy out of the midrange in order to provide superior depth perspective and reduce harshness on poor or heavily compressed recordings.

As such I found even relatively small changes in the angle of the loudspeakers could produce a marked change. In the end I had the 'speakers pointing straight down the room with the waveguides firing away from each other at first.

Positioned like this and fed by Naim's new Uniti Atom (see review elsewhere this issue) it soon became apparent the Cesti Bs do have a different sonic signature than most other standmounts of this size and price.

Most impressive was the way they revealed the various layers of instrumentation with strong depth to the soundstage. On Leonard Bernstein and the New York Philharmonic's stately interpretation of Mussorgsky's 'Great Gate Of Kiev' (24/96) I was able to track every instrument and the whole piece came over with exceptional clarity. The Cesti Bs also imbue instruments with a realistic timbre where some others fail to capture their character.

They relay the leading edge of notes exceptionally well. On Joe Bonamassa's 'This Train' from the 'Blues Of Desperation' CD his coruscating fretwork zipped along - the ferocity of his playing came over loud and clear.

With this track I switched the 'speakers over so the waveguides faced inward. True enough, it tightened up the stereo imaging but I did miss the wider soundstage from

outward facing. Toeing them in raised treble, if a touch too much for my liking. The midband, though, remained consistent in character throughout. It was smooth with decent detail and an even-handed presentation that never sounded forward.

Full-range drivers are often criticised for lacking some low-end power but the MarkAudios have been judiciously engineered in this regard. The port reaches down to 40Hz which - while it won't match the output of big floorstanders - is easily enough to produce a firm low-end. So with Model 500's pioneering slice of Detroit techno that is 'No UFOs' the low-bass synth line went deep enough; I didn't miss the lowest octaves.

These 'speakers will also go loud from conservative amounts of power - 40 Watts (per channel) from the Naim Atom managing to drive them to prodigious levels with ease.

If there's any drawback it's that the Cesti Bs might not sound the most exciting listen at first. Others can sound a bit more up-front and punchy in short demonstrations. These, however, are more nuanced and balanced with a greater insight into the music which, in the end,

provides greater satisfaction over the long term I felt.

**CONCLUSION**

If you are looking for something a little different in the 'speaker market then I'd heartily recommend the MarkAudio Sota Cesti Bs. And not just because they are different but because they are a damn fine loudspeaker. Even-handed yet insightful, smooth yet powerful. They are just what a good 'speaker should be.



*The tweeter is actually a full-range driver but differs from the mid/bass driver purely in size. An unusual arrangement but one that works well.*

**MEASURED PERFORMANCE**

The Cesti B cabinets come 'handed', meaning identified as Left and Right. Unusually, the drive unit arrangement is vertically symmetric but the baffle's surface profile is not. Frequency response measured on-axis had a sharp treble peak, but slightly off-axis (15 degrees) was as shown. The upper mid-range rolls down slowly and this will

slightly soften the sound, whilst the low frequency roll down is to accommodate near-wall placement. So, placed close to a rear wall and pointed straight down a room, not toed in at listeners, the Cesti B will sound mild but balanced all the same, without obvious deficiencies.

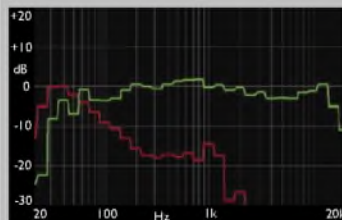
Response extends down to 40Hz as claimed, the front firing small port contributing to output at this frequency, shown by the red trace of port output. The Impedance trace correlates with a dip at 40Hz as expected. Bass output is in good balance overall and the smoothness of response ensures a well controlled and balanced sound.

Sensitivity was high at 87dB sound pressure level from one nominal Watt (2.8V) of input. Amplifiers of 40 Watts will be sufficient for very high volume. Apart from the usual twin residual peaks around the port's damping, the impedance curve is smooth and largely resistive, overall impedance measuring 7.5 Ohms with a music-like pink noise signal.

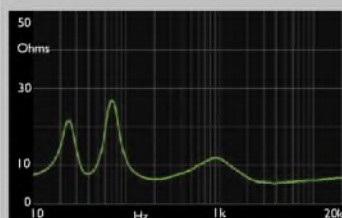
The Cesti B is well engineered measurement shows. It will sound smooth and quite easy in its delivery, but with well stated treble all the same. **NK**

**FREQUENCY RESPONSE**

*Green - driver output  
Red - port output*



**IMPEDANCE**



**MARKAUDIO SOTA CESTI B £1200**



**OUTSTANDING - amongst the best**

**VERDICT**

Custom-made full-range drive units and a clever cabinet design add up to an excellent, musical loudspeaker.

**FOR**

- musicality
- good bass
- go loud easily
- insightful

**AGAINST**

- need careful positioning

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AIRBOURNE

Diamond Cuts  
Netzwerk

**T**hink AC/DC and you've basically got this Aussie rock band in one.

With a bit of Rose Tattoo thrown in for good measure. The band's debut ('Runnin' Wild') appeared in 2007 but the band members love – and I mean love – 70s-era hard rock. Hence, their comparatively recent debut release glows with a sepia-tinged rocking rhythm. It's classic stuff and any hard rock fans will adore it for its 'no fuss' attitude.

Their next album, 'No Guts. No Glory' extended the macho rock element with plenty of muscle-bound, beer swilling, babe hunting grooves, following the template of the debut to the letter and, I have to admit, sounding all the better for it. 'Black Dog Barking' (2013) didn't surprise and worked upon earlier, simpler rocking times. The music continued on its comfortable path but never became tired.

This band's passion and energy for their muse remains unbounded

which makes the experience a wholly enjoyable one.

Now they can be heard in all of their hair flailing glory in this box set, celebrating 10 years of hard rockin'. The set includes their debut, 'No Guts. No Glory' (2010), 'Black Dog Barking', a new B-Sides album called 'Diamond Cuts – The B-Sides' plus a new documentary DVD.

Incidentally, that B-Sides album features two previously unavailable tracks: 'Money' and 'Heavy Weight Lover'. Bonus material includes a previously unreleased and unseen documentary DVD of the band, 'It's All for Rock n' Roll', and all this is present in a sturdy pizza-style box.

I wouldn't say that the mastering is particularly insightful or that clarity is especially impressive, but that might be down to the original sources and the recording processes. There's nothing wrong, though. No midrange brightness or bass bloom. Mastering is solid – like the band and the music.

AUDIOPHILE VINYL



ALISON MOYET

Hoodoo  
BMG

**T**he blues just oozes from Moyet's husky presentation and it's one that has progressively matured. This essentially pop-oriented singer grew up as a member of the synth pop duo Yazoo with then partnered with ex-Depeche Mode member Vince Clarke, wowing the music world with the hit, 'Only You'. She entered into a solo career with the LP, 'Alf' that sprung hits such as 'All Cried Out' and 'Love Resurrection'.

Her solo career has now received a measure of the retrospective with the release of four LPs on blessed vinyl. Including 'Alf' (1984), 'Raindancing' (1987), 'Essex' (1994) and, to my mind, the best of the bunch, 1991's 'Hoodoo'.

On 'Hoodoo', Moyet feels at home and relaxed in her work. This might be because she had more influence and control upon the entire album project than on

her previous outings.

LPs are such a personal thing and any album that attracts will always trigger a favourite track but this LP's 'Wishing You Were Here' is a definite standout that combines beautiful song writing with a passionate delivery that goes all out – as well as a rhythmic balance that can be overwhelming in emotional terms.

There's also some sterling backing vocal work from Kirsty MacColl.

Those looking for blues inflections and gospel tones will be happy to listen to both sides of this excellent album.

When looking at the mastering, I'm happy to report that the cut has been produced at a low volume which begs for the gain to be increased so that you can further investigate those elusive and fragile frequencies and details. If your hi-fi system is sublime, then that's the sound you will hear here.



Some people thought that The Rolling Stones were the bad boys of sixties rock but those people never saw The Pretty Things. The Pretties never really received the fame and stardom that many believed they deserved (it took them a full ten years to even chart in the USA). Instead, the band became one of the biggest cult rock outfits of their time – and just about any other time.

This was a band who were nasty, dishevelled and just about any other term but 'pretty'. A band name that fell off the edge of irony and turned it into a bad joke. Yet they were feted by their contemporaries. Pete Townshend was so enamoured by the Pretties' own ground breaking LP, 'S.F. Sorrow' (the first concept rock album) that he penned his own magnum opus, 'Tommy'. David Bowie, meanwhile, covered two Pretty Things tracks on his covers LP 'Pin-Ups'. They

were 'Rosalyn' and 'Don't Bring Me Down'. Both of these tracks can now be found on the new 'Greatest Hits' double album, residing in a gatefold cover.

The title offers more irony. 'Hits'? Maybe not. Here's brilliant music that spans R&B all the way to psychedelia. There's even Bob Dylan's 'Mr Tambourine Man'. Can you believe that The Pretty Things were offered (and then turned down) this track before The Byrds got their hands on it? But that's what cult bands do. They make great music and terrible decisions.

Also check out 'Rock St. Trop' via Philip DeBarge with the Pretty Things from 1969. The former was a wealthy playboy who wanted to be the front man for his own vanity LP project. He invited band members, Phil May and Wally Waller (plus friends), to his family estate to produce his record. The result? Full of energy and quality performances throughout. Well worth seeking out.



## THE PRETTY THINGS

Greatest Hits & Rock St. Trop  
Snapper

# AUDIOPHILE VINYL

I was stunned to see this reissue from the German audiophile outfit. Maybe I've been looking the other way for too long but I can't remember when I last saw a reissue from this superlative R&B/funk outfit. A highly influential band, they spanned many years and a whole heap of evolution during that period.

Why influential? Right from their early days, the band were lauded by the fans and their contemporaries. You just have to hear The Beatles 'Twist and Shout' and Lulu's 'Shout' for evidence of that. Even Jimi Hendrix made his first recordings with the Isleys. Never mind the band's classics such as 'Summer Breeze', 'It's Your Thing', 'That Lady', 'Harvest for the World' and many more.

This album was released in 1975 and was infused with a sound that blended both soul and rock with guitar fiend Ernie Isley taking

a lot from his time with Hendrix. This album included the hit, 'Fight the Power' – but there is far more to this LP than that hit, such as the ballad 'Make Me Say It Again Girl' and the jam-like 'For The Love Of You'. Ronald Isley owns this LP in vocal and funk terms, while also successfully spanning the fragility of the ballads and the force and power of the more rocking outings.

In terms of mastering? One word arises after the first few seconds: sumptuous. There is a delicious seventies warmth allied with bass power that provides a deep, heavy, almost bottomless pit of low end power. Speakers Corner has brilliantly combined this with a sense of space and clarity that gives a searing emotional performance from the lead vocals and a guitar performance that is positively drenched in funk grooves. A mighty LP and a mighty remaster.



## THE ISLEY BROTHERS

The Heat is On  
Speakers Corner

# The Quest(yle) continues...

**If rising British prices put you off Questyle's capable CMA600i, says Martin Pipe, then why not consider its more affordable CMA400i sibling?**

Last year, I gained my first 'ears-on' experience of Questyle – an emerging quality-audio brand from the manufacturing powerhouse that is China. This centred around the CMA600i, an innovative DAC/headphone amplifier based around the proprietary CMA ('current mode amplification') technology conceived by Questyle founder Jason Wang. Here, most of the amplification is Class A and takes place in the current (as opposed to voltage) domain. The CMA600i is the 'step-up' model in Questyle's current range; here I examine the entry-level CMA400i, which also boasts True DSD and CMA.

About the only major CMA600i

audio-related function that's absent in the CMA400i is the ability to accept analogue inputs. In other words, you won't be able to listen to your tapes or vinyl with it – unless, that is, you convert them into digital first. Asynchronous USB apart (the drivers are supplied on mini CD-ROM), the CMA400i's rear panel caters for optical and electrical connection of digital S/PDIF sources – indeed, the CMA400i enables two of the latter to be connected. There's also an S/PDIF electrical output, which may be useful for those with digital recorders or existing DACs. The chip around which the 'True DSD' DAC section is built is AKM's capable AK4490 – also found in the CMA600i. DSD64, 128 and 256 are supported via USB, as is

PCM all the way up to 384kHz/32-bit.

This entry-level unit with its black CNC-machined casework and busy fascia is reminiscent of pricey Benchmark products – which, funnily enough, have the same UK distributor. Front-panel LEDs indicate the input selected (a pushbutton cycles through the available four), what sort of signal is being applied (PCM/DSD, sample rate) and whether the unit acts as a DAC (with balanced XLR or unbalanced phono outputs) or a DAC-plus-headphone amplifier – a choice made with another button. The only other 'everyday' control is a toggle switch that applies or removes mains power. Remote-handset operation, as supported by





the CMA600i, isn't a possibility.

To be honest, I'm surprised that the CMA400i doesn't automatically switch to headphone mode as soon as a pair of cans is plugged in. If Lehmann Audio can achieve that with its diminutive 'all-analogue' amps, then why can't Questyle? All the same, the CMA400i does cater for balanced phones. As well as a four-pin XLR connector, you get a balanced 2.5mm socket. This is great news for owners of personal players with such socketry, as it means the same phones can alternate between both mobile and home equipment without recourse to clumsy adaptors. To the best of my knowledge, the CMA400i is the only 'non-portable' product to boast 2.5mm balanced connectivity.

Naturally, there's a 6.3mm socket for 'unbalanced' headphones – the vast majority on sale. Note that only one pair of headphones can be driven at a time. The CMA400i features circuitry that protects your valuable headphones in the event of a fault that might place potentially-destructive DC voltages on the output. Furthermore, the CMA600i's output transistors benefit from short-circuit protection that might be needed if, for example, you accidentally plug in headphones with a damaged cable. If a fault condition is detected, an 'error' LED will glow.

Beneath the unit are a series of slide switches that determine headphone-amplifier gain (1.1 or 2.5dB). Oddly, the in-phase and out-



*Internally, from left to right is the mains power supply with toroidal transformer, headphone amplifier and digital section with AKM AK4490 DAC chip.*

of-phase outputs of both channels are independently-selectable. Those wishing to make use of the analogue line output – with their active speakers or power amps – will be pleased to learn that flicking a rear-panel switch from 'fix' to 'adj' enables its level to be adjusted with the volume control, which benefits from a pleasant and positive feel. The CMA400i's low-noise linear power supply is built into the case, and is fed from a sizeable toroidal transformer. Internal construction is neat, and decent components are in evidence.

