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## EDITOR

Ncel Keywccó  
e-mail: [editcrial@hi-fiworld.co.uk](mailto:editcrial@hi-fiworld.co.uk)

## DESIGN EDITOR

Faiza Chunara  
tel: +44 (0) 20 8206 6018  
e-mail: [adproduction@hi-fiworld.co.uk](mailto:adproduction@hi-fiworld.co.uk)

## PRODUCTION EDITOR

David Ncble  
tel: +44 (0) 20 8206 6017  
e-mail: [classifieds@hi-fiworld.co.uk](mailto:classifieds@hi-fiworld.co.uk)

## SALES MANAGER

Lcuisse Palfrey  
mcb: +44 (0) 7917 047 548  
e-mail: [lcuisse@hi-fiworld.co.uk](mailto:lcuisse@hi-fiworld.co.uk)

## ADVERTISING EXECUTIVE

Jcanna Holmes  
mcb: +44 (0) 7958 602 347  
e-mail: [jcanna@hi-fiworld.co.uk](mailto:jcanna@hi-fiworld.co.uk)

## PUBLISHER

Ncel Keywccó  
e-mail: [publisher@hi-fiworld.co.uk](mailto:publisher@hi-fiworld.co.uk)

## FREE READERS CLASSIFIEDS

tel: +44 (0) 20 8 206 6017  
e-mail: [classifieds@hi-fiworld.co.uk](mailto:classifieds@hi-fiworld.co.uk)

## SUBSCRIPTIONS

tel: +44 (0) 1442 820 580  
fax: +44 (0) 1442 827 912  
e-mail: [hi-fiworld@websubscribe.co.uk](mailto:hi-fiworld@websubscribe.co.uk)

## PHOTOGRAPHY

David Noble  
tel: +44 (0) 20 8206 6017

## WRITERS

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



This month's lead product – the gorgeous World Design Pre4 preamplifier came up in the slow lane, even a back lane. The first one we received wasn't quite right so review was postponed. There was no space in a torrent of other products coming in on the fast lane, most of them perfectly preened. World Design Pre4 did not come with a Press Release, shiny press shot images or anything else – it crept in through a back lane I could say here. But it floated to the top, through wonderful sound quality and build quality, pushing itself onto our front cover this month, in chrome plated sparkling glory that you can see more of on p10. A very unique product in every way.

We continue our coverage of Roon music distribution software with the full monty package provided by Roon's own Nucleus+ server – a complex product for a modern age where software is slowly taking precedence over the hardware it runs on. Intelligence isn't always so intelligent, as you can read on p27, but that's overlooking all that Roon can do. It's a seriously heavyweight but audiophile piece of code writing.

And to make that point Naim's recent ND5 XS 2 can be used as a Roon Ready end-point DAC, carrying Roon software, although I suspect it's own web surfing abilities will be foremost in most people's minds, since Jon Myles found it a great way to access music services, as you can read on p54.

Arcam started out with their punchy but smooth A&R A60 amplifier. Recently they announced new SA20 and SA10 models, now with on-board digital ability. Martin Pipe takes a close look on p18.

Valves still have their place, different more expensive circuitry and the use of weighty transformers limiting appeal. But if you want high sound quality they are always worth the effort. Meanwhile, software systems like Roon are becoming ever more influential. I hope you enjoy both in our latest issue.

**Noel Keywood**  
Editor



## hi-fi world

Audio Web Publishing  
Studio 204,  
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## verdicts

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

amongst the best  
extremely capable  
worth auditioning  
unremarkable  
flawed  
keenly priced



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

To ensure the utmost 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

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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  
Tel: 603 9283 8171 Fax: 603 9281 3762 e-mail: [info@millennium-audio.com](mailto:info@millennium-audio.com)

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# contents



## AMPLIFICATION

**ARCAM SA20/SA10 INTEGRATED AMPLIFIERS 54**  
A pair of thoroughly modern amplifiers from Arcam catch Martin Pipe's attention.

**WORLD DESIGN PRE4 10**  
A remote-controlled valve preamplifier with transformer balanced output delights Noel Keywood.

## DIGITAL

**NAIM ND5 XS 2 STREAMER 54**  
Jon Myles takes a close look at a new affordable streamer from Naim.

**ROON NUCLEUS+ 27**  
A powerful network music server from Roon has Noel Keywood peering into the future.

## MAINS

**ISOTEK EVO3 NOVA MAINS CONDITIONER 41**  
Martin Pipe sets about cleaning his mains courtesy of experts Isotek.

## SOUNDBITES

**AUDIO TECHNICA DISC STABILIZER/STYLUS CLEANER 89**  
A brass puck stabiliser and sticky stylus cleaner from Audio Technica catch Martin Pipe's attention.



# MAY 2019

VOLUME 29 : NO. 3

## CABLES

### 93 CHORD COMPANY SHAWLINE X LOUDSPEAKER CABLE

Jon Myles on Chord Company's new Shawline loudspeaker cable.

## FEATURES

### 46 BRISTOL SHOW

Highlights of this year's Bristol Hi-Fi Show, by the magazine's team.

### 50 HI-FI WORLD AWARDS

Hi-Fi World's Annual Awards ceremony, held at the Bristol Hi-Fi Show, for best products of 2018.

### 58 AUDIO JUMBLE

Martin Pipe reports from this year's Audiojumble, Tonbridge, Kent.

## VINYL

### 80 NEWS

All the latest and greatest vinyl releases for you, from the pen of Paul Rigby.

### 83 MOBILE FIDELITY FEATURE

Paul Rigby and Noel Keywood talk about Mobile Fidelity and their 45rpm 'LPs'.

### 91 AUDIOPHILE BOOK

Paul Rigby reads Galactic Rumble, a massive book on UK music history.



## REGULARS

### 7 NEWS

Words from the world...

### 15 COMPETITION

Your chance to win a iFi xDSD DAC worth £399!

### 34 MAIL

Six pages of your views, wonderful as always...

### 24 SUBSCRIPTIONS

Ensure your copy every month and save money too!

### 62 AUDIOPHILE VINYL

Paul Rigby rounds up the latest audiophile vinyl releases.

### 65,67,69,71,73 OPINION

The team get to grips with matters music, hi-fi and life!

### 74 WORLD STANDARDS

Updated guide to the latest and greatest hi-fi hardware on sale

### 92 DIAL-A-DEALER

A comprehensive guide to UK hi-fi retailers.

### 95 CLASSIFIEDS

Second-hand bargains.

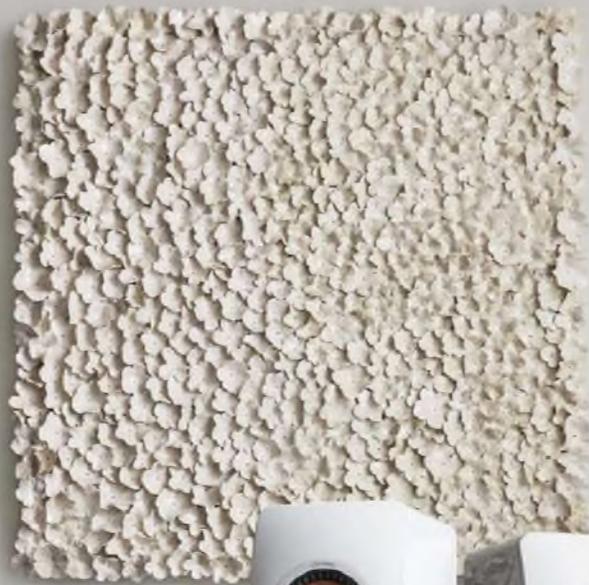
### 96 NEXT MONTH

What we hope to bring you in the next sizzling issue...

