

# HI-FI WORLD

JULY 2015

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## CAMBRIDGE AUDIO AZUR 851N

network player



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# welcome

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Paul Rigby, Rafael Todes, Jon Myles,  
Martin Pipe



It has been a long time since we published circuit diagrams in Hi-Fi World. But you'll find pages of them this month, starting at page 88. As editor I always quake a little at what non-technical readers will think when we publish circuits, because if you're not into DIY and don't enjoy the smell of solder flux, this is all gobbledegoek. But on the other hand I know a lot of readers love a good, hard look at what's going on, as well as something to build – and I feel David Lord's feature has merit past the effectiveness of his circuits. He writes in an easy, accessible style – rare in this field – and both parts of his

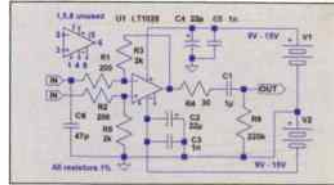
feature article have contained in-depth info on the best way to get a great sound from LP. He even makes the point that unless you're running in balanced mode, you are not getting the best from your record deck, going on to illustrate the issues in fine detail. I loved reading it all – I hope you do. And solder flux smells sort-of nice in any case!

Good grief – Cowon's Plenue PI has an ARM based Cortex A9 computer on-board, running on Linux. And it played 384kHz sample rate digital – I half expected smoke to come out of the headphone socket. Having just received a press release in our editorial in-box for a new Astell&Kern player, an AK380 with dual-32bit DACs (actually, most DACs have 32bit minimum internal resolution) and a price of £3000 – yes, really – there seems to be some sort of portable techno war going on in Korea, both companies being Korean. You can read about the amazing Cowon on page 15. It eats digital for lunch.

Whilst reviewing Tannoy's new XT 8F loudspeakers I heard that they had been sold by their previous investment company owners, who probably turned a nice profit since Tannoy are an attractive purchase, and have been bought by an acquisitional offshoot of German pro audio manufacturer, Behringer. What Behringer get is a large factory in Coatbridge, Glasgow and an almost unique name with a long and illustrious history. I hope they will continue with Tannoy's wonderful Prestige Series that must surely be just about unique. I see this product in the same vein as Bentley or Harley Davidson; both were once seen as anachronistic and beyond hope in a modern world, and both are now thriving in a way few thought possible. Happily, Tannoy never gave up on the Dual-Concentric and you can read about their lovely new XT 8F – a loudspeaker with cojones – on page 58.

Yes – it's a busy hi-fi world out there. I hope you like the bit of it we bring you in here, our latest issue.

**Noel Keywood, Editor**



## 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.



## hi-fi world

Audio Web Publishing  
Studio 204,  
Buspace Studio,  
Conlan Street,  
London W10 5AP  
[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk)

## verdicts

●●●●●	<b>OUTSTANDING</b>
●●●●	<b>EXCELLENT</b>
●●●	<b>GOOD</b>
●●	<b>MEDIOCRE</b>
●	<b>POOR</b>
£	<b>VALUE</b>

amongst the best  
extremely capable  
worth auditioning  
unremarkable  
flawed  
keenly priced

## ELECTRONIC MAGAZINE

Go to our website [www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) to buy an electronic version of this magazine, individual issues, back issues or a subscription.

Distributed by Seymour Distribution Ltd 86 Newman Street London, W1T 3EX Tel: +44 (0) 20 7396 8000 Printed by Artisan Press Limited Tel: +44 (0) 116 235 5221  
Our Agents in Malaysia Millennium Hi-Fi & AV Simon Chang Showroom & office, 500-1-3 First Floor Wisma Indah (Shen Court), Jalan Tun Razak 50400 Kuala Lumpur, Malaysia  
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# Audio Cable Award Grand Slam

**Products of the Year 2014:**

Black Diamond Speaker Cable

Black Diamond USB

Blue USB

Black Power Cable

Black Diamond RCA

Black Diamond XLR



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

HiFi World, Awards Edition Jan 2015

**HI-FI WORLD**  
VERDICT ●●●●●

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



email:news@hi-fiworld.co.uk

# news

## MCINTOSH CLASSIC DUO

McIntosh has reintroduced two classic amplifiers updated to modern standards

The sixties' vintage C22 preamp maintains the retro McIntosh design but has been modernised and features ten inputs, including two balanced and six unbalanced plus moving coil and moving magnet phono inputs, the latter offering selectable resistance and capacitive loading to enable a wide range of cartridge and turntable combinations.



The C22's outputs comprise one set of balanced and three sets of unbalanced connections, while further features include (bypassable) bass and treble controls, plus a power control, enabling a complete McIntosh system to power up/down using the front panel or remote.

Originally launched in 1970, the reintroduced KT88-powered, 75W MC75 mono vacuum tube power amplifier includes the patented Unity Coupled Circuit design. Balanced and unbalanced inputs combined with power control and a featured Sentry Monitor or tube protection circuit.

The C22 is priced at \$6,000 and the MC75 is \$3,750. Both are available in non-EU regions, at the moment.

Call 01202 911886 or click on [www.mcintoshlabs.com](http://www.mcintoshlabs.com) for more information

## ICON AUDIO – NEW CD PLAYER

The new CDX2 features 192kHz 24bit upsampling technology and combines that with an all-triode valve Class A output stage using T J Full Music or original Mullard valves. Weighing in at 9kg, the digital and analogue circuitry is hand-wired.

Externally, the CDX2 features a top-loading Sanyo mechanism which is CD-R compatible. A heavy alloy clamp also acts as a flywheel to increase rotational stability during playback. In keeping with Icon's 'built to last' philosophy, everything in the CDX2 is serviceable and replaceable and, as with all Icon products, the company keeps an extensive bank of spare parts, ensuring a reliable product with a long life.

As each CD player is finished in the UK, Icon can offer a range of 'David Shaw Signature' upgrades including Jensen copper foil oil-in-paper capacitors and 'new old stock' valves. Prices are on application.

Other features include coaxial digital output and gold-plated RCA sockets. The price for the standard version is £995.

For more information, call 0116 244 0593 or click on [www.iconaudio.com](http://www.iconaudio.com).



## KEF HEADPHONES

Available in a choice of four colour finishes, KEF's new M400 headphones are made from a compact, cast aluminium frame and use a race-track supra aural ear shell, which follows the contour of the human ear for improved noise-isolation.

The M400s use KEF's full-range 40mm dynamic neodymium driver, including a copper-clad aluminium wire voice coil. You also get breathable ear-pads and high-density memory foam covered in a protein leather. Available in racing blue, sunset orange, deep black and champagne white. Price is £195.95.

The M100's race-track casing is made from solid aluminium. Each earpiece in the M100s contains a full-range, high-10mm neodymium driver. They feature ultra-thin silicon ear-tips (three sizes). Available in racing blue, sunset orange, champagne gold and titanium grey. Price is £119.95.

For more details, click on [www.kef.com](http://www.kef.com)





## THE COLOURS OF SONUS

The Sonus Faber Chameleon replaces the Toy series at the most affordable end of Sonus faber's range and comprises three models (a compact 'bookshelf' speaker, a floorstander and a centre channel speaker for home cinema systems), each using polypropylene bass/midrange cones and a fabric dome tweeter handmade in Italy and wrapped in leather with interchangeable side panels in a range of colours. Those colours are black, white, metal blue, metal grey, orange and red. More colours will be released in the coming month. Prices start at £430.

For more information, click on [www.absolutesounds.com](http://www.absolutesounds.com) or call 020 8971 3909

## HENRY DAC PRICE CHANGE

Henry Audio's USB DAC 128 mkII features RCA outputs and supports asynchronous USB Audio with sample rates up to 192kHz. It works on Mac, Windows and Linux and has just come down in price to a healthy £159, down from £210.

For more information, click on [www.henryaudio.co.uk](http://www.henryaudio.co.uk)



## BLACK RHODIUM STYLUS PAIR

Black Rhodium has announced the launch of two tone arm interconnect cables. The STYLUS and STYLUS VS-2 employ separate coaxial screened cables for each channel to protect the sensitive low level signals from the turntable's cartridge from picking up high frequency noise and interference present all around. Further protection against noise and distortion is provided by placing both channel cables in an outer jacket, preventing the return conductors of both channels from acting as a 'loop aerials' for RFI.

Both use two silver-plated copper cores, insulated in low loss PTFE dielectric and terminated with Rhodium Plated plugs. The Black Rhodium-plated DIN connectors have been designed for use in Black Rhodium tone arm cables. The RCA end is terminated with Graham Nalty Legacy Range GN-3 RCA connectors.

The STYLUS VS-2 is fitted with two Graham Nalty Legacy Range VS-2 Vibration Stabilisers while the connectors used in STYLUS VS-2 are treated with DCT++ Deep Cryogenic Treatment. This involves temperature processing above and below room temperature. The DCT++ process alters the molecular structure of the cable to improve uniformity. In addition to DCT++ the connectors used in STYLUS VS-2 are also treated with the Crystal Sound Process. The Crystal Sound process, which is applied to the cable following

the completed DCT++ process, refocuses the outermost skin of the conductor. The result is that the surface of the conductor is more closely packed and regular.

Price for the Stylus DIN tone arm cable at 1.3m is £350 while the Stylus VS-2 DIN tone arm cable at 1.3m is £500.

For more information, call 01332 342233 or click on [www.blackrhodium.co.uk](http://www.blackrhodium.co.uk)



## MITCHELL AND JOHNSON AMP

The new British based hi-fi manufacturer is launching its integrated amplifier with built in 24bit/192kHz DAC and a matching CD player. Designed in Europe, the SAP-201V is an updated version of the slim-line integrated amplifier previously sold under the Sansui brand name, without increasing the price. The 40W amplifier features seven inputs including: four line level analogue inputs, a 3.5mm front panel socket, a dedicated phono input and a coaxial or optical digital input for use with the built-in DAC (24bit/192kHz Wolfson).

The SAP-201V includes a headphone socket on the front panel and line level output via RCA connections on the rear for recording purposes. Supplied in brushed silver or black finishes, with restyled metal volume controls and flush mounted control buttons, the SAP-201V matches the CDD-201 CD player, which is compatible with all common CD formats including CD/CD-/R/RW and MP3. The CD player can be connected to the amplifier via its analogue or digital outputs.

The DAC and phono stage equipped integrated amplifier is priced at £299 and the CDD-201 CD player is £249.

Click on [www.mitchellandjohnson.com](http://www.mitchellandjohnson.com) or call 0845 643 5064 for more information.





## ONKYO: IRON MAIDEN & AVR

Onkyo & Pioneer Innovations announce the exclusive release, via their high-res audio download service, of nineteen heavy metal classic LPs from the Iron Maiden catalogue, using 24bit high resolution masters. Click on [www.onkyomusic.com](http://www.onkyomusic.com) for more information.

Onkyo has also announced the release of the 5.1-channel TX-SR343 and 7.2-channel TX-NR545 A/V receivers. The TX-NR545's discrete 120W comes with Dolby Atmos support along with Wi-Fi, AirPlay and Bluetooth technology.



The TX-SR343 is the company's base model A/V receiver. The rear panel has been completely revamped with input and output terminals clearly labelled and illustrated for easy setup. Because the receiver up-converts analog video, all media players (including VCRs and legacy gaming consoles) can plug directly into the receiver.

Price for the TX-SR343, available in black or silver, is £249. The TX-NR545, also available in black or silver, is £449.

Call 08712 001996 or click on [www.onkyo.co.uk](http://www.onkyo.co.uk) for more information.



## MBACO 'STATUS'

The Modern British Audio Company has announced the Status integrated amplifier, a dual mono design manufactured in the UK, from largely British sourced components. The Status comprises two separate 170W

monoblock amplifiers within the casework.

Digital and analogue power supplies are utilised for the pre-amp section, with a switch mode design offering very low standby dissipation that is then regulated using linear regulators.

The integrated Bluetooth 4.0 receiver and DAC allows streaming of music from iOS, Android and Windows devices using A2DP and AVRCP 1.4 protocols.

Physical connection to the Status is via three sets of phono inputs, a 3.5mm front-mounted socket and the balanced XLR inputs. Left, right and subwoofer pre-amp outputs are provided and the speaker terminals are fitted with WBT posts. The Status also features a dedicated Class A headphone amplifier.

Control is via the IR remote and provision has been made for integration into control and distribution systems via the RS232 port. Price is £6,295.

For more information click on [www.mbaco.uk](http://www.mbaco.uk) or [enquiries@mbaco.uk](mailto:enquiries@mbaco.uk).

## KII THREE

Spanning 200x400x400mm and weighing in at 15kg, this pair of active speakers features four 165mm woofers, a 127mm midrange and a 25mm wave-guided tweeter and each is driven by a custom made 250W nCore amplifier.

Utilising Active Wave

Focusing technology to control

dispersion and direct the sound pressure, it also includes Intelligent DSP processing for a cardioid dispersion pattern down to the low-mid and bass frequencies. Price should be around £7,000.

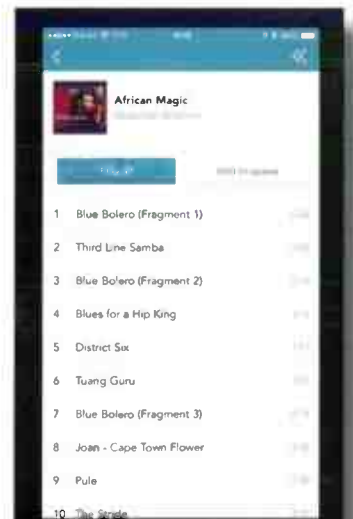
For more information, click on [kiiaudio.com](http://kiiaudio.com).



## FOZGOMETER

The Fozgometer is a small portable battery-powered unit that is used in conjunction with a test record. It measures channel separation over a wide range of signal levels, channel balance and signal direction. Readings are taken without needing to touch the unit, leaving your hands free to work with the tonearm. Price is £350.

Call 0118 981 4238 or click on [www.soundfoundations.co.uk](http://www.soundfoundations.co.uk) for more information



## ARCAM MUSICLIFE APP

Developed in-house at Arcam by their new app software team, MusicLife supports playing media from network/UPnP servers out to any Bluetooth device, enabling streaming on almost anything, if paired with an Arcam miniBlink or rBlink Bluetooth DAC.

You can control the Media Player in Arcam network-based music systems, including features such as playback of content stored on iPad, iPhone or iPod Touch, library searching, sorting and shuffle and repeat playback. For more, including equipped devices, go to [www.arcam.co.uk](http://www.arcam.co.uk).

# Sure Azur



**Cambridge Audio's flagship 851N network player promises audiophile sound quality at a realistic price. Jon Myles says it more than meets its goals.**

**C**ambridge Audio has made its reputation by producing great sounding, well-engineered products that offer superb value for money.

On a sound for your pound basis its entry-level range of electronics is hard to beat and has become a best-seller for exclusive UK distributor Richer Sounds.

But the engineering team behind the brand has never been afraid to push the envelope – as evidenced by the development of Class XD operation for its 851A amplifier or the use of BMR (Balance Mode Radiators) in its Aero loudspeakers.

So when Cambridge unveils a new flagship network player you tend to sit up and take notice – especially when you take a look at the specifications for its relatively modest asking price of £1200.

The 851N is a combined UPnP streamer/DAC/pre-amp with support for all current popular PCM codecs up to 24bit/192kHz, as well as DSD 64 via a computer connected to one of the USB inputs. Added to this is built-in support for Spotify Connect and Apple AirPlay, as well as internet radio. An optional BT100 dongle is also available for those looking to add Bluetooth capability.

Internally, all signals are up-sampled to 24bit/384kHz before being passed to a pair of Analog Devices AD1955 DACs operating in dual-differential mode, while Cambridge has made use of a sturdy toroidal transformer for the power supply.

Both wireless and wired streaming is supported and the 851N features no less than five USB inputs – four Type A for HDD/flashdrive connection and one asynchronous

Type B designed for hooking up to a Mac or PC. Do note that with the latter the unit has to be switched into USB 2.0 mode via its menu system to support 24/192 files – with Windows users needing to download the appropriate driver from the Cambridge Audio website.

Other connections include digital AES/EBU, two S/PDIF coaxial and two Toslink optical inputs as well as balanced XLR and unbalanced RCA analogue and AES/EBU, coaxial and Toslink optical digital outputs.

The front of the unit features a colour 4.3-inch screen for displaying album artwork plus track and menu information, flanked by the rotary volume control and small buttons for playback control and access to the three digital filter options available - Minimum Phase, Linear Phase and Steep (more of which later).

All functions can be accessed

via the front panel controls or the supplied fully-featured remote – but like most streamers nowadays the best way to operate the 851N is through the free dedicated control app (both Android and iOS versions are available) via a smartphone or tablet. Dubbed Cambridge Connect, it's a relatively slick affair which allows input selection, volume and balance control, browsing, adding and removing tracks and albums from the play queue as well as storing favourite internet radio stations.

### SET-UP AND OPERATION

Feature-packed it may be, but the 851N is admirably easy to set-up and operate. Connected wirelessly it took just a few seconds to find and list all music files stored on two MacBooks – and a NAS device also sharing the network. Plugging a USB stick into the front socket also saw its contents immediately listed under the Music Library section of the operating menu.



*Inside, the Cambridge 851N uses a beefy toroidal transformer in its power supply. And just look at all those heavyweight digital chips...*

"not only were the strings relayed with realistic pitch and timing but the bass-drum and triangles jumped out with astonishing dynamics and speed"

Switching inputs and controlling volume with the Cambridge Connect app via an iPhone 6 Plus proved smooth, with no undue time lag – and the wireless connection remained robust throughout.

Cambridge recommends using a wired connection for file sizes above 24/96 but in practice I experienced no drop-outs with streaming 24bit/192kHz material wirelessly – although much will depend on your own network and the amount of other data on it.

Spotify operation was similarly fuss-free, the Cambridge establishing a connection immediately and remaining rock-solid throughout playback.

### SOUND QUALITY

The first thing that strikes you about the 851N is just how clean and neutral it sounds. This is not one of those products that seeks to impose its own sonic signature on the music

but instead seems to let it flow with as little interference as possible.

With the Cambridge in digital pre-amp mode feeding a Sugden FBA-800 power amplifier, a 24/96 FLAC stream of Nick Cave and The Bad Seeds' 'Murder Ballads' had excellent clarity and openness. There was excellent separation between the layers of drum, bass and guitar while Cave's vocals were suitably raw and edgy.

It's a quality that pays dividends on complex material such as the Mark Lanegan Band's 'Blue Funeral' where the Cambridge managed to cut through the slightly dense mix to reveal much more of the musical information, with greater detail.

A well set-up high-resolution streaming system can better a similarly-priced CD player and the Cambridge proves the point by bringing a more organic, free-flowing feel to the sound than you'd get via silver disc.

Switching between the three digital filter options made no massive difference to the sound. The steep option did sound a little smoother on some edgy 44.1kHz pop material – but the effect was extremely subtle.

Moving onto computer-based replay, I connected a MacBook Air for the DSD recording of Michael Tilson Thomas and the San Francisco Symphony's 'Mahler No 1'. This is a visceral, dynamic performance and the 851N portrayed it with all the necessary impact. Not only were the strings relayed with realistic pitch and timing but the bass-drum and triangles jumped out with astonishing dynamics and speed. There was no missing the sheer scale of the orchestra while the switch between dark and light passages was handled with aplomb – the Cambridge seeming to handle the dynamic contrasts without batting an eyelid.

On Spotify the Cambridge was detailed enough to show the limitations of the service's reduced bit-rate – but not so much as to make music unlistenable. Instead it's a nice, solid presentation that is one step above background music but



*A button laden, do-it-all, remote control.*

Our SuperUniti all-in-one player will unleash your digital music, from high-resolution audio files to Spotify playlists. Its analogue heart is an integrated amplifier backed by over 40 years of engineering knowledge to offer countless years of musical enjoyment. Just add speakers.



Next-generation music systems,  
hand-built in Salisbury, England.

Discover more at [naimaudio.com](http://naimaudio.com)



Go Deeper



The wi-fi antenna plugs into one of the rear USB sockets while a full range of analogue and digital inputs and outputs are provided.

just a shade below being true high fidelity. But as ever with Spotify, it's the convenience that pays dividends – so if the service ever catches up with the likes of Tidal in terms of providing 16bit/44.1kHz material then the option could become seriously interesting.

If there's any criticism to be made, it's that some may find the Cambridge a little too polite. Overall there's not quite the sheer dynamism of

something like a Naim NDS streamer or the outright crystalline quality of the Chord DSX 1000 network player – but both those will set you back six times the cost of the 851N.

Instead the Cambridge goes about its business in an even-handed manner that doesn't draw too much attention to itself. If that sounds like damning with faint praise, it's not – it is describing just how assured the unit is at its price.

**CONCLUSION**

In terms of sound quality, versatility and value for money, the 851N is hard to beat. It is inherently neutral and uncoloured through whatever input you choose to use, meaning it never sounds anything less than sure-footed and sophisticated. Add in its DSD capability, pre-amp function and promise of future software upgrades and the new Cambridge could well set a benchmark at its price.

**PRODUCT DEVELOPMENT**

Increasingly, today's sophisticated network hi-fi products stand and fall by the quality and robustness of their operating systems – and Cambridge Audio says it spent more than two years developing the streaming and software sections of the 851N.

The company employs its own software engineering team, instead of buying off-the-shelf solutions, to ensure complete control over its products.

Cambridge Audio Technical Director Dominic Baker says "All of our products are software driven and as we developed this and the streaming module ourselves we have total control over it. That also means we can supply software updates quickly and efficiently without having to rely on a third party. We see the product as living and improving from the moment you supply it to the customer".

That attention to detail also extended to fine-tuning the 851N's control interface – which involved actually videoing people using the unit to iron out any glitches.

"We make between 50 and 100 products and then send them out to people to see how they are used before collating the data" says Dominic. "We video people from unboxing the products to setting it up, so we can spot any potential problems".

**MEASURED PERFORMANCE**

With 192kHz sample rate digital, frequency response of the Azur 851N measured flat to 60kHz before rolling away gently to the 96kHz upper theoretical limit, our analysis shows. The filters affect this very little with CD or hi-res, 'Steep' changing the roll off rate slightly. Subjectively, their impact will be minimal, as in earlier models. But wide analogue bandwidth means the Azur 851N exploits the benefit of high

sample rate, even through the optical S/PDIF input that processed 192kHz successfully, where many optical inputs fail.

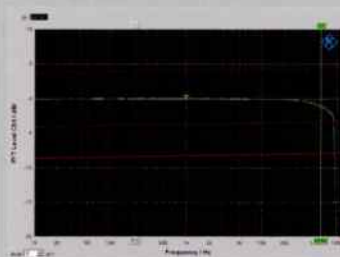
Distortion levels were low, from CD or hi-res, with distortion at -60dB measuring 0.24% from the former (16bit) and 0.03% from the latter (24bit), our analysis showing the low level of noise and absence of distortion products from 24bit.

Low noise and high output of 4.4V from the balanced XLR output, together helped the Azur return a 115dB EIAJ Dynamic Range figure from 24bit digital – if not class leading.

USB was limited to 96kHz in USB 1.0 mode and frequency response measured flat to 46kHz. Distortion and noise were both low, resulting in an EIAJ Dynamic Range value of 114dB, similar to S/PDIF.

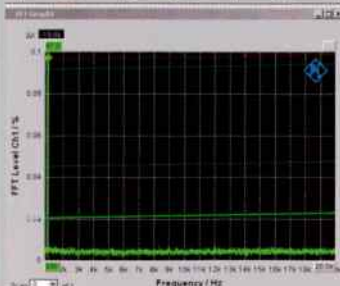
The Azur 851N streamer measured well all round, although it does not significantly improve on the preceding StreamMagic and is behind Sabre32 DAC equipped market leaders. NK

**FREQUENCY RESPONSE**



**DISTORTION**

THD @ 1kHz	Level @ 100dB	Frequency
0.0367 %	4.4066 mV	0.9970 kHz
OFF	OFF	OFF



Frequency response (-1dB)  
4Hz-60kHz

Distortion	
0dB	0.006%
-60dB	0.03%
Separation (1kHz)	94dB
Noise (IEC A)	-114dB
Dynamic range (EIAJ)	115dB
Output	2.2 / 4.4V

**CAMBRIDGE 851N**  
**£1200**



**OUTSTANDING - amongst the best.**

**VALUE - keenly priced**

**VERDICT**

One of the most natural-sounding, versatile and well-equipped streamer/DAC/pre-amps available at its price. Sets the standard for rivals.

**FOR**

- neutral, flowing sound
- DSD capability
- comprehensive inputs
- good control app

**AGAINST**

- nothing at the price

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K3 Integrated  
January 2015



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February 2015



K3 System  
April 2015

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The K3 CD Player is a high-quality source component that delivers a rich, almost analogue, sound performance that perfectly matches the Integrated Amplifier's delivery. When using these products together, you have a package that is truly unrivalled for the price.

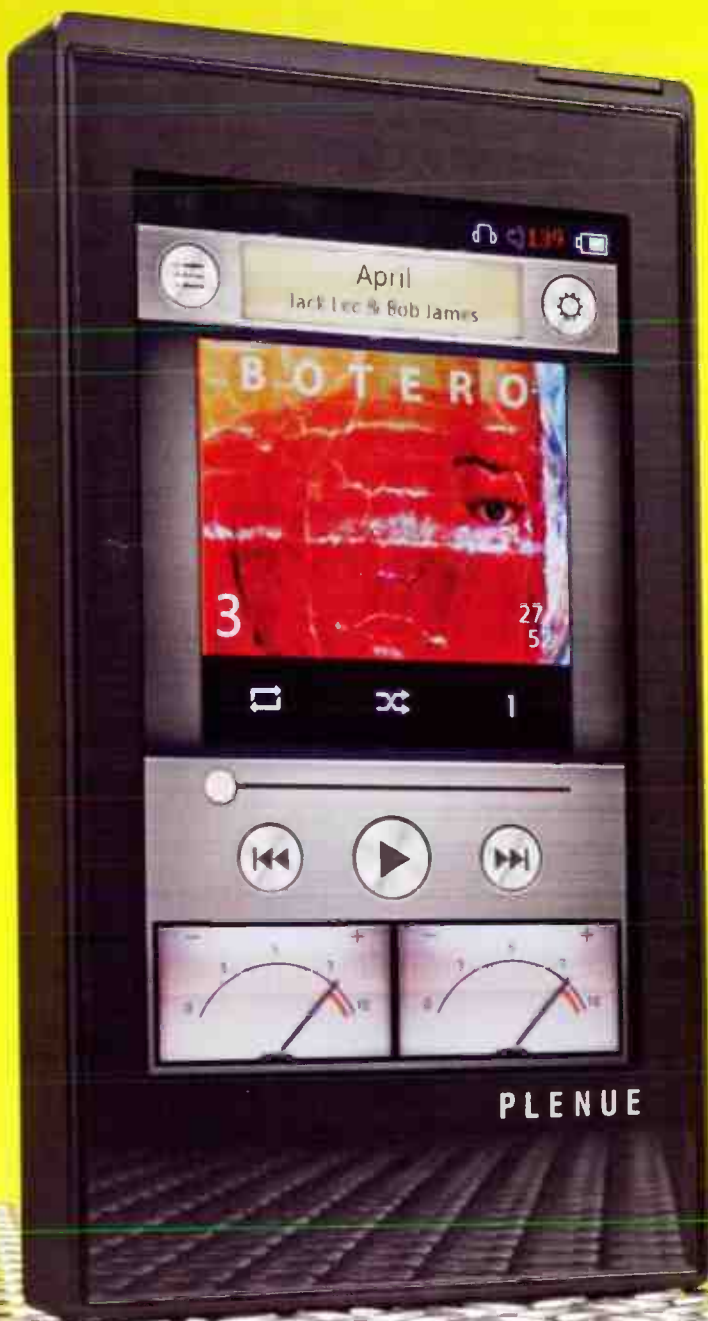


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# Smooth Operator

Cowon's new Plenue 1 aims to take on Astell&Kern in the high-end digital portable player market. Noel Keywood puts it to the test.



I found the Plenue 1 on Amazon, price £740. Right next to it was an Astell&Kern AK120. And that says a lot. This is a premium grade high-resolution digital music player from Korea, like the Astell&Kerns, pitched in at the top end of the market, right beside the AK120 I use regularly. But Cowon say their player has the best performance on the market. If so, then it has taken the crown from the Astell&Kerns that traded on being the best. I was intrigued; measurement would reveal the truth of course.

The Cowon is very well built, machined from a solid billet of aluminium, with slightly chamfered edges and no protruding bits; in other words it lacks the volume control knob of the AK120, there are flush mounting Up and Down buttons instead.