## SOUND QUALITY

Sources included a USB-interfaced Windows 7 PC and a Cambridge CXN streamer (connected via coaxial digital). My PC's optical drive won't accept 3in. CD-ROMs, and so I had to transfer the Questyle drivers to a USB-stick 'intermediary'. The accompanying manual, like the ones supplied with some competing products, explains how FooBar2000 (free) and JRiver Media Center (commercial) can be configured for use with the CMA400i. I took the latter route, and I was soon able





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to enjoy my PC-accessible music collection. In terms of headphones, I relied mostly on Focal's revealing Utopias but Oppos more modest PM3s were tried too. Both of these are unbalanced; sadly, I was thus unable to try two-thirds of the CMA400i's headphone capability. The line output, meanwhile, drove a pair of Quadral Aurum Wotan VIII floorstanders via an Arcam A49 integrated amplifier.

The USB function worked exceptionally well, with none of the audible 'gitching' that compromised my enjoyment of the Pro-ject Pre-Box DS2 Digital last month. I was able to enjoy the hauntological analogue tonality and sparse rhythms of that Pye Corner Audio Sleep Games album (CD-rip, FLAC) with no unpleasant distractions. Through headphones and speakers alike, the album's organic textures and warmth emerged unimpaired. I did find a touch more insight and bass weight via the headphones, but I suspect there's more to that than



**Recessed slide switches on the base of the CMA400i determine headphone-amplifier gain (1.1 or 2.5dB).**

the CMA400i's output stage. I then listened to the same track via the CXN, and sonically speaking there was little to tell them apart. Evidently, Questyle has paid close attention to minimising the effects of jitter.

What you can't do with yer average digital connectivity, though, is convey DSD material in native form – in other words, with no intermediate conversion to PCM. Some say this isn't an issue worth sleepless nights, given that during the production phase most music is manipulated whilst in PCM form, but I decided to stay within the spirit of Questyle's 'True DSD' philosophy. In any case, at least one of the albums I tried - Robert Len's Hope, a DSD128 file - was actually captured



**The rear carries optical, coaxial and USB digital inputs. The coaxial output will be particularly useful on those rare occasions you want to use the CMA600i as a high-grade USB interface.**

in the DSD domain with 2xHD's Fusion Mastering system. Amongst other things, this system includes a Merging Technologies' Horus A to D converter in its quest to get as close to analogue as current practice allows.

And the CMA400i does justice to both Len's stripped-back performance and the painstaking care taken in its recording. It's clean, musically-involving and detailed in a 'you were there' sort of way. Which is pretty darn good, considering that we're not talking unaffordable. PCM hi-res material also fares well, if the three beautiful and dynamic 'orchestral sketches' that comprise Debussy's La Mer (24-bit/96kHz

FLAC; DG/Pro Studio Masters, Berliner Philharmoniker/von Karajan circa 1964) are anything to go by. So evocative are they of the sea, you can almost smell the salt. Rich and sensual here are the subtle harmonies that permeate the work; meanwhile, the devices used to convey waves, currents and spray are resolved accurately – and within a perceptible spatial area.

**CONCLUSION**

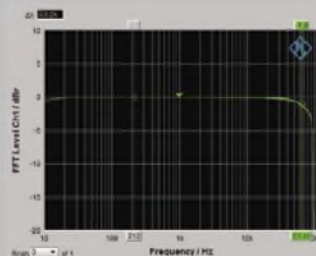
The CMA400i continues the same strong showing set by the CM600i. Sonically, it's almost as good and extra features are thrown in too. And yet it sells for less...A superb product then, well worth considering.

**MEASURED PERFORMANCE**

From digital electrical and optical (S/PDIF) inputs, as well as USB, performance of the CMA400i acting as a DAC met a high standard, with 117dB dynamic range (EIAJ), bandwidth to 63kHz (see our analysis) from a 192kHz sample rate signal even through optical, via both XLR and Phono socket outputs.

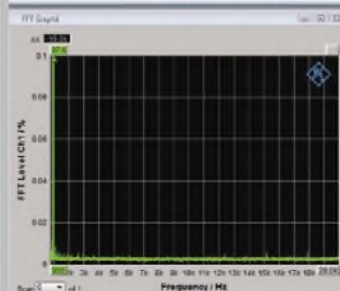
Distortion was minimal at 0.03%

**FREQUENCY RESPONSE**



**DISTORTION**

THD @ 10%	0.0246 %	Level @ 10%	6.9352 mV	Frequency	997.05 Hz
CH1	OFF	CH2	OFF	CH3	OFF



(24bit, -60dB) that was mostly noise rather than distortion harmonics – as our analysis shows. Audiolab, Oppo, and Chord Electronics DACs manage around 6dB more dynamic range but this is still very good.

Output from the rear XLR sockets measured a high 6.8V and from Phono sockets 3.4V. Together with optional control of volume this is plenty enough to drive power amps direct, eliminating the need for a preamp.

Maximum headphone output was very high at 5.7V and distortion and dynamic and values identical to the line outputs.

USB from the XCore driver and internal AKM DAC registered as offering 768kHz maximum sample rate on a Mac - way above what is necessary. All lower rates are available of course, 24/96 being arguably the best hi-res option.

The CMA400i measured well in all areas, offering a high standard of performance. **NK**

<b>Frequency response</b>	<b>4Hz- 63kHz</b>
<b>Distortion (1V, 1kHz)</b>	<b>0.03%</b>
<b>Separation</b>	<b>88dB</b>
<b>Dynamic range</b>	<b>117dB</b>
<b>Noise</b>	<b>-112dB</b>
<b>Output (Phono/XLR)</b>	<b>3.4 / 6.8V out</b>

**QUESTYLE CMA400i, £800**  
  
**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

**VERDICT**  
 Well-specified and well-built, with a fine sound.

**FOR**  
 - crisp, clean and neutral presentation  
 - effortlessly drives headphones  
 - easy to set up and operate

**AGAINST**  
 - have to manually-switch between line output and headphones  
 - digital sources only

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# Christmas Wishes

**NAME: Paul Rigby**

**STATUS: Hi-Fi World's own Mr Vinyl**

**Vinyl expert Paul Rigby tells us what he'd like to see in his stocking on the big morning.**



**MILTY ZEROSTAT 3 (£60 [shop.armourhome.co.uk](http://shop.armourhome.co.uk))**

The Zerostat 3 is a gun-shaped device set in moulded hard plastic that produces a combination of positive and then negative ions at the 'target'. The idea is to neutralise the area of static charge, the thing that attracts dust to the area. The intended prime target being your vinyl records. The Zerostat 3 is not too badly priced for an accessory. Used in conjunction with a record cleaner, the Zerostat 3 will not only provide a more pleasant vinyl listening experience, it will extend the life of your precious records. A good thing, by anyone's standards.

**REGA ATLAS TRACKING FORCE GAUGE (PRICE: £175 [www.rega.co.uk](http://www.rega.co.uk))**

The Rega Atlas tracking force gauge features a tough and hard-wearing durable aluminium chassis with a highly stable load cell and precision amplification circuitry. It's a full bridge, shear beam construction. There is also a custom designed front guard to protect the measuring element but it also helps during alignment. The guts of the gauge are resistant to temperature variations and also shocks. The Atlas is one of the best downforce gauges you can buy. When you consider how robust it is, its reliability and accuracy, the price begins to make sense.



**SOUNDECK PM (£90 [www.sounddeck.co.uk](http://www.sounddeck.co.uk))**

Produced as a development of the SoundDampedSteel isoplatmat, this variation arrives in two flavours: the standard 295mm diameter model and the 285mm version for those turntables with a lip on the perimeter. The model is available in black and silver. Without a mat, frequencies can often seem rather uncontrolled and liable to zoom off in a random direction at any given moment. The SDS extends dynamic reach, in terms of the upper midrange, smoothing and controlling midrange frequencies while the lowering noise and increasing air around the soundstage.

**ELUSIVE AUDIO AUDIOPHILE GRADE SORBOTHANE ISOLATION FEET (SET OF FOUR: £8.20 (30 X 14MM)/£13.40 (38 X 20MM) [stores.ebay.co.uk/elusiveaudio](http://stores.ebay.co.uk/elusiveaudio))**

Elusive Audio say that its Sorbothane feet are designed for 'tiny impacts', for improved performance. Offered in two sizes, the 'feet' can be placed under any piece of equipment. According to the company, the 14mm model can support 4.5kg (set of three) and 6kg (set of four) while the larger 20mm models can support 8kg (set of three) and 11kg (set of four). Possibly the most cost effective and best value for money 'upgrade' you can utilise to improve overall sound quality in and around your hi-fi chain.



**IFI IPURIFIER2 (£99 [IFI-AUDIO.COM](http://IFI-AUDIO.COM))**

This gizmo from iFi is designed to reduce noise from the USB port of your computer. Computers are horribly noisy products. Mainly because they are not geared to audio output and also because, while they are pushing music out to you, they are also being, well, computers and performing house-keeping tasks...which also produces noise. This little block from iFi is fitted within an aircraft-grade CNC-aluminium shell anodised in titanium, featuring a host of keyword feature names such as: Active Noise Cancellation, REclock, REgenerate plus REbalance. The iFi iPurifier2 reduces the sonic rubbish to allow your music to flow.



# Christmas Wishes

**NAME:** Jon Myles

**STATUS:** Hi-Resolution Digital Expert

**Fan of all things digital and a self-confessed technophile, Jon Myles sends Santa his Christmas wishes.**



## **CHORD POLY (£499 [www.chordelectronics.co.uk](http://www.chordelectronics.co.uk))**

Last year I was hoping for a Chord Mojo DAC/headphone amp. Santa didn't deliver so I bought one myself. It's wonderful - but now the clever guys at Chord have come up with a way to make it even better with the Poly. It plugs into the Mojo to turn it into a fully-fledged streamer - accepting AirPlay, Bluetooth and signals from DLNA devices as well as incorporating a microSD card slot so you can store music on it. Pure genius and a must for all Mojo owners.

## **CLOTHES, CLOTHES, CLOTHES. MUSIC, MUSIC, MUSIC. BOYS, BOYS, BOYS - VIV ALBERTINE (£10 [www.amazon.co.uk](http://www.amazon.co.uk))**

This book is a roller-coaster ride through the heady days of punk as recounted by Viv Albertine - lynchpin of the all-girl group The Slits and one-time girlfriend of The Clash's Mick Jones. Structure-wise it jumps all over the place but is never less than insightful, energetic and honest - especially when Albertine discusses her post-Slits struggles which included cancer and IVF treatment. For anyone who lived through the punk era this will bring back vivid memories - even if you weren't a fan of The Slits.



## **ATACAMA HD-L FLOOR SPIKE SHOES (£21.99 [www.atacama-audio.com](http://www.atacama-audio.com))**

If, like me, you've got a wooden floor then protecting it from the punishing effects of spikes on stands or floorstanding 'speakers can be a problem. Some people use coins under them - but these shoes from Atacama are a better solution. They're made of a copper/zinc alloy with a hole on the upper surface to locate the spike into and a non-slip EPDM elastomer membrane on the underside to protect the floor and aid sound damping. They are good for weights of up to 125kg so will handle most 'speakers easily and keep your floor looking pristine.

## **MITCHELL & JOHNSON WAVE BLUETOOTH ADAPTER (£39.99 [www.mitchellandjohnson.com](http://www.mitchellandjohnson.com))**

Fancy adding Bluetooth connectivity to an existing hi-fi system without spending a fortune? The Wave from Mitchell & Johnson is just the thing. It's a small unit that fits into a 3.5mm headphone socket on an amplifier and enables the user to stream music from a computer, laptop, smart phone or tablet via Bluetooth. It will operate from a range of up to 20 metres and also boasts more than decent sound quality. It will also work in a car if you so desire. Ideal for adding 21st century convenience to any hi-fi set-up.



## **NAIM POWER-LINE LITE (£95 [www.naimaudio.com](http://www.naimaudio.com))**

Naim's Power-Line mains cable brings an appreciable improvement to any of the company's electronics. The only problem is it costs over £500. So that's where the Power-Line Lite comes in. Costing just £95 it features a robust thermoset resin case which houses floating pins which are claimed to give a superior electrical contact. There's also a floating cable retainer finished in high-gloss. Taken together all of this is meant to provide better power delivery and stop micro-dynamic vibrations entering components. And it doesn't just work on Naim components - being just as effective on electronics from other manufacturers.

# Christmas Wishes

**NAME:** Martin Pipe

**STATUS:** Technical expert on all things hi-fi

**Want to give others a few ideas about a suitable Christmas present? Here's what Martin Pipe would suggest that you suggest!**

## HEAD DEMAGNETISER (£15, [www.analogueseduction.net](http://www.analogueseduction.net))



I bought one of these devices thirty years ago, and am pleased to note that they are still available. Metal parts in your analogue recorder's tape path should be not only kept clean, but demagnetised. Over time, the passage of recorded tape and the Earth's natural forces leads to a build-up of magnetism that can, amongst other things, impair high-frequency response. The plastic-shrouded tip of this mains-powered device is carefully brought into proximity with your tape (or cassette) deck's heads, capstan and guides. Its focused AC field then eliminates any accumulated magnetism. A must for analogue revivalists, at a stocking-filler price. Keep well away from DCC decks, though...

## SENSATIONAL SWEET: CHAPTER ONE: THE WILD BUNCH (£50, AMAZON)

How many of us grew up with classic feel-good Sweet glam-rock singles like Teenage Rampage, Block Buster! and Ballroom Blitz? They're in this nine-CD box, alongside many other delights. You get the first six studio albums (spanning 1971's 'Funny How Sweet Co Co Can Be' to the band's 1978 Polydor debut 'Level Headed') plus a singles compilation, rare BBC sessions and a live Rainbow performance. Sweet – influenced by The Who and themselves an influence on the likes of Kiss and Def Leppard – managed to strip away their 'teenybopper' image to reveal a highly-talented group of musicians, and the box reflects this musical development.



## SYNOLOGY DS218PLAY NETWORK ATTACHED STORAGE (£250, PLUS DRIVES)

Modern technology is revolutionising how we listen to music, and many of us are now storing our collections (ripped CDs, hi-res downloads, recordings of radio programmes and tape/vinyl transfers) on networked hard drives that can be accessed from various streaming players dotted around the house. Instant access – no need to hunt down that album you recall seeing six months ago! This consumer-oriented Synology NAS box is fast, well-featured, straightforward to install, can accommodate two drives (basic RAID security is supported) and boasts an industry-standard (DLNA) multimedia server. New functionality-boosting 'apps', security and upgrades can be managed via a powerful web interface.