### 97 ADVERTISERS' INDEX

### 98 CLASSIC CUTS

Hitchhiker's Guide to the Galaxy, by Douglas Adams – reviewed by Paul Rigby.



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# news

## ALL IN THE FAMILY...

Interesting fact: the founder and CEO of E.A.T. (European Audio Team) - specialist manufacturer of turntables, cartridges and phono stages - is Jozefina Lichtenegger. Her husband Heinz happens to be the boss of Pro-Ject. E.A.T. new products are designed and built by a "specialist team" within Pro-Ject's Czech factory. They are the Prelude, the firm's first sub-£1000 turntable, and the valve-based E-Glo Petit phono stage (£1,249).



The belt-driven Prelude is described as a "simple, elegant and highly-effective design" that incorporates elements from the company's more costly 'tables. Supplied 'ready to play' with a purpose-made carbon-fibre tonearm and Ortofon 2M Red MM cartridge, the £999 deck has a heavyweight aluminium platter of low-profile, pulley speed-change (33 or 45rpm) and a DC power supply. No fewer than eight layers of piano lacquer give the Prelude a "luxurious look and finish".

The distinctive-looking E-Glo Petit phono stage, the smallest of a three-strong range, is a hybrid design featuring two prominently-positioned 12AX7 valves, an aluminium and wood casing and controls that complement the tactility of the vinyl medium.

Contact: Absolute Sounds (UK distributor), +44 (0)208 971 3909. [www.absolutesounds.com](http://www.absolutesounds.com).



## NOT A TOY...

McIntosh RS200 have launched their 'Wireless Loudspeaker System.' This £3,495 unit is claimed to redefine 'all-in-one' sound quality and supports AirPlay 2 and Bluetooth 5.0. Thanks to 'Amazon Works With Alexa wireless technologies' the unit can be operated in any room simply by speaking to a third-party Alexa control device.

two woofers, four midrange drivers and two tweeters – powered by a claimed 650W of amplification.

Other features include an output for an active (powered) subwoofer, optical digital connectivity, the iconic McIntosh power meters, an audio-only ARC HDMI input for better TV sound and a three-position switch that 'allows the EQ to be set based on the specific room and the user's listening preferences'. The unit can be converted to surround by adding RS100 wireless speakers.

Contact: McIntosh, [www.mcintoshlabs.com](http://www.mcintoshlabs.com).

The RS200 has streaming support for AAC, aptX HD for low-latency hi-res playback and DLNA support. It also offers Play-Fi from DTS, which has built-in interfaces for services like Amazon Prime Music, Pandora, Qobuz, Spotify and Tidal. You'll hear the music sourced from them via



## UK-KI NOKKI

The Dutch Okki Nokki record cleaning machine (RCM) – one of the most affordable currently available – now has a UK distributor, in the form of County Durham based Decent Audio. Priced at £435, the Okki Nokki – claimed to be one of Europe's best-selling record cleaning machines – is described as a 'compact yet powerful piece of kit...with a build quality, features and performance that might be associated with more expensive machines'. A record is placed on the platter, which can be spun in either direction, so it can be scrubbed with a goat-hair cleaning brush and cleaning fluid. It is then vacuumed using the aluminium suction arm to remove any residual dirt.

Originally conceived around 15 years ago by Dutch designer Johan Bezem, the cleaner's design and construction have 'steadily and deliberately' evolved. A raft of enhancements have been added over this time, yet the price has been kept 'firmly in check'. Audiophiles on a budget, who are nevertheless keen to keep vinyl collections in tip-top condition so that they can be heard at best should give the Okki Nokki some consideration.

Contact: Decent Audio, +44 (0)5602 054669. [www.decentaudio.co.uk/okki-nokki](http://www.decentaudio.co.uk/okki-nokki)

## SOLID PERFORMER

Japanese manufacturer DS Audio, better-known for its innovative optical photo cartridges, can now supply a headshell in which to fit them. The HS-001 solid headshell can however 'provide a superior fitting for any and all phono cartridges' – and not just DS Audio's own designs. Precision-machined from a solid billet of light but rigid Duralumin alloy, the HSD-001 is an SME bayonet-fit of the sort

that has seen a resurgence in popularity. It features an 'upper and lower vertical pin structure' for even tonearm-fitting contact; most conventional designs, in contrast, have a single vertical pin on the upper side of the connector that DS Audio claim results in uneven contact pressure.

The whole contact surface is then further-anchored by a domed headshell washer, custom-developed by DS Audio, for even greater stability and resonance control.

DS Audio selected a Japanese made Litz wire for the HS-001's signal leads, which are carefully hand-soldered to 'preserve signal

integrity' for the optimal sound performance.

Such attention to detail doesn't come cheap. In a presentation box with cartridge mounting bolts, a HS-001 will set you back £395.

Contact: Sound Foundations, +44 (0)1189 814238, [www.soundfoundations.co.uk](http://www.soundfoundations.co.uk)



## DANCING WITH PHYSICISTS

'The laws of physics' Black Rhodium reminds us 'describe effects that occur when electricity flows through conductors', such as the leads that interconnect your hi-fi gear. These effects, they say 'can be heard as distortion to the music, spoiling your enjoyment of it'. The firm's

engineers claim to have discovered that 'at least seven' of these laws - among them "conductor choice, insulation and its susceptibility to vibration and electrical interference' that affect the sound quality of audio cables.

In its quest to 'counteract these forms of audible distortion' Black Rhodium has tried a range of methods, some of which are proprietary. They're embodied in the latest Polka Classic speaker cable that which is claimed to deliver a 'quantum leap in sound quality'. Features of the new hand-made cable – a 2m pair of which will set you back £1,200 – include silver-plated stranded-copper conductors, silicone rubber insulation, braided screen, vibration-damping and Graham Nalty terminations (a choice of 4mm or spades).

Developed from Black Rhodium's existing Foxtrot, Quickstep and Waltz cables, the Polka Classic has been 'designed especially for classical music, with a lesser influence on conductor size and greater emphasis on conductor and material quality'.

Contact: Black Rhodium, +44 (0)1332 342233. [www.blackrhodium.co.uk](http://www.blackrhodium.co.uk)



## DOUBLE D-LIGHTFUL

Kilmarnock-based Atlas Cables is doing its bit for cleaner power by launching the Eos dd, a new range of high-performance screened mains power cables. The latter letters are an acronym for 'dual-drain', a technology that was originally 'researched and implemented into the company's EOS 4dd'. Atlas claims that dual-drain acts as 'a super filter against harmful incoming RF AC power contamination, dumping any airborne and electromagnetic disturbance effects rapidly to earth thereby removing them from the AC power feed'.

Other features include high-current OFC conductors, highly-stabilised PVC dielectrics and a hybrid carbon screen with Atlas's anti-vibration filler.

The engineering brief was to deliver a high performance lead that 'could improve the performance of the majority of hi-fi systems' at low cost; to this end, a 1m Eos dd with an IEC male connector at one end and a 13A plug at the other will sell for £145. Other available lengths are 1.5m (£165), 2m (£185) and 3m (£225).