Measuring 117mm high, 65mm wide and 14mm deep it sits easily in the hand and will fit most pockets. It isn't as small as Astell&Kern's cheaper AK100, but it is similar in size to the AK120. Weighing in at 174gms on our scales the Plenue 1 feels weighty but is not heavy, staying below the 200gm



**A small plastic captive clip-on cover protects the player's ports from pocket lint. A microSD card slot and microUSB port are visible here, plus the exposed 3.5mm headphone jack. This jack also houses an optical S/PDIF digital output. There's no volume control, just Up and Down buttons, also seen here.**

dividing line here. You get a nicely finished player, that's for sure, with an AMOLED touch screen.

Cowon package the P1 lavishly, following Astell&Kern in this respect, but the folded leaflet that passes as a User Manual was all but illegible, due to small silver type on a chocolate brown background, a triumph of style over substance.

However, these players always come loaded with an on-board user manual in .pdf format, that can be read on a computer when the player is attached – and the P1 was no exception. The same manual is available on the website too.

What it told me was interesting. As you might expect, all high-resolution files are catered for, including 24/192 WAV and FLAC which are probably the most popular formats – FLAC especially so because it has metadata and is half WAV's file size/bit rate. Apple people can play AIFF and ALAC equivalents, and then you have APE, OGG, MP3 and WMA compatibility too. DSD is

to play high-resolution digital audio through the hi-fi, but it will not work from an external USB power supply of the sort used to charge a phone, whilst playing – a drawback. You can charge or play – not both at the same time - on PC or Mac I found.

If you don't want to use the player's on-board BurrBrown 1792A DAC – claimed to have 120dB dynamic range but see Measured

"the Cowon has a smooth, mild presentation but is nicely detailed and rich in its delivery"



**Yes – you even get output level meters on the Plenuie !! They are a display option, with red bar graph meters an alternative. Note the small red volume level readout at top right, and low resolution battery indicator – both difficult to read.**

now mandatory in high end players and both DSD64 and DSD128 are compatible.

The ARM Cortex A9 CPU on-board will also play DXD and PCM at 352.8 and 384kHz, both of which run at massive bit rate (18Mbps) in 24bit resolution but the BurrBrown 1792A DAC can't process this so it is down sampled to 192kHz. You won't find much DXD on the 'net but 2L of Norway have some free downloads for those interested. Oh – and DXD files consume around 1GB of disc space!

Talking of which, the player has 128GBs of on-board storage and will address a removable microSD SDXC card that can be plugged in, adding up to 64GB more, enough for 1000 hi-res tracks.

A 3.5mm headphone jack delivers full CD player output level of 2V to headphones, plenty enough even for insensitive planar magnetics like the Oppo PM1s I used for this review. This means the player can be connected to an amplifier's CD input through a jack/phono adaptor lead,

Performance – then there is an optical S/PDIF output in the headphone socket, for connection to an external DAC. To use this an adaptor is needed to couple into a Toslink digital optical cable, but these items cost little. Mains powered DACs usually have more weight to their sound, and an external DAC provides better sound quality I find.

Another stumbling block is that around 80% of optical DAC inputs reach 96kHz sample rate maximum, due to limitations of cheap optical receivers. The player will suddenly fall silent in this situation when playing an ordinary 24/96 hi-res followed by a 24/192; it happens to me frequently and I have to remember to look at sample rate on the display panel of the AK120 before prematurely jumping to the conclusion that the player has died for some unknown reason. But there's no sample rate read-out on the Plenuie I – oh dear! This is an unfortunate omission. Even my little AK100 gives this in clear orange text on the display panel, so I know what is going on.





**Red bargraph music level meters are a display option. Above them are touch screen transport controls that duplicate the side buttons.**

There are a range of music enhancement modes, all said to improve the sound, including 'reverb canyon' should you feel the need. You get different skins and even analogue output meter displays, plus an equaliser. The user interface was reasonably straightforward but the Plenue powered off when unplugged and then had to be powered back on to initiate a music update, even if no files had been transferred into the library and there was nothing to update.

Power up takes 10 seconds. The player can be used as a USB DAC, but only when connected to a PC, not a Mac, the instructions say; I did not try this.

**SOUND QUALITY**

The Plenue 1 played everything I loaded without murmur, including DSD64 and 128 files, and DXD running at 384kHz. It had plenty enough output to drive insensitive Oppo PM1 headphones; I played at around 100 on a small red readout that reached 140 maximum. The PM1s are mild mannered though and I changed to Philips Fidelio X1s because the Plenue 1 was also quite mild in its presentation and needed the extra zest of the Fidelios.

I could get more zip in the sound by choosing some of the enhancements available like 'BBE headphone', but for review purposes I stuck with Normal – and kept away from Canyon! On this subject note from Measured Performance that dynamic range collapsed with BBE or Jet7 processing engaged, due to the extra signal processing required. Processing must be turned off to get the best from this player.

All of which is to say the Cowon has a smooth, mild presentation but is nicely detailed and rich in its delivery. This suited Beethoven's Moonlight Sonata (24/96) – it slid by with ease, piano sounding sonorous and solid. There was a good feeling of weight to the instrument and the image spread wide.

With regular review tracks I use across all players for the purposes of comparison, like Amber Rubarth's 'Storms are on the Ocean' (24/96), I felt the Cowon lacked a certain dynamic punch of the AK120 and its wow factor, but it came across as refined and very svelte. It has enormous range and is deeply impressive in long term listening – great for classical – but is a tad slow in the time domain.

**CONCLUSION**

Cowon have a nice player in the Plenue 1, one that looks good, feels good and can play just about every digital file currently available.

Sound quality wise it is a smoothy, lacking the dynamic pizzazz of an AK120, but with a smooth darkness to its sound – an almost chocolatey quality – that was at the same time very satisfying in its own way.

It does, as Cowon claim, improve on the Astell&Kerns in its technical performance, our measurements show. By any standards it is impressive in this respect, up with the best hi-fi DACs at £1000 or more – suggesting it is cheap at the price!

With lightweight Jays Vjays the sonic match was superb; headphone matching matters.

On balance, I felt the Plenue 1 was deeply impressive. Its svelte nature may not turn on heavy rockers, but everyone else will likely be happy. It's rich, smooth and deeply detailed sound was eerily captivating in its own way.

**MEASURED PERFORMANCE**

Frequency response with 192kHz sample rate PCM reached 45kHz (-1dB) before rolling away slowly to the upper limit, at this sample rate, of 96kHz. Selecting Slow and Fast made little difference, except in final roll down steepness and alias rejection. Slow gave the smoothest response shape overall and best time domain behaviour with a raised cosine pulse.

Maximum output measured 2V with headphone mode On, or 0.65V with it Off. The former is for insensitive phones and/or to mimic a CD player, whilst the latter will suit sensitive headphones and safety-limt volume.

Distortion with 24bit measured a creditable 0.05% at -60dB, very good for a portable, if not quite up to the best mains powered DACs (0.02%).

The headphone amplifier's EIAJ

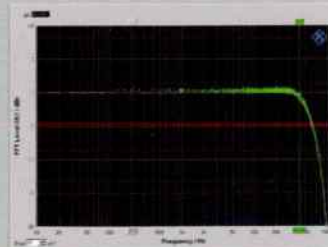
Dynamic Range (headphone mode On) measured a stunningly high 122dB, higher than Cowon's claimed 120dB. This is high by any standard, especially for a portable - but only with BBE/Jet 7 processing off; with it on, performance collapsed to a poor 93dB.

The Plenue 1 measured well all round, especially in its measured dynamic range value with sound processing off - impressive stuff. NK

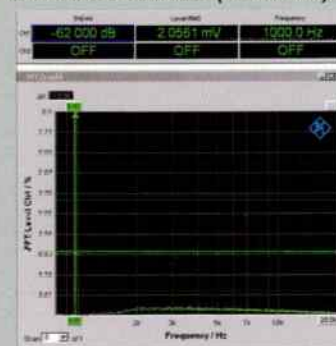
**Frequency response (-1dB) 4Hz-45kHz**

<b>Distortion</b>	
0dB	0.007%
-60dB	0.05%
<b>Separation (1kHz)</b>	<b>94dB</b>
<b>Noise (IEC A)</b>	<b>-102dB</b>
<b>Dynamic range</b>	<b>122dB</b>
<b>Output</b>	<b>2V</b>

**FREQUENCY RESPONSE**



**DYNAMIC RANGE (-62-60dB)**



**COWON PLENUE 1 £740**



**EXCELLENT - extremely capable**

**VERDICT**

A fine player with smooth, sound quality, but detail improvements like a sample rate readout are needed at the price.

**FOR**

- build quality
- screen
- file compatibility

**AGAINST**

- lacks dynamic verve
- no sample rate readout
- won't play on a charger

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# Arcam hits the G spot

**It looks and weighs like an Arcam home-cinema amp. But the big and beautiful FMJ-A49 is strictly two-channel, Martin Pipe discovers.**

**O**ver the past couple of years, Arcam has been beavering away at a new range of amplifiers. I was told by an insider from the Cambridge-based company that the brief was to produce the “best-sounding amps” it could, with cost a “secondary consideration”. They are therefore truly ‘state of the Arcam’, to the extent that the man most responsible for their design – company founder John Dawson – has been ‘immortalised’ by having his signature silk-screened onto one of the integrated amp’s circuit boards.

There are three products in the US-built ‘49’ series – a preamp, a power amp and the aforementioned integrated amp tested here. The latter two are true solid-state powerhouses (200 watts into 8 ohms, courtesy of paralleled output-transistors and an enormous toroidal power transformer) and take advantage of an amplification technology known as ‘Class G’. Here, the negative and positive DC power-supply rails that supply the bipolar output stage of a conventional Class AB amplifier are instantaneously ‘lifted’ (from  $-/+35V$  to  $-/+65V$ ) when needed.

This ‘rail-switching’ process is claimed to combine energy-saving efficiency with effortless power delivery at times of demand (such as dynamic fortissimo passages at high listening levels).

Although Class G has been understood in theoretical terms for some time, it has only become a practical reality with the development and intelligent implementation of new MOSFET devices in circuitry able to ‘follow’ the audio signal and, as necessary, switch in copious amounts of DC power at sub-microsecond speeds.

And that’s where Arcam’s R&D

efforts came into their own. Class G was first proved in recent Arcam multichannel AV receivers; the '49s' are, however, its first 'pure' stereo products to benefit from such thinking.

Goals that have been met include the virtual elimination of crossover and total harmonic distortions, the ability to drive difficult loads (down to 2 ohms), DC-coupling throughout (Arcam believes that capacitors in the signal path introduce audible colouration) and the banishment of noise and channel mismatches through careful component choice, earthing and circuitry layout.

At lower listening levels (below 50W – with most modern speakers, you'll seldom need to go above this in typical British rooms) the A49 works in Class A, thanks to biasing circuitry of proprietary design.

The preamp, meanwhile, has its own power-supply with separate transformer. It features a clever microprocessor-controlled, solid-state source-switching system, and a signal attenuator (volume/balance control) based around chips with integral resistor ladders. The advantages of ridding the A49 of mechanical switches and conventional potentiometers include enhanced long-term reliability and freedom from 'contact noise'. Arcam have even bestowed the A49 with an independent headphone amplifier!

There's plenty going on as regards connectivity. The A49 has a low-noise MM phono stage (based around audiophile op-amps), a balanced input and no fewer than six line-level feeds – if it's not needed, the phono input can be converted into a seventh line-level one.

Also specified are preamp outputs (balanced and unbalanced) for additional amplification (if you need it!), 6V and 12V DC terminals for Arcam accessories and a



*Impeccable build quality (and much surface-mount circuitry) is in evidence here. Note the two toroidal power transformers - the smaller one is for the preamp. Towards the lower edge of the upper (preamp) circuit board can clearly be seen John Dawson's signature.*

dedicated tape output that allows you to record the selected source. Sadly, the A49 lacks a specific tape input (and the associated 'monitor' facility) so you won't be able to hear what you've just recorded – unless you use one of the line inputs, and risk creating an enormous positive feedback-loop if you accidentally select the wrong one with your recorder in 'source monitor' mode. Not a good idea for your speakers (and ears), with all that power on tap!

Two pairs of individually-switchable speakers, interfaced to the A49 via substantial binding post/banana-plug receptacles, are catered for. The A49 is easy to configure and drive, courtesy of the front-panel controls or the supplied handset (which will also operate other Arcam gear – players and tuners, for example). In addition to source and speaker selection, it will let you adjust volume, mute and stereo balance. No tone controls are on offer here, but an AV 'processor' mode (volume control disengaged) is available. A (dimnable) front-panel

display confirms selected input, volume level and operational status.

### SOUND QUALITY

I partnered the A49 with a pair of Quadral Aurum Wotan VIII speakers – substantial floorstanders with revealing ribbon tweeters. Source duties were performed by Arcam's very own FMJ-CDS27 (as reviewed in the May issue) with the option of an offboard Chord DAC64 to provide digital-to-analogue conversion, and a Rega Planar 3 turntable equipped with RB300 tonearm and Bias cartridge. And it was the latter with which I started my listening. First up was a 12in. single of Information Society's What's On Your Mind (Pure Energy), one of those wonderful electro-infused dance tracks from the late 1980s.

Wow! When most people talk about the Arcam sound, adjectives like 'safe', 'smooth' and 'laid-back' traditionally pop into their sentences. Not here; the electronic drums that give the track its rhythm bristle with snap, tautness and, well, energy. The bright synths and upbeat vocals



*All of the (analogue) connections you could ask for – with the exception of a dedicated tape-monitor input. XLRs, six line inputs and a phono input that can be switched to act as a seventh line input if needed jostle for panel-space with two sets of speaker terminals.*



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also come across well. In short, excitement abounds – although those Aurum tweeters are of obvious assistance here at higher extremes of frequency. I recall hearing the track's drum and synth bass reach a tad lower; subsequently, I discovered a very detailed briefing document prepared by Arcam in which it was revealed that the phono stage includes a high-pass filter with a -3dB point of 20Hz.

It's there to prevent record warps and their subsonic like from destroying speaker cones, and isn't active on any of the line inputs. That's not to say the A49's sensibly-restricted lowest-end excursion detracts from your enjoyment of vinyl. Switching to a 180g pressing of Mark Beazley's Stateless, and the bass elements of tracks like Three Twenty-Two are conveyed with ample depth and articulation. This beautifully-minimalist album may have been recorded by the Rothko bassist at home, but the A49 shows us that there's plenty of atmosphere and musical detail to explore.

This observation was reinforced by playing 'The Kissin' Cousins Sing', a 1966 LP produced by easy-listening legend Enoch Light. Said album, master-recorded on 35mm magnetic film and nicely-pressed on the era's decent vinyl, contains Lew Davies'

arrangements of various standards. And it proved to be a thrilling listen, with a believable stereo image (rare at that point in stereo's history) and a presentation that combined musicality with analytical insight. It's easy to pick out Doc Severinsen's trumpet, Tony Mottola's guitar or the basswork of Bucky Pizzarelli. The vocal chorus is also well-defined, the various male and female contributions being discernable.

Next to CDs – and Wendy Carlos' Sonic Seasoning, a proto-ambient work that must have confounded those more used to Carlos' Bach interpretations when it was released in 1972. The album consists of Carlos' evocative interpretations of the four seasons, using a combination of field recording and specially-composed music. The 'Spring' piece features a thunderstorm, and the A49 held on effortlessly thanks to its sheer reserves of power. Its Moog textures and harmonies retain their distinctiveness, and complement rather than compete with the 'real-life' elements.

Rather more conventional a listen was Unknown Soldier, an customarily-extended piece by the persecuted Nigerian Afrobeat pioneer Fela Kuti. The metallic 'tang' of Kuti's keyboard, the sharp brasses and insistent traditional rhythms all

come together as a musically-cohesive whole that never loses its grip. And as soon as Kuti's female-backed lead vocal starts about a quarter of an hour into the track, it can be heard to crackle with a powerful emotion that befits a composition dedicated to his mother (the 'Mother of Nigeria'), who was murdered by the titular 'unknown soldier'. That the A49 facilitates such a connection does it justice as a piece of reproduction technology.



*The handset has a rather plasticky feel, but will operate not only the A49 but also other Arcam products. It worked with the FMJ-CDS27 used as a source. Indeed, the CDS27 is supplied with exactly the same remote!*

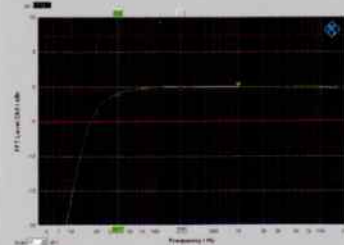
**CONCLUSION**

Yes, you feel a sense of 'involvement' – and that's something that Arcam amps haven't always delivered in the past. Arcam reckons the A49 is the best integrated amp it's produced over 40-odd years of history. I can't disagree with that. It combines finesse with depth, focus and slam – all of which are underpinned by a natural musicality.

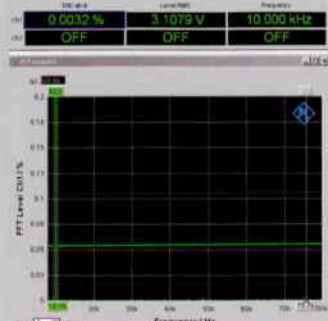
**MEASURED PERFORMANCE**

Power output from the A49 was massive, measuring 242 Watts into 8 Ohms and

**FREQUENCY RESPONSE**



**DISTORTION**



420 Watts into 4 Ohms, plenty enough for huge volume in any system, no matter how insensitive the loudspeakers or how large the room. In practice few loudspeakers could absorb such power on a continuous basis without the voice coil overheating, but such massive reserves help maintain dynamic punch.

Distortion levels were low, just 0.002% in the midband at low power output, and 0.003% at high frequencies, with just about no sign of crossover products. The A49 should have smooth sounding treble and will seem subjectively quite neutral.

Bandwidth was wide, stretching from 3Hz up to 66kHz through CD or XLR balanced input. The line stages had high input sensitivity of 260mV, and the balanced XLR input needed 500mV for full output to be achieved.

The MM phono input RIAA equalisation was accurate across the audio band, but there is a strong warp filter that cuts output sharply below 40Hz, our frequency response analysis shows,

and Arcam's handbook quoted phono response of 20Hz-20kHz wasn't achieved due to this filter. It will lighten bass a tad but also eliminate loudspeaker cone flap. Noise was a low and overload high.

The FMJ A49 is a massively powerful amplifier with very low distortion. It should sound punchy yet smooth. **NK**

<b>Power</b>	<b>242watts</b>
<b>CD/tuner/aux.</b>	
<b>Frequency response</b>	<b>3Hz-66kHz</b>
<b>Separation</b>	<b>86dB</b>
<b>Noise</b>	<b>-102dB</b>
<b>Distortion</b>	<b>0.003%</b>
<b>Sensitivity</b>	<b>260mV</b>
<b>Damping factor</b>	<b>47</b>
<b>Disc (MM/MC)</b>	
<b>Frequency response</b>	<b>38Hz-20kHz</b>
<b>Separation</b>	<b>72dB</b>
<b>Noise</b>	<b>-75dB</b>
<b>Distortion</b>	<b>0.004%</b>
<b>Sensitivity</b>	<b>1.8mV</b>
<b>Overload</b>	<b>70mV</b>

**ARCAM FMJ-A49 £3750**



**OUTSTANDING - amongst the best**

**VERDICT**

Arcam shows it hasn't forgotten how make a fine-sounding amplifier

**FOR**

- effortless delivery, detailed and innately musical
- should be able to drive practically anything
- plenty of inputs

**AGAINST**

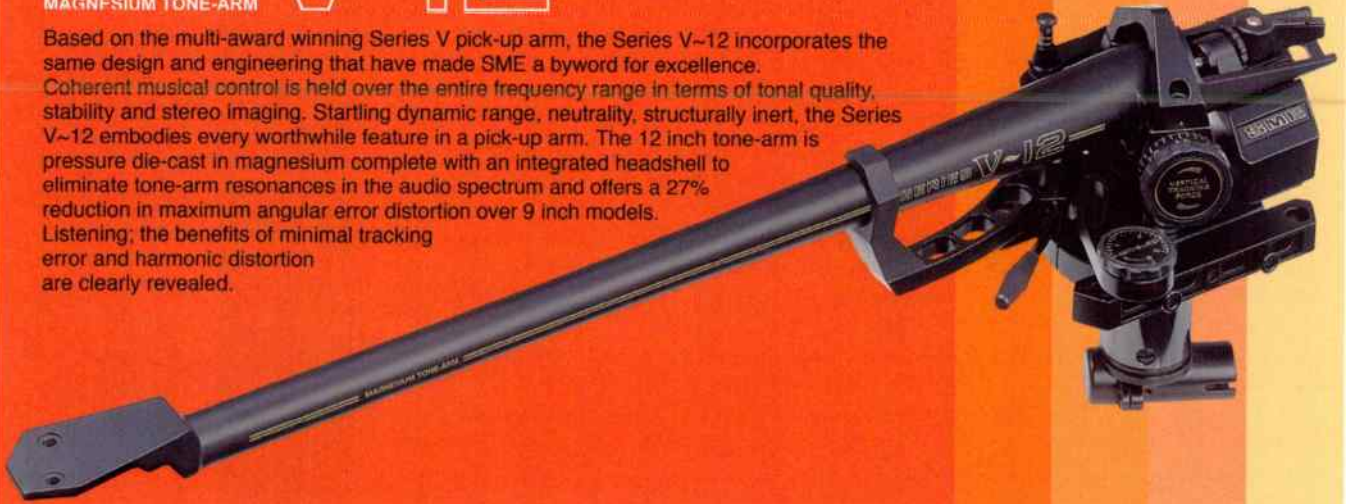
- no dedicated tape monitor facility
- large

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of smaller floorstanders as well as a centre speaker for home cinema duties along with sub-woofers and surround sound speakers.

The '290s are big – a 1.2m high floorstander. Or in Imperial measure, four feet tall and 13 inches deep; they weigh in at 25kg each. A true three-way loudspeaker, bass duties are handled by a pair of 8-inch drivers. These are made from JBL's proprietary PolyPlas material – essentially a polymer-coated cellulose fibre construction – as is the four-inch mid-range unit which sits above them.

The 25mm tweeter is again of JBL's own design, being a ceramic metal matrix (CMMD) unit that sits in its own sculpted waveguide, said to improve imaging and natural balance.

All in all, the Studio 290 is an impressive and purposeful-looking package. Just as impressive is the price, the '290s coming in at £760."

For a chance to win this great prize, just answer the four easy questions at right. Send your entries on a postcard only, by July 10th, to:

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### QUESTIONS

**[1] How big is JBL's Studio range?**

- [a] five models
- [b] 10-strong
- [c] very big
- [d] elephantine

**[2] How high are the Studio 290s?**

- [a] 830mm
- [b] 1000mm
- [c] 1.2m
- [d] 4ft

**[3] What does a Studio 290 weigh?**

- [a] 100lbs
- [b] 2000g
- [c] 0.54 ton
- [d] 25kg

**[4] The bass drivers are made from -**

- [a] paper
- [b] aluminium
- [c] PolyPlas
- [d] Bextrene

**H**ere's your chance to win JBL Studio 290 floorstanding loudspeakers we reviewed in our October 2014 issue. Read the review excerpt

below and answer the questions at right.

"This is the largest 'speaker in the 10-strong Studio range, which also includes two bookshelf models, a pair

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# Mighty Atlas

**A high-end system deserves a high-end interconnect – and the new Mavros Ultra from Atlas Cables certainly fits the bill, says Jon Myles.**

**T**here are still a number of people who are serial sceptics when it comes to the difference Interconnects can make to a system. Suffice to say, I'm not one of them.

After all, the greatest distance any audio signal generally has to travel in a system is between source/amplifier and amplifier/loudspeaker.

So if you're spending many hundreds or thousands of pounds on electronics and transducers you owe it to yourself to ensure the wires connecting them are up to the job. Construction, materials and even the design of the plugs all play crucial parts.

In the case of the new Mavros Ultra interconnect from Scottish-based Atlas Cables this means technology trickled down from its flagship Asimi Ultra – which costs a not inconsiderable £2750 for a 1 metre pair. By comparison the Mavros Ultra comes in at £875 for an equivalent length.

For that price you get a beautifully constructed and finished cable that is both sturdy yet flexible enough to fit round awkward corners.

Internally the copper conductor wires are drawn using the Ohno Continuous Casting (OCC) process which is said to minimise grain boundaries within the metal. Identical signal and return cores are made up of six bundles of 12 OCC strands surrounding a thicker central wire. After application of the dielectric insulation the conductors are covered by a continuous Copper-Mylar electrostatic screen and a copper close weave shielding braid to minimise RF interference, while the outer sheath is made from hard-wearing PVC clad in black woven Polyester.

The new Ultra solder-free phono plugs (XLR are also available) offer a 57 per cent mass reduction over

their predecessors and employ an internal Teflon non-conductive sleeve matched to the dielectric properties of the cable.

They are exquisitely machined and polished, offering a firm grip on the terminals.

Like other Atlas cables the Mavros Ultra is directional – indicated by small arrows on the outer sheath.

## SOUND QUALITY

Doing duties between an Oppo BDP-105D Blu-ray/CD player and a Sugden Sapphire FBA-800 Class A amplifier the Mavros Ultras immediately came over as neutral, detailed and smooth.

They do a great job of lifting the grain and smear that some cheaper interconnects can bring to a system – as though they are allowing extra air and space into the presentation.

On Miles Davis' classic 'Kind Of Blue' instruments took on an added sense of realism and the music seemed to flow a little more naturally. Percussion was firm and detailed, but most impressive was the way Miles' trumpet floated in front of me, but when John Coltrane's saxophone cut in it not only sounded sweet, but soared just a little bit higher in the soundstage.

Vocals were a particular delight through the Mavros interconnects. On London Afrobeat Collective's new 'Food Chain' CD, Funke Adeleke sounded suitably soulful, helped by the fact that the complex backing tracks were so clearly delineated I could follow each instrument with ease.

The Mavros was remarkably speedy sounding, subjectively faster than other cables of a similar price. The searing guitar line on The Pixies'



'Debaser' simply rocketed along, leading edges of notes have dazzling transient attack.

It did feel as though these interconnects were throwing an open window onto the system, allowing characteristics of partnering equipment to shine through. For example, swapping the Sugden for a Naim Supernait 2 the icy clarity of the former was lost but the Ultras highlighted the slightly darker but more propulsive properties of the latter.

Consequently, be careful of the Ultras if you have doubts about any element of your system as they won't flatter below-par components. Instead they'll more than likely let you know exactly what's wrong – although that really is what you'd expect from an interconnect costing more than £800.

So if you have a high-end system that you're looking to take to the next level, the Atlas Mavros Ultra could just be the thing for you.

## CONCLUSION

The Mavros Ultra has an extremely natural and organic sound that brings zest to all forms of music without adding excess brightness. Transparent enough to let you hear right into the densest mixes without ever losing the rhythm or tempo of the music.

**ATLAS MAVROS  
ULTRA £875 1  
METRE LENGTH**



**OUTSTANDING - amongst  
the best**

### VERDICT

A fabulously built interconnect that is clean, smooth and detailed, with exceptional bass grip. Capable of bringing new levels of resolution to even the most expensive systems.

### FOR

- bass grip
- detail
- smooth mid and treble construction

### AGAINST

- not cheap
- needs a good system

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# Damson Delight

**Damson's new Vulcan portable Bluetooth loudspeaker packs five drivers into a compact enclosure to sound much bigger than it looks, says Jon Myles.**

**P**ortable Bluetooth loudspeakers seem to come in three varieties these days. There's the cheap and cheerful which will easily slip in your pocket and give you decent(ish) sound for their size, the premium products with distinctive design and better build quality (think Beyer Audio's excellent Soundbook) and then you have the

middle ground – those aiming for a decent audio experience at a still wallet-friendly price.

Into the latter category comes UK company Damson's new Vulcan. It costs just £100 (and can be had for less on-line) but is obviously aiming to be a cut above your basic Bluetooth portable loudspeaker.

To that end the rugby ball-shaped curved cabinet contains no less than

five drivers in an attempt to produce room-filling sound in a medium-sized space.

Behind the detachable metallic mesh grille at the front are two 5cm drivers while to the rear sits an 11.8cm passive bass radiator for the low frequencies. But what sets the Vulcan apart from its rivals are the two 3.8cm Neodymium magnet-equipped side-facing drivers on each



end of the unit which are designed to open up the soundstage and give a greater sense of stereo separation.

The on/off, volume and source controls sit on top of the cabinet on either side of an illuminated Damson logo which changes colour to indicate whether the Vulcan has been paired to a device and when the battery has reached its full capacity. Charging is via a rear USB input and Damson claims a 12-hour battery life – easily achieved during testing.