## NEOTECK DIGITAL STYLUS GAUGE (£10, [www.pollyparrot.co.uk](http://www.pollyparrot.co.uk))

It's important to correctly-set parameters like vertical tracking angle, anti-skating force and tracking weight after replacing your turntable's cartridge. If the latter is too high, you'll wear out record grooves and stylus. Too low, and groove-wall damage can occur – if the tonearm doesn't just skitter across your record. This gadget is essentially a specialised set of scales, onto which your tonearm is gently lowered so that its stylus sits on the measuring platform. The weight is then shown digitally, to 0.01g resolution. Adjustments can then be made until the manufacturer-specified weight is attained. Half the price of a record – and a perfect 'make-weight' present...



## ORTOFON TEST RECORD (£45 PLUS SHIPPING, [www.ortofon.com](http://www.ortofon.com))

In hi-fi's heyday you could purchase test LPs from a variety of sources, including Ortofon. They contained test signals and 'torture bands' that would reveal just how good your deck's ability to track grooves was, but disappeared when CD took over. Thanks to the vinyl revival, test LPs are back! This test record is again from major cartridge manufacturer Ortofon. Its 15 tracks (frequency sweeps, reference tones and tracking tests created with 21st-century technology) are duplicated on both sides of the LP. It's a bit too big for the average stocking, and playback is likely to be infrequent, but the Ortofon Test Record is useful nevertheless.



# Christmas Wishes

**NAME:** Dave Tutt

**STATUS:** Hands-on audio engineer

**When you fix and use audio equipment at base level, you have some demands to make of Santa. Here they are.**



## **GOLDRING E1 (£59.95 [www.goldring.co.uk](http://www.goldring.co.uk))**

I definitely need to get Santa to find me a nice new cartridge for my old turntable. If I could find a Shure V15 VST I would go for that. I have had an old SME3009 S2 fixed arm for over 30 years and have used an Ortofon VMS20E cartridge for all that time – I want to try something new that is compatible with the mass of the SME. One of the new Goldrings, like an E1 in the bottom of the stocking, would be just fine.

## **12S HIFI DAC ES9023 DECODE BOARD FOR RASPBERRY PI B+ (£33 [www.ebay.co.uk](http://www.ebay.co.uk))**

I have been experimenting with DAC modules from Ebay – all made in the Far East. Some that I have tried are very average as an upgrade fed from my CD players but I am hoping the one I am looking at now is rather better. Costing about £35 and using the ES9023 it is a module for the Raspberry Pi music storage system I am developing. As a present for a Raspberry Pi B+ owner this DAC board would be ideal.

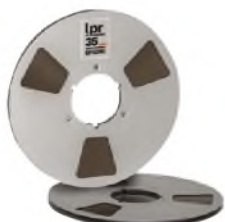


## **ELTAX BASS DRIVERS (UNDER £100 [www.ebay.co.uk](http://www.ebay.co.uk))**

I have been thinking about doing some modifications to a pair of Eltax floor standing speakers I was given this year. They are nothing special but need to be drastically improved to make them worth keeping. They have no bass, so an additional cabinet to fit a 6 inch bass driver, using the floor to act like a small horn / reflector would be fine. Total cost of drivers and other parts probably less than £100.

## **MARANTZ PM4000 MODULES ([www.ebay.com](http://www.ebay.com))**

Another current project is the re-imagining of an old Marantz amplifier. Aside from mounting a PCM5102 DAC in there, it needs a new power supply and a set of output amps. The wonders of Far East modules is they are cheap but sometimes far better than you can imagine. Santa should look at giving me these 100watt modules. My last pair cost me £22 which is less than half the components cost in the UK for the same thing and with free delivery Santa won't be loading down his sleigh!



## **LPR35 10.5" REEL, 3608' LENGTH, METAL NAB (£59.95 [www.tapecity.co.uk](http://www.tapecity.co.uk))**

Last on my list would be some new LPR35 open-reel tape as I am repairing so many tape decks I need to establish what the market is producing currently. My last reel was bought about 8 years ago and things move on. 10 inch reels of LPR35 are £55 each which isn't cheap, but for music demo purposes it is about to be expected.





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Stereo 25 MKII

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Final E2000s

Final E3000s

# Es Are Good

Two budget in-ear 'phones from Japan's Final are music to Jon Myles's ears.

Japan's Final are renowned for their high-end over-ear headphones - including the seriously bling-tastic Sonorous X that boasts gold leaf detailing and costs some £3500.

The company, though, also produces a range of rather more affordable in-ear monitors (IEMs) of which the E2000 and E3000 models comprise the entry-level models.

Although priced at just £39.99 and £49.99 respectively they still feature some interesting design cues that mark them out from the majority of run-of-the-mill headphones at this price.

Firstly they both feature sturdy metal housings where plastic often rules the roost at this price. The E2000s have an aluminium body while for the E3000 stainless steel is used.

Secondly they are vented at the rear in an attempt to expand the soundstage and aid accurate reproduction of lower frequencies. To prevent excessive sound leakage there's a filter fitted and a stainless steel mesh cover but if you are sitting close to someone on public transport with the volume turned up they'll definitely get some idea of what you are listening to.

Both use a single 6.4mm dynamic driver so sound differences are basically down to the tuning/case material of the individual models. Impedance is quoted as 16 Ohms with the E2000s having a 102dB/mW sensitivity and the E3000s 100dB/mW.

They come packed with a 1.2m cable that seems rather thin but in practice stood up to regularly being

pulled in and out of my pocket over a prolonged period and, praise be, remained tangle free most of the time.

Also included are a variety of eartips in five sizes ranging from very small to large to ensure a secure fit as well as a set of hooks that can be attached to the cable if you wish to route it over your ears.

In use the Finals are very light (12g for the E2000, 14g for the E3000s) meaning they don't pull down from your ear canal and so remain securely in place.

Overall both the E2000s and E3000s are a good, solid design with a quality feel that wouldn't seem out of place on in-ears costing twice the price.

## SOUND QUALITY

Final's headphones - both in-ear and over-ear - tend to have a distinctive 'house' sound that is smooth, slightly warm but with a good level of detail.

The E2000s and E3000s don't stray far from this blueprint although there are some obvious differences.

With Massive Attack's 'Safe From Harm' the opening bass line with the E3000s was big, punchy and powerful. Switching to the E2000s some of that punch was lost but, conversely, it was a lot tighter and faster.

The same characteristics come through with both the midband and treble. The E3000s have more of a lush quality - the piano on the classic Thelonious Monk and John Coltrane's 'At Carnegie Hall' set (24/96) displaying more resonance compared to the E2000s where it is leaner without quite the same body.

Where that brings dividends for the latter is that the tracks push

along with more rhythmic drive - although at the expense of losing some of the acoustic atmosphere of the recording compared to the (slightly) more expensive E3000 model. It was the same with the harder-charging sounds of The Buzzcocks where 'Ever Fallen In Love With Someone' had greater pace through the E2000s, the guitar lines sounding sharper as the bass was a little more restrained.

The E3000s do, though, replay classical music with a greater sense of orchestral power. There's an out-of-ear soundstage on offer with Mahler's 'Symphony No 5' which the E2000s can't quite match in terms of scale and grandeur.

That said, neither earphone leaves you wanting for detail. They comfortably beat the likes of the Sennheiser CX 3.00 or Phillips TX2 in-ears - both around £40 - in this regard, sounding much more nuanced and sophisticated and so able to reveal the extra information available on high-resolution material.

If pushed I'd probably plump at spending the extra £10 on the E3000s for the richer sound they offer across all genres of music but the E2000s may well appeal to those who prefer a more dynamic presentation.

## CONCLUSION

Both the E2000s and E3000s are excellent IEMs for use on the end of a portable music player or smartphone. They sound subtly different so which one you prefer will depend on personal taste and choice of music. But both provide exceptional value for money and come highly recommended.

### FINAL E2000S £39.99



**OUTSTANDING** - amongst the best

**VALUE** - keenly priced

#### VERDICT

Rhythmic, detailed and musical. A best buy at the price.

#### FOR

- detail  
- timing  
- build

#### AGAINST

- slightly lean presentation

### FINAL E3000S £49.99



**OUTSTANDING** - amongst the best

**VALUE** - keenly priced

#### VERDICT

Deliciously rich and vibrant in-ear monitors from Final which something of a bargain at the price.

#### FOR

- powerful bass  
- big soundstage  
- rich midband

#### AGAINST

- nothing to speak of

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# "Those in the music business are the ones who most need to be acutely aware of sound quality."



Noel Keywood

People commonly ask me one of two questions: "what is the best hi-fi?" and "is my Technics any good?" Both questions are almost impossible to answer, if for very different reasons. It's the first question that I'll cover here though. The second question's answer is "yes, no, possibly, maybe – it all depends".

The question: "what is the best hi-fi" is far from one of trivial interest. For those that work in music, making a living from it, it is a major concern – or it should be. This obviously includes musicians, everyone in the professional audio business, namely recording engineers, cutting engineers, mastering engineers, even management. Then funnily, we have hi-fi manufacturers. They should know a thing or two of course and have no problem. But what if you only make pickup cartridges? These can cost thousands and live or fall on sound quality alone, so you hardly want to be developing them using a dodgy hi-fi system. If it had bright sounding loudspeakers, the cartridges could end up sounding dull to compensate.

It gets worse. I've read scary accounts of miserable 'consumer' playback systems used for the assessment of both Digital Audio Broadcasting (DAB) in its early European days, and similarly of the systems used to assess early digital compression schemes like MP2.

Both DAB at the European Broadcasting Union (EBU) and MP2 (and derivatives) at the Fraunhofer Institute were pushed through against scepticism and disagreement. Both had technological merit but both sacrificed sound quality in order to gain merit! DAB was purposed for cars where sound quality wasn't considered a big issue – in days before Naim was paired with Bentley. It got unlucky when national

broadcasters like the BBC tried to use it for terrestrial radio as a replacement for VHF/FM and listeners with better audio playback systems than the developers started listening. Then the complaints rolled in.

MP2 allowed music to be stored and transmitted quickly and cheaply, by slashing away at the information within it. But the developers never knew how bad it was, because their judgement of sound quality was peremptory, made on cheap 'consumer' audio equipment that disguised the sonic horrors they were creating.

Those in the music business are the ones who most need to be acutely aware of sound quality. Yet here there's not so much ignorance of the subject as confusion. Most times, big studio monitors are the order of the day, like massive PMCs or giant B&W 801s, often in small rooms that pressure load listeners in the near field. This fails to represent real life experience in any way, unless you like to sit in front of the PA at Rock concerts. All the same, music studios like this sort of 'hi-fi'. It is what they know, are used to and feel fits their purpose (ignoring the now understood danger of hearing damage).

In terms of size, price and sheer force studio monitoring systems make a strong case, but not necessarily an effective one. If you feel it necessary to listen close-in at very high volume you are using a sound reproduction system quite unlike anything used by your target audience.

Outside such pro systems, that essentially comprise a big amp and big speakers, there's little understanding or appreciation of consumer audio. This is worst with vinyl. One large London studio I visited were cutting LPs but had no playback system at all. I was taken aback when they

asked me what to buy as a budget but decent turntable (I advised Rega, mainly for the RB300 arm, with Ortofon 2M Black – but that was a few years ago now).

All the same, big studio monitoring systems are surrounded by the magic of their professional status and I will admit, massive Tannoy loudspeakers able to shake a house to its foundations are awesome – until the complaints start rolling in from near and afar!

Nowadays, another body of influence has joined this debate: archivers. Here's where sound quality gains cultural gravity. Music is a form of cultural expression, old recordings capturing the past, untainted by modern commercialisation. It was the U.S. Library of Congress that first said "no" to compressed digital audio, on the grounds that it degraded America's cultural heritage. That's a massive endorsement for good audio if ever there was one!

Countries around the world are archiving their musical past and quality is considered essential. A twist in here is that long ago music recording systems were technically crude, ad-hoc affairs, using custom equalisation and disc/cylinder/tape speed, details being lost in the mists of time. To retrieve music for archival purposes both equalisation and play speed must be guessed, so here we have another and quite different need for an audio playback system that is both witheringly accurate in itself, yet also adjustable.

So what is the best hi-fi? What sort of high quality audio system should be used to assess the quality of music recordings, for all the various purposes I have mentioned? The answer is, there is no agreement at all! My reply is "use valve amps to drive electrostatics" and that's when my questioner may well say "how about Technics?" Doh! ●

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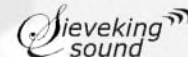
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# “Rock’n’roll is nothing but rhythm & blues and we’ve been playing it for years down in New Orleans.”



Paul Rigby

**W**hen you next walk into a record shop, I dare you to take all of the music genre label boards you see (you know, Rock, Country, Soul, Classical and the like), hide them under the shelves and then proceed to mix all of the records into one grand hodge-podge. You must do this before the shop owner can get to you with his baseball bat and/or call the police. Additionally you must also make a plan to head off down the back alley before your actions result in dire physical consequence.

Why? Well...maybe it's because of the sad recent loss of Fats Domino, who died at the grand age of 89. I think there's a gradual re-writing of musical history going on, one his death highlights.

Apparently the fifties was Elvis Presley. It was Sun Records and Sam Philips. It was Chuck Berry, Carl Perkins and Jerry Lee Lewis.

When you read a lot of music history, many other artists are mentioned and due respect is often paid, but the underlying theme, nevertheless, is often that they were merely residuals to the grand rock'n'roll rainbow, that everything was dovetailing and careering towards rock'n'roll.

Events in a careering music scene were unstoppable and inevitable. Other artists' stuff was all very well and good but, hey, it didn't really matter. Not really. Because rock'n'roll was what the fifties was really all about.

How do we know? Because all of the big rock and pop stars name-checked them as influences. And so did the seventies stars. And so the linkage progressed with successive artists name-checking those from a decade or more previous, all the way back to the rock'n'roll geats.

Then there were the regular rock'n'roll resurgences. Even now, there is a healthy rockabilly/rock'n'roll scene both in terms of music and fashion.

The rock'n'roll guys were the motherlode of the fifties, it seems. They were what mattered. They were the point of the 50s. Everything else was wallpaper. Everything else was a bit twee and rather silly. Everything else was short-lived and halted down a creative cul-de-sac. Everything else was seen as a fad or was an old fashioned hang-over from the past.

You can tell that I'm going to disagree, right? And I am. I've been a music journalist for many, many years. Long before I became a hi-fi journalist. Music journalists (in fact, all media) have to make a living like every one else so they write articles and write books that sell.

Often, the fall-out is a repetition of the same old stories and facts that merely skew events from the past. If you've ever lived through a reported event and then read about it later, how often have you said, "Well, it wasn't quite like that..." It may have been like that for them, but not for you. Who is right?