Contact: Atlas, +44 (0)1563 572666. [www.atlascables.com](http://www.atlascables.com)



## BASKET CASE

For proof of how our music-listening habits have changed over the years, we need look no further than the latest (2019) 'basket of goods and services' that the Office of National Statistics publishes annually to gauge consumer price inflation.

In comes a 'new item': the smart speaker. Devices like the 'Amazon Echo and Google Home' have, according to the ONS, 'been added due to increasing popularity, and to ensure the basket is representative of the latest technology items that consumers are purchasing'.

An existing item, the 'Portable Speaker, e.g. Bluetooth Speaker', replaces 'Hi-Fi' as a category. This, says the ONS, is "to reflect developing technology and improve coverage compared with the hi-fi item which was becoming increasingly-difficult to price'.

Vinyl records were removed from the basket in 1995, but the ONS ponders on the possibility of their return to the basket, following an 'increase in sales – the highest in 25 years'.

ONS, <https://bit.ly/2VFjada>



## T+A THREESOME

German audio brand T+A's latest high-end digital onslaught comprises three new flagship HV-series components – the £21,990 SD3100HV DAC/streamer, the £23,400 SDV3100HV DAC/streamer with analogue volume control and the £13,996 PDT3100HV reference CD/SACD transport. The digital converters in these units can handle PCM signals all the way to 32-bit/768kHz and are ready for DSD1024 (49.2 MHz) for 'detail, transparency and dynamism, the maximum possible upsampling and reproduction at the highest level'.

They are the "most powerful and innovative" converters developed by the firm to date and also boast a "completely new" two-port UAC3 USB receiver, which will sustain playback of 32-bit and DSD1024 material via computer.

A playback alternative is the inbuilt T+A High-Res streaming client, which provides direct access to selected music services (Roon-Ready certification is "in preparation").

There's also aptX Bluetooth, USB audio, no fewer than seven conventional digital inputs, HDMI support, a tuner compatible with FM and DAB+ services, a pair of headphone sockets and outputs in both balanced (XLR) and unbalanced (phono) form.

Interestingly, T+A's engineering efforts have been supported by Germany's Federal Ministry for Economy and Energy. I wonder what assistance is offered to the British hi-fi industry by the UK government?

Contact: Kog Audio +44 (0)2477 220650. [www.kogaudio.com](http://www.kogaudio.com)

## MINE'S A STELLIA!

Focal is clearly hoping that its new Stellia – a £2,800 statement of pure headworn-transducer luxury – will do for closed-back 'cans' what its remarkable Utopias did for those of the open-back variety.

Intended for both home and on-the-go use, the Stellia is built around specially-designed full-range 35-ohm speaker drivers with Focal's trademark M-shaped beryllium domes and low-mass frameless copper voice coils. The dual-vented cups they're mounted in employ some clever design, such as the judicious deployment of EVA foam pads and acoustic diffusers to ensure a wide and even frequency response (5Hz – 40kHz is specified).



These 'comfortable and ergonomic' headphones are claimed by the French firm to reproduce 'the tiniest sound details at both high and low frequencies... with exceptional tonal balance and dynamics'. The closed-back design also ensures a worthwhile degree of ambient soundproofing.

The Stellia, with earpads fashioned from full-grain leather, is supplied with two cables - a 3m balanced type with 4-pin XLR, and for portable players a 1.2m lead terminated in a 3.5mm plug.



Focal has also announced a DAC/headphone amplifier, the 'uncompromising' £2,500 Arche. Its two balanced AK4490 DACs can deal with 32/384 PCM sources, as well as DSD256 content. The outputs of the Class-A 1W headphone amps they feed are available on 6.3mm (unbalanced) and XLR (balanced) sockets.

In addition to digital sources (USB and optical/coaxial S/PDIF), the Arche can be driven from a line-level analogue source.

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

## M&J MAKES IT A THREESOME

The courageous – if flawed – 800-series two-box amplifier from Mitchell and Johnson, reviewed recently in Hi-Fi World, now has a matching CD player.

Designed, engineered and built in the UK, the new S800 CD player perfectly complements the existing S800 pre- and S815 power amp. It reinforces the company's transition towards 'a new era of entirely British-built equipment for its customers, following a period of considerable investment'.

The £1,300 S800 CD player employs a European-sourced tray-loading CD drive and digital data from it is turned to analogue using an industry-leading ESS Sabre DAC chip. Other features include a linear power supply and a sensible complement of outputs - balanced XLR and unbalanced RCA for analogue, and both optical and coaxial S/PDIF outputs for external DACs. 12V Power Link connectivity is provided for integration with other equipment, notably the aforementioned M&J amplification. Its crowning glory is an unusual - but nevertheless welcome! - onboard headphone amplifier, with its own volume control.

Contact: Mitchell and Johnson, +44 (0)845 643 5064, [mitchellandjohnson.com](http://mitchellandjohnson.com)



# Simple, Pure

**A valve pre-amplifier with gorgeous build quality, finish and sound. Noel Keywood explains.**

**R**oll up your sleeves – this is a kit (but it can be bought built). A kit pre-amplifier with valves. At £725 World Designs Pre4 isn't a kit designed to save you money, so much as one aimed to deliver great sound from a unit whose fundamental build quality and finish you'll find few places else.

This is a kit that will last a lifetime, because of the pride and satisfaction behind building such an item yourself, its intrinsic quality and of course its accessibility for repair or upgrade. You'd never junk Pre4; it's not a throw away; I still have and use my World Audio Design – predecessor of World Design – preamps that were designed with the same aim in mind. Never to become obsolete and re-cycled.

To build it you must be able to use a soldering iron – and it helps to have some idea of what electronic components are about. Although, on the other hand, many World Audio Design kits went to educational establishments, but I guess a tutor would be present.

With Pre4 high voltages exist inside, so it must be handled with care when switched on and the circuitry exposed for test purposes. A multimeter is needed for final testing.

There is a build service, cost £200 to have Pre4 built.

Pre4 is a preamplifier with gain of x5 from its phono socket inputs to phono socket (unbalanced) outputs, or x10 from phono socket inputs to XLR socket (balanced) outputs. Although the internal ECC82 valve gain stage, one per channel, is a conventional unbalanced design, balanced output is provided by line-drive output transformers. The point of this is to attain a low impedance but high gain from one double-triode amplifying valve, avoiding the use of a cathode follower or silicon chip for line drive – the usual solution. Isolated secondary windings also avoid hum loops. And a bit of religion: transformers always deliver the best sound when designed properly!

What impressed me about Pre4 was its fabulous build and finish, as well as remote control of volume and input switching. A front panel machined from a 4mm thick aluminium billet, custom machined control knobs chrome plated, and a high quality motorised Alps volume control give it a lovely feel – firm as a rock – and appearance. The WD logo and text are actually etched in, likely by a computer controlled milling machine. Few manufacturers go this far. Size is 220mm wide, 314mm deep

and 82mm high, with a weight of 4.5kgs.

Turn the input selector switch and its silky solid action promotes small clicking sounds from sealed small-signal relays deep within. They have low contact resistance and last forever (rated at millions of operations). The switch isn't a switch in fact, it's a rotary encoder and the relays allow input selection by remote control. It's a solution we used in WAD preamps after disassembling mechanical switches with silver contacts, only to find the soft silver plating had been pushed aside after a very short time, raising contact resistance and degrading performance. This is where hi-fi products in real life can deteriorate fast for reasons few understand or appreciate, so they're rarely mentioned. Sealed relays designed for audio are a definitive solution; Pre4 is more than it seems.