Other features include NFC pairing, aptX capability, a 3.5mm input and built-in microphone for hands-free calling. Additionally the fashion-conscious can opt to buy a set of differently-coloured grilles so they can change the look of the device to suit their mood or room decor.

## SOUND QUALITY

Essentially the Vulcan is a 4.1 'speaker system in a compact enclosure. It's a fairly novel configuration but works surprisingly well, making the Damson sound a lot bigger than it looks.

Those side-firing drivers really do give an impressive width to the presentation, one that opens out the music better than many similarly-sized rivals. That, added to a decent weight and punch to the sound means the Vulcan imparts real body to whatever it is playing.

On Bjork's 'Human Behaviour' the bass was full while individual instruments were easy to track. There's actual air and separation around individual notes and when the volume is turned up the music swells naturally to fill the room.

Indeed, while playing this track a colleague walked into the room and initially thought she was listening to a pair of full-sized stereo loudspeakers.

Treble was a little brash and unruly at times but never harsh

**An 11.8cm passive bass radiator on the rear helps add extra low-frequency energy.**



**Two front-firing 5cm drivers are allied to a pair of 3.8cm side-firing units for expansive sound.**



and it didn't grate even on heavily processed pop tracks.

Fed some better produced fare – such as Massive Attack's remastered 'Blue Lines' debut – the Vulcan was more than capable of

different price category.

Used within its comfort zone however, the Damson punches well above its weight. Switching from Massive Attack to the gentler sounds of the Neil Cowley Trio, piano had

"a compact package and rewards with an expansive sound allied to commendable definition"

revealing the extra quality and clarity on offer. Shara Nelson's vocals lacked some smoothness but were never unpleasant, while the bass-driven backing track motored along with verve. There was excellent detail on offer, the Vulcan able to reveal some of the subtle studio effects and samples employed on tracks such as 'Safe From Harm'.

Increasing the volume, the cabinet did start to contribute to proceedings. My hand on the plastic casing allowed me to feel it vibrating. I can't help thinking a sturdier enclosure would have helped here – but that would inevitably increase the cost and push the Vulcan into a

good definition and weight and there was a thwack to the drums that provided a solid, believable foundation to the overall sound.

The wide soundstage also placed individual musicians into their own space, when appropriate. On John Coltrane's 'One Up, One Down: Live At The Half Note' I could hear who was placed stage left, stage right and dead centre in the mix – a trick not many compact Bluetooth 'speakers are able to pull off.

No, it's obviously never going to rival even the most basic of decent full-sized stereo set-ups but at its price the Vulcan does a remarkably good job of producing an immersive musical experience. It's refined enough to be used for more than just background music and I could happily get along with using it as my main music provider in a kitchen, bedroom or office space. I'd go as far to say that it probably sets the standard for portable Bluetooth loudspeakers at this price.

## CONCLUSION

An innovative design which packs five drivers into a compact package and rewards with an expansive sound allied to commendable definition. At just £100 it has to be considered something of a bargain.

## DAMSON VULCAN £100



**OUTSTANDING** - amongst the best

**VALUE** - keenly priced

### VERDICT

Great portable Bluetooth loudspeaker at a bargain price. Innovative design translates into excellent sound.

### FOR

- wide soundstage
- good bass
- stylish looks

### AGAINST

- nothing at the price

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**KEF Q100 LOUDSPEAKERS**

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

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

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

A pair of KEF Q100 loudspeakers are on their way to **ANTHONY PARKIN**, Letter of the Month winner in our June 2015 issue.

## Letter of the Month

### BASS TEST

Thanks to your reviewing systems/equipment by using regular tracks (personal favourites - or just good tracks to test with?) I have made a new purchase; *Aye* by Angelique Kidjo. I got this CD to hear the bass you listen out for/test with, and apart from track four (*Tatchedogbe*) there doesn't seem to be impressive bass when compared to Lady Gaga's *Monster*, although the album as a whole bounces along nicely. I'm not a loud music freak (these days...) and haven't run it through my Sennheisers yet, but although the bass lines are good they're not up to the standard of - say - *Billie Jean*, but that's personal preference/taste for you.

However, for what it's worth, for seismic bass I recommend Kraftwerk's *Electro Kardiogramm* or even *Suicide's Cheree* (the remix version). OK, so synths can go much deeper - and with more power - than traditional instruments (*Tangerine Dream* take a bow!) but so what? The power of a big kettledrum can still hit the spot, and a beautifully bowed double bass can make the emotions well in a most satisfactory fashion.

Yes, I know there's more (much more!) to music than the lower registers, but showing off deep bass can still be deeply satisfying in a way that crisp cymbals or other high frequency sounds cannot.

This leads me on to how the slowly diminishing hearing range we all suffer

from (especially us over 40s...) affects how you and your colleagues review kit. I know the brain compensates, but surely it would be nice to have a little lift in the upper registers (tone controls anyone?) just to restore the slight edge that has disappeared due to the ravages of time? Maybe an 'Over 50s' button on the front of an amp, just to give a dB or two of sparkle?

Taking this to its illogical conclusion, maybe hi-fi manufacturers could produce kit that is (shock horror) actually easy to use and understand - digital I'm looking at you! - instead of requiring a degree in standards, jargon and gobbledegook just to configure and then (finally) to listen to. A mere fancy, I fear, but we can but dream...

Yours  
**John Malcolm**

Hi John. The CDs I use are specifically test CDs. As such they are meant to be of verifiably good technical quality - more in a minute - reasonably representative of the field, and with properties that are



'Aye' CD, from Angelique Kidjo. "There doesn't seem to be impressive bass" says **John Malcolm**.

effective in highlighting common weaknesses in equipment. What they are not are either "best or biggest" in the field, or personal preferences, although it is best if I at least like the music or I would go nuts listening to it repeatedly.

And that raises another issue - consistency. Some readers wonder why I use the same material over and over - for consistency is the answer. However, recordings reach their sell-by date, where their shortcomings are highlighted by better sound all around. Recordings that I once thought were good, like those on Steve Earle's CD *The*





**Michael Jackson's Billie Jean has better bass than Angelique Kidjo's Aye CD, John Malcolm tells us.**

Hard Way, now make me wince. The reason is that digital sound quality is steadily improving as ADCs and studio equipment in general get more sophisticated.

Now back to Aye. This has a conspicuous bass line played by a human being, so it has a funk, meaning it isn't metronomically timed as it would be were it synthesised (although synth timing is randomised these days to lessen the problem I believe). And I have run it through our spectrum analyser to ensure there is truly strong and deep bass (Aye produces strong energy down to 30Hz). It is a verified test tool. The heartbeat at the start of Dark Side of the Moon goes lower – it is a 25Hz pulse – but I use Aye to represent a typical bass line that is used in Rock to provide rhythm; I do not want one-off sound effects. As such it isn't meant to be stand-out strong, merely representative: it has to do a job.

One job it does is to show how well a loudspeaker can "play a bass tune", which brings into the picture a myriad of complex properties, especially acoustic and electrical damping, and port tuning. Whilst Lady GaGa tracks, especially Monster that we also use, have strong deep bass they're not a good test of these properties, using sustained synthesiser chords that don't test time domain behaviour.

Life moves on and now I prefer to use hi-res tracks from an Astell&Kern AK I20 portable player, including test tracks from Chesky Records, recorded by David Chesky specifically for subjective assessment.

If you have a bass favourite you'd like to tell us about, just write

in. I'm sure we can do better than Angelique Kidjo, Lady GaGa and Michael Jackson! **NK**

### SUMMIT X

*I've read your thorough review on Martin Logan Summit X – and since I consider of buying it – I wonder if you can suggest to me a choice of tube type to drive it among KT88 and KT120 – quads per channel. What do you think it will be a better match in power and sound?*

Regards

**Ranis Nikolaos  
Greece**

The KT120 delivers more power than a KT88, but in my experience a worse sound. It can sound somewhat hard and uncouth, so of the two I would go for KT88s in push-pull parallel pairs. However, realising there was a need for a higher power tube with a better performance than the KT120 the New Sensor corporation have come up with the KT150 and these sound very smooth. They are starting to appear in amplifiers from Icon Audio and Audio Research, to name but two. However, the 80 Watts or so you get from KT88s in pairs is enough for the Summit X I feel, which has a powered bass unit. **NK**

### K6L6 KIT

*I recently bought a Hi-Fi World Supplement (No.18 Nov.1995) in which Noel describes a valve amplifier kit (K6L6 integrated amp. designed by Andy Grove). In it he says further info. about ordering is in the main magazine [which I don't have].*

*I know it's a long shot, but are any of these kits [or complete built amps.]*

*still available or in existence, how good were they, were many sold and finally do they ever appear on the second hand market [eBay]?*

*Hoping you can help.*

Regards

**Robert Berry**

*Hi Robert. World Designs (<http://www.world-designs.co.uk/>) still produce a range of valve amplifier kits that are based on original World Audio Design models. Andy Grove was a very talented designer, who formally studied electronics at Uxbridge, had a fantastic theoretical background as a*



**Martin Logan Summit X hybrid electro-static loudspeaker. "Can you suggest to me a choice of tube type to drive it?" asks Ranis Nikolaos.**

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Anyway, have fun enjoying our website.

Thank you for looking, Matthew Frost

If you want to buy ready built Hi-Fi then click here to see our associate company. If you are interested in vinyl, turntables and tape then the Turntable forum is for you. [Click here to see it.](#)

18 November 2011

**World Designs still offer a range of valve amplifier kits. Go to [www.world-designs.co.uk](http://www.world-designs.co.uk).**

result, yet knew everything there was to know about valves and – especially – output transformers. As a result the transformers, wound expertly by a company in Cambridge, Morite, one of the few able to handle such complicated multi-layered and sectioned designs, were superb. I know because I started and owned World Audio Design (so I'm not biased!).

The problem became too many were being sold – around the world. The company grew and grew but I decided I would rather be in publishing than manufacturing. Having to help unload a van carrying a ton of transformers convinced me of this!

World Audio Design amplifiers do appear, but probably not as many as you might expect, because owners have invested time and effort into them to get what they want, and can of course repair/upgrade them if necessary, unless a catastrophic valve failure occurs, destroying an output transformer. HT fuses prevent this, but only if the correct valve types are used. Where an incorrect fuse has been inserted and valve failure occurs it can destroy an output transformer. This problem affects all valve amplifiers, but since a fuse blows faster than an output transformer primary, fuse protection is satisfactory. So as and when they appear on eBay, which is not very often, be aware that the amplifier must be in working condition on both channels. **NK**

### HI-FI IS A HOBBY

Since my earliest memories of dabbling in audio reproduction in the home, I have always looked upon hi-fi as a hobby rather than as a consumer. And because your respected journal has always promoted the virtues of "getting your hands dirty", I thought I would write and tell you that in hindsight my two greatest audio landmarks from the past 45 years have been as follows:

1) Spending a whole day setting up and realigning my tonearm and turntable. I would encourage anyone else reading this letter to do the same. And please use the templates provided by the manufacturer as a rough guide only. In my opinion it is far better to use your ears as a gauge as to when the arm height and offset are correctly positioned. A reduction in the background surface noise will also be a good pointer to an accurate set-up.

2) Doing away with the CD transport and injecting the digital signal straight into the DAC's USB socket, having first converted the music to a lossless codec. I now consider that my vinyl bias has been, to a large extent,



**World Audio Design K6L6 valve amplifier from 1995. "Are any of these kits [or complete built amps.] still available?" asks Robert Berry.**

fuelled by the adverse effects of jitter between the transport and converter. Hey – digital can sound half-decent when downloaded!

In conclusion, I would encourage anyone new to this noble pastime to do the same. You may even save yourself some money on that promised upgrade, if you would only take the time and effort to make the experience hands-on, rather than governed by your wallet. Keep up the good work!

Regards,  
**Jonathan Ledger.**

Absolutely right Jonathan. Turntables are mysteriously difficult (too many variables to compute!) and great fun to set up, if you have the patience. Just looking closely at what the world's biggest electronics manufacturers have to say about the difficulties of designing a preamp chip able to exploit the low

noise of an MC cartridge makes me realise that what we are playing with here is a mechanical transducer of amazing sensitivity, one that traces down to molecular level. It is such a perfect transducer only DIY perfection can tease the best from it.

A lot of people find that ripping CD to a digital file improves sound quality, and it is thought re-clocking within this process reduces intrinsic jitter. So to readers who have never ripped a track, give it a try and replay via USB like Jonathan. You might just enjoy digital!  
**NK**

### MIND SPARKS

I have a couple of suggestions that may not, in themselves, be viable, but may spark an idea or two.

How about a complete system review every month? A complete budget, or mid-range system, to handle either



**One "greatest audio landmark" for Jonathan Ledger was "spending a whole day setting up and realigning my tonearm and turntable". There's plenty to do, aligning the arm's geometry, assessing bias force and ensuring tracking force is ideal. Use a modern digital gauge, as above, to get this right.**

vinyl or digital, complete with cables and balanced for a neutral listener – one who doesn't want thumping bass, or just simple acoustic guitar music, but a balanced system suitable for all tastes (if there is such a thing).

It seems to me that in these rushed-off-your-feet times a full system that is recommended by experts and would be worth people spending good money on, without having to trudge around dealers across half the country to chase up exotic kit and get an audition. OK, so part of the fun of hi-fi is the auditioning and trying out stuff, but not everybody has the time or the inclination to hunt around, read reviews and take time out to audition kit left right and centre, so maybe this would help people who just want a high-quality all-in-one system, ready made for them. It would only be one article/review a month, so the rest of the mag could still be devoted to the usual stuff, and maybe it could tie in with the recommendations given out on the letters page.

Now this isn't quite so serious... How about an ultimate surround system? OK, Hi-Fi World is a hi-fi mag, not a Home Cinema mag, but hear me out. I suggest, as source, the new (and, by all accounts, the rather wonderful) Oppo 105D (do people who aren't going to use it for serious movie use - i.e. audiophiles - actually need the Darbee enhancement, so is there a 105 for them, saving a few pennies?), with seven Icon Audio single-ended valve amps feeding seven Tannoy monsters, such as Yorkminsters. What a fabulous 7.0 (no sub-woofer required with this!) surround system that would be, but you might need quite a large lounge/warehouse to handle it... Add in one of those new LG 55" OLED screens - or some super projector and 100" screen - and you'd have a Hi-Fi Home Cinema, suitable for Dark Side Of The Moon or the 1812 on SACD as well as Star Wars.

If I had the money I'd buy such a system, but we can all dream...

**John Malcolm**

Er – thanks John. Taking your less serious suggestion first, we have assembled a valve surround sound system, comprising Onkyo preamplifier and Quad II-eighty power amplifiers, in our July 2009 issue. It makes surprising sense if you eliminate the centre speaker and are content with normal stereo. This is easier and more effective than most people realise I suspect: Centre can be switched off in the loudspeaker set-up menu of most AV



**"How about an ultimate surround system?" asks John Malcolm, one using valve amps and Tannoys. We put together a valve AV system back in 2009, using an Onkyo AV preamp. Here is today's equivalent, the Onkyo PR-SC5509 AV pre-amplifier. But an Oppo BDP-105D Blu-ray player would also be a great choice.**

receivers and this doesn't simply lose the information – typically dialogue in discrete multi-channel video. It re-distributes it to left and right, so dialogue then forms a phantom centre image, as per usual in stereo. Good hi-fi loudspeakers produce phantom centre perfectly well, as we all know; it was only in low grade AV, based on cinema practice, that a Centre loudspeaker was thought necessary but I think that was wrong, quite frankly. I never use Centre or even consider it because it is impossible to site properly, unless you don't mind singers and drums coming from the floor beneath the TV screen. Freed from the Centre issue, you can then assemble a 4.0 surround-sound system with valve amps and Tannoys if you wish. It works very well I have found and suits music as well as video.

Why don't we actually do it? Tannoy, Martin Logan, KEF et al would be unlikely to want to participate in this little exercise, so no chance of it actually happening. We are still awaiting Tannoy Westminster Royal SEs for review, each one being a three-four man lift, usually onto a pallet truck, and there's difficulty here in awaiting packaging etc before they are uplifted from their current abode.

Then there is the rear loudspeaker issue. For much of the time they handle little and as surround-sound audio fades into the sunset (again) this is unlikely to change. Rear loudspeakers handle mostly crowd noise from live concerts, sound effects from

movies and such like. Large bookshelf speakers are adequate here.

But having said all that we do have and use an Oppo BDP-105D, plus Quad II-eighty valve power amps and putting them together is a great idea. Now, when the Westminsterers finally arrive...

System reviews? Absolutely. We



**"Seven Tannoy monsters, such as Yorkminsters" would be fine in an AV system, thinks John Malcolm. Hmm... not the easiest thing to arrange!**

have overlooked them recently, what with the torrent of digital streamers and portable audio products that are now so popular, not to mention vinyl's revival.

So thanks for the suggestions. Even your fanciful one is a great idea!

**NK**

Hi John – an excellent suggestion regarding system reviews, especially these days when it is becoming increasingly difficult to find one dealer who may stock all of the various products you are looking to audition. Suffice to say, we'll be turning our attention to putting together some value-for-money systems over the next few months so, as they, say watch this space. **JM**

### ARCHIVING VINYL

I found much to interest me in the latest (May) issue of *Hi-Fi World*, in particular the articles on recording vinyl and the review of the Furutech GT40a ADC. Reading Mark Eleys letter on vinyl archiving, it seemed to me that he and other readers might be interested to know about an alternative route I've taken.

The USB device I'm using to get digital or analogue audio signals into my computer is the Roland Quad Capture. As well as being cheaper, this differs from the Furutech in several important respects: most notably it has S/PDIF inputs and outputs on coax sockets. This was mainly why I bought the Roland, because my particular requirement was to dub some DAT tapes onto CD and I wanted to keep the signals in the digital domain. However I have also used it to digitise some of my wife's old jazz 45s so I can burn them to CD for her to listen to while doing the ironing.

I haven't yet tried it for anything more ambitious, but the Roland has an ADC which will operate up to 24/192. Moreover it has fully variable analogue input level adjustment on each channel and proper level metering, unlike the Furutech GT40a.

The input pre-amps on the Roland are for microphones (with 48 volt phantom powering if required), but they will also take balanced or unbalanced line level signals. So for vinyl archiving you need a phono pre-amp feeding into the Roland. The Furutech has the advantage of having this built-in, but as most of us already have a phono pre-amp it may not be all that useful in practice.

I cannot comment on how the ADC in the Roland compares with that in the Furutech, but it's probably good enough for back-up archiving of LPs. Like Editor Noel, I use the Audacity software: this works fine with the Roland, although there are other Digital Audio Workstations you can use.

**David Lord**

Thanks for that David. You are a busy



**A Roland Quad-Capture. "It has fully variable analogue input level adjustment on each channel and proper level metering, unlike the Furutech GT40a", says David Lord.**

man, what with building balanced preamps – as featured in this issue – whilst recording Jazz LPs.

I ought to quickly mention that Apple's once-free GarageBand programme can be used to make digital recordings too – and I am told by a professional who uses it that it is very good. GarageBand was bundled free in Mac systems, so if like me you have old Leopard discs and suchlike, you may be able to dig it out. Nowadays it is available as a £3.99 download, in new updated 10.0.3 form, from the App Store. This suits new OS-X Yosemite – and I see there is an OS version too, for iPads, iPhones etc.

Audacity, however, is free and

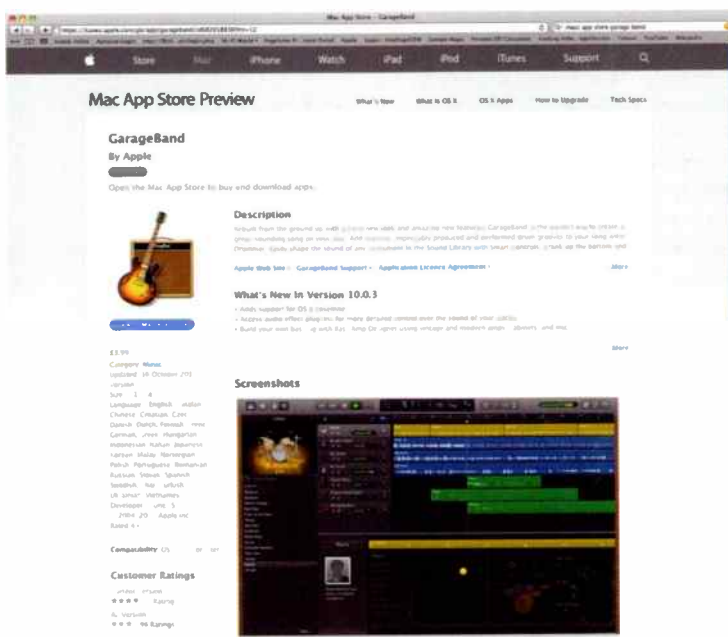
offers great quality, if a somewhat complicated and stark user interface.

**NK**

Hi David - I've also used GarageBand for making digital recordings and very good it is too – with a range of features and the sort of intuitive interface you expect from Apple. Luckily the programme still comes bundled free on all new Macs and iPads. **JM**

### DIGITAL RECORDING

You already know about my love of music and my addiction to everything vinyl, as a result of the correspondence with Tony Bolton that I kept in the last few years. My Vinyl and Shellac systems are now fully operational and – thanks



**Audacity is a superb free music editor, essential if you want to make digital recordings. Alternatively, Apple's Garage Band - shown here - can be used and it comes free with Apple computers. Just look in your Applications folder!**

to Tony's counselling – with magnificent results. So I will refer to them later if some new upgrade self-explains the general interest of a new letter on this old subject.

That doesn't mean that my audio questions are over and so, you got yourself a plague, in the form of my letters to the editor. This time, the subject is my frozen turkey sandwich, as I like to call digital recording and mastering, followed by home-vinyl LPs manufacture.

Computer music section of Hi-Fi World is where I first got in touch with digital recording, many years ago, during the late nineties, I think. However, I soon lost interest in this particular way of recording music as even with an early Creative external soundboard neither could I obtain serious recordings of my own songs, nor the MP3 format seemed to provide the sound quality I was looking for.

Thus I kept using Marantz CD recorders and a Numark mixing table, an Akai 2 track open reel recorder, a Sony DAT and lots of microphones to mike up e-guitars amps and acoustical instruments, as well as voices. Two Pioneer 24 band graphic equalisers made sure that overdubs wouldn't be much too obvious.

The production of a DAT tape or a music CD took me the best part of a week for each song, working hard with a pen and a pad, taking notes, planning the recording and leaving bass, drums and piano for my kids, during weekends. An album, in the other hand would need about 6 months to be produced.

Sometimes, the number and type of guitars I have, even corroborated by a huge set of pedals, wouldn't grant me the effects I wanted to obtain (I never succeeded in doing half-decent covers of the Beatles 'A Hard Day's Night' and 'I Feel Fine' because, among other things, I couldn't reproduce the initial chord in 'A Hard Day's Night' nor a convincing distortion of the open A string of the guitar at the beginning of I Feel Fine.

What I do not do with my hi-fi equipment (I have never sold a single item) I did with my music instruments and sold several guitars, amps and pedals to buy a Roland VG-99 guitar modeller and a V-Fender Stratocaster and a VOX AC-30 Amp, which made things much easier from then on.

By the way, the initial 'A Hard Day's Night' chord sounds the way it does because it is perfectly mixed with a second G7sus4 chord played on a concert piano. Mr. Martin's magic, I presume.

In the nineteen nineties my family



**"The Boss BR-800 made it simple to record live music" says Mario Tulio Kopke.**

and I lived in a flat in Lisbon and playing and recording music was our winter hobby of choice.

Anyway, soon that period of my life passed and I moved to the countryside where I have been living since 2005. Retired, sufficiently young to be 100% active but, old enough not to get a new job, I found myself most of the time alone and with plenty of time to dedicate to my hobbies (a huge Marklin model railway, long music listening hours and system sound improving and even longer sessions playing and producing homemade CDs for the family).

The recording method kept being a time consuming activity and the final product wasn't good either. My home recorded CDs always sounded fake – very far from a live or a studio performance. An increased difficulty in finding the right virgin audio rewritable CDs led me into buying a Boss BR-800

digital recorder and projecting to buy a home vinyl lathe from a German manufacturer (<http://www.vinylrecorder.com>) that produces such type of equipment that's clever, and interestingly fits on a Technics SL-1200/10 turntable!

The budget rose to 8000.00 in order to include the Stereo version of the lathe and all the equipment that allowed the production of master records and subsequent copies, including specially manufactured power valve mono blocks, for semi-professional use.

I had to face and solve two problems prior to investing the necessary amount: my wife's strong opposition and the need for additional room in the loft, otherwise the model railway would go back into boxes, for what is left of my life.

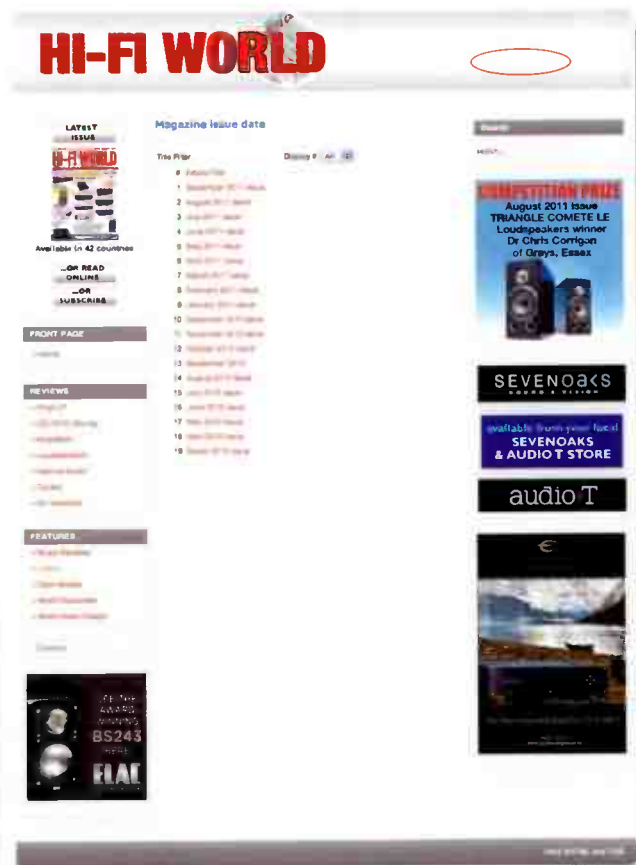
As I never sorted out the first problem I ended up buying the recorder only. Well, the cutter project still stands



**"I also noticed that you have published a picture of Tony's portrait by his artistic friend" says Mario Tulio Kopke. And here it is again, painted by David Denyer who studied fine art and was a good friend.**

# Letters On-Line!

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



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## World Mail June 2011 issue

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but, waiting for a better opportunity to arise, in the next couple of years, I hope. This turkey, stilton and cranberry sandwich had to be frozen, for the time being.

In the meantime I learned to play piano and I'm learning now to play bass and also improving my guitar play. So, the whole of my days are now dedicated to music and I only move to the model railway when my grandchildren come for the weekend.

The Boss BR-800 made it simple to record live music, to produce recordings including a variety of effects and voices. It corrects my pitch when singing, produces a second voice of my own voice or it simply allows me to record a playlist of previously recorded music and the results, partially due to the Roland guitar processor (or modeler, as they prefer to call it) are outstanding. Overdubs aren't a problem anymore, different tracks synchronisation (up to twenty eight) became the result of simply pressing a button and mistakes during play are easily patchable by using different parts of different takes of the same piece.

The result is a WAV file and converting it to FLAC or simple CD quality is a simple operation that the VG-99 software installed in my laptop takes care of without a fuss.

In the other hand, my turkey sandwich remains on hold. In fact, it's still frozen.

Last but not least, I must mention that I'm greatly enjoying your articles on digital music recording and your technical explanations that even for a technical dummy like me have been most helpful. Thanks.

I also noticed that you have published a picture of Tony's portrait by his artistic friend. It is comforting to notice that he keeps being remembered by his friends and colleagues as people only really die the day we stop talking about them. This month too in one competitor magazine, a much more relaxed and nicer than-in-the-past Ken Kessler wrote a few lines about Tony, reminiscing of him having been the first guy to state that iPods are awful and wearing a T-shirt stating that iPods suck! Kessler also recalls Tony's love for everything vinyl and his particular love of 78s. It is nice of him to have mentioned Tony as his fellow writer at Hi-Fi World. Best regards,

**Mario Tulio Kopke**  
Portugal

Hi Mario – and many thanks for an always-interesting letter. You certainly are a busy man – and that's a big loft



"A home vinyl lathe from a German manufacturer (<http://www.vinylrecorder.com>) " is the next purchase for Mario Tulio Kopke - if the wife permits.

if it houses a Marklin Gauge Z. I hope the children enjoy it.