Fats Domino wasn't conned by the marketing. At the time, in the fifties, he was asked about rock'n'roll on US-based TV and he said, "Rock'n'roll is nothing but rhythm and blues and we've been playing it for years down in New Orleans".

And what was rhythm and blues? It was swing jazz, it was hillbilly music, it was Blues and it was everything in between.

That's the problem with labels. Labels are used to sell music. They are a construct of the music industry. You don't think that musicians actually care about labels do you? Many are actually irritated by them. Real musicians certainly don't care. It's all music. That's all

they care about.

I have a bunch of disparate CDs on my desk as I type these words. All of them feature music from the fifties. All are worthy. There's Ray Charles 'Live 1958-60' (Hoodoo; [www.discovery-records.com](http://www.discovery-records.com)) oozing Soul with Country tinges, influencing a host of black singers including Stevie Wonder. There's The Kingston Trio's 'The Five #1 Billboard Albums' (Hoodoo) offering superlative harmony-based vocalisations on a jazz theme, that would influence The Beach Boys.

'The Sound of the Flamingos' (Hoodoo) focuses on R&B/doo-wop and would directly influence Motown. Carl Smith's 'Let's Live A Little' (Hoodoo) features this honky tonk colossus (racking up 31 Top 10 hits) who would influence a host of modern country stars.

As for Vic Damone's 'The Hits Collection' (Acrobat; also on Discovery). Sinatra referred to him as "...the best set of pipes in the business."

Even Stan Freeberg – comedy genius and innovator – was recording in the fifties. You can hear his 'The Singles Collection' on Acrobat but this man influenced everyone from director Steven Spielberg to actor Tom Hanks and – yes – the Beatles!

All of these artists – strictly speaking – had nothing to do with the nebulous rock'n'roll label in and of themselves. Yet each was highly successful within their chosen field and each spawned their own influences after their commercial popularity had waned.

As Fats said, he'd been playing rock'n'roll before it was ever called that. Music is...music. Labels should be taken with a pinch of salt and never taken too seriously. If they are, they threaten to diminish the work of the very artists that created them. ●

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# “If you’re supposed to be an edgy rock band is being associated with FIFA all that clever?”



Jon Myles

**R**emember the days when rock 'n'roll symbolised rebellion, the young thumbing their noses at the rich and powerful and breaking down all manner of social taboos?

From an American TV company just filming Elvis Presley from the waist up because of his suggestive hip swivelling, The Clash berating MPs for being “fat and old, queuing for the House Of Lords”, the BBC banning the playing of ‘God Save The Queen’ and one prominent DJ refusing to play Frankie Goes To Hollywood’s ‘Relax’ because of its supposed sexual connotations?

On a lesser level The Clash consistently refused to appear on Top Of The Pops as they thought it was phoney. This did have the benefit of producing a surreal episode of the programme when dance troupe Legs & Co were featured gyrating to the group’s Top 20 single ‘Bankrobber’ on a set consisting of prison bars (do look it up on YouTube - it’s very, very funny).

Well, those days appear to have gone if recent events are anything to go by. For evidence just look to once indie-rockers Kasabian providing the entertainment at football world governing body FIFA’s recent star-studded awards ceremony in London.

That’s right FIFA; the body so mired in corruption allegations that its President Sepp Blatter was forced to step down after 16 officials were arrested during the organisation’s annual congress in Zurich as part of an FBI investigation.

Then there’s U2 who were the house band at the recent wedding vow renewals of Guy Oseary and wife Michelle Alves held under the iconic statue of Christ The Redeemer in Rio de Janeiro in Brazil. They

regaled guests at the reception including actresses Demi Moore, Dakota Johnson, model Helena Christensen, Madonna and even Noel Gallagher.

To be fair, Mr Oseary is U2’s manager – but playing at a wedding reception is hardly classic rock ‘n’ roll is it, with its spirit of rebellion? I wonder what the happy couple stepped out to on the dance-floor, ‘Sunday Bloody Sunday’ perhaps, or ‘I Still Haven’t Found What I’m Looking for’!

(As an aside here, Joy Division’s late, lamented manager Rob Gretton once promised a friend he’d try to get the band to play at his forthcoming wedding. It never transpired - which is probably just as well as it might have been the most depressing musical accompaniment to the launch of a long and happy relationship ever envisaged).

Then again, U2 are no strangers to doing perverse things. Frontman Bono has long campaigned for Western countries to spend more of their GDP on foreign aid while simultaneously moving part of the band’s financial affairs from Ireland to Holland because of its more advantageous tax regime.

Not that I begrudge musicians earning money in any way they choose, but shouldn’t there be a smidgen of image consciousness involved? If you’re supposed to be an edgy rock band, is being associated with FIFA or playing at a wedding reception really fitting for the image?

There are ways, though, that bands can accept corporate gigs and turn it to their own advantage in boosting their credentials as truly rebellious and different.

I think of the Sex Pistols on Thames Television’s Today programme where a string of invectives aimed

at presenter Bill Grundy propelled the band from the music press to front page news across the UK and subsequent fame and huge record sales.

Then there’s perhaps the perfect way which came courtesy of arch-pranksters The KLF. Having become the biggest-selling singles act in the world in 1991 the duo of Bill Drummond and Bill Cauty capped a raucous, grunge-like performance of ‘3am Eternal’ alongside Extreme Noise Terror at the black-tie British Phonographic Industry’s BRIT Awards by firing machine gun blanks over the heads of the audience before exiting the stage while a PA announcement stated “Ladies and gentlemen, the KLF have now left the music business”.

They later dumped a dead sheep with the message: “I died for ewe – bon appetit” tied around its waist at the entrance to one of the post-ceremony parties.

True to their word they shortly afterwards deleted their entire back catalogue and then travelled to the Scottish island of Jura to film themselves burning £1 million – most of the proceeds they’d accumulated from their record sales.

Probably not the most sensible thing to do – but in terms of cementing your legendary status in the rock ‘n’ roll hall of fame it was certainly effective. So no surprise that The KLF are still revered today and held in high esteem by a variety of acts that followed them.

Perhaps if U2 or Kasabian tried something similar they may well be remembered long after they’ve departed the business. Chances are, though, that the likes of FIFA may well seek to withhold their fee from any band which tried a similar stunt at one of their events! ●



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"I dismantled the unit, and cast my eyes on what was essentially junk"



Martin Pipe

**D**uring one of my occasional forays into Sunday boot-sale territory, I chanced upon a nice-looking pair of Sony bookshelf speakers. The seller only wanted £4 for the pair, and he threw in a late-noughties Sanyo audio unit. How could I refuse?

The speakers, part of an upmarket Sony mini system from the early 1990s, functioned and proved surprisingly good. Far better than much of the rubbish that has been flogged to mainstream consumers in recent years - and into this latter group, I must reluctantly cast my 'make-weight' Sanyo.

Remember the Sanyo of the Seventies? Yes, the one responsible for some pretty-decent receivers (which competed with the aforementioned Akai). The Sanyo in question got quite sophisticated with its elegant 'Plus' series of separates that spanned the late '70s and early '80s. Quartz-locked turntables, synthesiser tuners, logic-controlled metal-compatible cassette-decks...and the 'Super D' noise-reduction unit.

Super D was a 'componder' similar to the American dbx. I have a Sanyo Plus N55 Super D box, a glorious-looking 'piece' with fluorescent bargraph peak-metering and the typically-meticulous Japanese construction. It joined forces with a big Akai reel-to-reel to timeshift BBC Radio 1's Saturday late-night 'Essential Mix' show (which, I'm pleased to note, is still running nearly a quarter-century on).

Admittedly companding probably wasn't necessary, as the dynamic-range of Radio 1 FM - not to mention the music played - was (and remains!) rather squashed. I nevertheless retained the unit, which must be fast-approaching its 40th

birthday. A sensible move, as it has enabled me to correctly-reproduce encoded tapes and transfer them to digital. The N55 worked perfectly, despite not having been powered up for over 20 years.

Which is more than could be said of the bootsale Sanyo, a vertically-styled thing with slot-loading CD player, FM/AM tuner and the ability to record (as well as play) MP3 files, stored on SD cards or USB sticks. What a great little gadget...well, it might have been! Unfortunately the CD player wouldn't recognise discs and although MP3 files could be selected for playback, their audio was quiet and very distorted.

I dismantled the unit, and cast my eyes on what was essentially junk. The thing was a mish-mash of cheap mechanical and electronic items, evidently thrown together with little thought wasted on accessibility, disassembly or repair. The cheapest electrolytic capacitors had been specified, and some of them were beginning to 'bulge'. A far cry, then, from the neat internals of Sanyo's past products. Repair would have been uneconomic, meaning that its user could 'make do' with the still-working tuner-amp section - or throw it away.

Out of interest, the unit's service manual was found online. This seemed to be have been the merest of afterthoughts - lacking in information, and difficult to follow! In contrast, the Plus N55's comprehensive service manual detailed the unit's theoretical operation as well as providing calibration instructions, exploded views, parts lists, board layouts and full circuit diagrams. You could probably build your own N55 from this document! Most other Japanese manufacturers, notably Sony, were equally-thorough.

Sadly, we've become a society obsessed with price. Admittedly developments in materials, design techniques and electronics - even larger scales of integration, and the use of microprocessors and DSP - have brought down costs. But they only go so far. The Consumer Electronics industry, faced with cut-throat global competition - mostly from China - reacts by cutting corners wherever possible. A product might be sourced from a sub-contractor in a low wage country like Vietnam or Malaysia to sell under the brand name, as that Sanyo likely was.

Such an approach produces rubbish that barely outlives its guarantee. When a replacement is dutifully-purchased, what it replaces is left out on the street with the rest of the trash - which, these days, might also include a 2 year-old flat-panel TV. Sometimes, the demise of the latter can be attributed to an electronic fault (like a duff power supply). More often than not, though, the fragile LCD screen (a complex glass 'sandwich', 3mm or so thick) is cracked - accidentally-knocked by a vacuum-cleaner handle, maybe.

How much would it cost to put a thicker sheet of protective glass in front of the screen? Enough to make the TV uncompetitive in what is a globalised race to the bottom. Planned obsolescence, working to ever-shorter time scales, and cheap credit exacerbate the problem.

But the broader cost, in terms of sustainability and resource-consumption, is embarrassingly-high. It's just as well that 'real' hi-fi emerges largely-unchanged from this madness. It's more expensive, but is built to last with abundant 'software'. Repair is economic, and upgraded gear can either be passed to the next generation or sold 'second-hand'. ●

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# "A modification to the circuitry may change the sound – but is it actually better?"



Dave Tutt

I have been buying again. My workshop is more full than usual. It's not that I actually need any of this stuff although I have to admit I enjoy the opening of the packages, the potential of the diagnosis, the excitement of the repair, the search for the spares, the little modifications, it all adds up to the complete package of an engrossing experience.

I rarely pay more than £30 including postage for anything I buy. Some things are bulk buys: for example, 50 or so pairs of faulty headphones. Having got the first pair, I had to buy up each subsequent batch of 10 that appeared on Ebay because, although not the highest quality phones, they only needed the terrible cables with integral microphone and volume control removed and proper cables installed to raise the game significantly.

These bargain phones were made by Marley and sounded pretty good although probably not worth more than the old list price of £48 – but since the entire collection only cost me £65 I feel I did well. I have fitted some with 3.5mm jack plug terminated cables, although I actually prefer more reliable quarter inch jacks. I have also fitted some with 4pin XLR connectors for balanced headphone output circuits, matching my new headphone amp still in construction in the workshop.

Other recent purchases include a NAD 712 receiver with voltage regulator failure that knocked out the entire preamp. PCB burns had to be removed and the damaged tracks built up but it now works well. New LEDs in the display backlight are a considerable improvement over the original yellow bulbs that I replaced and take less than a tenth of the current – which may have caused the demise of the old regulators over the life of the unit. I will double

the size of the main smoothing capacitors to see how it alters sound quality, as the originals are worn out.

Then there is my stack of CD players. Single disk machines from Denon, Teac and Technics as well as three multi-CD players from Denon and NAD. The only one not repairable was also the most expensive, the Technics SL-PS70 where the CD laser assembly for this 1990s machine was totally unique and impossible to replace.

Never mind! The Technics might be re-engineered – turned into a DAC since it has pretty advanced circuitry and downstream analogue electronics. Big question is how will it sound in this role?

All seven machines cost me less than £80, the purchase of the laser replacements only adding £38 to the total bill. My customers who arrive and ask if I have a spare CD player will now find me fully stocked!

One of the things that I have considered is how some of these relatively budget machines might sound with some modifications. Going over the circuits it is clear that the analogue output stages on several of them are made to a strict price limit. Think around 40p in component terms at manufacturers' purchase price.

The digital side of a CD player is going to be pretty much the same at this price point; there are no fancy chips, no additional complications. The digital stream comes out, goes to the DAC and becomes analogue, being buffered by the output chips. That's why it isn't surprising that most CD players sound very much alike. The same cooking Japanese standard low noise op-amps are fitted, together with electrolytic coupling capacitors. With the analogue output sharing power from a common set of power rails, it is going to be blandsville in sound

quality terms!

I think it is possible, for very little money, to at least raise the game a little here. There are so many great op-amps out there and who cares if we use capacitors that don't look pretty on the circuit board? I intend to take a machine and replace and improve where I see an obvious opportunity, to see what the results actually amount to in sonic improvement.

One of the things you notice when you get to repair a wide cross section of equipment is that some are rather more equal than others. As you can imagine much equipment has a sound that fits the original price point. There are also manufacturers' sounds. So older NADs all sound similar, and Denon too have a sound very much formed from their design and manufacturing origins.

I also have Cambridge Audio equipment, an A1 Mk3 that is a bottom of the range item with nothing that shouts hi-fi when you take the lid off. The pre-power P500 / C500 series and the Azur 540A have a similar sound probably because the 540A seems to have the same power amp and power supply circuitry as the P500 but the PCB is designed rather better. Ten years of development perhaps?

A modification to the circuitry may change the sound – but is it actually better? I am as fallible as anyone in making an assessment here. But if you have say a Teac or Denon CD player and I upgraded just the output stage would such an upgrade be worthwhile? Would a sub £250 player move up the quality pecking order with £15 of output amplifier components rather than 40p? This will be an interesting experiment in old fashioned analogue, because at the end of the day analogue still matters and makes a difference. ●

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### QUESTIONS

**[1] When did the AE100 first appear -**

- [a] 1920
- [b] 1996
- [c] 2006
- [d] 1896

**[2] Is the motor -**

- [a] short throw
- [b] spin throw
- [c] long throw
- [d] fast throw

**[3] Is crossover at -**

- [a] 3.6kHz
- [b] 3.6Hz
- [c] 36Hz
- [d] 30MHz

**[4] Low frequencies are augmented by -**

- [a] a long horn
- [b] a circular port
- [c] a sub-woofer
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# Exciting stuff!