The cleverly laid out internal circuit board carries LEDs that indicate visually which input has been selected – a nice touch.

Alps are the go-to source of high quality audio volume controls and Pre4 uses their popular motorised unit that can be remote controlled. Press up or down on the remote and watch the volume control knob



move in ghostly fashion! Build Pre4 and you learn how it all works behind the scenes.

The remote control unit is generic, not purposed for Pre4, but that is to be expected for a specialised low-volume kit – we're not talking Sony here. It is small and lightweight, so unobtrusive.

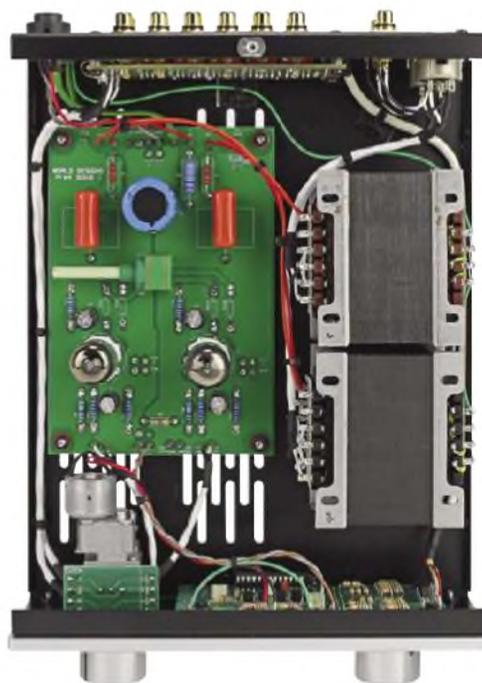
Avoiding hum in a valve preamplifier is difficult so power is external, from a supply that will also feed Phono3, an all-valve phono stage. The main issue here is cost – £299 for PSU3. The power supply has been styled to match Pre4 rather than be hidden away, demanding another alloy fascia and custom machined and plated knob. The power lead carries 400V d.c. and 6.3V d.c. for the

ultra low noise. Size is 135mm wide, 314mm deep and 82mm high.

**SOUND QUALITY**

I connected the World Design Pre4 via Chord Company Epic balanced XLR cables to our Creek Evolution amplifier through its direct (no volume control) balanced Line 4 input. It fed our Martin Logan ESL-X loudspeakers through Chord Company Signature cables, the system being run from an Isotek Evo3 Mosaic Genesis regenerated mains supply. Source was an Audiolab M-DAC+ connected to a Chord Electronics M Scaler digital filter fed CD from an Oppo BDP-205D acting as a transport, as well as hi-res.

Oh the sound of valves! Spinning



*Top view shows a rear relay board, main board with valves, massive line output transformers, a front indicator board and motor driving the Alps pot (bottom left).*



*A clear view of the Alps motorised volume control (right), front indicator and input select board and massive line output transformers – expensive (so not used by anyone else).*

Josefine Cronholm's In Your Wild Garden (uncompressed CD) I was caught up in the spacious, texturally rich, dynamic but easy going sound that only valves can give. Her microphone seemingly gave not only the subtle modulations and inflexions of her vocals but also the background ambience it was collecting. Free from the hard quality of solid-state, Pre4 came over here as naturally rich and crystal clear, without any hint of crystal to the clearness. As if a glass window had



heaters. This can be made long if you wish allowing the power unit to be placed away from the preamp if space is limited. Similarly, the balanced output of Pre4 can also be made long, feeding a power amp – valve or transistor – on the floor perhaps.

Construction is on circuit boards with plated through holes, the instruction manual carrying numerous coloured pictures and diagrams to explain where everything goes. When complete and running, gain can be set internally to match outside sources. There is no feedback in the circuit.

PSU3 is solid-state but possesses (expensive) choke regulation for



*The power supply unit, PSU3, with toroidal mains transformer at right, frame choke (top), Schottky diode rectifier and smoothing capacitors.*



**XLR balanced line outputs at left, together with solid, gold plated phono sockets. There are five line inputs and a tape out at right.**

been removed to let in natural light and an open view of the outside world. Simple, yet full of life.

I went into listening thinking limited bass and treble might be obvious in the sound. Pre4 is so open and clear it is not warm or soft. Quite the reverse, it has a lucidity that is forceful in its own way: "just hear this". That's the treble bit.

Bass quality was interesting. Pre4 proved fast, able to discern the

natural resonant quality of a bazouki in Loreena McKennitt's Gates of Istanbul. There was a fluidity in the progress of this track that seemed unquestionably natural – sharply timed yet with no sharpness in its timing. With the capacitor fitted to our review unit imposing a low bass limit of 100Hz (-1dB) I would increase its value from 0.1µF to 0.22µF or so to add some extra weight but as it stands Pre4 comes over as clean and fast.

With a kit you can alter components to tweak the sound.

The simplicity and purity of Pre4's circuitry made it transparent to the source, clearly revealing what Audiolab's M-DAC+ was delivering from CD, via Chord Electronics M Scaler. Pre4 passed this information through with a sense of natural clarity elusive to other preamplifiers.

**CONCLUSION**

World Designs Pre4 preamplifier was a delight. It has a simple purity of sound that evades most others, a balanced output with high gain that suits modern balanced power amplifiers and both build quality and finish that shades all else. Complete with remote control, in its own quiet way Pre4 is a beacon of audiophile standards. The built version at £1304 (inc. built PSU3) is of higher quality than most other preamps available. If you want a top quality preamp this is the one

**The umbilical power cord that carries 400V d.c. and 6.3V d.c. for heaters.**



**Rear of power supply PSU3. It will feed both Pre4 and the World Designs Phono3 valve phono stage.**

**MEASURED PERFORMANCE**

Pre4 gain measured x5 (14dB) from the line inputs to phono socket (unbalanced) line outputs, with a maximum output of 3.5V.

From line inputs to XLR socket (balanced) outputs gain measured x10 (20dB) and maximum output 7V. With a lot of expense in the output transformers, Pre4 is best used from its balanced XLR socket output, that had a low output impedance of 40 Ohms.

Because the line inputs feed direct into the volume control there is no input overload limit. The output limits are more than enough to feed all power amplifiers, most needing 1V into a phono socket input (unbalanced) or 2V into an XLR socket input (balanced).

Frequency response shows output rolls down above 20kHz and below 100Hz (-1dB). The upper limit is likely set by winding capacitance in the

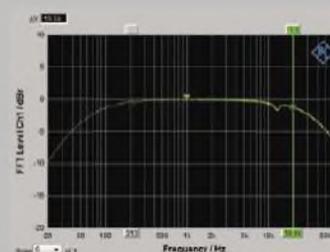
output transformer, but the lower limit by a 0.1µF coupling capacitor that is easily changed for more downward extension, to add some low end weight. Noise was low at -100dBV and distortion also low at 0.1% for 1V output.