Funny how MP3 is now something from the digital stone age and iPods very yesterday. The world moves on; Tony was always right – he preferred 78s! Today we have a full blown ARM Cortex A9 processor inside a hi-res player: see the Cowon Plenue 1 in this issue that didn't blink running DXD at 384kHz. Combine this with your own home recordings, or a recording made in Audacity, and you have real yet affordable quality.

**NK**

### LINUX & FURUTECH

Thank you for the review of the Furutech ADL GT40 alpha, and the tutorial which appeared in the May issue. I'd been eagerly anticipating the review, and as it did not disappoint, set about ordering one of these little gadgets.

It arrived complete with USB cable, and a printed instruction booklet with very clear instructions covering Windows and Mac. My main purpose in writing is to say that the GT40 alpha also works well with Linux. I set aside an evening to play, and connected the GT40 alpha to the USB port of a laptop running openSUSE. The computer found it straight away. Like Mac OS-X, Linux is a Unix-based operating system and needs no additional drivers. All that remained was to configure Audacity.

After two or three test runs, which included an adjustment to the attenuation to prevent

the clipping which occurred when set to 0, I made my first recording. At 24/192, the four tracks of a 1959 EP by Shirley Collins generated raw files of almost a gigabyte – just as you warned. I topped and tailed them so that each track faded in from silence and out again at the end, and edited out a few clicks and pops before exporting them as individual FLAC files.

Although it's early days, recording has (so far) been a doddle. I have used Audacity at a basic level for some time, and no one who is unfamiliar should be put off trying it. Even though I intend to continue playing vinyl and 78s (and aspire to a turntable upgrade), being able to stream files from a USB drive or to headphones from a computer makes for flexible listening. I'd certainly add my recommendation of the GT40 alpha to your review.

**Graham Gough**  
Bladon,  
Oxfordshire

Thanks for that Graham. It's always good to have reader's experiences – for better or worse! It helps us all.

**NK**



Furutech's GT40 Alpha can send vinyl direct to digital, with output via USB. "I'd certainly add my recommendation of the GT40 Alpha to your review" says Graham Gough.

# Back To The Future



**Luxman's new integrated amplifier may look like a throwback to the past – but it sounds rather up to date, says Jon Myles.**

**N**obody could accuse Luxman of following fashion. At least not fashion from this decade – or century even.

For in these days of pared down, fairly minimalist-looking amplifiers its latest L-550AX integrated looks nothing less than something straight out of the 1970s.

It's just the sort of high-end Japanese amplifier many of us would have lusted after back in those days. In other words it's big, shiny, festooned with buttons and boasts two big, illuminated power meters on the front.

And it also boasts more features than your average Sunday newspaper supplement. Tone controls? Check.

Two pairs of loudspeaker outputs? Check. MC and MM phono stage? Check. Loudness button? Check. Stereo/mono button? Check. Balanced operation? Check. Headphone circuit? Check. Recording loop? Check. Line Straight button. Check.

I could go on... but you get the picture. In fact the only obvious omission is a digital input. Suffice to say, this is not a stripped-down amplifier.

Added to that, it also has the traditional bomb-proof build quality of the great Japanese amplifiers of the past.

So looks-wise you'll probably either love it or hate it. Personally I'm in the former camp. The silver fascia may be busy but all those

buttons and the power meters give it a purposeful, muscular look – similar to that of a McIntosh amplifier.

Slide this into your hi-fi rack and no-one will miss it. You'll also need a decent amount of space as the 550AX is fairly large measuring 440mm × 193mm × 463mm (W/H/D) and weighing in at a shade over 28kg.

Part of the reason for the size is the Luxman needs decent ventilation because it operates in Class A up to 20 Watts per channel into 8 Ohms. However, after that it moves into Class B to deliver over 60 Watts peak power into the same load (see Measured Performance).

For some reason Luxman's documentation makes no mention of this – purely quoting Class A output



figures. But it's worth bearing in mind that, in the strict sense of the matter, this is not 'Pure Class A' as in the case of, say, a Sugden. Having said that, most amplifiers only push out a small number of Watts at domestic listening levels. You'd probably have to be using the Luxman in a room the size of the Buckingham Palace ballroom with some very insensitive loudspeakers to actually move it into Class B.

**SOUND QUALITY**

Despite all the bells and whistles, at the heart of it this is a no-nonsense amplifier. By which I mean it thoroughly gets on with the job in a totally engaging way.

One of its chief attributes is the clarity and separation it brings to even the most congested mixes. Listening to Led Zeppelin's 'When The Levee Breaks' through the Luxman, it retained the crushing dynamics of the track – but in a well layered and fluent manner. The low-end was forceful, but not overly dominant, while the harmonica sat in its own space and Robert Plant's vocals were distinct, plaintive and beautifully pure.

That purity of tone shone through on solo instruments. Yo Yo Ma's 'Bach Cello Suites' had a rich resonance and clarity via the Luxman – but more importantly it also spotlighted the spine-tingling moments of bow striking string. This isn't the easiest thing to do – but the 550AX has the knack of moving from absolute silence to dramatic crescendo without batting an eyelid.

It also brought out a high amount of detail. The tinkling glasses and blur of voices at the start of The

Clash's 'Jimmy Jazz' were not just background but an integral part of the track through the Luxman.

Having said that, there was a slightly dry quality to the bass and trying some heavy dub in the shape of King Tubby shows the 550AX isn't quite in its comfort zone here.

But that's a very minor criticism as overall it is a superb performer. Even the phono stage is no mere cosmetic add-on. It supports both

MM and MC cartridges and also has a switchable subsonic filter. In use it shared the same even-handedness and tonal clarity of the rest of the amplifier. Indeed, it was remarkably quiet, with a very low noise floor.

Playing Johnny Cash's seminal 'The Man Comes Around' disc, the body and weight of his ageing voice was palpable. It was uncannily lifelike, and there was realistic depth to the soundstage. This amplifier errs slightly



*Internally the Luxman's block construction incorporates shielding panels to isolate the individual sections while oxygen-free copper cabling is used throughout. Big heatsinks absorb heat produced by Class A working, and at centre lies a big, linear power supply.*



*Connections include both balanced and unbalanced, as well as a phono stage in, pre-out and two pairs of loudspeaker terminals, A & B, that can be switched at the front panel, or turned off completely for headphone use.*

*traditional philosophy*  
*modern design*



## *Triode 25*

*Class AB Push-Pull amplifier*

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

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

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



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on the side of richness as opposed to absolute clinical detail, but that's no bad thing. I've heard standalone phono stages costing more than half the price of the entire Luxman L-550AX that don't sound as good.

All this – both digital and vinyl – was listening to the Luxman without the tone controls switched in, in Line Straight mode. Put them in I got a tailoring of the sound although I did find it comes at the expense of a slight diminution of depth and vibrancy – nothing too stark but just

"playing Johnny Cash's seminal 'The Man Comes Around' disc the body and weight of his ageing voice was palpable. It was uncannily lifelike, with depth to the sound stage"

somehow not as clean and clear as with them switched out.

On the other hand, with some rather brash and harsh-edged 1980s synth pop in the shape of Gary Numan, trimming the treble while giving a slight boost to the bass did

smooth out the sound and allowed me to turn the volume higher before the music became too grating.

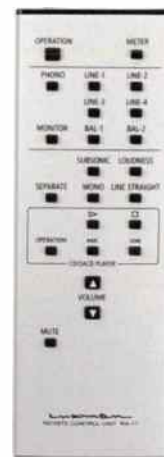
The same goes for the loudness button which adds an extra bounce to the mid-range while artificially inflating the treble. It's not unpleasant but I wouldn't be a fan overall. But at the end of the day it is nice to have the option – and it might work well for many users, especially for late-night listening at lower volumes.

Which is part of the beauty of the Luxman. The options are there if

essential elements of whatever is being played through it.

Which means that if you happen to like acoustic jazz this will play it for you with swing and detail, yet it will also rock out with conviction if that's what you prefer, handling just about any genre in between with aplomb.

In the end you do not get the outright tempo of a Naim amplifier nor the icy clarity of a Sugden but something that straddles both camps – which is quite a good place to be. And one I would heartily recommend.



*The remote control selects input, volume, subsonic, mono, loudness, line-straight – and even meters.*

### CONCLUSION

Old-fashioned looks but bang up-to-date sound. There really is nothing not to like about this amplifier.

It combines superb detail with an easy-on-the-ear soundstage that brings the best out of anything you pair it with. It might not suit those that crave super-low bass but if you want accuracy give it a go.

### MEASURED PERFORMANCE

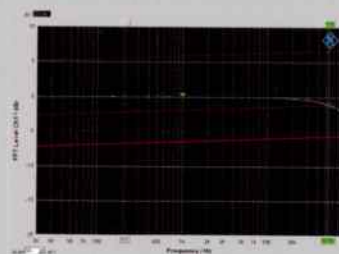
Power output measured 66 Watts into 8 Ohms and 121 Watts into 4 Ohms, plenty enough for high volume in most systems. Being Class A up to 20 Watts the LX-550AX runs very warm all the time, but not hot.

Distortion levels were low, just 0.005% in the midband at low power output, and 0.04% at high frequencies. Bandwidth was wide, our frequency response analysis shows, stretching from 2Hz all the way up to 53kHz, and the line stages have a high input sensitivity of 150mV, so will accept even low gain external phono stages.

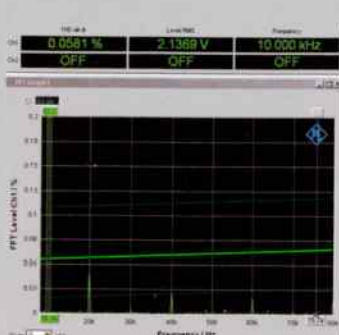
However, the Luxman has an on-board phono amplifier with switchable MM/MC input. Equalisation was accurate, giving flat audio band frequency response for both MM and MC cartridges. There was plenty of gain for MC so low output cartridges can be used and equivalent input noise was very low at 0.08µV so hiss will not be a problem either. Likewise with MM, noise was very low, but in practice it is swamped by thermal noise from a typically 800 Ohm MM source impedance.

The tone controls offer shelf lift and cut above and below 1kHz and could apply it in precise amounts, so it was

#### FREQUENCY RESPONSE



#### DISTORTION



easy to dial up just a few dB bass or treble lift or cut. They do not work at spectrum extremes though, but across half the audio band and this wide effect will impose obvious alteration that won't suit all situations.

The L-550 AX was very precisely engineered in all areas, in typical Lux fashion. It has very low noise figures in particular and generates a good amount of power. **NK**

**Power** 66watts

**CD/tuner/aux.**  
**Frequency response** 2Hz-53kHz  
**Separation** 82dB  
**Noise** -104dB  
**Distortion** 0.04%  
**Sensitivity** 150mV  
**Damping factor** 37

**Disc (MM/MC)**  
**Frequency response** 20Hz-20kHz  
**Separation** 72dB  
**Noise** -88/-72dB  
**Distortion** 0.06%  
**Sensitivity** 2.5/0.3mV  
**Overload** 150/18mV

### LUXMAN L-550AX £4795



**OUTSTANDING - amongst the best**

#### VERDICT

Superb amplifier that combines a range of features with a natural and organic sound

#### FOR

- detail
- fluid sound
- functionality
- impressive phono stage

#### AGAINST

- looks might not appeal to everyone

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**It was Martin Pipe's first CD player, back in the eighties. It might have been yours too...**



# Philips CD104

**B**y the mid-1980s, CD had become established among audiophiles courtesy of machines like Sony's CDP-101 and the Philips CD101. It was still expensive; I can remember Radio 1 DJ Annie Nightingale referring to the format as the 'millionaire's compact disc'. So now it was time for the mass-market push to begin. That meant producing more affordable machines, and expanding the range of discs to play on them, so that CD stood a chance of attracting aspirant mainstream '80s consumers.

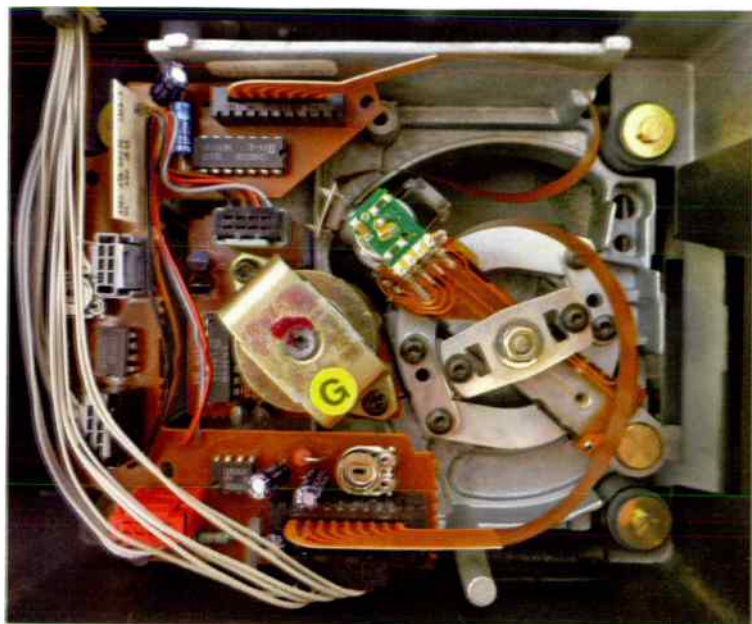
CD co-inventor Philips' secret weapon in this regard was the CD104, a Sony-style front-loader introduced late in 1984 and sized to match the then-popular 'midi' audio systems. The basic 'second-generation' CD104, which sold for around £300 at launch (prices fell significantly over time), was a huge success. Many are still in working order today. Much of the reason for such longevity is the sheer build

quality, which is superior to many of the era's more upmarket competitors from the Far East. There's very little plastic to be seen anywhere. Indeed, expensive die-cast components (among them the chassis itself) are much in evidence.

It may have been small, but the Belgium-built CD104 weighed a deceptive 7kg. Such substantial construction is very unusual for what was a 'budget' product by the standards of the time, but Philips was a maverick and tended to follow its own rules. The CD104 was on sale for over two years – the specimen you see here is the very same player I bought new at the end of 1986. It's a later CD104B – in black, rather than the two-tone grey of the first

*During a Philips presentation of Compact Disc on March 9th 1979, Joop Sinjou – who helmed the firm's CD Lab – holds up a prototype disc. The format was finally launched on a commercial basis over two years later.*





**The underside of the super-reliable Philips CDM1 transport – of very different design to the sled-driven type that persists to this day. The laser and the system that rotates it into position can clearly be seen towards the right of the picture. Next to it on the left (and identified by a yellow ‘G’ sticker) is the turntable motor.**

production models; there are minor production differences internally too.

This was my first CD player, bought for less than £200 from the long-defunct ‘Power City’ retailer in Southend-on-Sea – and it gave me a first taste of digital audio’s potential.

But the CD104 was not only popular as a Philips product. The same basic hardware, tweaked, became the basis of Mission’s first CD player (the DAD7000). Then there was Revox’s B225 – its initial foray into CD territory. It looked completely different to the CD104 and boasted refinements like armchair remote-control, headphone socket and a fancy LCD screen. But at its heart it was still a CD104.

B+O meanwhile sold its elegant CDX, a top-loading version of the CD104. And naturally, there was the CD34 – a Marantz version (the respected hi-fi firm was Philips-owned at the time).

European ‘national’ brands like Schneider and Grundig in Germany simply ‘rebadged’ it.

At the other end of the scale were beer-budget ‘all-in-ones’ with integrated CD104s to play those fancy new silver discs. Among the firms to buy in product from Philips were Matsui (the Dixons brand) and Amstrad. Yup, the same guts in Amstrad and Revox...

As a budget player, there aren’t

too many bells and whistles. Remote control is absent, there’s a tiny numerical fluorescent-green display, and programmable options were limited; most important were track-seeking (‘search’) and repeat.

Most users would just insert a disc (the drawer has a slow but silky-

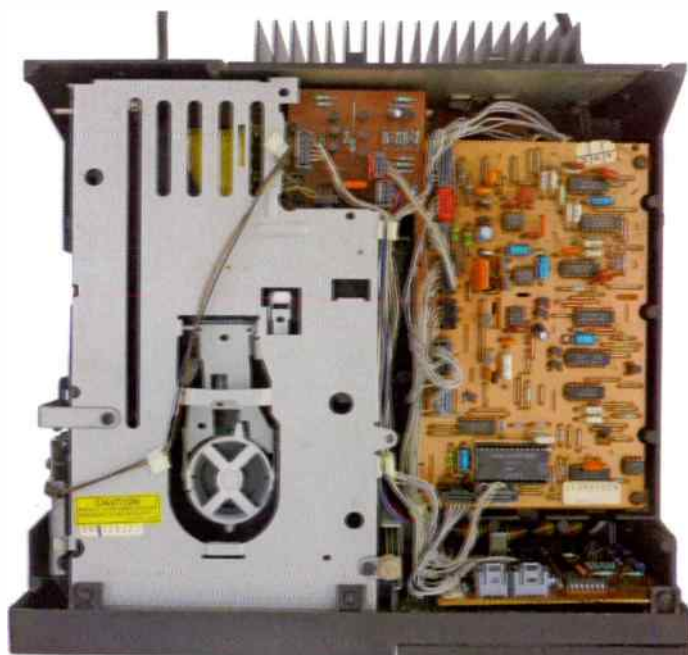
smooth motion) and hit Play, possibly using Pause to interrupt the music when the phone rang. The Back and Next buttons could skip disliked tracks.

The audio output cable was captive. Philips wanted to make the player as easy as possible to connect to an existing audio system’s Aux input.

The CD104’s fixed output was, as with most CD players, 2V – high compared to most line-level sources. I built attenuators into my then amp – a Pioneer SA-9500 Mk2 – to avoid jumps in volume.

Inside, there was a Philips CDM1 transport. This massively-built assembly employs a single-beam laser that swings with precision on a pivoted-arm under the accurate influence of a ‘radial’ motor, rather than the sled-mounted three-beam types found inside contemporary Japanese players.

The CDM1 is fantastically-reliable, the lasers enjoying long lives; that’s probably why so many CD104s are still in use. It will read CD-Rs, but CD-RWs are rejected (the front panel ‘error’ LED illuminates). The bitstreams recovered by the CDM1 are delivered to digital technology that’s rather primitive by today’s standards – 14-bit DACs (a TDA1540 for each channel) and 4x oversampling (courtesy of a SAA7030



**Inside the CD104 – there’s a lot going on underneath too! Most of the circuit boards have a top foil, to act as a shield and prevent high-speed digital data from contaminating the analogue audio. The heatsink at the back dissipates the heat generated by the multiple voltage regulators – prone to dry joints.**



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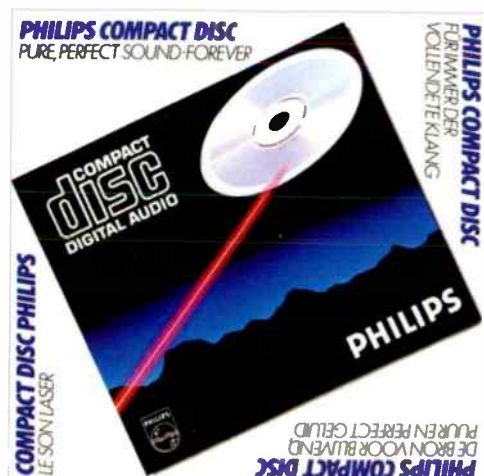
**HI-FI WORLD**  
VERDICT 



digital filter).

Old tech it may be, but sonically it performs much better than you would expect. It certainly lacks the unpleasantly-bright and fatiguing character of the early 16-bit converters found in Japanese players, such as the Sony CDP-101 featured in an earlier Old Worlde. Treble is nevertheless crisp and clean, while lower frequencies are tight and tuneful. Oh, and there is of course CD's complete lack of clicks, pops and surface noise.

A pleasant surprise today they may be – more than three decades of digital development on – but such



Every new format needs a promo 'sampler' to show it off – and CD was no exception. This 14-track 59 minute disc from 1982 included a variety of popular and classical pieces. Among its 14 tracks are Elton John's Blue Eyes, Dire Straits' Once Upon A Time In the West, an excerpt of Rimsky-Korsakov's The Tale Of Tsar Saltan played by the Rotterdam Philharmonic Orchestra and the Dutch Swing College Band's interpretation of Wilbur Sweatman's Down Home Rag.



The CD104's diminutive display, and some of its 'no-nonsense' controls. To the right of these is a rectangular panel with the Play, Pause and Forward/Reverse search buttons.

traits were revelatory to someone who had hitherto been playing his music on vinyl courtesy of a Thorens TD165 equipped with Philips GP412 MM cartridge.

Where the CD104 falls down is in its inability to resolve finer musical detail; with more modern hardware, the subtleties and musical insight of decent recordings become more apparent.

The good news is that the CD104 is reliable, and it is also, on the whole, easy to work on thanks to the intelligent design of Philips' engineers. My own player was found at the back of my parents' garage during a 'clean-out', and nearly ended up in a skip! It needed little more than a clean, a new drive belt (for the tray mechanism), resoldering of dry joints and the replacement of broken phono plugs to restore to full working order.

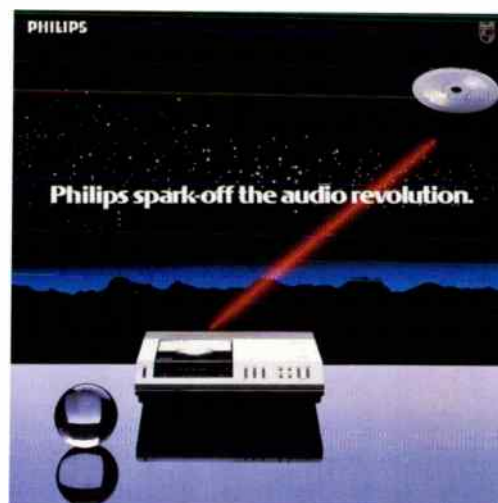
The biggest dry-joint problems occur around the voltage regulators, the decoder's chips and the 'griplets' that link the two sides of the various circuit boards.

Naturally, some love the CD104 for its build quality – which is better than that of some higher-end players!

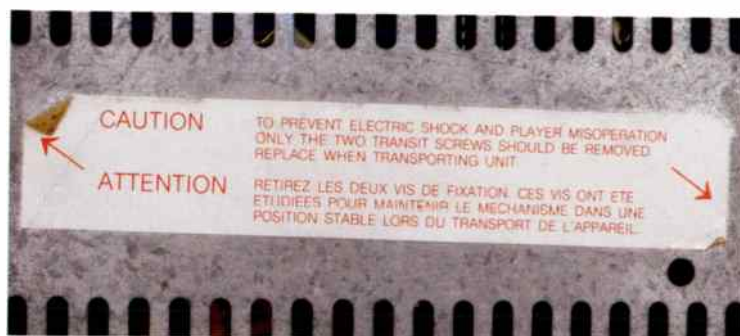
And naturally, the tweekers have had a field day over the years – starting with the modified version of the player that Mission sold. Capacitors have been replaced with 'audiophile' exotica, while the humble NE5532s in the analogue output stage have been substituted by op-amps of more modern design. Greater transparency is claimed as a

result of such mods.

Some have even tried more drastic measures, such as bypassing the SAA7030 (feeding the DACs directly from the preceding SAA7000 interpolation/muting chip's left and



The famous advertising image that Philips used to launch CD. The machine shown is the first-generation CD101 – also sold in this country as the Marantz CD63.



With all that heavyweight hardware on board, it's just as well that the CD104's mechanism can be secured by a pair of 'transit screws' to prevent shipping damage. Don't forget to remove them before playing a disc, though...

right digital outputs).

Others have modified their CD104s to use TDA1541 16-bit DACs, or deliver digital outputs to external converters. Naturally, work of this nature is very involved and not recommended to those without an understanding of electronics.

But even as it stands, the CD104 is a fine little player that's built like the proverbial outhouse and capable of a pleasing sound. A worthwhile 'digital upgrade' for those intent on playing their Dire Straits and Michael Jackson CDs on systems composed of other 'Olde Worlde' components perhaps?

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# On the record

**A powerful entry-level field recorder – and it works exceptionally well. Martin Pipe jumps for joy!**

Let's examine the latter point; well, this magazine is after all concerned first and foremost with high quality sound. The stereo mic, mounted at the top of the unit, employs two cardioid electret capsules in a standard 'X-Y' configuration. You can also plug in an external stereo mike or analogue line source if need be (conventional digital-audio connectivity is absent). User adjustment of recording level is only available in M (manual) mode; the others – 'loud' (claimed to cope with 120dB SPLs), 'instrument', 'interview' and 'music' – are 'presets', with the appropriate range of automatic level control applied.

An excellent menu system, utilising a backlit 128x128-pixel display with function-dependent 'smart' buttons underneath, configures the DR-22WL. One of the key settings is recording quality. You can record in MP3 (16-bit, with sampling rates of 44.1kHz or 48kHz, and bitrates ranging between 32kbps and 320kbps). Quality-conscious users can choose uncompressed WAV, which adds the further possibility of 24-bit recording (with sampling rates up to 96kHz).

There's no lossless compression option, although the DR-22WL does support the professional BWF uncompressed standard too. Mono (left-channel only) recording is offered as an alternative to stereo. While recording, the LCD features a pair of reasonably-responsive bargraphs – you also get peak (-2dB) and -12dB LEDs to help prevent nasty-sounding 'digital clipping'.

While recording, you can monitor with headphones thanks to



**B**roadcasters, professional sound-recordists, musicians and cinematographers have expensive microphones and recorders for 'field' and 'location' work. And at the other, more familiar end of the scale, there's the basic audio recording facility built into smartphones, whose quality leaves much to be desired.

Here's an alternative – and one that will fulfil a number of roles. The Tascam DR-22WL, a compact hi-res digital recorder with in-built stereo microphone, can be optimised for

each. You could use it to record a live performance, prepare a podcast (or interview) or practice your musicianship. The DR-22WL can be optimised for some of these roles by rotating a digital camera-like 'mode dial' to the appropriate position.

The DR-22WL is a perfect recording tool for five reasons. It's inexpensive, it will run for ages off a pair of AA cells (alkaline or NiMH), it records onto microSD cards (as specified for Android phones and thus widely-available and cheap), it's easy to use and it performs much better than it has any right to.



*Here we see the X-Y electret microphone capsules that give a good natural stereo recording at its starting point. The camera-like 'mode dial' covers a number of common recording scenarios, but there's also a manual setting. To prevent accidental operation of the controls, they can be 'locked out' with the on/off slider's third 'hold' position.*



**Choose manual ('M') mode, and you're given full control over input level. The DR-22WL's 'programmable gain amplifier', which precedes analogue-to-digital conversion, has a wide range (45dB). Its noise is surprisingly low, hiss being kept at bay during quiet recordings (countryside ambience, for example)**

a 3.5mm socket. Indeed, copy MP3 or WAV files to it via USB and the DR-22WL can be used as one. A 0.3W speaker is built in too.

All sorts of other extra features are possible. Musicians can switch on a metronome, add reverb (this can be active on recording or playback), overdub (play an existing file – this is kept unaltered – and it's mixed with 'live' audio and saved as a new composite recording) and even a practice mode (with 'loop playback',

speed-change and even key-change!). Recordings are time/date stamped, and you can add 'cue marks' (as supported by BWF) and indulge in track-splitting. The DR-22WL can also be set to trigger recording automatically in the presence of sound.

But the cleverest feature is undoubtedly Wi-Fi. Set up a 'Wi-Fi Direct' connection between the DR-22WL and your smart device (Android or iOS) and you can run the free DRControl app. This enables you to remotely-operate the recorder with a representation of the unit's own controls. Even recording level can be changed; thankfully, the app duplicates the metering.

The app will also let you copy a recording over the connection to your smart device (you can't – currently at least – stream a recording, or monitor 'live' audio) so it can, for example, be sent somewhere online. The DR-22WL has a mode in which compact Internet-friendly MP3 and quality WAV (16-bit) recordings are simultaneously-made.

**PERFORMANCE**

All of this extraordinarily clever stuff is made possible by an Analog Devices Blackfin DSP chip (conversion between analogue and digital is carried out by a Cirrus CS42L52). And it's clearly energy-efficient. During the review period, I never had any trouble with battery life, improper shutdowns or 'lost' recordings. Wi-Fi does of course impact battery life and will automatically disengage beyond a certain level of battery discharge (the DR-

22WL will however continue to run 'normally' for some time thereafter). Officially, a pair of alkaline cells will offer over 17 hours of use.

For what is a budget device, the DR-22WL can make fine recordings – even when they're played back on a decent system (in this case, Arcam CDS27/A49 and Quadral Aurum Wotan VIII speakers. The stereo mike is capable of capturing a beautifully-natural soundstage.