Martin Pipe examines the psychoacoustic phenomenon that is the Aphex Aural Exciter

In this month's Olde Worlde, I'm looking at a piece of equipment that you have probably never slotted into your hi-fi system. Yet you might have heard its effects, if late-70s albums from artists as diverse as the Black Byrds, Status Quo and Linda Ronstadt happen to be in your record collection. The gear in question is the Aphex Aural Exciter. It's a clever form of analogue signal processing – an early example of psychoacoustic enhancement – designed to add or restore 'life' and 'clarity' to dull analogue recordings that might have lost something in the multiple dubbing and mixing stages their epic seventies-era production may have involved. Notably, percussion gets more 'bite' – hence the verb 'excite'...

The Aural Exciter's birth, it seems, was accidental. In 1956 a Swedish inventor living in the US, Curt Knoppel – whose day job involved designing aerospace hardware – incorrectly-built a tubed

the two decades that followed, he allegedly spent close to a hundred thousand dollars trying to recreate what he described as the "audio equivalent of holography".

By 1975, his research had paid off – culminating in a patent and the Aural Exciter in working prototype form. A chance encounter led to a meeting with businessman Marvin Caesar and the birth of a company, Aphex Systems, to develop and commercialise the design.

Caesar's musical interest helped to spread the word, and the Aphex Aural Exciter ended up being used on some NBC TV broadcasts. A PA firm then got wind of the system, and it found a place on the American leg of the Wings Over The World tour. Record producer Peter Asher attended one of the Wings concerts, and was impressed by what he heard.

Enquiries put Asher in touch with Aphex, and the Aural Exciter was pressed into service during the recording of country-rockster Linda



**Simple Dreams by Linda Ronstadt was "mixed using the Aphex Aural Exciter system". Some didn't like it – to one listener, it seemed as if Linda (unprocessed?) was "singing through a foot of cotton" although the accompanying "instrumentation (processed?) is nicely-recorded".**

Browne's fourth album The Pretender.

Here in the UK, lovable boogie-merchants Status Quo's If You Can't Stand The Heat... included the tell-tale credit 'This album was mixed with the Aphex Aural Exciter'. Dire Straits made use of the box of tricks for their first record too.

Initially, studios couldn't just buy a box and stick it in the effects rack. Aphex essentially hired their units out to studios, and charged for it in terms of the finished product. Eventually, Aphex made their money through the sales of hardware – like the late 1990s-vintage Aphex 104 model you see here – and studios could use it as much as they liked without further payments.

So successful was Aphex Systems that the company moved from its Massachusetts home to Burbank in California.

Some artists didn't however like the 'Aphex sound' – they found it artificial, or fatiguing to listen to. The sleeve notes of the Eagles 'In The Long Run' LP famously declared that "the album was NOT mixed through the Aphex Aural Exciter"!

So how does it work? The Aural



**The Aphex 104's economical offers two channels of Aphex Aural Excitement and 'Big Bottom' processing. Most of the chips are standard op-amps, with the exception of a LM13700 'transconductance amplifier – associated with the exciter's filter. Earlier models had the chip numbers removed to prevent the design being copied.**

amplifier kit. It sounded different – far from pure and neutral, the aim of every good amp. Some kind of distortion taking place in the miswired circuitry was evidently making the music more engaging to listen to.

Knoppel later corrected the fault, but he never forgot that sound. Over

Ronstadt's 1976 Hasten Down The Wind LP. It would be also used on her follow-up album Simple Dreams. To Asher, the Aphex was "a gift from God". And word spread fast; other albums to benefit from 'Aural Excitement' included James Taylor's folk-rock JT, the Black Byrds' slice of funk Unfinished Business and Jackson





Exciter exploits the fact that all musical instruments produce a complex waveform that consists of a fundamental frequency and a complex series of harmonics (multiples of the fundamental) that help to define their timbre. The higher-frequency harmonics are the first to be lost in the analogue recording chain, owing to frequency-response limitations; the losses tend to increase with the number of 'generations' (dubbing). This is why analogue studio tapes can sound 'dull' after many generations.

What Knoppel's team did was to arrange for the input signal to pass through an tunable (800Hz to 6kHz or so) high-pass filter, that allows the user to pass a narrow band of frequencies close to the instrument's fundamental. The Aphex 104 model featured here – which features the 'Type C2' revision of Aural Exciter technology – has two 'ranges' of filtering, to help users 'hone in' on what delivers the most effective result.

The filtered signal then goes to another analogue circuit that synthesises the missing or reduced-amplitude harmonics, through tightly-controlled non-linear behaviour. In other words, distortion is added – something that will cause a true audiophile's hackles to rise!

This processing takes place in what is known as a 'sidechain', basically a separate path. The generated harmonics of this sidechain are then mixed, to the user's taste, with the original unprocessed audio. The result is an 'enhanced' version of the source, with regenerated high-end sparkle.

Sounds like a terrible prospect, doesn't it? In practice it works very well – especially with bright synth leads, searing effect-laden guitars and percussion like drums, snares and cymbals. It yields its best if applied subtly. Fail to tune the unit to the frequency that best reflects the musical content, or add too many of the artificial harmonics into the mix, and it sounds dreadful. The process can impact stereo imaging, and this isn't always a good thing.

As one who can remember albums with the 'mixed with the Aphex Aural Exciter' note on the sleeve, I bought this Aphex 104 out

of curiosity when I came across it at a second-hand store (I think I paid £30 for it – new, it sold for around £400). Being pro-audio gear, it supports both unbalanced and balanced inputs and outputs via 6.3mm jacks; you can also switch between -10dBv and +4dBu levels to match levels with the rest of your gear. I used phono-to-jack adaptors to interface the 104 with consumer audio devices.

The US-built 104, unlike earlier generations of Aphex processors, also incorporates conceptually-similar circuitry that deals with the bass end of the audio spectrum. Its raison d'être is, in Aphex's words, to "dynamically shape the bass response,



**Aphex co-founder Curt Knoppel, from the October 1977 issue of 'Modern Recording' - a US magazine that covered the 'behind the scenes' technicalities of recording**

increasing the perception of low frequencies without boosting the maximum peak output". The unfortunately-named 'Big Bottom' sidechain, which centres on frequencies between 20Hz and 120Hz, can be quite effective with some types of music (electronic dance, for example) if used sensibly. That's possibly why some nightclubs have installed these units. With other genres, though, obvious 'thickness' and colouration set in.

The treble exciter element of the 104 is worthwhile when dealing with analogue tapes and cassettes that, for one reason or another, lack 'top'. There is a definite subjective improvement in 'snap' and clarity, and details buried in the mix are given greater prominence. However, add too much regenerated harmonic content to the mix, and nasties like sibilance become apparent. It's interesting that the first versions of the Aural Exciter featured a de-esser circuit to lessen sibilance.

Used properly the Aphex exciter is superior to adding a simple treble boost, as this just makes tape hiss more obvious; there is negligible hiss in the upper-midrange frequencies that are driven into 'excitement' by the sidechain.

But what of the original Aphex Aural Exciter, a product that was never aimed at consumers? You can still buy the hardware, in rack-mountable form, for pro-audio applications today. Aphex – or DVC-Aphex, LLC as it now is – pitches it as of value for "recording, mixdown, post-production, broadcasting, webcasting, live sound, installed sound and DJ" use. Selling for £350 or so online, this current unit is simply called the 'Exciter'.

The Aphex technology (and logo) also feature in effects 'plugins' for professional audio-editing software like Pro Tools.

The Aphex Vintage Aural Exciter from Waves even looks like a vintage processor, complete with analogue meter movements and retro knobs; this plugin, the manual explains, was modelled on "one of only a few tube-powered (Aural Exciter) units that were ever made".

Izotope's Ozone 8 'exciter', meanwhile, offers Aphex-type features alongside various emulations of 'tube' and 'tape'. It seems, then, that an idea that started in the analogue era still has relevance in the digital age...

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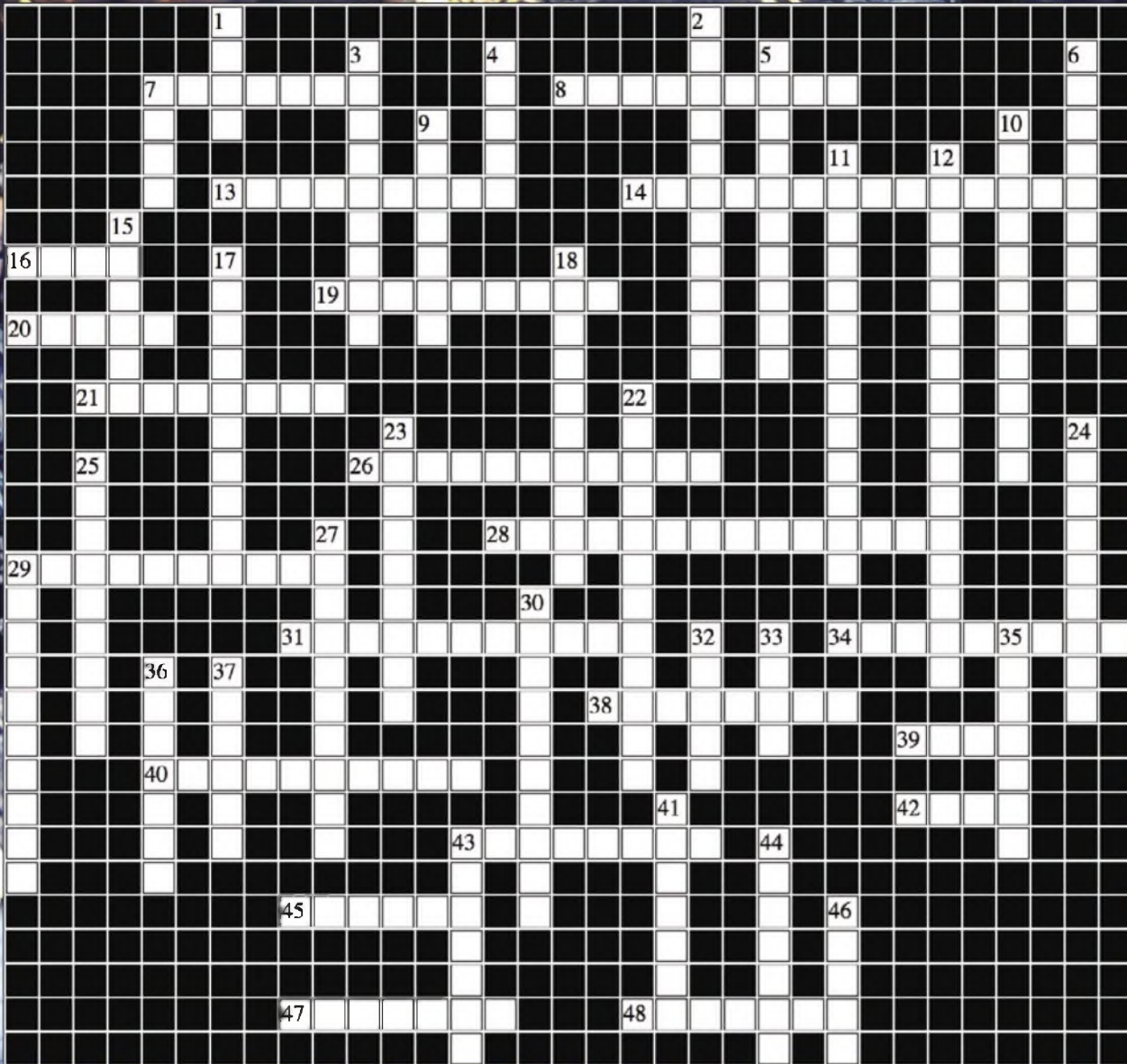
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GUTWIRE BASIC INTERCONNECT 2 METRE RCA PAIR	DIS/DEM	TBA
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# Christmas Crossword



**ACROSS**

- 7. Common name for a loudspeaker's high-frequency driver (7)
- 8. Home of Elvis Presley (9)
- 13. Founder of Apple(5/4)
- 14. Queen lead singer (7/7)
- 16. ...And The Ants? (4)
- 19. Electronic group who sped down the Autobahn (8)
- 20. A Walker Brother who went on to record Tilt (5)
- 21. Partnered Mel Smith on Rockin' Around The Christmas Tree (3/5)
- 26. A name for the study of bells - and bell ringing (11)
- 28. Backing band of Elvis Costello (3/11)
- 29. Home city of the Halle Orchestra (10)
- 31. Bassist in The Clash (4/7)
- 34. London studio associated with The Beatles (5/4)
- 38. German town which hosts an annual festival dedicated to Wagner (8)
- 39. Singer with U2 (4)
- 40. Composed The Great Gates Of Kiev (9)
- 42. Part of a book...or guitarist in Led Zeppelin (4)
- 43. Leader of Dire Straits - Mark...(7)
- 45. South American river - and a place to buy CDs (6)
- 47. I Wish It Could Be Christmas Every day...the band? (7)
- 48. Where Motown was founded (7)

**DOWN**

- 1. Sonny and...(4)
- 2. Coventry band containing Jerry Dammers and Terry Hall (3/7)
- 3. The London Symphony...(8)
- 4. Surname of the founder of the Glastonbury Festival (5)
- 5. First David Jones, then achieved fame as...? (5/5)
- 6. Founder of The Proms (5/4)
- 7. Santa Claus is Coming to... (4)
- 9. Spot this music streaming service (7)
- 10. Band who famously threw a bucket of water over John Prescott (11)
- 11. American rock 'n'roll star known as The Killer (5/3/5)
- 12. The man known to his fans as The Boss (5/10)
- 15. First name of Shostakovich (5)
- 17. Malcolm McLaren managed the... (3/7)
- 18. A James Bond girl and also a Slave To the Rhythm (5/5)
- 22. Band who didn't like Mondays (8/4)
- 23. The home of American Country music (9)
- 24. A tropical cyclone - and also the name of a Bob Dylan song (9)
- 25. Another name for a record deck (9)
- 27. Lead singer of Roxy Music (5/5)
- 29. Recorded Kind Of Blue (5/5)
- 30. Guitarist with The Faces who later joined The Rolling Stones (6/4)
- 32. Classical music loving TV detective (5)
- 33. They recorded the album Parklife (4)
- 35. Johnny, Dee, Joey and Tommy were all...(7)
- 36. Producer of the single Telstar (3/4)
- 37. Patti Smith's debut album (6)
- 41. She's married to rapper Jay-Z (7)
- 43. Best-selling single by Paul McCartney - Mull Of...(7)
- 44. Former Stooges member who had a Lust For Life (4/3)
- 46. Power measure of an amplifier (5)

**Answers**

- Across:**  
 7) Tweeter 8) Graceland 13) Steve Jobs 14) Freddie Mercury 16) Adam 19) Kraftwerk 20) Scott 21) Kim Wilde 26) Campanology 28) The Attractions 29) Manchester 31) Paul Simonon 34) Abbey Road 38) Bayreuth 39) Bono 40) Mussorgsky 42) Page 43) Knopfler 45) Amazon 47) Wizard 48) Detroit
- Down:**  
 1) Cher 2) The Specials 3) Orchestra 4) Elvis 5) David Bowie 6) Henry Wood 7) Town 9) Spotify 10) Chumbawamba 11) Jenny Lee Lewis 12) Bruce Springsteen 15) Dmitri 17) Sex Pistols 18) Grace Jones 22) Boomtown Rats 23) Nashville 24) Hurricane 25) Turntable 27) Bryan Ferry 29) Miles Davis 30) Ronnie Wood 32) Morse 33) Blur 35) Ramones 36) Joe Meek 37) Horses 41) Beyonce 43) Kityra 44) Iggy Pop 46) Watts



# New Diamonds

Noel Keywood reviews Wharfedale's new Diamond 11.3 floorstanders.