This is a fascinating circuit arrangement with its use of output transformers. It measured well in all areas. **NK**

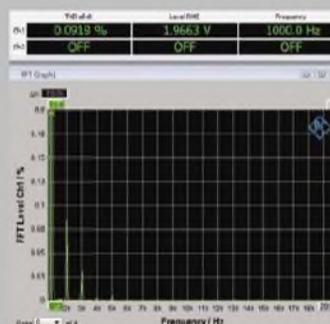
**Frequency response (-1dB)**

100Hz-20kHz	
Distortion (1kHz, 5mV in)	0.1%
Separation (1kHz)	68dB
Noise (IEC A)	-100dBV
Gain (unbal., bal.)	x5, x10
Overload (unbal., bal.)	3.5V / 7V
Output impedance (XLR)	40 Ohms

**FREQUENCY RESPONSE**



**DISTORTION**



**WORLD DESIGNS PRE4 £725 KIT**



**OUTSTANDING - amongst the best**

**VALUE - keenly priced**

**VERDICT**

A lovely valve preamplifier with superb sound and modern day ability.

**FOR**

- sound quality
- remote control
- build and finish
- balanced output

**AGAINST**

- needs skill to build
- no digital

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# WIN AN iFi SUPERB xDSD DAC WORTH £399 IN THIS MONTH'S GREAT GIVEAWAY!

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plated, as do Canford. You need to be dextrous and have good eyesight to solder these things (plus the right tools) so be aware of the realities of going balanced here; best to seek out proprietary cables.

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Unusually, iFi have fitted a rear 3.5mm jack socket to accept an S/PDIF digital input in either electrical or optical form, supplying an optical Toslink adaptor".

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## QUESTIONS

**[1] What is the four-pole socket?**

- [a] 6.3mm
- [b] 3.5mm
- [c] 2.5mm
- [d] 1/4 inch

**[2] Who has 3.5mm four-pole plugs?**

- [a] Tesco
- [b] Boots
- [c] CPC Farnell
- [d] Laskys

**[3] Output measured?**

- [a] 4.3V
- [b] 3.0V
- [c] 3.4V
- [d] 4.0V

**[4] Volume was set by?**

- [a] remote control
- [b] smoke signals
- [c] knurled wheel
- [d] semaphore

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# Guts 'n' glory

Martin Pipe checks out Arcam's all-new SA20 and SA10 integrated amplifiers. They have a gloriously gutsy sound he thought.



**T**his new mid-price series of separates from Arcam is known as HDA (High Definition Audio), and it will be eclipsing the FMJ (Full Metal Jacket) range that has been around for a couple of decades or so. The HDA line-up currently comprises the CDS50 streaming CD/SACD player and two matching slimline integrated amplifiers – the SA10 (£699) and SA20 (£999), reviewed here. In this review, I'll examine the latter units, destined to replace the existing A19 and A29 respectively. I'll concentrate on the SA20, the lower-end SA10's principal deviations being described at the end of my review.

The differences between the HDA models and their FMJ predecessors is striking, reflecting changes in hi-fi over the past few years. Both A19 and A29 made little provision for digital, streaming and AV integration. They had 3.5mm front-panel sockets for the personal MP3 players that were then in vogue, and the A29 built on this with a rear-panel USB socket for charging

devices of this type. In contrast, both SA10 and SA20 feature built-in DACs fed from rear-panel inputs labelled 'BD', 'SAT' and 'AV'. They also have a 'processor' mode that enables them to dovetail with surround-sound audio systems. There are rear-panel Ethernet (RJ45) and USB ports, plus RS232, but these are for software upgrades, rather than audio streaming. Despite the presence of Ethernet, there's no web interface for control of the amp via a PC or smart device like an iPad. Wi-fi isn't incorporated, and Bluetooth is missing too.

Like the A29, the SA20 incorporates Arcam's 'Class G' amplifier technology; in contrast, the lower-powered (50 Watts per channel, against the SA20's 80 Watts claimed) SA10 has a conventional Class A/B power amplifier. In a Class G amplifier, the output stage's power-supply voltages change according to the signal level. It's difficult to do this in 'real time' without affecting sound quality, a problem that preoccupied Arcam's engineers for much time. Why go to

so much trouble? Conventional amps apply the full supply voltage at all times, regardless of the demands of the music you're listening to – and this is wasteful. Class G operation was conceived to improve efficiency, but not at the expense of musical performance. Greater efficiency equates to less wasted heat, and as a result amps can be made smaller and lighter. In theory, at any rate; I note that the SA20 is heavier (9.2kg) than the non-Class G SA10 (8.4kg)! Both make use of toroidal mains transformers.

Similarities between the old and new ranges include – for both SA10 and SA20 – a 3.5mm front-panel headphone socket and line-level input (Aux), a power-saving auto-standby system that automatically shuts down the amp after a preset period of 'idling', the ability to adjust stereo balance, muting and an integrated MM phono stage.

A decent remote, which will also operate other Arcam gear, is supplied for armchair use – you also get a practical complement of front-panel controls, together with a

bright alphanumeric fluorescent display that can be 'dimmed' or extinguished altogether.

The SA20's DAC is one of the ESS 'wonder chips' that have gained so much attention of late – the ESS9038 K2M. It can be fed from three inputs – two of which are coaxial, and one optical. Despite Arcam's intention to make amps relevant for modern musical consumption, no provision for USB sources (like computers) has been made. So no DSD over USB (DoP) here! They max out at 192/24 (96/24 if you're using optical) and the sampling rate of what you're feeding the amp is shown on the front-panel display.

Although the manual doesn't mention it (you'll find the details in a 'supplement' on Arcam's website), the characteristics of the DAC's digital filter can be modified courtesy of four preset modes accessible in the menus.

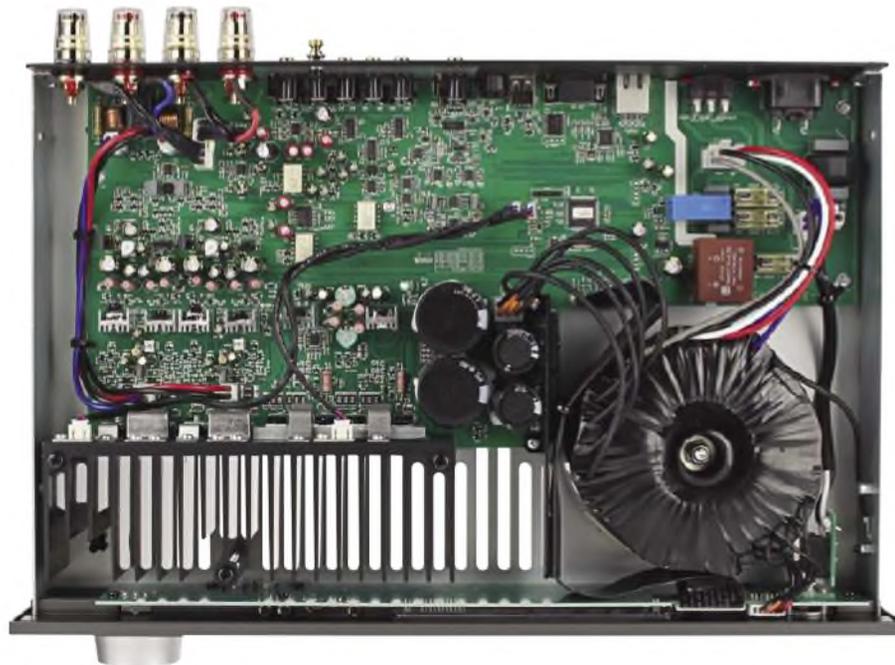
There are three rear-panel analogue line-level inputs – plus the aforementioned phono stage and front-mounted 3.5mm auxiliary jack.

No tape loop is present, but a line-level pre-amp output has been fitted for 'bi-amping' suitable speakers with the help of whatever external power amp happens to be at your disposal.