Speech is even and on the



**You can use the free Android/iOS DRControl app to remotely stop/start recording and configure the DR-22WL via the 'Wi-Fi Direct' technology. Recordings can also be transferred across the link - great if they're to be uploaded somewhere (podcasts, reportage) from your smartphone.**

whole uncoloured, and although crisp the treble can veer towards brittle. MP3 (128kbps or less) can impart a 'phasey' sound – I noticed this with higher-range voices and running water (!) – although 256kbps/320kbps aren't so bad. PCM improves clarity and detail, and considering how cheap is memory nowadays, it should be used by default.

On which subject, recording 24-bit/96kHz WAVs with the onboard mics is a waste of memory. 24-bit yields more openness, but you can stick with 44.1kHz or 48kHz and lose nothing. A high-pass filter (wind-cut) can be switched into position via the unit's extensive configuration menus, but no windshield is supplied. Use the DR-22WL outside and you'll discover that one is essential. Thankfully, the Maplin JP44X type fits (just!). Handling noise can be a problem; usefully, the DR-22WL has a camera tripod bush on its back.

With a homebuilt adaptor and a pair of tieclip mikes, I was able to capture the soundtrack of an interview film I'm making. The clarity was excellent, and noise low (note by the way that Wi-fi doesn't introduce any unwanted artifacts). However, some fixed-level line sources (I tried a CD player) are just too much for the DR-22WL, even with the limiter/'peak reduction' facility engaged and the recording level set to minimum.

I would recommend sticking with the 'manual' mode unless you have no practical alternative ('set and forget' unattended sessions, for example), as the auto level control can 'pump' audibly.

As a player, the DR-22WL acquits itself very well – with its own recordings, or music you copy to its MicroSD card (capacities of up to 128GB are currently supported, by the way). Listening with Sony MDR-1Rs shows there's plenty of drive – more so than some dedicated music players! - coupled with a good tonal balance.

**CONCLUSION**

Brilliant! It costs the same as a budget CD player but does a whole lot more; you could be making your own recordings, instead of just listening to the efforts of others. Sure, listen closely with high-grade hi-fi and you won't fail to distinguish the DR-22WL from the sort of gear the Beeb are using. But it gets surprisingly close in many respects.

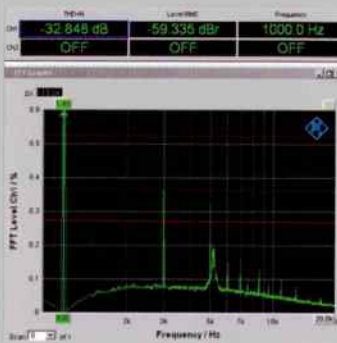


**For outdoor use - such as the recording of ambience seen here - a windshield is recommended as one isn't supplied. Maplin sells one (around £6) that does the job - you want the larger of the two types sold online and in its high-street stores. The handy 'mini tripod' came from a pound shop.**

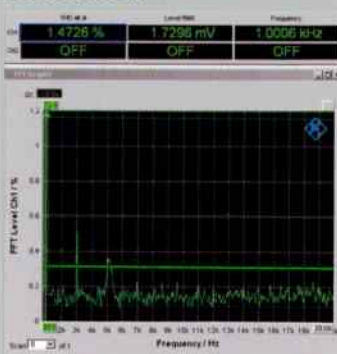
**MEASURED PERFORMANCE**

Frequency response of the DR-22WL measured flat from 20Hz to 46kHz using the Tascam's highest sampling rate of 96kHz, so bandwidth wise it gets the full benefit from this high rate with an upper limit that is close to the theoretical maximum.

Dynamic range, from line input to line output, measured 93dB. Although this is lower than CD (102dB) and seemingly poor for 24bit resolution, **DYNAMIC RANGE (33+60dB)**



**DISTORTION**



in practice it is good for a signal that traverses high gain input stage, an ADC and a DAC. Budget ADCs are noisy and this is likely limits the small DR-22WL.

The line input is purposed to cope with external microphones and is consequently very sensitive, at full gain (90 on the input gain scale) needing just 3mV for peak record level (0dB). At minimum gain, flagged on the display as -45dB, it took 600mV (-46dB) to achieve 0dB. No further attenuation was possible, so this input would be overloaded by 2V from a CD player, or 1V from a modern VHF/FM tuner (1V), if not from an older tuner (0.3V).

The output amplifier delivers a healthy 1.3V maximum before overload occurs (clipping) as volume is turned up – enough to drive all headphones, powered loudspeakers, or an external power amplifier.

The little DR-22WL measured well for what it is, having a good operating range and very respectable basic performance, even if it fell short of full 24bit resolution. **NK**

Frequency response (-1dB)	CD	20Hz-46kHz
Distortion	0dB	0.06
	-60dB	1.5%
Separation (1kHz)		88dB
Noise (IEC A)		-91dB
Dynamic range		93dB
Output		1.3V
Input		3-600mV

**TASCAM DR-22WL**  
**£130**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

**VEROICT**  
Features, performance and usability in one affordable package. Treat yourself – and (re)discover a great hobby!

**FOR**  
- numerous features provide supreme flexibility  
- surprisingly-capable sonically  
- cheap to run - micro-SD cards and AA batteries

**AGAINST**  
- microphone array cannot be angled, thereby enabling transducers to face forwards if the recorder's in your pocket!  
- no lossless (e.g., FLAC) recording mode

Tascam  
www.tascam.eu/en/index.html  
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# Amazing Grace

Grace Design's m920 headphone amp/DAC/preamp combines pro-audio roots with audiophile credentials to tremendous effect, says Jon Myles.

**T**here's a long tradition of professional studio gear crossing over into the domestic market to become a firm favourite with hi-fi fans. Over the years no end of monitor loudspeakers have made the jump – the most famous being the BBC's legendary LS3/5.

The trend has not been quite so pronounced on the electronics side of the industry, until recently when the increasing prevalence of the standalone DAC and headphone amplifier saw a number of pro-gear manufacturers finding a ready market for their products amongst home audiophiles.

One such company is the USA's Grace Design, founded in 1994 by brothers Michael and Eben Grace. In the intervening years the

company has built up an impressive range of clients including the New York Metropolitan Opera House, Skywalker Sound, Dolby Laboratories, Shure Microphones and even Stevie Wonder.

But Grace first came to the serious attention of the audiophile fraternity in 2001 with the launch of its m901 model, one of the first commercially available 24/96 headphone amp/DACs on the market.

That was updated to the 24/192-capable m902 in 2005 and followed by the m903 in 2011 which added a new asynchronous USB interface as well as both balanced and unbalanced outputs; it drew high praise from the hi-fi press and headphone enthusiasts. Indeed it achieved a Five Globe rating back in Hi-Fi World's July 2012 issue.

Now the model has been upgraded again, this time to m920

status and in a nod to Grace Design's pro-audio background is described as a 'High Resolution Monitoring System'.

Outwardly it looks little different to its predecessors, being a sturdily built, brushed aluminium unit, measuring 1.7in x 8.5in x 8.25in (H/W/D) and weighing in at a reassuringly solid 2.2kg.

It's inside, however, that the most significant changes have taken place. The Burr Brown digital to analogue converters used in the m903 have been replaced by the latest ESS Sabre32 DAC – widely acknowledged as one of the best on the market at the moment.

As well as handling PCM files of up to 32bit/384kHz, the Sabre also allows for playback of both 64x and 128x DSD. It also features three user-selectable filter options: fast, slow and



minimum phase, so users can tailor the sound to their individual taste either for entire listening sessions or to suit individual music selections.

Grace has also improved its proprietary s-Lock system, which is a dual-stage 'phase lock loop' circuit aimed at reducing jitter from non-USB digital sources.

Other interesting features include a crossfeed option (dubbed xfeed) which subtly blends part of the right and left channel outputs together to better simulate the sensation of loudspeakers when listening through headphones – especially useful on recordings featuring hard-panned left/right stereo effects.

All the various functions are accessed via the busy front panel which features two headphone outputs, the power switch, input selector as well as a series of small LEDs to indicate incoming sample rate as well as the rotary volume control and a small but clear display panel. Holding down the volume control for three seconds and then turning it right or left gives access to the various menu options – although some of the symbols used can be a little cryptic so keeping the instruction book handy is pretty mandatory until you become familiar with the m920's operation.

A row of small lights beneath

the display indicate which output has been selected – headphones, line one, line two or both line one and two together.

Around the back input connections include USB, unbalanced RCA, balanced XLRs and AES3 as well as digital coaxial and Toslink. Both unbalanced and balanced outputs are provided, although unusually the latter are on 1/4" TRS sockets which is either another nod to the m920's pro-audio roots or simply because there wasn't enough room for an extra set of the more common three-pin XLRs.

## SOUND QUALITY

Right from the off the m920 comes across as a highly-resolving performer. Plugging in a pair of Oppo's PM2 planar magnetic headphones, Dylan Howe's 'Subterranean' had tremendous extension at both ends

of the frequency spectrum.

The Oppos can sound a little soft but the m920 seemed to brush this tendency aside to portray the music with masses of bite and detail. Howe's delicate cymbal work positively shimmered with the right sense of brush hitting metal while bass was tight and punchy but never



*Despite its relatively small form factor the Grace uses a beefy toroidal transformer as the basis of its power supply.*





**Inspire Hi-Fi**

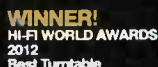
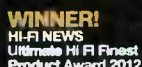
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**Black Rhodium Black Rhodium Black Rhodium Black Rhodium Black Rhodium**

# Duet DCT++ CS

## Low Distortion Loudspeaker Cable



by **Black Rhodium**

"Compared to many high-end cables whose bulk and rigidity (or fragility) seem contrived to make their installation as arduous as possible, Black Rhodium's Duet DCT++ CS is a positive joy to hook up. But while the cable is unusually 'bendable' its sound has real spine – its bass powerful and robust while the treble is smooth rather than incisive or biting. Certainly one for the shortlist, the Duet's warm quality is suited to sharp-sounding systems."  
**Paul Miller, Hi-Fi News, March 2015**



+44 (0)1332 342 233 • sales@blackrhodium.co.uk • www.blackrhodium.co.uk/duet

overpowering.

Playing Led Zeppelin's 'When The Levee Breaks' there was a tremendous integrity to the music. This is a dense mix but the m920 pulled off the trick of letting the individual instruments have their own space without losing any of the bone-crushing power of the track. I've rarely heard John Bonham's drumming sound as powerful through any headphone amplifier.

Swapping the Oppos for a pair of ADL HI28s the sense of detail remained, except the more forward nature of the latter headphones imbued the music with even more drive and tempo, showing the m920 is adept at highlighting differences between partnering equipment.

As ever with ESS Sabre DAC-equipped components, changing between the three filter options does subtly alter the sound – although bear in mind the effect is dependent on the bit-rate and production quality of the material being played. I tended to gravitate towards minimum phase which seemed to give a slightly richer bass but opinions will vary.

Also, the xfeed feature was intriguing. Switched in it seemed to bring a wider soundstage, allowing the music to float a little more freely outside the headphones – although the overall mix sounded

a little busier with perhaps not so much forensic detail.

Using the m920 as a DAC/preamp combination into the power amp section of a Creek Evolution 100A showed its talents are not confined to the headphone section alone.

The Clash's 'Bankrobber' had focus to the vocals and instrumental backing, through the frequency range. Again the m920 was adept at highlighting detail yet never sounded sterile or overly mechanical in the manner of some DAC/preamp combinations.

It also evinced excellent rhythm and timing thanks to a supple, agile feel that never let the music wallow. Part of this is down to its bass reproduction which was tonally rich and complex – and a world away from the one-box thump of lesser products.

Playing 'Passage To Hades', Jah

Wobble's throbbing bass didn't just underpin the music but wound sinuously around Evan Parker's saxophone improvisations so both were operating as melodic counterpoints.

And that's what the m920 does so well – simply play music superbly, whether as a supremely confident headphone amplifier via either analogue or digital inputs or as a DAC/preamp feeding a good power amplifier. As such it's capable of forming the heart of a very good system indeed.

### CONCLUSION

It may look a little utilitarian but the sound the m920 produces is anything but. This is a rich, detailed and musical headphone amp/DAC and preamp combination that bears comparison to some of the best on the market. Recommended without reservation.

**Both balanced and unbalanced inputs and outputs are provided, along with an AES3 input and the usual co-axial, Toslink and USB connections. Note that the balanced out connection is on 1/4" TRS sockets.**



## MEASURED PERFORMANCE

The Grace m920 had a gain of x3 (dB) from its analogue Line input to the headphone output sockets, and no less than 5.8V was available for headphones where most need 1V-2V, so there is plenty to spare. Curiously, there was slight attenuation of x0.8 from XLR input to headphone output. Both inputs were wideband, with an upper limit beyond 80kHz, and low distortion (0.001% at 1V out).

All three S/PDIF digital input – AES/EBU, Optical (Tos) and Electrical – processed a 192kHz sample rate signal; no limitation was imposed by the optical receiver. Frequency response extended to 60kHz (-1dB) before slowly rolling away to the 96kHz upper limit, our analysis shows. Distortion from 16bit (i.e. CD) measured 0.21% at -60dB, and with 24bit resolution 0.03% – both low values. However, some quantisation noise products existed close to the fundamental and these limited EIAJ Dynamic Range to 116dB via Optical and Electrical, and 117dB via AES/EBU, where the Sabre32

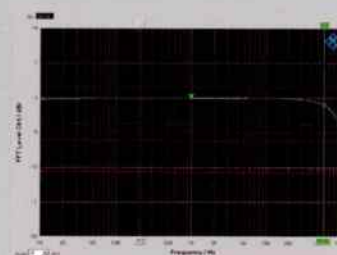
is specified as and usually manages 123dB.

The USB input processes 96kHz sample rate maximum, below 192kHz or 384kHz now being achieved. Frequency response measured flat to 46kHz (-1dB) and a full level signal (0dB) provided full 5.8V output from the headphone socket. Distortion at -60dB measured 0.09% and EIAJ Dynamic Range was 115dB, just 1dB below S/PDIF due to a little noise. This isn't very consequential however.

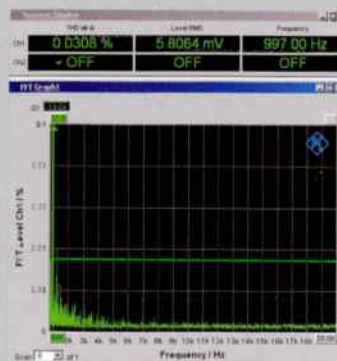
The m920 measured well and reaches high standards. However, it doesn't get the best from the Sabre32 DAC that can manage 6dB more dynamic range. **NK**

<b>Frequency response (-1dB)4Hz-60kHz</b>	
<b>Distortion</b>	
<b>0dB</b>	<b>0.0008%</b>
<b>-60dB</b>	<b>0.03%</b>
<b>Separation (1kHz)</b>	<b>96dB</b>
<b>Noise (IEC A)</b>	<b>-115dB</b>
<b>Dynamic range</b>	<b>116dB</b>
<b>Output (headphone)</b>	<b>5.8V</b>

### FREQUENCY RESPONSE



### DISTORTION, 24bit



## GRACE DESIGN M920 £1500



**OUTSTANDING - amongst the best**

### VERDICT

Great sound allied to tremendous versatility makes the m920 a winning combination

### FOR

- detail
- strong, accurate bass
- digital filter options
- comprehensive inputs

### AGAINST

- cluttered fascia
- complex menu structure

Criterion Audio Ltd  
+ 44 (0)1223 233730  
www.criterionaudio.com



The one metre high cabinet is well finished and stout bi-wiring terminals have removable links.

too hard to impress down below.

A little fine-tuning courtesy of a pair of bungs inserted into the downward-firing reflex ports helped tame this. Bass was appreciably more tight and tuneful with the extended drum roll on Stravinsky's 'Firebird Suite' sounding more lifelike. The XT 8Fs still had power, but with increased realism and timbre. It's to be hoped Tannoy consider packing in bungs on future shipments to allow customers to fine tune the 'speakers if required. Especially as in most other aspects the Revolutions are hugely enjoyable.

They latch onto a rhythm well, positively bounding along to the likes of New Order's 'Bizarre Love Triangle'. And the Dual Concentric driver's traditional strengths of a wide soundstage and pinpoint stereo imaging are present and correct. With acoustic jazz such as Wayne Shorter's 'Beyond The Sound Barrier', images are placed precisely and I could easily hear Shorter's saxophone drift between the 'speakers as he moves across the stage.

These loudspeakers had an expansive, immersive sound that



A newly developed 8in Dual-concentric drive unit with single magnet and shallower cone, also has a bullet waveguide to direct treble outward smoothly.

encouraged me to extend listening sessions just a little bit longer.

**CONCLUSION**

In the final analysis the new Revolution XT 8Fs were not totally accurate; they had a slight treble lift and upper-bass emphasis. But that does give them a lively, propulsive nature. We found that if their low-end is tamed through the use of acoustic foam damping bungs then they are an engaging listen – and great at the price.

**MEASURED PERFORMANCE**

Our frequency response analysis of Tannoy's new floorstanding XT 8F shows it is smooth and flat across most of the audio band and there's no crossover dip around 3kHz to reduce detail.

Treble rises a little above 6kHz, by enough to ensure the XT 8F will sound a little obvious up top. The amount of lift – a few dB – is low and there is no peaking from resonance, so quality should be good.

Down at the low frequency end, Tannoy have also lifted bass by around +2dB across a wide plateau (green trace), with a peak at 60Hz. This is enough to ensure bass will be prominent too, but it also suggests bass is underdamped and will excite a room, so in-room the XT 8F may well sound bass heavy. We checked this and it did in a big room that provides no modal support. There was slight but obvious cabinet boom too.

Putting a large foam bung into the downward facing port transformed the XT 8F, removing the cabinet boom and tightening bass so it better "played a tune". Our white trace shows that bass

peaking at 60Hz was removed by doing this and overall bass energy usefully reduced. The port (red trace) peaks high at 80Hz and is also under-damped – unusual port behaviour; ports are usually tuned low, not high. But because the XT 8F cuts off sharply below 50Hz it will not excite low room modes, lessening room boom; it also means subsonics will be absent. The foam port bung slightly increases low bass whilst taming the peak (white trace), a benefit.

Sensitivity was high, measuring 90.5dB sound pressure level from one nominal Watt of input (2.8V). But the bass unit has a d.c.r of just 2.7 Ohms – the lowest we have ever measured – and our impedance curve shows the Tannoy is a very low impedance loudspeaker – down to 3 Ohms at low frequencies. Potentially, it will draw heavy current from an amplifier, but with such high voltage sensitivity volume will be kept low and power drawn limited; amplifiers of 40 Watts or so will be fine and valve amps with 4 Ohm taps will suit.

The Tannoy XT 8Fs measure well, even if they are a tad unusual in places.

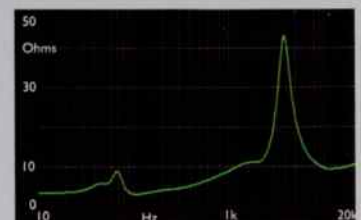
They tick all the Tannoy boxes, offering a basically accurate sound, if slightly enhanced. They have very high sensitivity and will go loud from little power. Foam port bungs get the best from them – and the best is very good. **NK**

**FREQUENCY RESPONSE**

Green - driver output  
Red - port output



**IMPEDANCE**



**TANNOY  
REVOLUTION XT 8F  
£1299**



**OUTSTANDING - amongst the best**

**VERDICT**

A lively, engaging floorstander with a big, bouncy sound and excellent sound staging abilities. Makes all genres of music sound fun.

**FOR**

- stereo imaging
- smooth mid and treble
- need little power

**AGAINST**

- boomy bass at high volume, without bung

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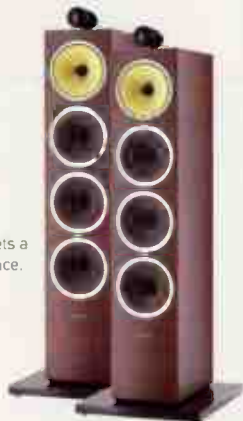
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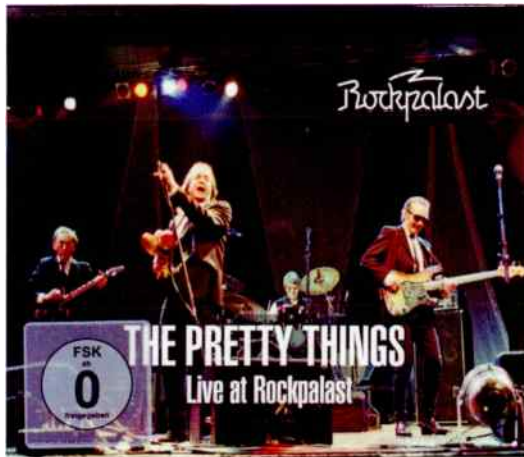
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**THE PRETTY THINGS**

**Live At Rockpalast 1998, 2004 & 2007 Repertoire**

**A**nd we say a warm welcome to Repertoire in this column. Long overdue and quite a series to do it with. Rockpalast was a music-based TV series broadcast on German TV, the WDR channel to be precise. It started in 1974 and featured many varied artists covering all musical genres and was stuffed with rarities which many fans have tried to grab and have appeared in many bootleg forms of varying quality. This series from Repertoire, though, is the real deal and features much that has never been seen.

In this case, The Pretty Things package includes a CD plus two DVDs: firstly, there is a Christmas Special, Philipshalle, Dusseldorf, 19 December 1998 (that includes the J. Geils band) and a pair of Crossroads Festival appearances at Harmonie, Bonn on 8 October 2004 (including a guest appearance from guitarist Sonny Landreth) and

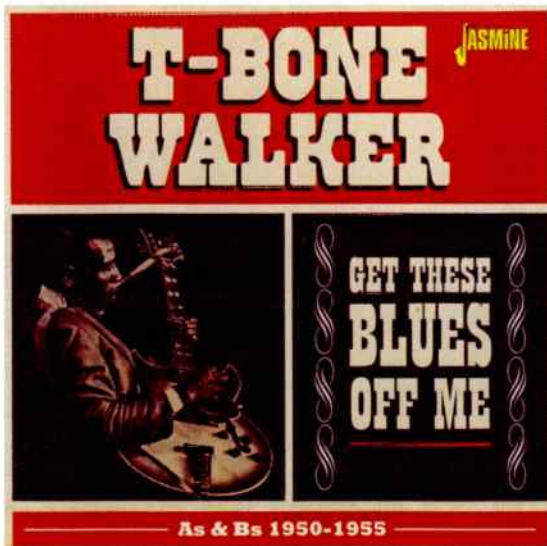
19 October 2007 (the J. Geils Band again). There's also a couple of interviews with the band too.

An excellent four hour or so package that includes 'Road Runner', 'Private Sorrow', 'Don't Bring Me Down' and 'L.S.D.', this set provides rare footage that every Pretty Things fan will want in their collection.

The fact that it's multi-media just adds to the value. The packaging is also of a high quality with a multi-page, colour glossy booklet featuring new liner notes from each member of the band and their memories of the gigs, including a meet up with Van Morrison and memories of Them.

There are more releases in this series featuring the likes of Man, Wayne County & The Electric Chairs, Willy deVille, Mink DeVille, Sniff 'N' Tears, Michael Chapman, Chas & Dave, Henry McCullough Band and the Tyla Gang.

All feature at least one CD and one DVD, sometimes more.



**T-BONE WALKER**

**Get These Blues Off Me Jasmine**

**W**hen you think of electric blues guitar you might consider the likes of B.B. King or Lightnin' Hopkins but the source of the modern electric blues guitar goes back further than that. In fact, right back to T-Bone Walker. He was doing his electric thing right back around 1940. The revolution from that moment can still be felt

I mentioned B.B. King. He cited Walker as a direct influence on his career. There were plenty of other blues greats who sprang direct from the Walker guitar, though. Gatemouth Brown and Pee Wee Crayton being just two.

To begin with, T-Bone...wasn't. He was Aaron Thibeault Walker from Dallas, a guy who learnt to play every stringed instrument that he could get his hands on until he teamed up with Blind Lemon Jackson, escorting the venerable blues man from bar to bar to allow

Jackson to play for tips.

Walker debuted for Columbia in 1929 and would later play with greats such as Charlie Christian. When he electrified his guitar he also combined it with acrobatic manoeuvres such as splits and playing behind his back. Signing for Capitol in 1942 he began to show the style that his fans know and love.

This collection focuses on Walker at Imperial featuring the likes of 'The Hustle Is On', 'Cold Cold Feeling', 'Blue Mood' and 'Vida Lee'.

It packs two discs of top notch songs and fifty-two tracks. A superb collection. Other releases from Jasmine, this month, include Slim Harpo's 'I'm a King Bee 1957-1961', Mark Dinning's 'Teen Angels And Other Lovers: Two Complete Albums and a Collection of Singles 1957-1962' and 'Watching The Detectives', themes and music from classic TV shows and movies from

The band formed in 1971 as a jazz-rock trio consisting of Colin Hodgkinson, Ron Asprey and Tony Hicks. Back Door could have been just another band but they had one security weapon, our Colin. Hodgkinson was a mighty bass player in the league of John Entwistle, Chris Squire and Jack Bruce. More than even these legends, Hodgkinson didn't even have to battle with lead guitars to make himself heard. He was the lead guitar. There was nothing else. He strummed chords on it the way you'd expect someone to with a six-string.

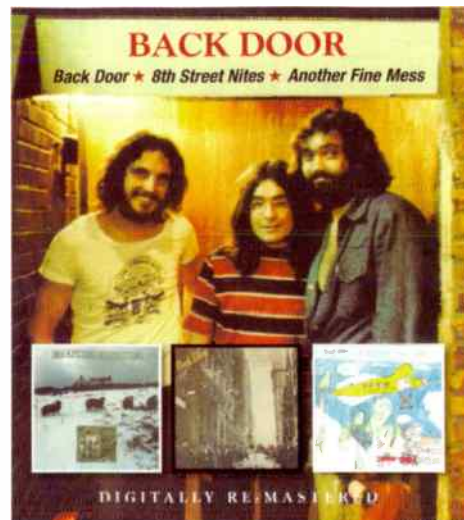
Hence, this beautifully released 2CD pack includes three of Back Door's albums: 'Back Door' (1973); '8th Street Nites' (1973) and 'Another Fine Mess' (1974). Buy them and you're in for a real treat.

For example, the self-titled instrumental album is impressive from start to finish and a joy for bass guitar fans who will be totally

humbled by Hodgkinson, I'm sure, while '8th Street Nites' is another cracker, although it wanders a touch.

It reaches new heights on occasion when Hodgkinson plays unaccompanied blues bass. To hear Hodgkinson powering away at an old Robert Johnson song with his bass is enough to flatten you.

Also released via BGO is a 2CD, four album pack from Billy J Kramer including a selection of intriguing Lennon & McCartney tracks; two albums from The Incredible String Band: 'U' (1970) and 'I Looked Up' (1970); John Peel favourites, blues/rock/country outfit Legend's 'Legend ('Red Boot')' (1970) and 'Moonshine' (1971) and the power blues sound of the James Gang's 'Bang' (1973) and 'Miami' (1974). Also in there is the country output of Jerry Lee Lewis including 1972's 'Who's Gonna Play This Old Piano (Think About it Darlin')' and 'Sometimes A Memory Ain't Enough' (1973).



**BACK DOOR**

**Back Door/8th Street Nites/  
Another Fine Mess  
BGO**

Goodness gracious, this box set is impressive. What you've got here is a compact, rather heavy, sturdy set that crams within 230 remastered Northern soul tracks spread over eight CDs plus two DVDs and a 160-page book.

The music of Northern Soul is basically the more obscure output from American soul labels such as Motown, Stax, Okeh and more but the culture that stemmed from that evolved and presaged the modern club movement, although you could make a case and say that the Northern soul movement was both purer and more innocent in prioritising the music over and above any stimulants.

In this case, alcohol-free club nights, arranged by the fans themselves, that were devoted to dancing to the music they loved in clubs that would become legendary. Places like Manchester's Twisted Wheel in 1968 through to The

Golden Torch, Blackpool Mecca, Wigan Casino and Cleethorpes Pier in the 1970s. From there, our journey takes us to Stafford Top of The World and the 100 Club in the 80s to the soul weekends and the 100 Club (again) from the 90s to the present day.

The ten hours of music has been curated by the head of Harmless Records and 1970s Northern Soul DJ and aficionado Ian Dewhirst and includes tracks such as 'Wrapped Tied & Tangled' from Lavern Baker, 'Try Me For Your New Love' by Junior McCants and Melba Moore's 'The Magic Touch'.