The original Wharfedale Diamond loudspeaker – a budget mini – was as I recall designed by Stan Curtis, then of Wharfedale, who has a presence on the 'net today. That was back in 1981 – and the loudspeaker was a big hit. It sounded fast, clean and was tonally accurate, yet cost little and didn't intrude.

Today Wharfedale's Diamond – now a series of budget loudspeakers – is up to iteration 11 and I'm looking at the 11.3 mini-floorstander here, price £599.95 per pair. For this you get a unit that stands a modest 87.5cms (just under 3ft) high, is 19.4cms wide and 28.5cms deep. It has quite a small footprint and is designed to be used close to a rear wall in a small-to-medium sized room – up to approximately 15ft long. For bigger rooms and more low-end heft there is an 11.4 and even an 11.5 that stands 1.1m high and weighs 35kgs – big. The 11.3s by way of contrast can be quite easily moved around, weighing just 15kgs. So Diamonds have gone the way of Minis, same name but not one – a whole family, where the biggest member strays far from the original concept.

What you get in the 11.3 is two woven Kevlar 130mm diameter drive units, the lowest handling bass alone whilst the one above handles bass and midrange frequencies, aided by central conical phase plug. It in turn hands over at 2.5kHz to a 25mm (1in) textile dome tweeter at the top of the array. Grilles are provided to cover these drivers for those that so wish, their grey foam surrounds looking a bit out of place and dated against today's black butyl rubber surrounds, but I'm sure they do a good job – which is to acoustically terminate the cone as well as compliantly suspend it.

Wharfedale continue with their interesting and effective damped bass port arrangement, where a long reflex port fires out through the bottom of the cabinet onto a base plate spaced just millimetres below. It forms a wide-area port exit that damps air flow and better back-loads the bass unit so that it works in controlled fashion – a benefit our measurements clearly reveal (see Measured Performance). You can see



this arrangement in our pictures as a small slot that runs around the perimeter of the cabinet, at its base. Not much to see then! All the same, it is sophisticated for a budget loudspeaker, producing clean and well defined bass lines from the 11.3s I found.

The cabinets feel sturdy and are very well finished, a deep gloss lacquer adding to a general air of good build quality. At rear there are sturdy connection posts that allow bi-wiring if the supplied links are removed, and will accept bare wire, 4mm banana plug or spade cable terminations.

The base plates accept four screw-in adjustable spikes as a floor interface, but they are not the usual sharp wood piercing variety so much as chrome plated cones that contact the floor rather than punch holes in it. All the same, protective steel pads are provided as an option to avoid even slight marking of the floor.

## SOUND QUALITY

The Diamond 11.3 cabinet is low, putting the tweeter below ear height. This commonly emphasises treble and reduces a sense of cohesion; loudspeakers are designed to sound right on-axis. So I tilted the cabinets back by using the front spikes at full height and the rears at minimum height. This doesn't give much back tilt all the same and for more the rear spikes could be removed altogether – but this is not ideal in terms of anchorage. For drive I used our trusty McIntosh MC152 solid-state power amplifier set to 4 Ohms on its output auto-transformers, fed by a balanced line from the new Oppo UDP-205 Universal player to spin CD, as well as replay hi-res digital fed in optically from an Astell&Kern AK120 player. The speakers were run in for 50 hours.

I casually grabbed Duffy's 'Rockferry' CD to provide some music whilst setting up after run-in and this slightly difficult recording, where the producer admitted he added digital distortion for "graunch" showed me fairly quickly that the 11.3s are, in basic character, dry, clean and very projective – but also bright to the point of being sharp, affecting Duffy singing 'Syrup & Honey' in a stripped-down-to-nothing vocal that I noted was being used by a San Francisco music producer at the California Audio Show for his sound quality checks on systems.

Running through a range of tracks that I use consistently for review purposes showed these Wharfedales are enormously revealing but quite hard in timbre; they dug deep to reveal hammer on strings in Benjamin Grosvenor's piano, with Chopin's 'Nocturne No 5' (24/96) and delivered a strong sense of mid-band insight, if not so much scale. The Chicago Symphony Orchestra was large and individual sections well identified, but there was some glare and edginess to strings. When Otis Redding stepped up to the mic to sing 'Respect' (24/192), from a venerable old analogue recording of superb quality, much of the analogue-ness as I well know it was absent, the 11.3s giving great insight but quite hard tone. But a background bass line I don't recall catching before was cleanly resolved and got my attention.

One of my Rock clinchers is Fleetwood Mac's 'Dreams', from another old analogue album sent to digital (24/96) that offers great insight and a smooth natural sound, but Stevie Nicks sounded shrill and cymbal crashes from Mick Fleetwood's drum kit were emphasised and harsh, singeing my

ears. As a counterbalance, the 11.3s were fast and insightful here, making for a clean and punchy delivery – if one lean in breadth of tonal range. But again bass was tight and very well resolved, if not especially powerful in our large listening room. In a smaller room, and close to a rear wall bass from the 11.3s will be more tuneful than most. With a 'speaker of this size subsonics are not possible but the 11.3s were speedy and had no overhang.

## CONCLUSION

Wharfedale's new floor standing 11.3s are ideal for small to medium sized rooms where they provide dry but controlled bass that is tuneful and totally free of overhang or boom, even close to a rear wall. Low cabinet height and a narrow front face make for design that blends into a room harmoniously. Their sound is revealing that's for sure, but the tweeter is forward and the overall balance was bright, veering into sharpness on some recordings. This is not a loudspeaker that is soft or easy going, so much as one that pulls out detail and underlying atmosphere in ruthless modern fashion.

## MEASURED PERFORMANCE

Our frequency response analysis shows the Diamond 11.3 offers a flat characteristic when measured off axis by 20 degrees, albeit with some treble lift – so this will not be a dull loudspeaker, in line with current practice.

When measured on-axis treble was strong, so the 'speaker is best pointed straight down a room and not directly at

listeners, to avoid obvious brightness. Unevenness in tweeter output measured on-axis was also ameliorated off-axis. Delivery of detail will be strong, since there is little dip in output at the crossover between the bass/midrange unit and the tweeter.

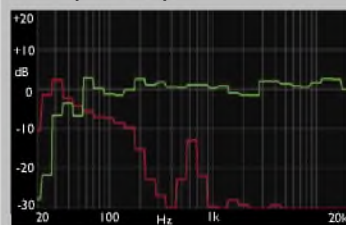
Response extends evenly down to 50Hz, with support from the floor facing port that peaks in output at 35Hz. It applied broad acoustic damping at low frequencies our red port output trace shows, suggesting well damped and tuneful bass that goes low. The impedance trace as always reflects this behaviour, showing fairly wide electrical damping on an amplifier.

Sensitivity was high at 88dB sound pressure level from one nominal Watt (2.8V) of input. Amplifiers of 40 Watts will be sufficient for very high volume. The impedance curve is mostly smooth and largely resistive, overall impedance measuring 6 Ohms with a music-like pink noise signal.

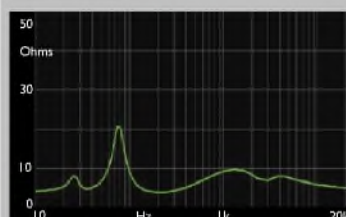
The floor standing Diamond 11.3 is tonally accurate across bass and mid-range, but the tweeter is prominent. Bass will sound dry, tuneful and go low, treble will be obvious. **NK**

### FREQUENCY RESPONSE

*Green - driver output*  
*Red - port output*



### IMPEDANCE



**WHARFEDALE**  
**DIAMOND 11.3**  
**£599.95**



**EXCELLENT - extremely capable**

### VERDICT

A fast modern sound full of detail and revelation but a tad hard in character and occasionally sharp up top.

### FOR

- good build and finish
- dry, tuneful bass
- revealing

### AGAINST

- forward treble
- hard tonality
- limited back tilt

Wharfedale  
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# vinyl section

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JANUARY 2018

[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk)

### NEWS 114

All the latest and greatest vinyl releases for you, from the pen of Paul Rigby

### GEORGE HARRISON BOX SET 117

Paul Rigby interviews the people behind this great new LP box set.

### ART USB PHONO PLUS 121

Martin Pipe is impressed by this budget phono stage with digital.

# news



## JAZZ IN THE KEY OF 'E'

Edition Records ([www.editionrecords.com](http://www.editionrecords.com)) has a host of intriguing new releases including Girls in Airports' 'Live', direct from Germany in 2017. Full of atmospheric and richly textured rhythms sitting on delicate ambience, rock impact and mesmerising loops.

Vernerí Pohjola (son of prog legend, Wigwam man, Pekka Pohjola) has released 'Pekka' in which his sparse trumpet playing appears to constantly search and seek. Peeking into corners of silence like a dog on the scent.

JazzKamikaze man, Morten Schantz's 'Godspeed' offers jazz in the wild...being wild and presenting dynamic fusion and a sense of the unstable. Jazz on the edge.

Finally, from Daniel Herskedal, 'The Roc' and his tuba! Plus Eyolf Dale on piano and Helge Andreas Norbakken on percussion that features world rhythms and constructions. A rich and full sound over a broad soundscape.

## MODERN HARMONIC

Four quirky LPs from this quirky spin-off record label from Sundazed in the USA. Up first is 'Gundella: The Hour of the Witch' (See?) Based in Detroit and descended from Green Witches in Scotland and a regular university lecturer, this factual LP is a bit of a 'how to' on casting spells. Complete with spooky background organ music.

Ranný Sinclair's 'Another Autumn' oozes soft and breathy vocals over orchestral jazz with a distant loungecore tone but with an edge. It's idiosyncratic and just a bit sexy.

Also look out for two Chet Atkins LPs: 'Hi-Fi In Focus' and 'Workshop' mixing pop, jazz and country. Superlative guitar craftsmanship from the master.



## STAX IN A BOX

Part of the 60th anniversary celebrations, The Stax 7s Vinyl Box. includes seven 45rpm singles featuring 14 rare groove tracks Johnnie Taylor and William Bell, Carla Thomas, Barbara Lewis and Margie Joseph and lesser-appreciated names including the Montclairs, Roz Ryan and Charlene & The Soul Serenaders.



## DEMON

Look out for The Shadows' hit package, 'All The Very Best' within a 2LP gatefold. It includes 'Theme from The Deerhunter', 'Apache' and 'F.B.I.' (and it might be CD-based but also look out for Demon's eleven disc Polydor-era box set covering 1980-1990, presented in a book-type container).

A deluxe version of Ian Dury's 'New Boots and Panties' features the original 1977 LP - replete with clever lyrics, energy, wit and imagery - plus a live show London's Paris Theatre, 1 July 1978.

Next is Bill Wyman's Rhythm Kings' 'My King and Queen; Georgie Fame and Beverly Skeete'. This 4LP compilation, curated by Wyman, includes both of Wyman's core band members over forty-three tracks that showcase both vocalists impressive talents, all in an outer slipcase.

Also look out for the 'Earth: One Amazing Day', 2LP, BBC, coloured vinyl soundtrack via Alex Heffes and 'Classic Rock Anthems II', a 2LP compilation including tracks from Toto, Survivor, Boston, Argent, Santana and Meat Loaf.



## THIRTY TIGERS

Via Thirty Tigers distribution ([www.thirtytigers.com](http://www.thirtytigers.com)) comes Hard Working Americans and 'We're All in This Together', latest from the jam band featuring members of Widespread Panic, Chris Robinson Brotherhood and Great American Taxi lead by Tom Snider. Packed with humour and solid vibes.

Roots rocker, Will Hoge's 'Anchors' is out too. Yet another 'relationships' LP? Yes, but this one packs in passion and emotion and does it well.

Also look out for rootsy performer Jason Isbell and the 400 Unit's 'The Nashville Sound' offering dynamic performances that matter as much as the songs.

## ...AND FINALLY

Piano Magic member, Angele David-Guillou's new solo work, 'En Mouvement' ([villagegreenrecordings.co.uk](http://villagegreenrecordings.co.uk)) utilises a classical template with an avant-contemporary approach.

Carla Bruni (yes, ex-First Lady of France" after marrying France's then-president Nicolas Sarkozys) has released 'French Touch' (Decca) a collection of stripped pop covers. This ain't 'alf bad, either. Gentle and innocent.

Guy Andrews' 'Tåke' ([Houndstooth](http://Houndstooth.com); [www.houndstoothlabel.com](http://www.houndstoothlabel.com)) is next. Norwegian for 'fog', 'Tåke' offers a post rock, guitar-based, interweaved, complex suite of rhythmic layers and soundscapes.

Mork's 'Eremittens Dal' ([Peaceville](http://Peaceville.com); [www.peaceville.com](http://www.peaceville.com)) is black metal of the extra raw and unremitting type with an up to date and dynamic and desolate vision of the genre. Think Darkthrone.

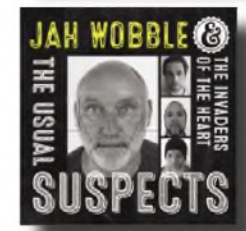
Aussie singer-songwriter, Paul Kelly, whose career harks back to the seventies offers 'Life is Fine' (Cooking Vinyl). An upbeat with simple yet direct stories on relationships and...life.

From Invenções, 'La Otra Vanguardia Musical en Latinoamérica 1976-1988' ([Munster](http://Munster.com); [www.munster-records.com](http://www.munster-records.com)) is a 2LP compilation featuring a host of cult, pre-punk influenced figures who emerged during times of revolution to spread avant vibes.