As with previous Arcam amps, the speaker terminals are robust fittings able to accept bare wire or 4mm banana plugs. When an input is allocated to 'processor' mode the SA20's volume control will be disabled. In this mode, said processor – typically a surround decoder, with its own volume control – will be using the SA20 and its speakers to reproduce the front left and right channels. Menus are also used to set the specific volume level.

## SOUND QUALITY

I partnered the SA20 with Quadral Aurum Wotan VIII speakers, a Cambridge CXN streamer (connected both via analogue and



***Internally the SA20 is a packed space, the large black toroidal transformer of its linear power supply (right) dominating. Although Class G and not running at a high idle current, there is still copious heat sinking – at front.***

coaxial digital, for comparison purposes) and an original Technics SL-1210 Mk2 turntable fitted with Audio-Technica AT-440MLb MM cartridge. The first thing I heard is just how deep bass notes go – this is a gutsy performer! It helps to compensate for the low-end reticence of the Wotans, the qualities of which are more concentrated in the treble (thanks mostly to their

And with Radiohead's *Idioteque* (lossless CD rip) the complex and busy percussion was bestowed with immediacy and bite. All this was with the analogue input, fed by Cambridge Audio's CXN DACs.

Feeding the SA20 from one of the CXN's digital outputs yielded a presentation that switching between the inputs revealed as a tad more forward and aggressive – and all

"The SA20's DAC is one of the ESS 'wonder chips' that have gained so much attention of late"

ribbon tweeters). The bassline of Boards of Canada's *Palace Posy*, from Tomorrow's Harvest (lossless CD rip), had the expected depth and guts. In other words, this amp manages to eke out the speaker's potential in this regard – and with no sense of strain audible.

The SA20 also did justice to the organic tonality of the track's analogue synth-driven melodies. Not much in the way of percussion here; other electronic music like Kraftwerk's *Tour de France Soundtracks*, in lossless CD rip form, were well-timed, crisp and clean.

the better for it! In terms of stereo imaging and tonal character, though, the CXN DACs may have a (slight) edge.

The bass end of the audible spectrum was well looked after with digital sources, but the same degree of impact was missing when playing vinyl. The bass harmonica of *The Boxer* (from my mid-70s CBS pressing of Simon and Garfunkel's *Bridge over Troubled Water* LP) may have been tight, but didn't have the sheer heft I have heard with other systems. Likewise the prominent bassline of Squeeze's *Tempted* (East



The rear panel carries an RJ45 ethernet socket, RS232 and USB at centre, for external control and software upgrade. At centre are S/PDIF digital inputs but no USB for computer connection. Then come analogue inputs and at right a single pair of loudspeaker output sockets for 4mm banana plugs, spades or bare wire.

Side Story, LP) lacked the depth I'm used to; Phono-stage warp filtering is to blame. These subdued elements were restored after I connected a Pro-ject Phono Box S2 Ultra (the infrasonic filter of which is switchable) between my turntable and one of the SA20's line inputs.

Putting aside its low-frequency reticence, the Arcam Phono stage is undoubtedly capable. For example, Paul Carrack's soulful vocal and organ-playing on Tempted both worked here.

Classical music on LP also showed the SA20 to be a capable performer. The sheer variety of

instrumental texture that underpinned my 1958 EMI stereo recording of Dvorak's New World Symphony (Berlin Philharmonic/Rudolf Kempe) was faithfully portrayed, as was the space in which the musicians perform.

Classical delivered via digital also had appeal. Radio 3 concerts, experienced via the CXN's ability to access the BBC's inadequately-publicised 320kbps stream, are immersive and take advantage of the SA20's broad frequency response. A 24-bit reference-standard recording of Britten's brooding War Requiem (LSO Live/Nosedá) showed that

the SA20 takes hi-res in its stride – orchestral attack and precision were evident, as was the ability to deal with the complex sound of massed choirs.

**CONCLUSION**

There is much competition in the sub-£1000 integrated amplifier market, but the SA20 has much going for it at this low price point. Arcam has attempted to make a product that appeals to everyone, and I can't help thinking that on the whole it has succeeded. The SA10 is more modest but still a respectable performer.

**MEASURED PERFORMANCE**

The SA20 produced 105 Watts into 8 Ohms and 182 Watts into 4 Ohms, enough for all situations. The SA10 produced 60 Watts into 8 Ohms and 72 Watts into 4 Ohms, lower power with poorer regulation.

Distortion levels of the SA20 were low at both low and high outputs at all frequencies, the critical 1W/10kHz value – a measure of crossover distortion – coming in at a low 0.02% our analysis shows. In the midband (1kHz) distortion measured 0.003% at 1 W and 0.005% just below full output. The SA10 was identical.

Input sensitivity was high at 190mV, so the amplifier will work with low output sources such as an MC phono stage.

Frequency response measured flat from below 3Hz to 68kHz, unaffected by volume control position. The SA10 was however limited to 10Hz-30kHz (-1dB).

The optical S/PDIF digital input worked to 192kHz sample rate on both amplifiers, frequency response extending to 66kHz on the SA20 but a lower 30kHz on the SA10. Distortion with CD was 0.22% on both models, and 0.05% from hi-res (24/96). The SA20 had a good EIAJ Dynamic Range value of 115dB from both

loudspeaker and preamp outputs, the SA10 managing 112dB due to higher distortion, so its digital section is slightly poorer.

The MM phono stage of both SA20/10 was very sensitive at 2mV for full output, suitable for high output MC cartridges. Overload was high at 55mV. A strong warp filter is built in and attenuates low bass heavily. There will be no cone flap, but also not the low bass presence LP provides.

The SA20 measured well all round and the SA10 wasn't far behind, being only marginally down in most areas except power. Both are well engineered with no weaknesses. **NK**

**SA20 AMPLIFIER**

<b>Power</b>	<b>105W</b>
<b>Frequency response (-1dB)</b>	<b>3Hz-68kHz</b>
<b>Distortion (10kHz, 1W)</b>	<b>0.02%</b>
<b>Separation (1kHz)</b>	<b>90dB</b>
<b>Noise (IEC A)</b>	<b>-91dB</b>
<b>Sensitivity</b>	<b>190mV</b>

**DIGITAL**

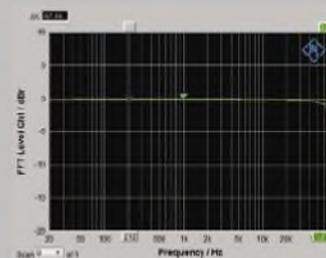
<b>Frequency response (-1dB)</b>	<b>4Hz-66kHz</b>
<b>Distortion (-60dB)</b>	<b>0.05%</b>
<b>Dynamic range</b>	<b>115dB</b>

**PHONO (MM)**

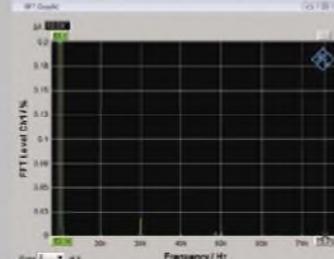
<b>Frequency response (-1dB)</b>	
----------------------------------	--

	<b>40Hz-20kHz</b>
<b>Distortion (1kHz, 5mV in)</b>	<b>0.04%</b>
<b>Separation (1kHz)</b>	<b>67dB</b>
<b>Noise (IEC A)</b>	<b>-76dB</b>
<b>Sensitivity</b>	<b>2mV</b>
<b>Overload</b>	<b>55mV</b>