Meanwhile, on one DVD you've got journalist and broadcaster Simon White interviewing the scene's best known characters within the film 'Keep On Moving On' and Northern Soul legend Richard Searling interviewing enigmatic record dealer John Anderson as well as Philadelphia International's Kenny Gamble for the other DVD.



**THE ODYSSEY**

**A Northern Soul Time Capsule:  
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Harmless**



# "Boffins see the MC phono cartridge as an interesting design challenge because it is ultra low noise"



Noel Keywood

**D**avid Lord's 'A Matter of Balance' article (p88) captured my interest in many very different ways. Most obviously – and importantly – it runs through the nitty gritty of how we connect up our turntable today and why what we do is all wrong – top man!

Behind the issue of sound quality there are other planes of interest. Nowadays most hi-fi is designed not by hi-fi manufacturers, but by big silicon chip producers that you may never have heard of. These guys run the world. That might seem a grandiose statement, but most of what you use today – mobile phones, i-pads, televisions and all – are at heart designed by big companies like Texas Instruments, Analogue Devices, Wolfson Semiconductor, ESS – to name a few active in audio. Then there's the military, medicine and on and on... So what we get in hi-fi is what we are given by big manufacturers almost unknown to us, with the arguable exception of Intel who make the chip in your PC...

This is a point David Lord's article quietly makes: ultimately performance is defined by the silicon chips such companies design and manufacture, not by the hi-fi manufacturers – unglamorously known as box stuffers – who use them in commercial products.

David uses a relatively expensive, high performance low noise preamp chip from Linear Technology to produce a low noise moving coil cartridge head amplifier. This is available to hi-fi manufacturers, although not so many use it because at £13 the LT1028 is relatively expensive.

Expensive? Yes, you need two of them, one per channel, and this comes to a massive £26. That's getting close to a major apart like a mains transformer or even the casework.

Manufacturers must add their margin to the cost of the part, and there is a dealer margin and one for an overseas importer and local dealer. As a result there is often a x5 difference between manufacturing cost and retail price, ignoring sales tax like VAT. So now £26 worth of LT1028s in this project amount to £130.

That's a lot of money. And it is merely the cost of the chips. Add in a case at £30 and power supply at £20, a £6 circuit board and £20 of components (all low prices) you are looking at a total parts cost of £102, suggesting a retail price somewhere around £500 – just for a small, low noise head amp.

Faced with a price this high the first thing most manufacturers want to do is to get the parts cost down, to ensure the product sells. And this is where David's project becomes interesting in the trade offs it highlights.

Firstly, peering at the RS Components on-line catalogue I see you can buy a Linear Technology LT1028 with their name stamped on it, or you can buy an LT1028 that costs half as much that – surprise, surprise – has no manufacturers name marked on it.

This is almost certainly a "generic part", meaning a copy out of some unknown Far Eastern factory. It will be LT1028-like, but not identical so as not to be a forgery. It may well be good, but is most likely to be worse, and that may mean more noise and more d.c. drift at the input terminals, threatening to drive current through the cartridge coils – not good.

Since using this part – price £6 – shaves £14 off the parts cost and £70 off the retail cost, bringing the shelf price to £430, there's a great temptation to use it.

Perfect – except this is a standard part and hi-fi is all about perfection, not imperfection.

By my calculations, if you use a LT1028 optimally you end up with a very low input noise level of 0.08µV. Connect up an MC cartridge and hiss will be almost absent even at high volume. However, whilst a few preamps I measure have such a low noise floor (and almost all transformers do), most are noisier by a good 6dB or so (i.e. 0.16µV input noise) and hiss will be quite obviously louder.

I think we can deduce then that an LT1028 isn't being used, nor any of the few chips that rival it from That Corporation, Analogue Devices and others. In which case we may then be looking at general purpose low noise preamp chips, not optimised for phono stages and microphones, which exist in quantity and are inevitably much cheaper. So we are out of hi-fi in intent, and into general Jimmy manufacturing. It doesn't impress me one little bit, but it is all too common in commercial hi-fi.

The big chip manufacturers actually do design chips just for MC cartridges. Their boffins see the MC phono cartridge as an interesting design challenge because it is ultra low noise. If you can produce a chip that's good enough to be acceptable here, then it will also be acceptable in microphone preamps and instrumentation amplifiers. In consequence a lot of work is put into this part and the hi-fi business isn't short of choice. Nor is it short of advice on how to get the best from such preamps. but it isn't being followed.

David Lord's Matter of Balance touches obliquely on so much of this, describing the underlying technology in an easy to read manner, and showing just what is required for low noise and balanced working. That's why it captured my interest. I hope you like it and enjoy building the circuits. Good luck with the Veroboard! ●

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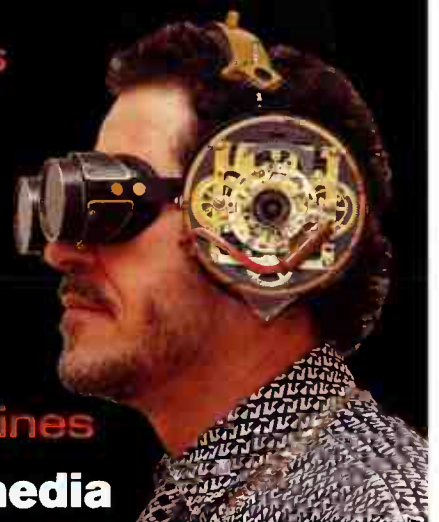
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"The genre exploded like a Roman Candle, going off in all directions at once"



Paul Rigby

I recently talked about the psychedelic music genre. While tracking more of this oft neglected music down, I stumbled across interviews from artists involved, telling how their lives changed completely in and around it. It was a heady time but its causal roots reached back further into history, World War II in fact. This global event resulted in effects akin to a petrol-driven version of the Internet.

You can see the similarities. People who would never have normally met each other (because of class, job position or financial means) mixed freely during WW2. Knowledge was exchanged between disparate groups of people leading to an explosion of new ideas and cross cultural revolutions. Information previously retained within communal and national boundaries was freely exchanged, assimilated and digested and then brought home to be implemented in new and innovative ways. War had accelerated the development of military technologies but it had also revolutionised consumer products.

Social bonds changed forever. The old and the young saw what was possible. It scared the life out of the former who tried to restrain it while it excited the latter who tried to accelerate it, causing clashes and the famed 'generation gap'.

It also caused the biggest cultural renaissance that the world has ever seen in terms of music, art, fashion and more.

This was the basis of psychedelia, the moment young people became young and irresponsible again. When they dared to be innocent and silly and stopped aping their parents: becoming adults at the age of sixteen.

Suddenly, youngsters said "What happens...if I don't want to? What happens...if I stop? What happens...if I

just let go? Let's do it and find out".

Often, the result was a musical group. A psychedelic group, in fact. Psychedelic in that they were keen to experiment. In many ways. That is, experimenting with creative and social structures, drugs, language and more.

The record label Tune In ([www.cherryred.co.uk](http://www.cherryred.co.uk)), is a great source for music of this type. For example – and how about this for a name of a group – NGC-4594 (in fact, the galactic location for the nearest black hole to Earth) entered fully into the drug, sex, rock culture of the time. The CD compilation, 'Skipping Through The Night' not only reveals that band's 'lost' 1967 album but tells of an underground group looking for answers.

Detaching yourself from a straight-laced society where you were expected to conform was incredibly liberating. Such was the case for the Merchants Of Dream and their 1969 LP 'Strange Night Voyage' which told of a Peter Pan-like story of pirates and crocodiles and eternal childhood.

One of the most famous groups within this niche is Strawberry Alarm Clock. Despite the wacky name there was plenty of musical talent within. There was, in fact, a real group there, with members who had played for a long time on the Southern California band scene. 'Incense And Peppermints' (1967) plus 'Wake Up... It's Tomorrow' prove that.

The debut release, 'Incense...' was a 'proper' album, which belies the often derisory comments cast at this genre. In fact, the album showed a measure of skill and craft in terms of its multi-layered harmonies with garage-like energy and styles that ranged between the flow of Love and the raw aspects of Spirit.

The output from the psychedelic era ranged widely from excellent to

horrendously bad but that's fine. Fine because the music reflected a time and a place.

These were people who were discovering freedoms, finding the powers – or otherwise – behind them, and testing boundaries. The music reflected their movements within society. Hence, some things worked, others did not.

The Hook and 'The Hook Will Grab You' was a case in point. They combined a power trio ethic but had a silly, goofy side to their presentation with songs like 'Everything's Groovy': you can just imagine, can't you? While 'Garbage Man' tells the story of a young girl infatuated with the neighbourhood's smelly, unkempt sanitation worker.

This is twisted psychedelia. This album is a sort of 'education through play'. What to do and what not to do. It lacks sophistication and craft but is infused by joyous energy which carries you along.

As does the innocence and ethereal strangeness of Wichita Fall's 'Life Is But A Dream' which has been described as orchestrated pop. Dream-like, yes. Certainly provocative in nature, the album offers plenty for fans of vocal harmony and late era Beatles-esque sound structures. It is, at times, quite beautiful.

I love the psychedelic era because of its imperfections and lack of structure. The genre exploded like a Roman Candle, going off in all directions at once.

The downside for music fans is a lack of coherence. The upside is that, in musical terms, it tried everything, all at once. This scatter gun effect resulted in projects of complete and total brilliance.

The fun part for any fan of the genre is acting like the proverbial gold hunter. Sometimes you find precious nuggets and, if you're very lucky, you hit the motherlode. ●

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"you can subtly tailor the sound to suit your particular preferences"



Jon Myles

**U**pgradeitis. We all get it, don't we? It seems to be an ingrained behavioural trait of every hi-fi enthusiast. No matter how musical, well sorted and detailed your system, there's always the nagging thought that it could be just a little bit better.

Maybe a better amplifier, streamer, CD player or cartridge would be the answer – the magical ingredient that elevates listening sessions from merely enjoyable to something approaching a transcendental experience.

Or perhaps you should take a punt on those new loudspeaker stands crafted from the wood of a rare and only recently discovered tree that grows deep in the heart of the Amazon rain forest but whose acoustic properties have been known to indigenous tribes for thousands of years? Whatever it takes you just know there's something out there that can improve the sound.

I know this because I've been down the same road many, many times over the years. New front-end, new amplification, better loudspeakers – but all too soon starting to think just how much more pleasure I could be getting if I upgraded just the one part of my system that needed it – but which part?

The drawback, obviously, is that this is an often expensive project. The higher you go up the audio chain the more you tend to have to spend to get a noticeable improvement. But the more important drawback is that often we are upgrading expensive pieces of equipment when perhaps we haven't got the best out of them in the first place.

This has been brought home forcefully to me in the past few months while I've had the pleasure of reviewing a number of loudspeaker

cables and interconnects. Now, I know there's are people out there who cling to the mantra that cables make no significant difference and the more expensive of their ilk are no more than a marketing con foisted onto a gullible public by greedy manufacturers. But anyone who has actually listened to various interconnects and loudspeaker cables in a settled system knows they can make a tremendous difference to the sound. Whether that difference is for the better or for the worse is the key here.

Which is where my recent listening experiences proved so informative. Testing a series of new cables from respected manufacturers such as Tellurium Q, Black Rhodium, Chord Company and Atlas proved one thing – in every case each product made a significant improvement to one or more elements of the overall sound than what I was using previously. And not just on one system but in a whole variety of set-ups from the relatively modest, to the truly high-end.

One particular set of loudspeaker cables and interconnects made such a significance difference to the timing and overall openness of the sound on Hi-Fi World's reference system (a combination of components costing in excess of £20,000) that I couldn't resist trying them out on some decidedly less exotic equipment. And yet again, the effect was the same, with improved timing, a sense that the music was less smeared and a clearer top-end.

These particular cables aren't exactly cheap – they'll set you back a good few hundred pounds for a decent terminated length – but I'd argue you'd have to spend at least as much or probably more to get the same level of improvement by upgrading your amplifier or loudspeakers.

And cables don't have to be expensive to make a marked improvement. One of the interconnects under review came in at a decidedly reasonable £35 and brought a firmer bass and richer midband when used between a Naim CD5i silver disc spinner and Creek Evolution 100A amplifier – an impressive result considering the wallet-friendly price. Indeed, with this particular combination I actually preferred the budget interconnect to a more expensive alternative from the same company's range.

Of course, not everyone may like that particular presentation but the beauty of experimenting with cables is that you can subtly tailor the sound to suit your particular preferences. You could perhaps think of them as a more sophisticated form of those tone controls so beloved of amplifier designers back in the 1970s.

Interestingly here, Tellurium Q – who have enjoyed great success with cables designed to combat phase distortion – now delineates its products not in terms of price but in the sonic attributes of each of its three ranges. Therefore Blue has a slight warmth, Black is more natural and neutral and so on. The idea is obviously to make it easier for consumers to choose a cable that suits their desired sound and the character of their system.

If your equipment is below par in the first place then spending heavily on new loudspeaker cables or interconnects isn't going to bring any benefit.

But if you are looking for an improvement in a particular area then I'd recommend looking at what your cables are doing first before rushing to upgrade the electronics. You may well find your current set-up can perform much better than you ever imagined for an outlay considerably less than you were originally planning. ●



# "Older hi-fi, as featured in Olde Worlde, can be kept going with a bit of ingenuity"



Martin Pipe

**E**lsewhere in these pages, I revisited the Philips CD104 CD player. It was my first foray into digital audio – and I suspect that of many other readers too. What became clear, apart from a sound that has unexpectedly stood the test of time, was how fantastic the build-quality is. It's almost as if Philips took a financial 'hit' on each player sold, in order to establish CD as the worldwide 'de-facto' music-carrier standard. I paid £190 (give or take a penny) for my CD104 – about £500 in today's terms.

I can't think of any £500 consumer product currently being sold that's as well-built. You would, I suspect, be willing to pay well over £1000 today. The CD104's design, unlike so much modern gear, allows for maintenance and repair. Repair of older designs is thus usually a practical option. Modern high-tech products are considerably more complex, but much of the extensive functionality they provide is packed into a small number of surface-mounted chips that are difficult (expensive in tooling and labour terms) to replace. The numerous connections of BGA (ball grid array) chips held to circuit boards with lead-free solder, the stuff of modern high-tech, often fail due to thermal cycling.

Some (an increasing number, sadly) of these products are difficult to disassemble in the first place; ugly screws spoil the 'consumer appeal', and cost money in what is after all a competitive global market. And you don't want to encourage the customer to take a peek inside – the 'no user-serviceable parts inside' is as relevant today as it was in the past. You might even need special tools to dismantle the case without damaging the finish that helped to

close the sale in the first place.

The screw-lidded CD104's circuitry consists of a large number of chips that are rather simple by today's standards. These chips are old-fashioned 'through-hole' types. They can be safely removed for replacement with nothing more than an anti-static wrist-strap and mat, a temperature-controlled soldering iron and a length of desoldering braid. One of the chips, an 8-bit microcontroller that forms part of the servo circuit, is even socketed – as you can see from the Olde Worlde photo!

That extensive bill of materials merely emphasises my original point. Well, if such 'loss-leading' was the plan then Philips succeeded. CDs are still bought and played today, nearly thirty-three years after the format was launched in the autumn of 1982. Philips is, alas, not the firm it was in the early 80s. Its once world-renowned consumer-electronics (CE) interests, with their numerous accomplishments and the wonderful audio and video products that so enriched our lives, have largely been divested. Buy a Philips audio system, and you buy just a 'brand'. Past glories are evidently a worthwhile marketing tool.

And Philips isn't the only one. It's difficult to make CE profitable, unless you're involved in a niche market (specialist hi-fi being an obvious case in point). Hitachi might have popularised MOSFET amplifiers and made some decent cassette decks, tuners and turntables but – like Philips – is now just a logo stuck on a Chinese-made OEM (original equipment manufacturer) product.

As people's confidence in the (UK) economy grows, they replace their consumer products with new ones – especially if the old ones are beginning to fail. Repair (and,

for that matter, servicing) isn't really an option any more, unless you're talking about the higher end of the market where products are desirable, expensive to buy and worth keeping going. Their owners forge a connection with them, and they attract sensible prices on the second-hand market.

These sorts of products are typically well-supported. Just think of firms like SME and Quad, and you'll understand that hi-fi is an obvious example. Older hi-fi, as featured in Olde Worlde, can be kept going with a bit of ingenuity – although supplies of 'genuine' spares are diminishing.

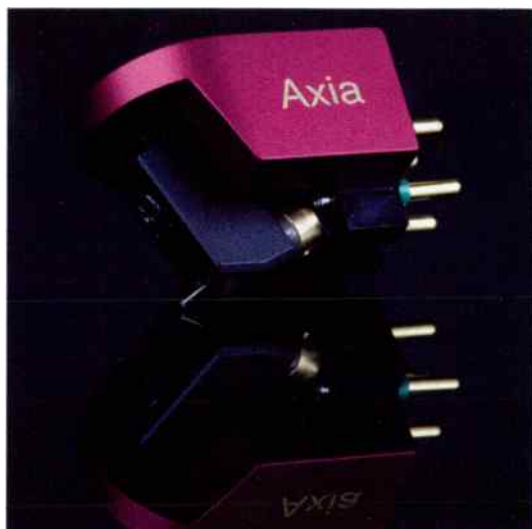
But gone are the days when every town would have one or more repair workshops to carry out this task. They've been priced out of existence, unless they can turn to additional services (such as consultancy and installation) for income. Repair, as I've said, needs special tools and equipment. Few if any 'small-operator' technicians will acquire these, as doing so would bump up the costs of repairs to an unviable level. How many customers will pay a repair bill approaching the cost of their product's newer and feature-enriched replacement? They will instead simply throw away the broken item, usually after buying its replacement from an online supplier.

Few members of the public have even heard of the comparatively-small hi-fi companies dedicated to making good, long life products, that appear in these pages. Hi-fi enthusiasts can continue to struggle to turn guide them to better-made hardware; or, until then, why not sell them the advantages of disposing of their old gear to those who might be able to do something with it, through services like Freecycle – which, by the way, has occasionally thrown up hi-fi systems. ●

# DECENT AUDIO

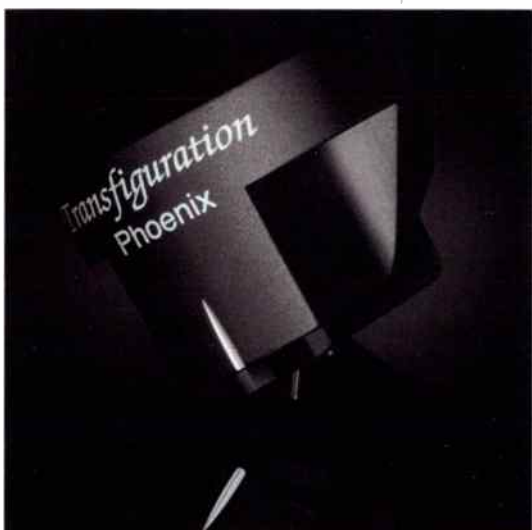
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'Outstanding Product' rating



# Heaven Sent

**Distinctive looks and a distinctive sound...Jon Myles takes a shine to a new pair of in-ear 'phones from Japan.**

**J**apan's Final Audio Design has been producing up-market hi-fi equipment since its inception more than four decades ago.

Over the years its portfolio has included MC cartridges and booster transformers, high-end electronics and some impressive loudspeakers including the likes of the massive Opus 204 that weighs 800kg and uses sand-filled ultra-thin aluminium cones.

Recently, though, the company has become better known on these shores for its series of innovative in-ear headphones, many of which feature expensive metal housings allied to custom-made drivers.

Latest to join Final Audio

Design's expanding range are the Heaven VII and Heaven VIII designs priced at £439 and £499 respectively. Apart from colour (matt black or silver for the VII, gold for the VIII) the two 'phones look outwardly similar.

The driver housings are constructed through a process known as Metal Injection Molding, where a fine metal powder is mixed with a binder material and resin before being sintered in a furnace at extremely high temperatures. Final Audio say this enables the casings to be constructed with high levels of precision and so help optimise acoustics to a degree not possible through standard machining.

It also means they can be made to look distinctive: the ridged,

geometric mosaic pattern on the backs of both models gives them a hand-crafted feel – a pleasant departure from run-of-the-mill in-ear 'phones.

Sound comes courtesy of a single balanced armature driver utilising Final Audio's proprietary Balancing Air Movement technology which is said to enhance bass and stereo imaging.

Both models are equipped with fixed 1.2m flat cables, said to reduce microphonic noise as well as eliminating annoying tangles. They are fitted with gold-plated connectors and weigh a relatively heavy 29g. Included in the box are also five different sizes of silicone eartips and – to add to the air of



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quality – a deluxe metal storage case resembling nothing less than a cigarette case from a bygone era.

All in all, both the Heaven VII and VIIIs exude quality and in terms of construction and presentation fully justify their price points. But, of course, what matters most is the sound...

### SOUND QUALITY

Clean, clear and detailed are the words that immediately spring to mind when using both the Heaven VII and Heaven VIIIs – but there are subtle differences to their individual sound.

Used on a variety of sources, including an iPhone, Astell&Kern digital portable and the excellent Grace Design m920 headphone amplifier reviewed elsewhere in this issue, the VII invariably sounded the more airy and neutral of the pair. The VIII had a lush, warmer tonality with slightly deeper bass. Don't take that to mean the VIIIs are short of dynamics, though, because both models excel in that area.

Listening to Alabama Shakes 'Boys & Girls' they cut through the congested mix with a control and sense of accuracy that strips bare the various layers of the music. Via the VIIs, realistic decay to the guitar notes imparted a great sense of atmosphere. Brittany Howard's

soulful vocals were pitched just right in the mix, with so much clarity I could hear the catch in her voice between lines.

There's the same overall presentation via the VIIIs, but here the bass dug a little bit deeper, while mids were slightly more forward, resulting in a richer overall sound.

Keeping with the VIIIs for ex-Bunnyman, Ian McCulloch's cover of Leonard Cohen's 'Hey, That's No Way To Say Goodbye', there was a nice sense of space to the sound. Unlike some in-ear 'phones, which sound as though they are pumping the music into your head, there was a broader soundstage on offer here, with a strong sense of width, depth and height.

The low-end was also richer and fuller than you'd expect from a single-driver in-ear phone. Bass on the Pet Shop Boys' 'Always On My Mind/In My House' was full and articulate with no sense of distortion when I pushed the volume up.

In fact, I've heard multiple-driver 'phones that offer less impact and definition. And while the VII is a little lighter in this area it isn't short of punch and has the same natural timbre as its slightly more expensive counterpart.

OK, you can get more extension (at both low and high end) with

something like the remarkable 10-driver Noble Wizard. But that's arguably one of the finest in-ear 'phones available and as such will cost you twice the price of the Final Audios. For their price, however, the latter offer a supremely balanced, articulate and – above all – detailed sound that's always engaging.

It would be wrong to label one model above the other as which you prefer will be a matter of personal taste. Of the two, the VIIs probably have the more neutral, even-sounding presentation while the VIIIs are voiced with a richer and deeper tonality.

But both are beautifully smooth and devoid of any undue stridence or artificial boost to either end of the frequency spectrum. Due to the crafted metal housings they are a little heavier than some rivals – but in use the Final Audios never felt uncomfortable.

So you can pay your money and take your choice. Whichever way you go, you're unlikely to be disappointed.

### CONCLUSION

Stunning build quality allied to extended frequency response and smooth, detailed sound make these Final Audio Design in-ear 'phones amongst the best at their respective price points.

#### FINAL AUDIO DESIGN HEAVEN VII £439



**OUTSTANDING** - amongst the best

#### VERDICT

Clean, clear presentation that sounds natural and airy but never lightweight.

#### FOR

- great build
- looks
- frequency extension
- clarity

#### AGAINST

- relatively heavy

#### FINAL AUDIO DESIGN HEAVEN VIII £499



**OUTSTANDING** - amongst the best

#### VERDICT

Richer, more lush presentation than the VIIs with deeper bass but the same level of detail and overall smoothness.

#### FOR

- design
- deep bass
- smooth midband

#### AGAINST

- weight

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# vinyl section

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JULY 2015

[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk)**MIYAJIMA ZERO B CARTRIDGE 80**

Paul Rigby tries out the new Miyajima Zero B cartridge from Japan.

**OPEN REEL RECORDS 82**

Paul Rigby talks to the people aiming to bring master tape sound quality to your listening room.

**SOUNDBITES 87**

A new 7" record stabiliser/adaptor and the Benz Demagnetizer ABCD-1 are tested by Paul Rigby.

**A MATTER OF BALANCE - PART II 88**

In the second part of our feature on balanced operation David Lord provides the circuits for a low noise head-amp and phono stage.

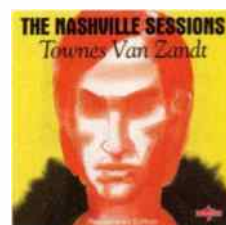
## news

**CHARLY TRIO**

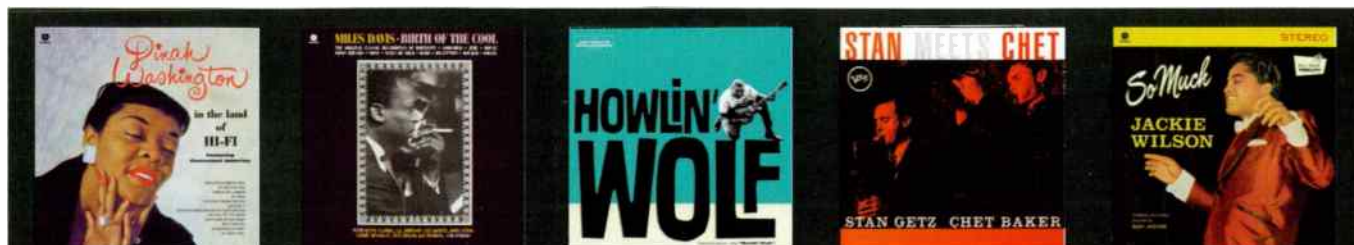
To celebrate the life of the much missed Daavid Allen is Gong's 'Camembert Electric' (1971, [www.charly.co.uk](http://www.charly.co.uk)). A storming classic, it took prog and moved it into (otherworldly) directions.

Lightnin' Hopkins' 'Free Form Patterns' (1968) features half of the 13th Floor Elevators. Blues poetry with a psyche slant.

Also look out for 'The Nashville Sessions' (1993) from Townes Van Zandt, basically the unreleased 'Seven Come Eleven' from 1974 after Poppy Records went bust. The tracks were eventually used elsewhere and this one sounds like a demos compilation.

**SQUIRE**

From Wah Wah ([www.wah-wahsupersonic.com](http://www.wah-wahsupersonic.com)) are four releases from the underrated The Squires who offered, like their contemporaries The Jam, a mod/punk/pop mixture. They include a Meynell solo album 'Anthony Meynell & Squire, Hits From 3000 Years Ago' (1984); unique takes for 'The Singles Album' (1984), the fan club rarities release 'Something Old, Something New, Something Borrowed' (1982) and the 1960s influenced 'Get Smart!' (1983). Excellent stuff, wholly recommended.

**WAXTIME**

Five classic DMM reissues ([www.discovery-records.com](http://www.discovery-records.com)) starts with Dinah Washington's eclectic 'In the Land of Hi-Fi' (1956) featuring ballads and up-tempo numbers – but quality throughout.

Miles Davis' hip and detached 'Birth of the Cool' (1957) marries big band arrangements with bop.

Howlin' Wolf's 'Rockin' Chair' presents many of the man's best singles such as 'Spoonful' and 'The Red Rooster'. Classic electric blues.

Look out for 'Stan Meets Chet' (1958) featuring Getz and Baker which is marred by the fact that they hated each other! While Jackie Wilson, who did so much to transform R&B to soul, appears here with 'So Much' (1959).

## MARC MOULIN & MORE

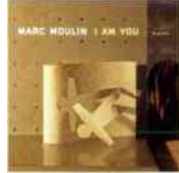
Ex-of Placebo (the seventies Belgian jazz outfit), Moulin has three solo efforts via Music On Vinyl ([www.musiconvinyl.com](http://www.musiconvinyl.com)): 'Sam Suffy' (1975), featuring electronica rhythms and samples presaging trip hop while 'Entertainment' (2005) and 'I Am You' (2007) offer an attractive jazz edge.

Also from Music On Vinyl are dance vibes via Faithless' debut 'Reverence' (1996) including the hit 'Insomnia'.

Sinead O'Conner's 'The Lion and the Cobra' (1987) remains distinctive, slightly unfocused yet compelling.

Curtis Mayfield's 'Live' (1971), the greatest live soul album ever, features two bonus cuts. Recorded at New York's Bitter End it combines elegance and intensity. Muddy 'Mississippi' Waters' 'Live' (1979) is the polar opposite. It lacks verve and immediacy.

Also look out for Les McCann's underrated classic 'Much Les' (1969).