Anne Muller, Sebastian Reynolds and Alex Stolze's 'Solo Collective Part One' (Nonostar; @nonostar on Facebook) includes modern classical constructions with deliciously melancholic and thoughtful flavours.

The debut LP from Danish, harmonica-toting, jazz man, Mathias Heise Quadillion, 'Sudden Ascent' ([Discovery](http://Discovery.com); [www.discovery-records.com](http://www.discovery-records.com)) takes a fusion approach mixing playful jazz with harder hitting rock and funk.

Also check out Jah Wobble & The Invaders of the Heart's 'The Usual Suspects' ([3MS](http://3MS.com); [3msmusic.com](http://3msmusic.com)) which reworks a host of classic tracks including 'Public Image' and 'Get Carter'.



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# George Harrison Vinyl Box Set: The Ultimate Review

Paul Rigby talks to the mastering engineers behind George Harrison's new 16LP box set, Lursen Mastering's Gavin Lursen and Reuben Cohen George Harrison 16LP box set.

**H**arrison's two CD/SACD box sets, covering his solo discography, have been on the shelf for some time (they were released in 2004 and 2014, respectively). I wondered if we'd ever see a vinyl box set of the same and, if it did appear, whether it would follow a similar two part template.

UMC has now released a single 16LP vinyl box set, 'The George Harrison Vinyl Collection'. With the albums also being made available as standalone releases, the collection has been pressed on 180gm vinyl mastered from the original analogue tapes and cut at Capitol studios.

Buyers will notice immediately that the slipcase box features... movement. Via the lenticular cover,

showing two faces of Harrison as he matured during his solo years.

The full contents list for the set includes: 'Wonderwall Music' (1968), 'Electronic Sound' (1969), 'All Things Must Pass' (1970), 'Living In The Material World' (1973), 'Dark Horse' (1974), 'Extra Texture' (1975), 'Thirty Three & 1/3' (1976), 'George Harrison' (1979), 'Somewhere In England' (1981), 'Gone Troppo' (1982),



**Reuben Cohen is on the left (pictured in the black jacket), Paul Hicks is in the middle, and Gavin Lurssen is on the right (pictured in the black sweatshirt).**

'Cloud Nine' (1987), 'Live In Japan' (1992) and 'Brainwashed' (2002). The set also includes two bonus 12" picture discs: 'When We Was Fab' and 'Got My Mind Set On You', both from the 1987 album 'Cloud Nine'.

Before tackling the LPs, I was fortunate to chat with the two mastering engineers responsible for the sonic production of this new analogue set: the multi-award winning Gavin Lurssen and Reuben Cohen of Lurssen Mastering in the USA.

Lurssen described how his company got involved with the project, "I had worked with Dhani Harrison. I'd met him on a Ben Harper project called 'Fistful of Mercy' with Dhani and Joseph Arthur. Dhani lived in town. Everyone seems to know everybody else and, if they don't, they know everyone through one degree of separation."

Friendship grew into trust and the invitation to work on this set. Paul Hicks (who began his career at Abbey Road) was the guy who handled the actual tape transfer. In this case, to 24bit/192kHz.

Why 192kHz? Why not DSD? The recently released Rolling Stones mono box set was processed using DSD files. "When you go into proprietary formats," said Lurssen, "it limits abilities. The PCM transfer adds flexibility to help future proofing. Everyone can play PCM. For an archival format - which is aimed at the future - PCM is something that can be read. We've never actually discussed that but I'm guessing that's the reason."

So why not 384kHz then? "It's got to do with what the gear's capabilities are and the necessity regarding time," said Lurssen. "Also, in my opinion, the ear's hearing range is all achieved from 192kHz. With 192kHz, you're gaining as much information as you can get. If you



**The George Harrison vinyl box set was created through meticulous attention to detail utilising all of these specialist hardware and software tools.**

open the gates wider, the information coming in doesn't increase, the gate is just a little wider. It's not going to buy you anything else really. Also, some of the gear won't work at that rate. Many people in the audio field believe that 96kHz is fine. Our feeling is that 192kHz is really where it should start."

Yet there are audiophile voices out there who would say that 192kHz doesn't give you everything that vinyl can offer. Lurssen was ready for that one, "Every time you do anything, there is compromise. An actual recording. That in itself is a compromise. If I'm sitting in front of an orchestra...that is the purest form of intake. If I then record that orchestra under the very best of conditions and circumstances where even money is of absolutely no object, for later replication, it's not going to be as good. It won't be as good as actually sitting in front of that orchestra. Everything that you do that is other from sitting in front of that orchestra, is a compromise. To me, it's a feel thing and at 192kHz, I feel fine. When I work at lower rates, I detect it."

Some vinyl fans shudder when the notion of any sort of digital is included within an analogue project but Lurssen believes that digital is a must and it's here to stay, "The idea is to get the work done with the minimal carnage," he said. "When you work on these old and fragile tapes, some are brittle and if you make analogue tape copies then you're picking up degradation. When you

handle the tapes and you rewind back and forth and you're EQing every track, you risk destroying the original tapes. Storing in the digital domain, it gives us the flexibility to really give the sonic treatment of the music into the exact place that we want it."

This means that the team could reach into a track, pull out the





**Lurssen Mastering's customised analogue console.**

information required, fix it and plug it back again. You can't do that by mastering with analogue tape. That is, not to such detailed and exacting standards.

There's more to Lurssen's mastering techniques than this though. Lurssen and Cohen went one step further than most mastering engineers, at least in my experience. What most mastering engineers do is to transfer a tape into digital, they edit it in the digital realm, then save it and send that file to the cutting engineer. Lurssen didn't do that.

What the team did was to take an element of the music that required attention from the digital source and converted that back into analogue then brought it into their analogue console. You know the type, the old fashioned console with switches and knobs and sliders. This is where the work was done, in the analogue domain. Here, the engineers moved physical controls to do their editing. Once completed, that newly edited piece was converted from analogue to digital and saved.

Now, you're thinking, what is the point if it ends up as a digital file anyway? Well, apparently it does make a big difference in the final sound, retaining an analogue feel. This is why Lurssen ended up with two sets of digital files: high-res pre-mastering and high-res post-mastered files.

As for the work itself? Well, apparently the tapes were in good condition and there were no real problems. Nothing to actually 'fix'. Cohen did mention that the tapes needed an infusion of energy, though. This is one of the problems of old master tape, the slow dissipation of that energy, "We initially had the benefit of hearing other formats from previous masters," this formed

a working reference. "We then used many processes but each of those processes would do only a little bit of work," said Cohen. "You wouldn't hear any one process doing a lot of heavy lifting. A little here and there will sound natural and effortless. All of those processes are inter-related to give a global process." That is, if you over apply any one element of processing, the listener will hear it. If you ask a group of processes to do various jobs in subtle ways then the final music retains its organic and natural hue. As Lurssen said, "Our job was to make it sound as if we were never there."

So, has the team done just that? I used my reference valve-based hi-fi chain to find out.

### SOUND TESTS

I began the test with an original 1987 pressing of 'Cloud Nine' and the title track. The new master is a low volume cut. I had to increase my pre-amp's gain by two clicks to reach the level of the original LP. Once done I was impressed by the extra amount of air and space around the broad soundstage. Particularly the reverb both hanging off the Harrison guitar and his lead vocal.

Going back in time, I then turned to 1974's 'Dark Horse' (this time a Music For Pleasure - MFP - re-press) and the track 'Hari's On Tour-Express'. The new cut was far more relaxed and open in nature. The MFP issue was overly compressed and bright within the upper mids, giving the treble a pinched presentation.

Reaching further back in time and an original 1970 cut of 'All Things Must Pass' and the classic hit single from it, 'My Sweet Lord'. I was pleased to hear the new master take a lot more notice of the bass frequencies. The original master – most surprisingly – tended to relegate them. Hence, there was more weight to initial strummed guitars and the mid-song entrance of drums was more of an event. Overall, the sense of tonal accuracy was enhanced.



**Will this George Harrison box set add to Lurssen's haul of Grammy awards?**

My A-B comparison shows that there really is no comparison. The new Lurssen remasters actually surpass the sonic quality of the original cuts. Greater clarity, more detail, delicately added precision, fragile yet delicious midrange insight and much needed improvement in tonal balance make this new box set a magnificent achievement.



**The lenticular cover on the box set features a front cover fade to view the two faces of George.**



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# State of ART

Martin Pipe engages with the USB Phono Plus, a clever and versatile budget phono stage.

**T**he ART USB Phono Plus is, as its name suggests, a phono stage with 'extras'. In vinyl playback terms, the unit is basic, only accepting moving-magnet (or high-output moving-coil) cartridges. However, you do get a very good switchable 'low-cut' filter to deal with warps and rumble. Phono stages with a built-in 'fixed' warp filter compromise bass impact. Since few turntables rumble and not all records are warped or contaminated with objectionable subsonic pressing-noise it's useful to have the option of a filter-free broad response.

Another switch selects Line input. Now, why would you want to do that? It's because the USB Phono Plus can also be pressed into service as a headphone amplifier – the front panel also harbours a tiny volume control and 3.5mm headphone jack. The output is available on the rear panel too, meaning that the unit can also be used to drive power amps, etc., directly. The headphone amp alone is fantastically useful. Great

for 'previewing' records – and we shouldn't forget that headphone sockets are rare on line-level source gear like CD players, streamers and tuners these days.

But it's when you turn to the rear panel that the full potential of the USB Phono Plus is revealed. Most obvious is a USB 'Type B' socket, which sets it apart from other budget phono stages. Yes, this baby can indeed be connected to your computer – which also powers the unit (a 9-volt AC/DC jack is provided for 'non-computer' applications, but no 'wall-wart' is included). The USB 1.1 port is internally-interfaced to an on-board analogue-to-digital converter (ADC), enabling a PC to 'digitise' your vinyl (or a line source). No drivers are required for Mac or PC, and ART even gives you a CD-ROM copy of the excellent Audacity recording/editing software.

Capture is alas only 16-bit, at a sample rate of 44.1kHz or 48kHz depending on software setting. This should suffice for 'needle-drop'

transfers of valuable records a DJ might want to take 'on the road', making CDs or getting your vinyl onto a portable player in FLAC form. A 'gain trim' control allows you to optimise 'recording level' for your source – whether it's a quiet fine-grooved compilation LP with half an hour of music squashed onto each side, or a heavily-modulated 12in. dance music single. It also accommodates different cartridge outputs. A LED winks green to indicate some kind of signal – it goes 'red' if levels are too high and unpleasant 'digital clipping' occurs.


Thanks to ART's sensible design, you'll make the most of the dynamic range that 16-bit can offer. Turntables with phono stages and USB converters don't have this useful facility, their gain being pre-set to a frequently-unsatisfactory compromise. Note that the digital audio interface of the USB Phono Plus works 'both ways'. It will also let you play back what has just been recorded – in other words, it's a 16-bit USB digital-to-analogue



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**The rear panel of the USB Phono Plus is suggestive of far more flexibility than one has any right to expect for under £100! 16-bit digital (coaxial and optical) sources can be captured, as well as analogue (phono and line) ones. The optical output can drive an external DAC or recorder; in this condition the unit behaves as a USB audio interface. The line output is only available for analogue sources, although the volume control (and, if desired, low-cut filter) are active. Computer audio can however be fed into an audio system via the headphone output!**

converter (DAC) as well as an ADC. Only here, you get the benefits of a headphone amp too!

It logically follows, then, that the unit can be harnessed as a replacement for your computer's on-board audio hardware. As the USB Phono Plus is 'bus-powered', it would be an ideal companion for laptops. To help you avoid draining its battery when mains power is available, though, plugging in a compatible wall-wart automatically over-rides USB power. A slide switch flips between preamp and USB DAC; in a third position, both are simultaneously-audible. This latter mode is fine for general use.

Not enough for you? There are coaxial and optical digital inputs (both S/PDIF coaxial and optical) and outputs. Making digital recordings from sources like DAB tuners and Minidisc decks is thus allowed. And the USB Phono Plus will also enable you to listen to computer audio with an existing audiophile DAC or home cinema receiver – note, however, that you can't use the unit as a 'standalone' DAC from such sources. Furthermore, the line output is restricted to your analogue source; the computer DAC output cannot be routed to it. Still, you can always drive your amp from the headphone output if there's a need.

On the whole, though, worthwhile stuff! And it's well-made, too. Connectors are robust, and ART give you a decent ground

post for your turntable. Inside, the unit – the electronics of which are spread over two boards – is well-populated. It's pleasing to note that decent components (like polyester capacitors) have been specified for the phono stage. Digital conversion involves a single Burr-Brown/TI PCM2902B chip, which contains the ADC, DAC and S/PDIF interfaces, and much use has been made of ST TS971 low-noise op-amps.

"I found the phono stage to be exceptionally clean, thanks presumably to those low-noise op-amps"

### SOUND QUALITY

I used the USB Phono Plus with two 'systems' – a line input-fed Arcam A49 amp driving Quadral Aurum Wotan VIII speakers, and a Dell laptop running Windows 10 (a Medion Windows 7 laptop proved compatible too). My turntable was a 'stock' Technics SL-1200 Mk2, fitted with an Audio-Technica AT440MLb cartridge. Oppo PM3 and (via an adaptor) Focal Utopia headphones were tried too.

As a phono stage, this unit punches way above its weight in terms of information retrieval, freedom from congestion and audible impact, as evidenced with

a range of records ranging from a 33rpm 12in. Prelude single of Unlimited Touch's funky 'Searching to Find The One' to a Victrola LP featuring Hans Wurman's The Moog Strikes Bach.

The former gave satisfying depth and bass tightness. I also noted excellent differentiation between the three types of guitar (rhythm, acoustic and a searing lead) that occupy various parts of the soundstage across the track's running time. The Moog album also fared well, the complex multitrack arrangements of lush oscillator tones and noise bursts built by Wurman around well-known classical works benefitting from the ART unit's open character. The sharp synthetic 'attacks' are also deftly-handled.

I found the phono stage to be exceptionally clean, thanks presumably to those low-noise op-amps, and even with the gain control turned up there's little hiss. Good news for those with quieter MC cartridges! Record surface noise is likely to be far more intrusive than anything generated by the USB Phono Plus circuitry. This was proved with the pristine grooves of a virgin German LP – Musikalische Erinnerungen ('Musical Memories'), published by the Hannover bookshop Leuenhagen & Paris.

This undated album is a collection of light-classical music

popular during the late 19th and early 20th century, performed in authentic fashion by the ten-member Hannover 'Nostalgie Ensemble'. The record's tonal balance and stereo spread were not compromised by the USB Phono Plus, individual stringed and woodwind instruments being definable.