**FREQUENCY RESPONSE**



**DISTORTION**



**ARCAM SA20**  
**£999**



**EXCELLENT - extremely capable**

**VALUE - keenly priced**

**VERDICT**

Gutsy sound and quality digital, but mediocre LP

**FOR**

- a gutsy and musical delivery
- ESS digital sound quality

**AGAINST**

- no Bluetooth
- no networking
- phono stage lacks impact

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**ARCAM SA10**

The SA20's 'smaller brother', the £699 SA10, may also be worth considering if you're after a lot of solid-state amp for your money. It will deliver 50 Watts rather than 80 Watts (claimed – but see Measured Performance) to each speaker, but in other respects it's so similar Arcam uses the same manual for both models! The SA10 power amps



*Interior of the Arcam SA10. The bottom left is dominated by the Class A/B power amplifier section and to the right is the enormous toroidal mains transformer feeding it. The top half houses the small-signal electronics (preamp, DAC and so on).*

are 'standard' Class AB, there being insufficient budget to incorporate the Class G technology. However, listening with the same source material I used for the SA20 reveals that the smaller amp is also capable of a gutsy performance. In a modest-sized listening room, the SA10's output should suffice.

Another difference between the SA10 and SA20 concerns the specific Sabre chip used in the DAC section. In the SA10, you'll find a ESS9016K2M – the SA20,

meanwhile, uses the more upmarket ESS9038K2M. In this regard, there is an audible difference. The SA20's converter seems to offer more 'space', resolves more complex musical details and sounds cleaner at lower programme levels. In both cases, the digital filters are very subtle in their effect – as is usually the case. I found myself being drawn more towards the linear-phase settings. Both SA10 and SA20 incorporate headphone amplifiers – which to my ears sounded similar. It's no substitute for a purpose-designed headphone amp, but most of the music is nevertheless there for listening.



*The SA10 and SA20 share the same rear-panel connectivity, except for the smaller loudspeaker terminals of the SA10. Again the Ethernet and USB ports of the SA10 are intended for remote-control and firmware upgrades respectively (the RS232 interface is for control too).*

**ARCAM SA10**  
**£699**



**EXCELLENT - extremely capable**

**VALUE - keenly priced**

**VERDICT**  
Solid sound and good digital, but mediocre LP

**FOR**  
- a strong musical delivery  
- good connectivity

**AGAINST**  
- no Bluetooth  
- no networking  
- phono stage lacks impact

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# Nuclear Server

**Roon's Nucleus+ music server packs power for a home network. Noel Keywood gets involved.**

Last month, in a feature explaining Roon – software that catalogues music and distributes it in the home – I ran it from my Mac computer. Inexpensive at \$119 for one year, it was quick and easy to use – but not so good when the computer is turned off! Roon recommend use of their always-on Nucleus dedicated server to deliver music over a home network. Here is their top Nucleus+, price a lofty £2500. It isn't a simple network-attached storage (NAS) drive so much as full blown, customised Intel NUC computer running Roon's own operating system/server software – a different experience to Roon on a home computer I found.

Nucleus server sends music to

your hi-fi over a network via wired Gigabit ethernet only. It can send from its own storage drive, from network attached storage, or from an external music source such as Qobuz or Tidal Masters (MQA encoded), to quote two that offer audiophile quality. Control is from a wi-fi connected iPad ideally, so both the cover artwork and music history can be read easily whilst listening. The obvious parallel is viewing LP cover art and sleeve notes whilst the disc spins.

To simply summarise, Roon plays music from computer storage under the control of an iPad or mobile phone, sending it to the hi-fi over an ethernet network cable. So receiving devices must have ethernet access. Currently, many DACs don't – but

that is changing.

Gathering data from on-line sources and assembling it for tablet presentation needs computing power Roon say, and Nucleus is designed to run the software effectively for stable, reliable, upgradeable and audiophile performance. Impressively, Roon are so audiophile orientated they even talk about the possibility of Nucleus running from a linear power supply rather than the switch-mode wall-wart supplied. I nearly fainted.

Roon have worked with Intel to extensively purpose NUC – Intel's mini computer – for audio use. For total silence it has no cooling fan, relying instead on a solid aluminium case to dissipate heat from the processor by conduction to the case and convection from its fins. Weight is





**Internally, Nucleus+ has an Intel NUC motherboard and a SanDisk 64GB Solid-State Drive (SSD) – no whirring sound, but modest in size. Capacity can be increased by external Flash Drive or Terabyte hard drive, or internal hard-disc drive (HDD).**

2.5kgs and size 212mm wide, 156mm deep and 74mm high. Inside is Roon's own Linux based operating system (OS) hardened by an independent boot sector to make start-up assured should a software update fail or the machine be hacked in any way, Roon identifying a need for security in a product permanently on and attached to the internet.

There are two models: Nucleus (£1500) and Nucleus+. The first will suit most people Roon state, whilst the + version reviewed here is aimed at those who want all features, including high rate DSD – something that especially interests me. Internal storage can be on a removable/upgradable solid-state hard drive (64GB SSD) or for more capacity a spinning drive (HDD), but the OS works best from SSD and a fast multi-core processor, meaning Intel i3 in Nucleus with 4GB RAM or i7 in Nucleus+ with 8GB of RAM. Roon software consumed 5GB of the 64GB SSD, and 35GB of music was installed, to give you some idea of real life capacities. Our DSD test tracks took up 4GB by the way. An easy and cheap way to expand memory would be a 128GB flash drive.

Power is supplied by an external 19V switch-mode supply that, like most, accepts 100V-250V a.c. input, 50/60Hz, so will work anywhere.

There is no drive for ripping CD – this must be done on an external computer. The company say that if you're retrieving music from on-line

sources like Qobuz or Tidal why bother ripping and storing it locally on Nucleus? Academic perhaps for most people who have already invested time and effort into getting their music collection onto a home hard drive, but a good point.

Roon can see and play music in 'watched folders' but here things got rocky. A Mac (Sierra) and PC (Windows 10) both saw Roon as a storage drive and granted it access as a guest, through their firewalls without my intervention (how this happens I do not know). However, Roon did not see either; I was unable to search (browse) from Roon, instead having to enter folder paths – and no success here. The Mac did ask for the Nucleus password which was not obvious in Roon's About info. Doubtless all this can be sorted out

but Roon server was 'computer-ish' difficult here.

It was both obvious and easy to load (copy) music files from Mac and PC directly onto Nucleus, then they were permanently available even with computers switched off. Or music can be loaded to a high capacity external disc drive connected via USB – at extra cost of course.

Two USB ports are fitted and see mass storage or peripherals. A USB flash drive (memory stick) with music files was seen without problem. Also, I drove an Audiolab M-DAC+ through USB to audition the unit, and it successfully flagged up DSD 5.6MHz on its display when faced with double-rate DSD (DSD128) from Nucleus+. There is an HDMI output and a high speed Thunderbolt socket too, both of which can handle audio and video – in this case album artwork etc.

Nucleus did not have to be installed. I just plugged in an ethernet cable from my BT router and it was immediately identified on the router's client list, and seen by both computers without further ado. Nucleus+ spotted both an Audiolab M-DAC+ on USB and a Leema Elements High Resolution Streamer on ethernet – accepting once given 'zone' names. You can use wi-fi bridges but I chose not to.