## GERMAN PROG

Influenced by the likes of Genesis and Eloy, Anyone's Daughter's self-titled album (1980; Sireena, [www.tepusfugit.de](http://www.tepusfugit.de)) was more prog-pop. Think Barclay James Harvest.

Tibet's self-titled album ([www.sireena.de](http://www.sireena.de)) sounds rather Camel-like. Organ-infused introspection. Not a classic but one for prog heads.



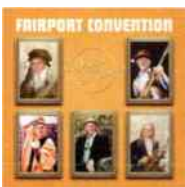
## ROCK IN EXTREMIS

It's a hell of a genre. On one side you've got the new release from Napalm Death. 'Apex Predator – Easy Meat' (Century Media; [www.centurymedia.com](http://www.centurymedia.com)) mixes thrash with grindcore, retaining the group's creative upsurge and, praise be, strikes back in rage at the state of the world.

On the other hand, Fairport Convention's 'Myths and Heroes' (Matty Groves; [www.fairportconvention.com](http://www.fairportconvention.com)) is their first album in four years. Packed with new songs it's confident, maybe not their best but one for the fans.

Krokodil (Spinefarm, [www.spinefarmrecords.com](http://www.spinefarmrecords.com), not the krautrockers but the prog-metallers) and their debut, 'Nachash' offers a supergroup of sorts (from SikTh, Gallows, Hexes, Cry For Silence and Canaya). A cohesive album, well played full of deft and nuanced songs.

Also look out for the pop/metal of Amaranthe's 'Massive Addictive' (Spinefarm), their third and best album - seems like they've matured; Hang The Bastard's 'Sex In the Seventh Circle' (Century Media) has an acrid, stoner groove; Bush's 'Deconstructed' (1997, Music On Vinyl) the band's ho-hum, hypocritical electronic grunge remix LP (they previously lambasted other bands who did this very thing); Elvis Costello's 'Extreme Honey' (1997; Music On Vinyl) and Vanilla Fudge 'Psychedelic Sundae' (1993; Music On Vinyl). Both 'Best Of's' and both on vinyl for the first time; 'A Tribute To Jimi Hendrix' (Music On Vinyl) featuring The Cure, Nigel Kennedy (!) Eric Clapton, Jeff Beck, Slash and why, sorry, more. Finally, Cheap Trick's debut (1977; Speakers Corner, [www.speakerscorner.de](http://www.speakerscorner.de)) combines Beatles-esque hooks, Who-like power plus lots of jolly japes.



## ...AND FINALLY

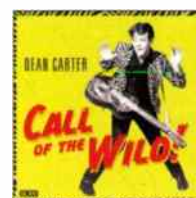
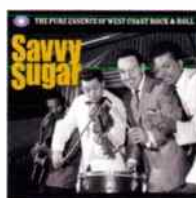
The debut jazz box set from eleven-piece Norwegian outfit Large Unit (PNL; [pnlrecords.bandcamp.com](http://pnlrecords.bandcamp.com)), is avant jazz hi-jinks, playful instrumentation, madcap improv with a stunning vibrancy.

Paper Aeroplanes' well mastered/pressed 'Joy' (Diverse, [www.diverserecords.co.uk](http://www.diverserecords.co.uk)) offers inoffensive, poppy alt.folk with increasingly fashionable/irritating fragile female lead vocal.

What's this? Fantastic Voyage goes vinyl!?'Savvy Sugar' and 'Heavy Sugar' offers West Coast rock'n'roll and New Orleans R&B respectively. Plenty of intriguing rarities on these 2LP compilation sets from the fifties.

Recorded in 1966-68, Dean Carter's 'Call of the Wild' (Big Beat, [www.acerecords.com](http://www.acerecords.com)) mixes garage rock with a rock'n'roll wild man delivery plus bits of soul and psyche. Amazing.

Finally, Live At Third Man ([thirdmanrecords.com](http://thirdmanrecords.com)) with Parquet Courts producing noise indie rock with punk accents which is full of charm.



# Miniature Mono

Now offering a mono cartridge option with a 0.7mil tip, Paul Rigby reviews the Miyajima Zero B.



**T**he concept of the mono LP is not a strange one. As music fans, we are happy to buy and collect new and old mono pressings while the instances of mono rarities appearing within classic LP reissues is actually a growing one. The Beatles, for example, recently released their entire mono discography within a humungous box set!

When faced with audiophile demands, though, why are we unsettled in the company of a mono pressing and rather shy of playing these mono pressings in the proper way? That is, why do we persist with the playing of mono pressings with a stereo cartridge?

OK, your mono collection may be too small to justify a new outlay on a mono cartridge and budget concerns might just prioritise the gas bill over a new unit. If your record collection features a healthy selection of mono pressings, though, and

money is not too much of an issue, then you really have to think again.

If I approached a Philips, star-headed, screw with a flat-headed screwdriver, you'd look upon me in an odd fashion. Sure, I may be able to shift the screw and, given time, complete the job yet any sane individual would tackle such a screw with the correct tool. It's the same here. If you are about to play a mono pressing, why not do so while using the right tool for the job?

Ah, you say, but does it really matter? In sonic terms, that is. Is the purchase of a mono cartridge really worth the bother?

The independent Japanese company, Miyajima, think it is. Run by a dedicated specialist in cartridge design, Noriyuki Miyajima, with a small staff of six people, Miyajima actually began his commercial business in 2002 by creating true mono cartridges. That is, mono cartridges designed from the ground

up instead of tweaked designs adapted from stereo. It was a full three years later that he decided to issue a stereo cartridge. This man is serious about mono.

Its top-of-the-range mono cartridge arrives in two sub-versions: A and B. The former features a 1mil tip for mono records with a 1mil groove pressed pre-1967 (or thereabouts, the date is not exact) and the B arrives with a 0.7mil tip for post-1967 mono pressings with the smaller 0.7mil groove, including modern pressings. This review focuses on the B model.

Using a conical tip, the Zero B arrived with an African blackwood body: known in instrumental spheres for its musical properties and often used to create clarinets, flutes, oboes and bagpipes. The cartridge weighed in at 11.8g, including a single coil over a resin core. The recommended tracking force range is very large, from 2.0-4.5g, but 3.5g seemed

optimal.

Positioning during installation was enhanced by the square body although the long screws, necessary for the deep chassis, but offering only a small exposed area for the two screw nuts, was a mite fiddly.

### 0.7MIL VS 1MIL

To begin, I decided to pitch Miyajima against Miyajima: A vs B via my Origin Live Sovereign deck. I wanted to see if there was any noticeable difference in sound quality when using a 0.7mil B mono cartridge with a record cut with 1mil grooves. I chose Bing Crosby's 'Anything Goes' (1956). I wanted to see how the two designs tackled Crosby's legendary baritone vocal delivery, rich in low frequency resonances.

Spinning the track, 'Magic Window' the performance of the 'B' was, in a word, 'weedy'. In isolation, the B offered commendable articulation. It was sprightly and nimble in how it sought and coveted detail and the clarity was, on the face of it, admirable. The 1mil A cartridge in the 1mil groove, though, added at least 40% more information as it retained contact with more of the wider groove (the B sat too low in the 1mil groove and 'rattled' around the larger space). Hence, the A cartridge gives far more contact and, especially, bass from the Crosby baritone. Because of that, the A showed me exactly what Crosby was trying to do in terms of contrasts. For example, at one point, he backed off the microphone for three words, losing bass, before coming back to emphasise the bass again. The 0.7mil B missed this effect entirely.

I changed tack and moved to a modern mono cut. The Kink's 'The Village Green Preservation Society' featuring a mono, 0.7mil groove cut in 2004. Now the boot was on the other foot! Now it was the 1mil A mono cartridge that sounded weedy and lacking involvement (because it sat too high in the 0.7mil groove). Again, in isolation, the 1mil Zero A on the 0.7mil groove was nominally impressive with good tonality and focus. It remained so, but the 0.7mil Zero B in a 0.7mil groove thoroughly trumped it. The latter sounded more involved. There was far more information swimming around and a whole lot more bass too. Both bass guitar and the bass strings on the electric guitar had presence and guts while low-end percussion had both heft and grip with the B. Vocals



*The Zero B targets more 'modern' mono pressings featuring a 0.7mil groove*

offered tremendous emotion and nuance, sitting in a busy and packed soundstage that was both wider and better structured. So, horses for courses then.

### TRUE MONO VS SIMULATED MONO

The next stage was to move to my Avid Acutus which toted a stereo Benz Glider. The first task was to do what most people do when faced with a mono cut, play the record using a stereo cartridge with the phono amp switch flicked to the mono position. I then swapped the Glider with the 0.7mil Zero B to hear any differences. The Glider is a top notch stereo cartridge and is my current stereo reference. Before I was exposed to the Miyajima mono cartridges, I was quite happy to listen to mono LPs via the Glider in mono-mode.

Now? Imagine a car running on office chair castors instead of wheels. Just imagine the lack of control that results. That's what the Glider sounded like. That's not being derogatory towards my Glider. It's recognising, again, that this is just the wrong tool for the job. Playing the Kink's track, in purely relative terms to the Zero B, the Glider's upper mids lacked essential focus while bass was wooly and the soundstage irregular.

The 0.7mil Zero B calmed these troubled waters; it widened the soundstage, separated the instruments, applied focus, insight and improved overall clarity. The difference was stark. After hearing how the Zero 0.7mil handled a 0.7mil grooved mono pressing, I'm

### SYSTEM USED

Origin Sovereign turntable  
Enterprise 12" arm  
Miyajima Zero A (1mil) mono cartridge  
Avid Acutus turntable  
SME IV arm  
Benz Glider cartridge  
Icon Audio PS3 phonostage  
Aesthetix Calypso pre-amp  
Icon Audio MB 845 Mk.II monoblocks  
Quad ESL-57 speakers with One Thing mods  
Vertex AQ & Atlas cabling

afraid that I cannot now listen to a mono pressing played with a stereo cartridge.

### CONCLUSION

For the Miyajima 1mil and 0.7mil comparison, the moral for both cartridge and groove sizes is that the 1mil cartridge performs best in a 1mil groove and the 0.7mil cartridge performs best in a 0.7mil groove. The differences are real and, surprisingly, large. Large enough for me to want to use the reviewed 0.7mil mono cartridge in more 'modern' mono records, exclusively. The amount of information lost when you use the wrong tools for the job is large and, frankly, unsettling.

In terms of 'making do' and using a stereo cartridge with the support of an active phono amp's mono switch, to play mono pressings, is a situation I no longer even want to consider.

If you have a collection of original late-production mono pressings or modern mono cuts you must demo a sample of the Miyajima Zero B mono cartridge. It is the best, in its class, that I've ever heard.

### MIYAJIMA ZERO B £995



**OUTSTANDING** - amongst the best

**VALUE** - keenly priced

### VERDICT

The best way to listen to a modern mono cut. A cartridge (in company with its 'A' 1mil sister) to change your entire perception of the mono format

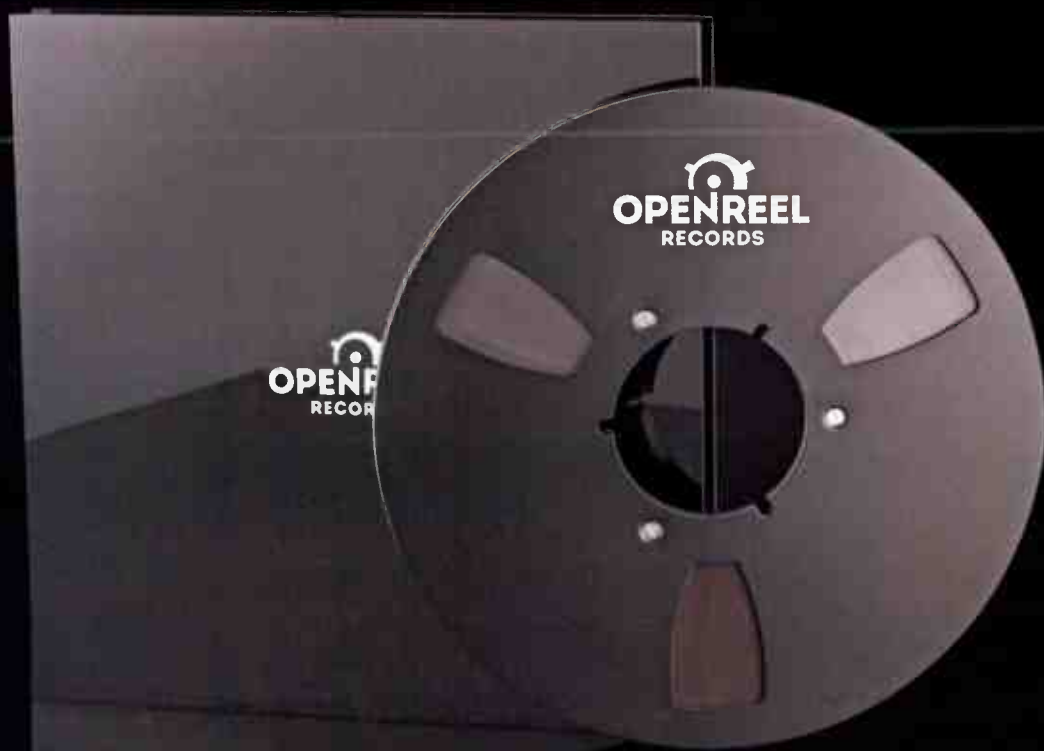
### FOR

- incredible value, overall sound quality, revitalises mono format

### AGAINST

- for 0.7 mono grooves only

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# Open Reel

Based in Italy, Open Reel Records supply new music productions on reel-to-reel tape. Paul Rigby talks to the company's Artistic Director, Marco Taio.

**M**ajoring on classical productions with a smattering of jazz to add spice and variety, Open Reel proclaims its founding rationale was to provide the best quality music it was possible to supply. How it could achieve that aim was something the company mused upon for some time, deciding that only with reel-to-reel tape could the ambition be fully realised.

"I am a producer and a sound engineer," said Taio. "Over many years, I have recorded for many major labels such as Sony and Decca. During this time, I have become tied to reel-to-reel technology. It provides the best method to provide the entire musical event. I accept that any market for such products will be a niche one, though".

Taio looks towards the second-



*Open Reel source its blank tapes from French manufacturer, Pyral.*

hand and specialist collector's markets as a healthy source of reel-to-reel machines. In fact, during today's digital domination, he believes that bargains can be found

for this often unwanted technology, "Absolutely, in fact we now have a market where a domestic situation has access to broadcast and pro-level quality hardware."

In return, Taio believes that he can deliver top quality music. As a touring classical guitarist with the benefit of perfect pitch "This allows me to ensure the tapes that we distribute can be as close to absolute fidelity as possible".

The outfit's hardware toolbox for new recordings includes a range of Schoeps and Neumann microphones plus Studer, Telecom and Nagra recording hardware. "While we have a wide selection of microphones to choose from, we use a minimal set-up

"While we have a wide selection of microphones to choose from, we use a minimal set-up during recordings to take the best advantage of the amazing acoustic environments we can access."

**Equalisation and compression is steadfastly avoided**



**The Open Reel recording studios includes a selection of classic hardware.**



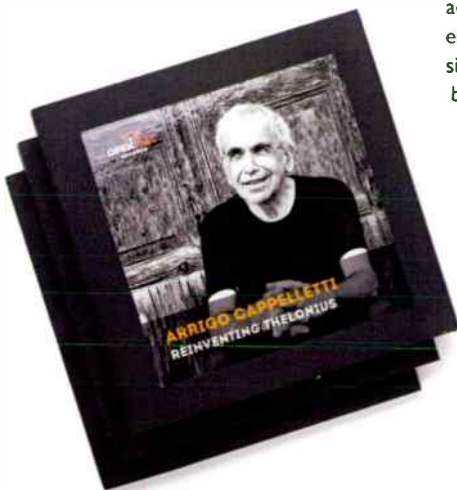
**The company believes that the best quality sound can only be sourced via reel-to-reel tape.**

during recordings to take the best advantage of the amazing acoustic environments we can access. The signal, in this way, will not be changed by artificial compressors, limiters or reverb units".

During the coming months, the label will issue its first archival title, the first concert, in Italy, from Thelonius Monk held at the Teatro Lirico in Milan in 1961. More archival releases will follow. To handle the archival tapes, the company uses a selection of reel-to-reel machines: Ampex ATR-100, various models

of Studer including the 807 as a recorder and a 812 for playback, Nagra T and IV-S and more.

For the archival productions, the company has a 'softly softly' approach to the original masters. "We avoid equalisation or compression. This means that, if an archive tape is damaged or if the original quality does not satisfy us, we just do not publish it. We tend to also avoid restoration, as this would involve at least some noise suppression that would inevitably change the original signal. The only intervention we perform is the preservation of oxide if the master is suffering from 'sticky



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The Quintet Series also includes a true-mono cartridge, for accurate reproduction of older mono recordings.



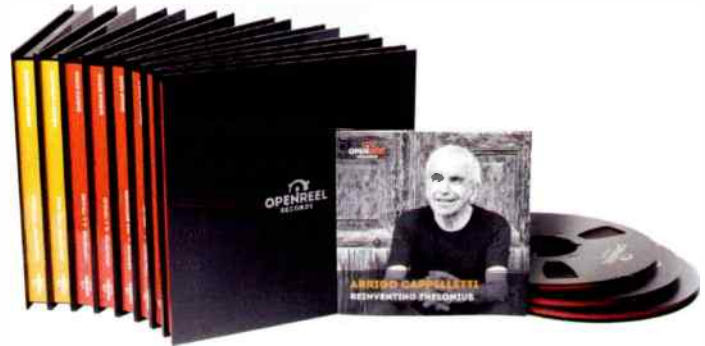
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**Classical is the main music fare, although jazz is growing in importance. Thelonius Monk heads a new line of archival recordings.**



**Marco Taio, Artistic Director.**

tape' syndrome' or oxide shedding."

If you want to buy a tape for yourself, you're looking at a price of €295 each. That's around £235 per tape.

Unduly expensive? "In an absolute or relative way? The price depends on what demands you have from music and the quality you want. Here, we are talking of top quality media, with a very high cost of production, materials and duplication".

In terms of the physical source, the quality of the actual tape, I was a little concerned. Firstly because the world leader in master tape, American-based Quantegy, closed its doors years ago and secondly, I heard that a Dutch outfit

was still producing reel-to-reel blanks but I had heard disconcerting stories about its quality. Taio had no issue, though. "The production of blank tapes is still very active as there is still demand for them, especially in 1in and 2in sizes. In Europe, the reference factory is actually Pyral, based in France. There are also many distributors and national retailers out there. Two years ago, Pyral completely updated and recalibrated its oxide process, removing random defects that had plagued some tapes of previous productions."

If Open Reel Records has your tape taste buds tingling and you fancy grabbing a machine of your very own, what should you be looking for? Taio offered a few pointers. In terms of studio-quality gear, he recommended, in general terms, machines from Nagra, Stellavox, Lyrec, Telefunken and



**Open Reel is now processing archival recordings.**

Studer. For the US/Japanese markets, he mentioned Ampex, Tascam, Otari and Sony.

For more domestic technologies, he also gave the following 2-track (not 4-track) models the thumbs up: the Revox A-77, Revox B-77, Revox A700, Revox PR99 (the consumer line by Studer), TEAC A-6300, TEAC X-10 MKII and Sony TC-758. Taio did acknowledge that there were others out there too that could also be recommended.

**For more information, click on [www.openreelrecords.com](http://www.openreelrecords.com)**

**The reel-to-reel market is a very active niche in the audiophile world**

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Jeff Dorgay, *Tone Audio Magazine*, January 2013



"Oozes quality in both construction and sound"

Paul Rigby, *Hi Fi World*, March 2013



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order something bespoke (prices on application) if you have rather more singular ideas of your own.

The only issue, in design terms, that I have with some of the adaptors is the finishing. A few (not all) have rather severe corners which, in the wrong hands with enough friction, could prove rather sharp to the skin. I would have preferred that these edges be removed by a touch of judicious filing just to remove the burr.

To test the adaptors, I placed a 'dinked' 7" single (Kraftwerk's Autobahn on Vertigo) on a Rega RP3 turntable and played the disc, using five supplied adaptors of various designs, on the supplied Rega felt mat. Each adaptor was tested for accuracy. Did it fit into the centre hole or was it going to slip, producing speed variations? Was each adaptor truly centred or would they allow the disc to move across the turntable platter producing distortions? Fortunately, each was centred and a perfect fit was provided by all. The final test was to remove the felt mat and place the disc on the bare, slippery glass platter. Fortunately, there was enough grip on the centre spindle to the adaptor and from the adaptor to the 7" single to maintain play at a constant speed.

Simple, good looking, low cost and each design does the job. What more do you need? **PR**

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# SOUNDBITES



### AESTHETIX ABCD-1 CARTRIDGE DEMAGNETIZER £230

The general concept of noise produced by magnets and magnetism is not new. The effects of magnetic-derived noise are an insidious irritation for hi-fi users too, although most users don't even know that it's there: not until it's gone, that is. I've even experienced how magnetic forces can effect CD and vinyl discs (there are gadgets on the market to

remove it too). The stuff is sonically destructive as it restricts your sound stage and smothers detail. One of the most ignored sources of magnetic interference are from the magnets in your cartridge. Yes, they are tiny but don't forget how much the cartridge signal (and, hence, magnetic noise) is amplified.

This is where Aesthetix (who make rather wonderful pre-amps — I use one for my reference system) and its Demagnetizer comes

in. The petite ABCD-1 is a relatively heavy, solidly built, rather prosaically presented black box. On the rear are two RCA sockets. You insert the phono cables, from your turntable, into these. On the front is a push button power (with light) switch plus an activation switch (with light). Once you plug in your turntable, you power up the box and then press the Activate button once (or more, you may find the performance improves with multiples 'treatments').

During tests with various rock and jazz vinyl, the ABCD-1 removed a lot of noise from the soundstage as a whole as well as adding space and air around the central stereo image, giving the presentation an extra 'epic' feel. Low frequencies were also tightened while the very lowest bass offered more character and heft.

To be used once a week, I was impressed with the ABCD-1. Well worth a quick demo. **PR**

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# A Matter Of Balance

**PART II.** Last month David Lord described in detail why you should use a balanced connection between turntable and amplifier. This month he provides circuits of a low noise balanced head amplifier suitable for moving coil cartridges, and a balanced phono stage too, both of which you can build yourself.

*All circuits were drawn and checked in LTSpice – a free Spice simulator from Linear Technology.*



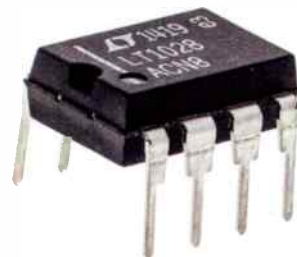
*The SME IV arm used by David Lord. Its output socket at the base of the pillar delivers a balanced signal. To go balanced the connecting cable must be changed to a 3-pin XLR on each channel or one 5-pin type.*

**L**ast month I explained why it is a good idea to have a balanced connection between a moving coil pick-up cartridge and the input to one's pre-amp and how to achieve this using a pair of transformers. This time I shall describe how to do so with an electronically balanced input: first with a little gadget that will substitute for the transformers, and then a complete phono pre-amp.

These days the design and construction of low-level audio circuits has been made much simpler than in the past due to the ready availability of suitably high-performance 'op-amps' which can be

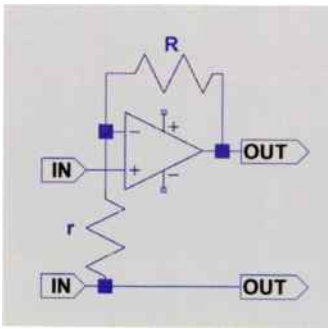
used as basic building blocks. Clearly one needs to choose the right chip for the intended application, which for us means seeking out those with the lowest possible noise when fed from a low impedance source such as a moving coil cartridge. I am aware of two such devices which are particularly suitable: the Linear Technology LT1028, and the Analog Devices AD797, both of which I've used.

As many readers are doubtless aware the standard op-amp has two inputs: one inverting and the other non-inverting. Common practice is to use the inverting input to set the gain by means of feedback via resistors  $R$  and  $r$ , with the incoming signal going



**LT-1028 op amp - an ultra low noise pre-amplifier in a standard 8-pin DIP package.**

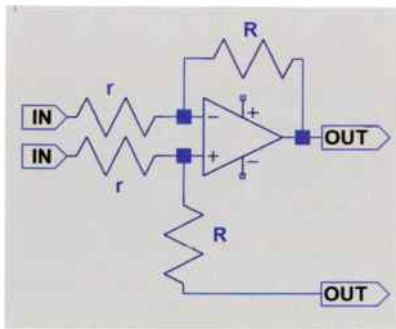
to the non-inverting input – see Fig 9. Used as the first stage of a phono pre-amp, any hum and noise picked up in the connecting cable will then



**Fig 9 - A typical unbalanced input; hum and noise are amplified.**

be amplified along with output from the cartridge.

But if the circuitry in Fig 10 is used, then the op-amp responds only to the difference in voltage between its inputs. This means the wanted signal from the cartridge will be amplified, but any spurious signals induced into the two cores of the cable are going to be pretty much the same and of the same phase: i.e. there will be very little difference between them. As a result the op-amp doesn't "see" such "common mode" signals, with a consequent marked reduction in unwanted background noise. Moreover, the best possible noise performance from an



**Fig 10 - A balanced differential input does not amplify hum and noise in the input.**

op-amp is obtained when the signal is applied to both its inputs and the ground line is now separate from the signal line.

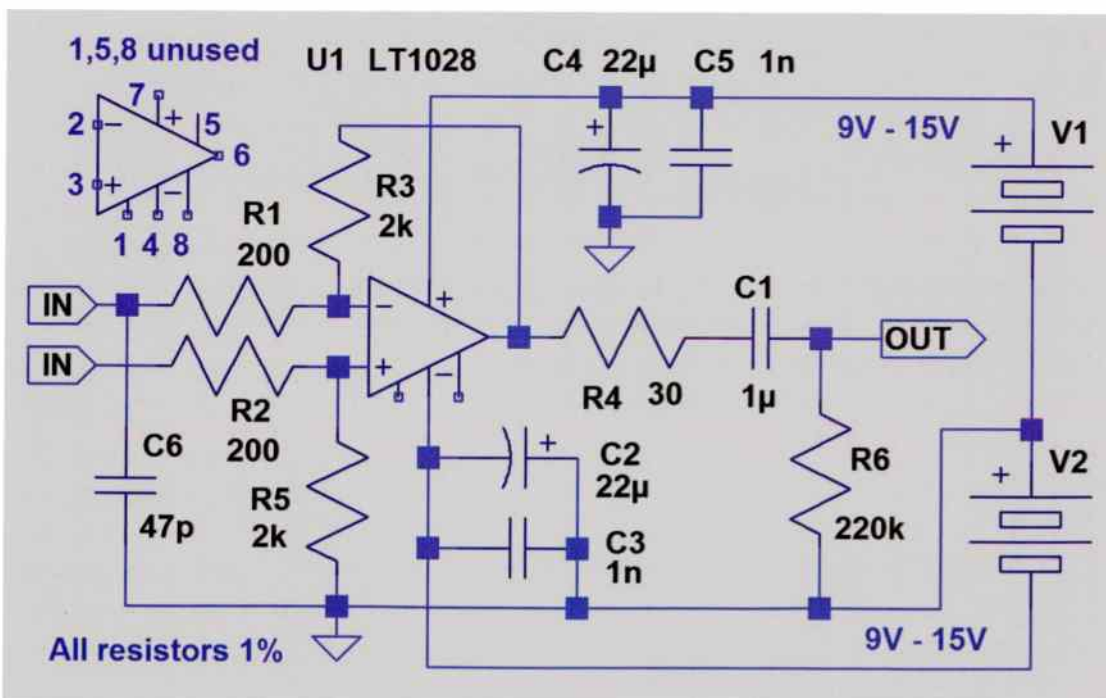
Strictly speaking, using a single op-amp as shown in Fig 10 does not provide fully balanced operation because the input impedance to ground is different for the inverting and non-inverting inputs. Moreover the ability of the op-amp to reject common mode signals will be compromised to some extent by factors such as the tolerances of the resistors surrounding it. Even so, a very worthwhile improvement results in practice from using this arrangement. I can state this with

confidence because one of the phono pre-amps I've built has the facility to switch between single ended and differential inputs, and there is a marked reduction in hum and noise using the latter.

### BUILDING A HEAD-AMP.

Fig 11 shows the circuit diagram for a simple 'head-amp' for an MC cartridge, which can be used instead of a transformer. This has the desired differential input and if the resistors R and r in Fig 10 are made the same, then the gain is  $R/r$  – in this circuit 2000/200 or  $\times 10$  (20dB).