The switchable low-frequency filter, which has a 3dB 'cut' at 22Hz, worked very well – its effects on music with deep bass content, including some of the above records, were virtually inaudible. So you can confidently leave it 'in circuit', to minimise the risk of woofer-cones flapping uncontrollably! Another area

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of performance is also much more transparent than I was expecting; digital conversion may only be 16-bit, but it's very effective – not least because you're given control over recording levels.

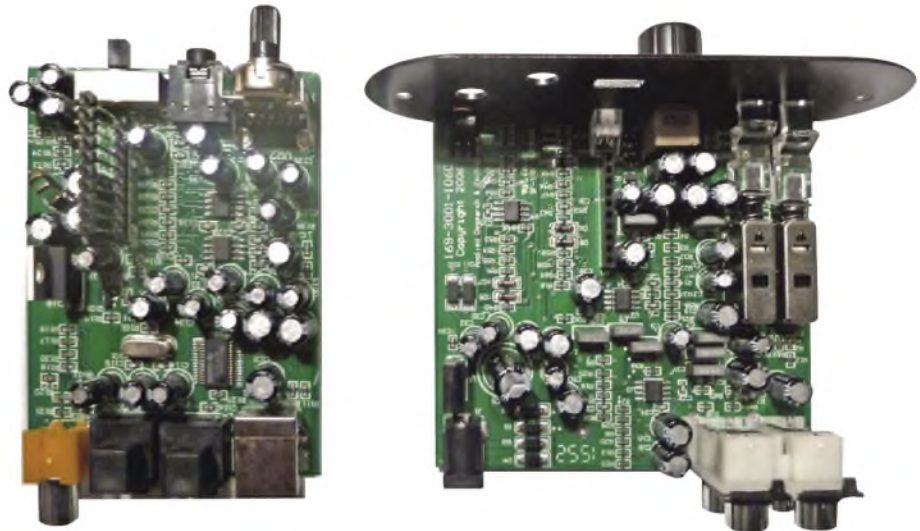
I was surprised at how little deterioration there was relative to 'direct' disc playback – the 'monitor/source' switch allows direct comparisons! I could hear traces of 'grittiness' added to higher-frequency percussive instruments like cymbals and hi-hats, and - on rare occasions - a little brightness and congestion are perceptible. With exceptional recordings some previously-audible detail remains buried on the mix, but the tonal character and rhythmic flow remain unimpeded on those 16-bit recordings.

Many years ago, I used the 16-bit DAT format as it was the best you could achieve without spending a fortune on a top-flight analogue recorder. In my view, the ADC of the USB Phono Plus is far superior to what was fitted to those DAT decks – but, then again, they're two decades apart in technology terms. To be honest, you'd probably need a better turntable and cartridge than what I was using to pick definite holes in the performance, and would you really be partnering a USB Phono Plus with such gear? Yes, conversion is that good.

Finally, the headphone amplifier. It's basic, but good enough to convey enough of the music to make listening enjoyable. I found it perhaps a little coarse and lacking in weight, compared to headphone amps that sell for four times the price. Even so it comprehensively trounces a laptop's headphone output in sonic terms; there's more musicality, and less listening fatigue. And that's quite important if you've a stack of vinyl awaiting the 16-bit treatment...

## CONCLUSION

It's difficult to fault the ART USB Phono Plus, especially when its bargain-basement pricing is factored in. If you're looking to 'transform' old tapes and records into FLAC files destined for a personal player or home NAS, and are prepared to overlook the technical limitations of 16-bit audio, then it's thoroughly recommended. Laptop users wanting an 'upgrade' for their onboard audio systems should look no further! I look forward to a 24-bit version – ideally with a line output that can also deliver computer audio.



**The two boards that make up the ART USB Phono Plus. Stacked within the case, they are interconnected by a pin header. On the left is the primarily 'digital' board which contains the USB interface and ADC/DAC. The right-hand board looks after the analogue side of the unit – most obviously the phono stage.**

## MEASURED PERFORMANCE

RIAA equalisation for LP was accurate and as a result frequency response flat from 10Hz to 20kHz (-1dB), as our analysis shows. The 'Low Cut' filter – a warp filter in other terms – is very well engineered, introducing a sharp roll off below 30Hz. It strongly eliminates the warp signals from LP (-30dB at 5Hz) that cause loudspeaker cone flap, without weakening audible bass – unlike so many of these filters.

With the front panel gain control set at its central 0dB position overload (digital peak level of 0dB) occurred at 25mV in, which is correct for MM

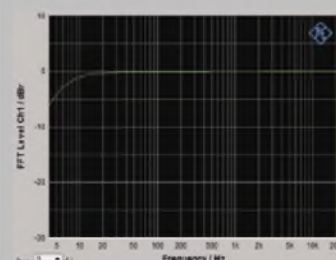
cartridges, since few provide more output on music peaks. Turning gain to maximum (+10dB) overload occurred at 7mV in, correct for MC cartridges. The gain control is able to set maximum record level to accommodate any cartridge, a front panel LED changing from green to red at exactly 0dB measurement showed.

The analogue-to-digital convertor is 16bit, not hi-res 24bit, so its noise floor is inevitably higher as a result, noise measuring -62dB. This is good, if not up to the 72dB or so possible from LP. This noise level was measured from both the Line output and from replay of a digital recording (5mV) via the headphone output of a MacBook Pro and an Audiolab M-DAC+, so is analogue noise. The ADC was linear and in itself low in distortion (0.03% at 0dB).

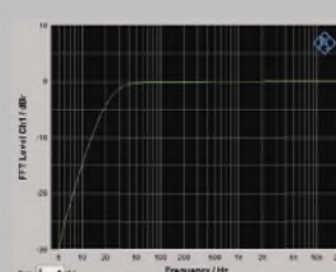
Gain from the Line input to output measured x2.5 so the unit can be used as a general purpose preamplifier too. Switched to Phono gain was x154.

The ART USB Phono Plus phono stage gave a well judged performance, free of limitations. It also works well as a line preamp. It isn't 'hi-res' but has a lot of ability and will provide good CD-standard results. **NK**

### FREQUENCY RESPONSE



### WARP FILTER RESPONSE



Frequency response	10Hz-21kHz
Separation	63dB
Noise	-62dB
Distortion	0.03%
Overload (set to 0dB)	25mV

## ART USB PHONO PLUS £95



**OUTSTANDING - amongst the best.**

**VALUE - keenly priced.**

### VERDICT

A fine entry-level phono stage with USB output for recording to a computer. A steal at the price!

### FOR

- incredibly versatile
- very capable phono stage and ADC
- bus-powered for portable use

### AGAINST

- headphone output can lack finesse
- DAC cannot be routed to line output
- can't use as a DAC with optical/coaxial inputs

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**NEAT MOTIVE I** speakers Cherrywood veneer excellent sound £600. Tel: Evan 07957 384 795



# Cleaning up



## Noel Keywood uses Isotek's EVO 3 Corvus filtered mains distribution block.

**T**he Isotek Evo 3 Corvus is a multi-way power distribution block fitted with internal filters to reduce noise from the mains, degrading sound quality. It has nine mains output sockets and can pass a maximum of 16A, although when plugged into a UK mains socket the limit will be 13A as set by the UK's fused mains plug. That's still enough for any hi-fi and, for most systems, enough outlets too. The only niggle is that of wall-warts – always a difficulty. Those that extend above their mains plug cannot be accommodated if the opposite socket is used, except by one central socket. But at least it can accept one such wart, unlike many distribution blocks.

The case is strongly built, measuring 363mm long, 147mm wide not including small attachment lugs, and 46.5mm high overall. It has a brushed aluminium cover, steel base tray with lugs that allow screw fixing, and a three-pin socket providing power input. The unit comes with a stoutly built Isotek Evo3 Premiere mains attachment cable 148cms (4.5ft approx) long.

Isotek use both common mode and differential mode filtering inside – to combat the two common forms of noise encountered. Common mode

comes in on the cables from a noisy source, by the way, whilst Differential mode typically comes in over the air as transmitted interference, this stuff happening outside your home to dirty the incoming supply. A small blue LED shows when the unit is live.

Although all mains powered electronic equipment turns the mains to d.c. internally, killing such noise in the process it would seem, subtler forces are at work, dirty leakage currents from the mains transformer (cheap variety with no internal screen and high leakage inductance) being one problem and RF noise re-radiation into sensitive internal circuits being another. We've all heard those small "cracks" that can occur when a fridge or similar switches on, showing that mains noise gets through; a mains filter like this eliminates such noise, whilst also lowering continuous background mush.

### SOUND QUALITY

I used the Corvus between our mains and a system comprising McIntosh MC152 power amplifier feeding Martin Logan ESL-X loudspeakers, that have mains power units I'll note. Sources were digital from an Oppo BDP-205D universal CD player/DAC, and analogue from LP spun by a

Timestep Evo Technics SL-1210 Mk2 turntable with SME309 arm, Ortofon Cadenza Bronze MC cartridge and Icon Audio PS3 valve phono stage, this lot occupying six sockets in all.

The sonic impact of this unit was quite obvious, giving a quieter background and a smooth, more liquid flow to music through reduction of apparent hash. It didn't quite knit the electrostatics together, XStat panel to bass bin, as well as Isotek's Evo 3 Mosaic Genesis regenerator that we rely upon – a peculiar effect that took us all by surprise – but it did in similar fashion make the whole system obviously more *couth* and *civil*, offering a marked improvement from both digital and analogue sources. This gave a sound that was more dimensional, relaxing and convincing. At the price the Corvus isn't cheap, but it works very well, providing an obvious step up in sophistication.

### CONCLUSION

Both the Corvus and Evo 3 Premiere mains lead feel and look like the quality components they are. With nine sockets and 16A capacity this is a large distribution unit able to cope with most hi-fi systems, no matter how ambitious. It offers a marked improvement in sound quality and is recommended.

### ISOTEK EVO 3 CORVUS £500



**OUTSTANDING** - amongst the best

#### VERDICT

Expensive but well built and effective in improving the sound by giving a quieter background and smoother flow.

#### FOR

- copes with large systems
- well made
- improves sound

#### AGAINST

- bulky
- one large wall wart only

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# NEXT MONTH

## FEBRUARY 2018 ISSUE



### ASTINTREW AT2 2100 INTEGRATED AMPLIFIER

ASTINTREW recently introduced the AT2 2100 amplifier – a complete revamp of their popular 2100 series model, known for producing a clear, concise yet amenable sound.

Don't miss our early review of this new update – backed by advanced measurement – in the superb February 2018 issue. We tell you where good sound is going.

Also, we hope to bring you –

KEF LS50 wireless 'speakers

Titan Audio Styx mains cable

Chord Electronics Toby power amp

T+A G200R turntable

QED XT25 'speaker cables

iFi iPhono phono stage

B&W 686 S2 'speakers

FiiO Q1 Mk2 2nd Gen headphone & DAC amp

Auralic Altair streaming DAC

...and much more.

This is a selection of what we hope to bring you, not a complete list. We regret that due to a wide range of issues, we cannot guarantee that all products listed above will appear.

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# DEEP PURPLE

## A FIRE IN THE SKY

RHINO



"the band have produced a wealth of memorable music and some of the most iconic guitar riffs known to man"

I'm taking an opportunity, in this column, to look at a body of work that spans almost fifty years, rather than a single album and I feel that I can do that with this group. One of the true pioneers and innovators of the entire rock genre and a band that set the standard. Yes, you can pick any number of LPs from the band's large catalogue but I wanted to give a respectable nod to Deep Purple's career as a whole.

It is also one that, before too long, will end, as group bassist, Roger Glover acknowledged, "...the writing is on the wall. Sooner or later this will end. We just don't know when but we're putting ourselves and everyone else on notice that, you know, it is around the corner, we just don't know when."

To many oldie rock and pop stars out there (stand up The Stones, Elton John, Paul McCartney and a host of others), it's not about the money. Not any more at any rate. It's the drug called music: creating it, playing it, performing it...this is what Deep Purple does and the band's career confirms that.

"Well, it's music. If you're a musician, you're always a musician, I think and we're lucky enough to have made a career of it. I can't stop writing songs. It's just something I naturally do. Every day I write down something. Even a line, a word, a title, a riff, a chord sequence, whatever it may be. I got thousands of them and every now and again I go back to one or two and go, 'Actually, it's not that bad.' Which makes me think. There's a famous quote, 'The older I get, the better I was.'"

Despite the interminable line-up changes, the creative shifts from prog rock to heavy metal and hard rock, the band have produced a wealth of memorable music and some of the most iconic guitar riffs known to man. That riff from the song, 'Smoke on the Water' is now part of the fabric of society: it's the first noise any budding guitar player makes.

You can wallow in these songs via a new compilation set available in three different skews. Called 'A Fire In The Sky', a single CD-disc version features twenty songs and focuses mainly on the band's singles. The three-disc version dives even deeper into Purple's past

with 40 songs and includes at least one track from every studio album through 2013's 'Now What?!'. This expanded version also features Kevin Shirley's 2010 remix of 'Dealer' and the 2012 stereo mix for an early version of 'The Bird Has Flown'. You can also grab a three-LP vinyl set that includes twenty-seven tracks. Among the highlights are the single edit version of 'Woman From Tokyo', the US single edit for 'Burn' and the radio edit of 'Bad Attitude'.

I decided to look closer at the vinyl version in terms of mastering and pressing. Diving – as it were – straight to 'Smoke on the Water', I was happy to hear that Rhino has veered away from any suggestion of loudness on this set. The volume is actually relatively low which demands that you lift the gain on your hi-fi to access further insight around the mids. The real highlight here is not the riff, surprisingly, but the bass guitar which has a surprising clarity, adding an almost industrial, metallic chug during the famous riffing sequence.

Moving further back in time to 'Hush' I have to emphasise that the volume really does need to be increased for the music to 'make sense'. There's a gamut of pulsating vibes, especially from this early track that needs low frequency boost to add life and dynamism. Once done, the music comes into its own with the organ of Jon Lord taking that starring role here. It's layered and almost chaotic textures are a feast for the ear, crackling and pulsating throughout.

For 'A Strange Kind of Woman', the most noticeable aspect of the track is the original compression that illuminates both the lead vocal but also the percussion, adding a brassy element to both. The mastering and pressing on this edition tames both, though, allowing the music to stand 'as is', in its historical form, compressed but certainly listenable.

This set from Rhino is a valuable testament to a great band who continue to fascinate and entertain. For how much longer is a question they have opened. In the meantime you can once again purchase Deep Purple and wallow in classic 1970s seminal Rock. **PR**



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