In practice, a number of other external components around the op-amp are required for satisfactory operation. The LT1028 used here is a thoroughbred among op-amps, and needs appropriate care if it is to work as intended. The manufacturer's data-sheet recommends the decoupling capacitors shown for both power supply lines for stability. These must be sited physically close to the I/C. But even with this precaution, I found it necessary to add the 47pF capacitor shown, otherwise the coil of the cartridge and capacitance of the pick-up lead form a tuned circuit which can – and in my case



**Fig 11. Circuit of a low noise head-amplifier suitable for moving coil cartridges.**

#### NOTES

- \* Pins 1&8 are for offset trim but are not used.
- \* Pin 5 is for a compensation capacitor but is not used.
- \* 9V PP3 batteries or a 15V PSU can supply power, the latter offering higher overload levels.
- \* Use single-point Star earthing.
- \* This head amp does not have RIAA equalisation; it must be used with a preamp having equalisation.

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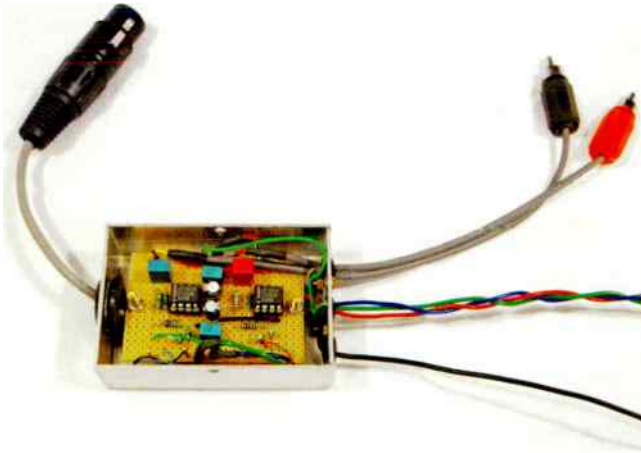


Fig 12. Head-amplifier in a small metal case.

did – turn the head-amp into an HF oscillator.

The LT1028 has a very low output offset voltage, so it may be possible to couple the output from the head-amp directly to the MM input of the following pre-amp. However I wouldn't recommend this, not least because of serious damage which could result under fault conditions: it's safer to use the 1 $\mu$ F coupling capacitor shown. I also added a small resistor in series with the output. While the LT1028 is

short-circuit proof, there's no harm in providing more protection.

Fig 12 shows how the head-amp can be assembled into a small metal box. The components are wired onto a small piece of "strip-board", which I've found ideal for making up IC-based prototypes. This can be obtained from Maplin Electronics ([www.maplin.co.uk](http://www.maplin.co.uk)) cat. no. FL17T. All the other bits and pieces can be bought from RS Components ([rswww.com](http://rswww.com)).

## POWER SUPPLIES

Unlike a transformer, the head-amp needs a power supply. It works very well with just a couple of 9 volt PP3 batteries and because the current drain is quite low these should last a long time if you remember to disconnect them when not in use. Batteries are also a very suitable low-noise source of power for this application.

However, for longer term use you may want run from a mains power supply. Fig 13 shows a suitable circuit, which only needs a readily obtainable 24 volt a.c. plug-top transformer to drive it and thus avoids dealing with any nasty high voltages. It gives an output of  $-12/0/+12$  volts. Fig 14 shows how this can be built into a small plastic case; also shown is the battery-box alternative.

## A COMPLETE PHONO PRE-AMP.

You may feel that if you are going to go to the trouble of building a head-amp, you might as well go the whole hog and build a complete phono pre-amp. If so, Fig 15 gives the circuit of a simple but high-performance

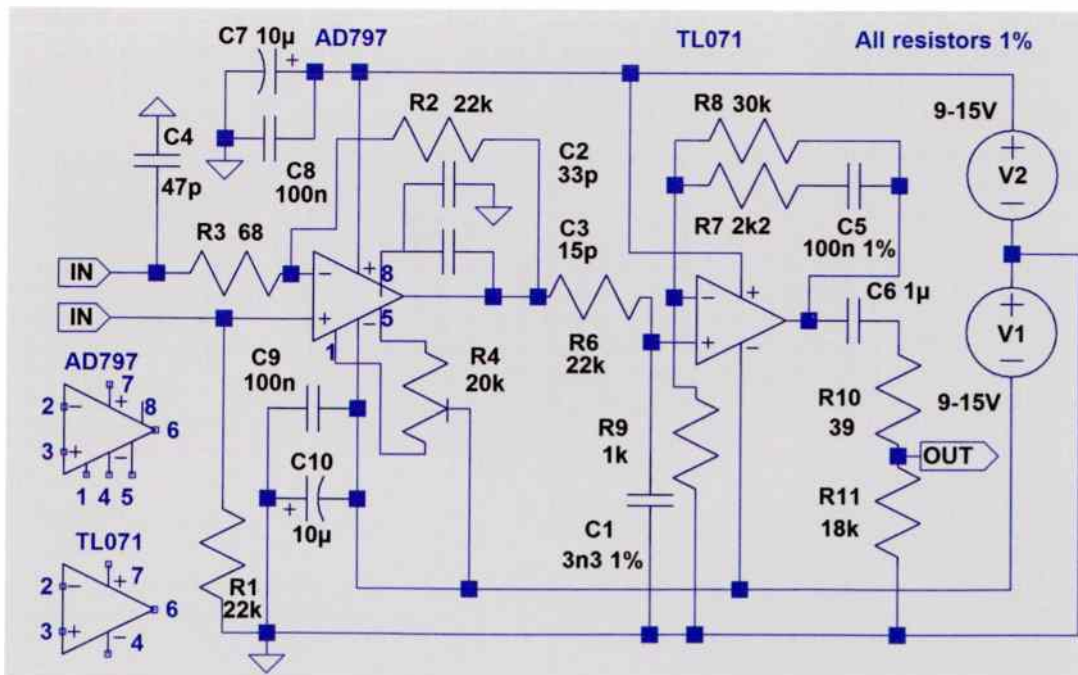


Fig 15. Circuit of a low noise phono stage with RIAA equalisation.

### NOTES

- \* V2 and V1 represent the power supply. They can be PP3 9V batteries or an external power supply.
- \* RIAA 75 $\mu$ S ~ R6/C1
- \* RIAA 318 $\mu$ S ~ R7/C5
- \* RIAA 3180 $\mu$ S ~ R8 gain limiter
- \* R4 is a 20 turn trimpot, used to minimise d.c. output offset.



**Fig 16 - The phono pre-amp.** You can see four black silicon chips, two per channel, sitting in sockets.



**External view of the phono pre-amp.**

unit with a differential input, also incorporating RIAA equalisation and sufficient gain to raise the output of a typical MC cartridge to a level comparable with that from a CD player. Fig 16 shows such a prototype built into a small metal box.

provide gains of up to 60dB at very low distortion across the whole audio bandwidth.

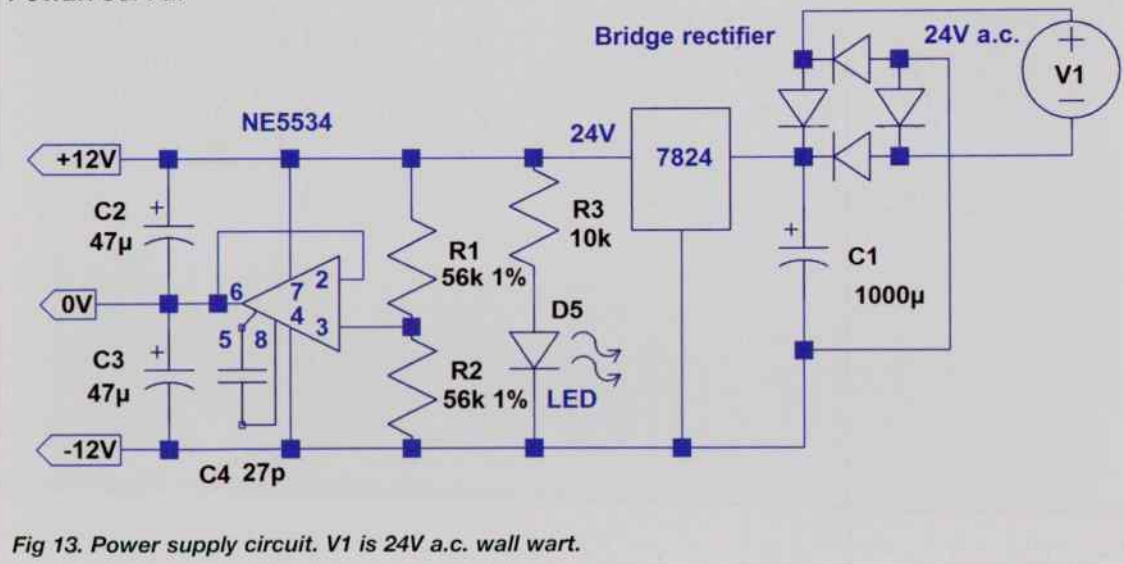
RIAA equalisation is divided between the op-amps and bass boost provided by the feedback round

to ensure maximum head-room. The 20k multi-turn trimpot connected to the AD797 should be adjusted to give zero DC at the output pin 6 of the TL071. Although this may result in a small DC offset at the output of the AD797, this is relatively unimportant.

As we saw with the head-amp, the supply line de-coupling capacitors and the 47pF cap at the input are essential for stability. Although in this design any offset at the output can be trimmed to zero, thus allowing DC coupling from start to finish, again I wouldn't recommend it. I say this not only because of possible damage under fault conditions but also because in my experience it's not a good idea to allow the response of a vinyl system to extend into the infra-bass region. The 1µF capacitor at the output blocks any DC, and with the 18k resistor (in parallel with the following amplifier's input impedance) it forms a simple high-pass filter to prevent rumble and any other LF nasties from getting through.

I am not going to pretend that this is the last word in phono pre-amps: plainly it is not. But to me it sounds very good driven by my Ortofon Cadenza Bronze and Kontrapunkt b cartridges and the technical performance is excellent. The frequency response measured with an inverse RIAA circuit is flat from 30Hz to 20kHz, with only 0.5dB drop at 20Hz due to the LF filter at

**POWER SUPPLY**



**Fig 13. Power supply circuit.** V1 is 24V a.c. wall wart.

I used an AD797 rather than an LT1028 for the first stage because a much higher gain is needed than for the head-amp. With the 15pF and 33pF "de-compensation" capacitors connected as shown, the AD797 can

the second op-amp – in this case a cheap but entirely adequate TL071. Because the op-amps are directly coupled and the overall DC gain is high, it is worth providing the facility to trim the DC offset at the output

the output. With the volume control set for normal listening level and the pick-up at rest, I can hear no background noise at all even with my ear hard against the 'speaker. And with the volume turned up to max





**Fig 14. The power supplies: mains supply from a 24V a.c. wall wart at left, battery supply at right.**

(about 20dB above normal) all I can hear standing right by the 'speaker is a faint, pure-sounding white noise hiss – no nasty burbles and zero hum.

I have built a +15/0/-15 volt power supply into my prototype of this pre-amp but I have also tried it with the 2x9 volt battery pack and simple +/- 12 volt supply described above. Higher voltages will give more

headroom to cope with heavily cut discs, but in practice even the battery pack seems to be entirely adequate.

### IN CONCLUSION

One of the joys of hi-fi is experimentation and here is an area ripe for a bit of DIY. If you make the pre-amp, you can also save money – either to enable you to buy a better cartridge

perhaps, or as a stop-gap before you can amass the funds to buy a commercial design. But whether or not you decide to build any of the things I've described, I hope you will have found what I have written of interest.

**See also Noel Keywood's column this month, for more on all this.**

**The first part of this feature, A Matter of Balance Part 1 is now available on our website together with a component list.**

### PARTS

You can get parts from Maplin ([www.maplin.co.uk](http://www.maplin.co.uk)), RS Components (<http://uk.rs-online.com>) or Farnell (<http://uk.farnell.com>). If you use Veroboard, double check all track cuts and ensure there are no solder whiskers: use a magnifying glass to closely inspect the board. Use a multimeter to measure voltages - d.c. and a.c. If the circuit does not work perfectly first time – not uncommon – this is your salvation. Use web search to find manufacturers data sheets on the ICs, showing pin outs etc.

Components cost little - less than £1 for a TL071. The LT1028 is 'expensive' at £13.30 (RS) or £6 for a generic unbranded part but get the LT part to be sure noise and d.c. offset/drift specs are met. Hardware costs – cases etc – dominate and final build cost will depend upon these parts.

### CONTACT:

TimeStep tell us they are available to provide suitable balanced cables for SME arms at a competitive price.

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### COMPONENT LIST FOR THE PHONO PRE-AMP

Quantities are for two channels.

All the resistors are 1% tolerance 0.6 watt metal film types, obtainable at very low cost in packs of ten:

2 x 68R  
6 x 22K  
2 x 30K  
2 x 2K2  
2 x 1K0  
2 x 18K  
2 x 39R

All the capacitors should have a minimum working voltage of 25 volts DC:

4 x 10µF electrolytic  
4 x 100nF plastic film  
2 x 15pF plastic film or silvered mica  
2 x 33pF plastic film or silvered mica  
2 x 47pF plastic film or silvered mica  
2 x 1µF plastic film  
2 x 3n3F plastic film 1% tolerance  
2 x 100nF plastic film 1% tolerance

Other components needed are:

2 x 20K multiturn trimpots, vertical type  
2 x AD797 ICs  
2 x TLO71 ICs  
4 x 8 way DIL sockets, preferably turned pin type.  
1 x 5 pin chassis mounted XLR "female" socket (Or two 3 pin types)  
1 x 5 pin cable mount XLR "male" plug (Or two 3 pin types)  
Wire, solder, solder tags, nuts and bolts

All the above are obtainable from RS Components. The following additional parts are needed from Maplin:

1 x metal case ( eg cat LI173Q)  
1 x Verostrip (cat FL17T)  
1 x pack of 1mm Veropins (cat FL24B)  
2 x phono sockets for the output (cats JZ05F and JZ06G)  
1 x pack of grommets for the power supply cable ( eg cat QT93B)  
1 x plug to suit the power supply connection (eg a 4 pin DIN plug, cat HH26D)

### COMPONENTS LIST FOR THE MAINS POWER SUPPLY

1 x 24 volt AC wall wart power supply transformer  
1 x chassis socket to take 24 volt input plug  
1 x bridge rectifier 1 amp 50 volt PIV  
1 x 1000µF 50 volt DC working electrolytic cap  
1 x LM 7824 or similar regulator I/C  
1 x NE5534 I/C  
1 x 10k 0.6 watt resistor  
2 x 56K 1% tolerance 0.6 watt resistors  
1 x 3mm LED indicator  
2 x 47µF 25 volt DC working electrolytic caps  
1 x 27 pf capacitor, ceramic or plastic film  
1 x chassis socket to go with the plug from the phono preamp or headamp  
1 x plastic or metal box, solder, wire, bit of Verostrip, 1 mm Veropins, nuts, bolts etc.

### COMPONENT LIST FOR THE HEADAMP

Quantities are for two channels.

All resistors 1% tolerance 0.6 watt metal film types.

4 x 200R  
4 x 2K0  
2 x 220K  
2 x 30R

All capacitors should have a minimum working voltage of 25 volts DC.

4 x 22µF electrolytic  
4 x 1nF plastic film  
2 x 1µF plastic film  
2 x 4/pF plastic film or silvered mica

2 x LT1028 I/Cs  
2 x 8 way DIL sockets, preferably turned pin type

Metal box, plugs and sockets as required, solder, wire, nuts and bolts, solder tags, bit of Verostrip, 1mm Veropins, etc.

# free reader Classifieds

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**WANTED: AUDIO-**  
Technica aluminium alloy  
S-shaped spare pipe  
for AT1100 tonearm  
(detachable) Tel: Toni 07971  
953628

**AKG Q701** Quincy Jones  
Signature line headphones  
in white. Mint condition,  
boxed. Only light use.  
Good reviews. (£340 RRP)  
£100. Tel: 07905 348 812  
(Watford)

**EPOS EPIC 2** speakers,  
beech finish with  
Soundstyle Z2 stands. New  
August 2013. One cabinet  
slightly damaged and travel  
costs hence £110 ono.  
Buyer collects (no boxes)  
Tel: Colin 01407 762 988  
after 8pm (Holyhead)

**INSPIRE APOLLO**  
turntable with Rega  
RB1000 tonearm, onboard  
PSU. New acetyl sub  
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Eclipse puck. Tel: Graham  
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**COPELAND CTA 401**  
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phono, CD, tuner, tape  
monitor. Four new EL34's.  
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detachable headshell arm,  
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very good condition,  
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good condition. £100. Tel:  
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PM-6004 amplifier, £120.  
Silver Yamaha AS-500  
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collect. 07946 283 255

**KT66 MATCHED** pair  
GEC VGC. £150. Buyer  
collects. Tel: 01344 776  
445 (Berkshire)

**ALBARRY S508** power  
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condition. £250.  
Musical Fidelity X-PSU  
V8 power supply unit.  
Mint. £275. Onkyo ES-  
HF300S headphones.  
Hardly used. £150. Tel: Ray  
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**RUSS ANDREWS** Silencer  
hand filter, recently won  
prize, never used! RRP  
£52 - £25 cash collected,  
£30 cheque posted. Tel:  
01902 884694 Email:  
[jukey39@yahoo.co.uk](mailto:jukey39@yahoo.co.uk)

**TOM EVANS** Micro-  
groove MC amplifier.  
Excellent condition  
incredible sound stage.  
£280.00. Arcam CD 72  
with digital output Boxed  
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[nigelsach42@tiscali.co.uk](mailto:nigelsach42@tiscali.co.uk)  
Wirral/Merseyside

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imeldayates@hotmail.com

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**MARTIN LOGAN Montis, ELS with 200w active woofer in dark cherry finish.** Perfect condition, boxed, very little use (60 hours and 9 months old) superb sound quality. Priced to sell £5995.00 ovno. Pictures available on request. Contact: [neilpage37@yahoo.com](mailto:neilpage37@yahoo.com) or call 00974 66312709 for more information.

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**COPELAND CTA 401 integrated valve amplifier, phono, CD, tuner, tape monitor.** Four new EL34's. £800. SME 3009 Mk2 detachable headshell arm, £175. DPA Little Bit D to A convertor, £125. Tel: 01704 530 928

## CLASSIC CONTACTS

When a classic goes 'poof' your troubles have just started, but there may be a good ending. Replacing failing parts can improve the sound, so here is a short listing of all these companies who specialise in getting a classic up and running again after its deposited a small ring of soot on your ceiling!

### GT AUDIO

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Classic tuners, radios and amplifiers restored, repaired.  
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Mob: 07960 962579  
[www.gtaudio.com](http://www.gtaudio.com)

### TECHNICAL AND GENERAL

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Turntable parts - wide range of spares and accessories, plus arms and cartridges. Tel: 01892 654534

### CARTRIDGE MAN

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Email: [thecartridgeman@talktalk.net](mailto:thecartridgeman@talktalk.net)  
[www.thecartridgeman.com](http://www.thecartridgeman.com)

### Dr MARTIN BASTIN

(Shropshire) Garrard 301/401 restoration, renovation and service. Special plinths; rumble cures, etc. Tel: 01584 823446

### CLASSIC NAKAMICHI

(Paul Wilkins, Worthing, West Sussex). Restore, Repair & Service Nakamichi Cassette Decks. Tel: 01903 695695  
Email: [paul@bowersandwilkins.co.uk](mailto:paul@bowersandwilkins.co.uk)  
[www.bowersandwilkins.co.uk](http://www.bowersandwilkins.co.uk)

### ARKLESS ELECTRONICS

(Northumberland)  
Specialist in repairs, restoration and modifications to all amplifiers, valve or solid state, ancient and modern. Tel.: 01670 530674  
Email: [info@arklesselectronics.com](mailto:info@arklesselectronics.com)  
[www.arklesselectronics.com](http://www.arklesselectronics.com)

### CLASSIQUE SOUNDS

(Paul Greenfield, Leicester)  
ESL-57s restored, rebuilt, fully renovated or improved. Leak, Quad valves amps etc. Tel: 0845 123 5137/  
Mob: 0116 2835821  
Email: [classique\\_sounds@yahoo.co.uk](mailto:classique_sounds@yahoo.co.uk)  
[www.flashbacksales.co.uk/classique](http://www.flashbacksales.co.uk/classique)

### ATV AUDIO

(Henry Dulat, Surrey)  
Repairs, restorations and upgrades to valve and transistor amps and all analogue audio including Revox. Tel: 01372 456921 Mobile: 07730 134973

### REVOX

(Brian Reeves, Cheshire)  
Revox tape recorder spares, service and repair. Accessories also available. Tel: 0161 499 2349  
Email: [brian@revoxservice.co.uk](mailto:brian@revoxservice.co.uk)  
[www.revox.freeuk.com](http://www.revox.freeuk.com)

### ONE THING

(Coventry) Specialist in electrostatic panel manufacture and repair. Can refurbish ESL 57s and 63s as well as Leak Troughlines and Quad IIs. Email: [one.thing@ntlworld.com](mailto:one.thing@ntlworld.com)  
[www.onethingaudio.com](http://www.onethingaudio.com)

### EXPERT STYLUS COMPANY

(Wyndham Hodgson, Surrey) Stylus replacement service for all types of cartridge. Including precise profiling for 78s. Tel: 01372 276604  
Email: [w.hodgson@btclick.com](mailto:w.hodgson@btclick.com)

### OCTAVE AUDIO WOODWORKING

(Bristol) Unit 2, 16 Midland Street, St Phillips. Bristol. Tel: 0117 925 6015  
[www.octave-aw.co.uk](http://www.octave-aw.co.uk)

### WEMBLEY LOUDSPEAKER

(Paul MacCallam, London)  
Comprehensive loudspeaker servicing. Tel: 020 8 743 4567  
Email: [paul@wembleyloudspeaker.co.uk](mailto:paul@wembleyloudspeaker.co.uk)  
[www.wembleyloudspeaker.com](http://www.wembleyloudspeaker.com)

### LORICRAFT AUDIO

(Terry O'Sullivan, Bucks)  
Garrard 301/401 and their own 501 repair, spares and service.: Tel: 01488 72267  
[www.garrard501.com](http://www.garrard501.com)

### QUAD ELECTROACOUSTICS (Cambs)

Quad's service department, able to repair almost all Quad products, from the very first. (Also Audiolab, Mission & Wharfedale). Tel: 0845 4580011  
[www.quad-hifi.co.uk](http://www.quad-hifi.co.uk)

### SOWTER TRANSFORMERS

(Brian Sowter, Ipswich)  
Large range of audio transformers for valve amps, cartridges, line drive, interstage plus all a associated services. Tel: 01473 252794  
[www.sowter.co.uk](http://www.sowter.co.uk)

### LOCKWOOD AUDIO

(London)  
Tannoy loudspeaker parts, restoration and repair. Also Epos and TDL loudspeakers. Tel: 020 8 864 8008  
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KEF are kings of loudspeaker engineering. And their new Reference 1 standmounter is a great example of just what this means. From the carefully contoured Uni-Q tweeter with its distinctive waveguides, through to the glossy cabinet, the new Reference 1 is a great new loudspeaker - and you will find it reviewed in-depth in our next issue.

**Also, we hope to bring you –**  
Exposure 3010 S2 D Series integrated amplifier  
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Pro-Ject RPM 3 Carbon Turntable  
Onkyo C-N7050 Network CD Player  
Mitchell & Johnson DR201V DAB FM RDS Tuner  
Munich High End 2015 Show report  
Stereo Sauce Feature part II

**...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, such as failure under review, we cannot guarantee that all products listed above will appear.

**PICK UP THE AUGUST 2015 ISSUE OF HI-FI WORLD ON SALE JULY 31ST 2015,  
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AUGUST 2015 - 4TH JUNE

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# CRESSIDA

CRESSIDA

1970



"This LP is an essential purchase for anyone who has an interest in both the psychedelic and progressive genres"

If you have never heard of Cressida before, but you have a soft spot for the Moody Blues, then read on because this group had a spiritual connection to that very group with their heavy organ and Mellotron sounds. An art rock group of sorts that were created in the late sixties, Cressida comprised Peter Jennings, on organ and Mellotron, Angus Cullen (who offered an almost poppy Justin Hayward/Paul McCartney vocal style along with his accomplished guitar playing), John Heyworth (guitar), Kevin McCarthy (bass) and Ian Clark (drums). Signed to Polydor's prog rock stable imprint Vertigo, Cressida had a dense, lyrical sound.

While this album could easily be shifted into a prog category it also had an innate sense of fun which helped to separate the band from much of the earnest noodling that was going on around them. That's not to denigrate what Cressida was doing, nor their attitude to their art. Don't mistake this debut album as frivolous. It was a serious project that had a welcome complexity, enabling the listener to extract new elements and nuances from it during repeated plays. The now classic combination of organ and Mellotron with classical-style acoustic guitar and melodies derived from classical and folk traditions offers, to modern ears, a golden glow that's as wholly welcoming and warm as the vinyl carrier it flows from.

Speaking to the blog Icon Music ([www.iconmusicmag.com](http://www.iconmusicmag.com)), Ian Clark (drums) and Kevin McCarthy (bass) talked about the creation of the album itself and its positive critical reception. "I don't think we knew what to expect to be honest" said Clark. "We had made the album and then it was more a question of waiting to see what the critics thought. We were obviously blown away by many of the reactions. It was very rewarding".

McCarthy added, "I always thought that this album was a good debut album, I wasn't so surprised. It took a couple of weeks to create, I remember".

Recorded at Wessex Studios, the band worked during the evening to record it, often – interestingly – right after a concert.

With a Moody Blues and even King Crimson-like delivery, the band provided a light tone. In fact, the cheerful nature of the

release continued right through tracks such as 'Depression!' This happy tone gave the album a pop/rock ambience that could be allied to late sixties psychedelia such as the Sgt. Pepper-era Beatles or early Bee Gees releases.

The combination of the attractive melodies from lead singer Angus Cullen, the understated and unaffected yet obviously intricate keyboard embellishments by Peter Jennings, the mastery and skill of the guitar work on display and the rather joyous and optimistic nature of this album, which tended to shy away from the traditional prog rock concept pieces, not only made it an attractive listen but makes the LP an essential purchase for anyone who has an interest in both the psychedelic and progressive genres.

Sadly, as a band entity, Cressida decided to go their separate ways after this album was released and before their final album 'Asylum' hit the streets. Like many start-up bands with a good idea, once completed they flailed round without much guidance. "We needed good management who knew how to help move the band to the next level" said Clark. "We definitely broke up far too soon. The fact the band split up before the second album was released was simply crazy. But events had overtaken us and suddenly Cressida was no more".

Originally released on the now collectable Vertigo label, Repertoire has reissued this album on 180gm vinyl from a high-definition 24bit audio file source. There will be some audiophiles that will balk at this but if the original master tapes are unavailable then you work with what you have. In this case, Repertoire has enlisted the vast well of experience from the experts at Abbey Road to produce a half-speed mastered copy (the modern technical variant of which was developed by the Studio's own Miles Showell) providing the best possible sound quality in the circumstances. Cressida fans will also be interested to hear that the band's second album, 'Asylum' (1971) has also been released by the label along with a range of other Vertigo releases of a similar ilk: jazz/rock outfit Affinity's self titled 1970 release, Linda Hoyle's (Affinity lead singer) solo LP 'Pieces of Me' (1971) plus two Warhorse prog/heavy metal releases from Deep Purple bassist Nick Simper: 'Warhorse' (1970) and 'Red Sea' (1972). **PR**

# USHER

The USHER Dancer Diamond Series features the world's first amorphous DLC (diamond-like carbon) diaphragm tweeter. This is a tweeter which is second to none in the current market. To find out more, visit [www.usheraudio.com](http://www.usheraudio.com) or your nearest USHER dealer...



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Weight: 15.5 kgs/34.2 lbs. per piece

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## Behind the scenes

Dr. Joseph D'Appolito a world renowned authority in audio and acoustics designs the crossover and performs prototype testing/final fine tuning for Usher Audio. Consulting to a couple of famous audio companies, Joe always finds the tremendous value Usher Audio products represent a delightful surprise in today's high end audio world.

## Rueyma Electric Technology Co., Ltd.

No.29-2 Jhonghua Rd., Taipei City 100, Taiwan  
Tel: 886 2 2314 3868, Fax: 886 2 2371 7253

## Distributed in the UK by Decent Audio

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W: [www.decentaudio.co.uk](http://www.decentaudio.co.uk) E: [info@decentaudio.co.uk](mailto:info@decentaudio.co.uk)

"The reality is the Krell manages to make good sounding recordings sound very good indeed" - Alan Sircom, hi-fi+, March 2015

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