Roon's server software was disappointing after my experience of Roon on Mac (or PC) in last month's review. The initial access screen was poor on an iPhone – just a blank white area of almost randomly assembled text, 'Settings' for example being plonked into the middle of music access categories like Genre and Artists.

There were also amusing/terrible confusions caused by 'intelligent' music sorting. Where portable



**The power switch at left lies in a recess with led downlight to indicate on status; Nucleus+ is designed to be left on. Power consumption is rated as 65W maximum. Flash storage must be inserted at rear; there is no front panel alternative.**

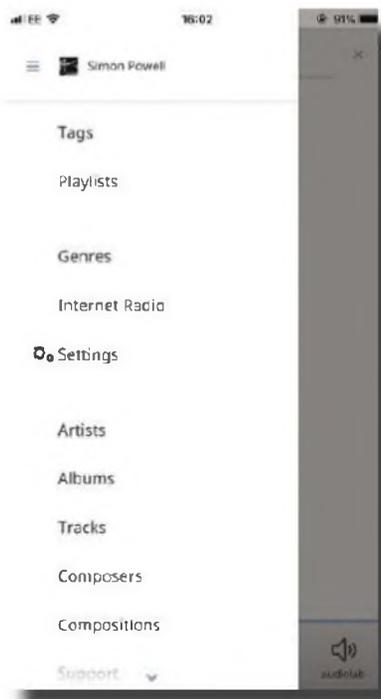
music players sort by folder and file contents in simple hierarchical fashion. Roon sorts primarily by metadata, reverting to file name as last default. Our Nucleus+ came loaded with 500 tracks for the convenience of reviewers/users and here I had fun.

Peter Green and Fleetwood Mac. I spotted Green Manalishi amongst the tracks, from Peter Green's Fleetwood Mac. Lurking unspotted was Black Magic Woman from Carlos Santana, a Peter Green composition. A Peter Green search brought up top result as Santana – no Green Manalishi because it had no metadata. Adding metadata to the track with Audacity and re-saving it dispelled the confusion. A lot of pre-loaded tracks lacked metadata I found – and this confused Roon.

DSD review tracks (various) I loaded were identified as an album – 'Kustbandet in Stockholm, various artists'. Don't ask! Roon seemed to be piecing together bits of information to make a whole, sometimes with confusing results.

The solution to the above is to preen album metadata, a big task when thousands of tracks might be stored.

All of which is to explain Roon on a Nucleus server. The initial user interface on my iPhone app was



**The start screen on an iPhone – not so attractive. And hierarchically illogical with Settings plonked in the middle.**

## METADATA

Roon catalogues music using metadata, not file names – except as a last resort. But what is metadata and how do you read it?

Metadata is data about a music file, such as singer, album title and track name. You can't mix text about a song, such as who sang it, in with the music itself so this info resides in an separate but appended file. WAV, you will read, does not have metadata but in practice it does, whilst FLAC does have metadata, but in practice may not. Confusing.

WAV is a traditional digital music file, containing pulse code modulation (PCM) info that all computers and DACs understand. It's old and simple as digital goes. In original form it was just a music file – no metadata. Nowadays however, WAV commonly carries metadata within appended RIFF List and ID3 tags, so you do get metadata with WAV. FLAC has metadata content as part of its spec., hence the assertion it carries metadata.

Tag	Value
Artist Name	Eagles
Track Title	Hotel California
Album Title	Hotel California [HD 24/96]
Track Number	1/9
Year	2006
Genre	Pop Rock
Comments	Interprètes : Eagles, Main Artist: Bill Szymczyk, Producer: Don Henley, Percussion, Vocals, Comp
Band	Eagles
Publisher	Rhino - Elektra
ISRC (international s	USEE11300195
Content group desc	Rock
Interprètes	Eagles
Copyright message	1976 Asylum Records. Marketed by Warner Strategic Marketing, a Warner Music Group Company.
Part of a set	1/1
UPC	0603497922888

Whether a file carries metadata or not depends upon whether anyone bothered to enter that data, more than whether the file format has the ability to carry it. Metadata carries info about the music track, but the data fields can be empty or full according to provenance. A dodgy digital recording will have no metadata because it is an adjunct to the recording process and a nuisance, but a commercial one will likely be loaded with metadata. See the metadata file for The Eagles Hotel California here.

Roon tries to make sense of music by reading the metadata files. Potentially, they carry far more info than the simple file title.

How to read metadata? I use Audacity, the free music editing software for Mac or PC. You can add metadata to music files, helping Roon make sense of what it is faced with.

crude but subsequent play screens with music data were well designed and engaging Roon server needs user interface development. But in the background its engine room worked well, delivering cover artwork, artist info and track format data. It's best used to both store and deliver music, rather than watch local network files. And there's no doubt that being available at networked computers and controllable from a wi-fi app is very convenient: definitely beats racks of CDs.

Sound quality from Roon is hard to pin down. The 'end point' as Roon call it – meaning the DAC that feeds the hi-fi – ideally carries Roon end-point bit-perfect software, making it Roon Ready This includes MQA processing at the end point as well as data checks. It's what Roon want you to use – but Roon Ready DACs like Moon's 280D fitted with Mind 2 module carrying Roon software don't come cheap, costing £2950.

Roon also recognises end-points without their software: both the Audiolab and Leema I used were seen and identified as such by Nucleus+.

I had a very good experience with Roon on my Mac and – user

interface apart – Roon server offered much the same assured quality through M-DAC+ (USB, driving headphones) and Leema Elements High Resolution Streamer (ethernet, driving Creek Evolution 100A amplifier and Martin Logan ESL-X hybrid electrostatics). Fleetwood Mac's Go Your Own Way (24/96) and Santana's Samba Pa Ti (CD) were well rounded, laid back – no harshness – and enjoyable. It additionally unfolds MQA and a suite of test files showed a profoundly smooth and easy sound, from Lise Granden Berg to Kyoko Tabé playing (sublimely) Beethoven's Piano Concerto 5 Emperor.

## CONCLUSION

Roon's Nucleus+ server has massive ability, but it is expensive and needy of a slicker user interface, if fine in speed and sound quality. A full Roon system demands use of a Roon Ready end-point (typically a DAC) equipped with their software, at extra cost. All the same, Roon server offers the convenience of network storage, control from an app via wi-fi, plus Roon's ability to provide artist data and album artwork for a more engaging experience, across a home network

## ROON NUCLEUS+ £2500



**EXCELLENT - extremely capable**

### VERDICT

A powerful music server with massive capability, but needs a better user interface.

### FOR

- fast
- comprehensive
- works with non-Roon devices

### AGAINST

- expensive
- ideally needs Roon end-point
- poor start screen design

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Answers by: NK - Noel Keywood. JM - Jon Myles. PR - Paul Rigby. MP - Martin Pipe.



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**A KEF EGG WIRELESS DIGITAL MUSIC SYSTEM is on its way to CHARLES PIDSLEY, Letter of the Month winner in our April 2019 issue.**

## Letter of the Month

### M SCALER (No1)

I really enjoyed reading your review of the Hugo M Scaler and also the Hugo TT2 DAC in the April issue of Hi-Fi World as I have been waiting for your review ever since hearing the TT2 at the North West Hi-Fi show last year

The M scaler is an intriguing product and I was particularly pleased to see you gave it an in-depth review and tried it with a different DAC, the Audiolab M-DAC+ as I own one these myself

However, I was surprised you seemed to think the Audiolab might be capable of accepting a 352.8kHz output from the M Scaler. The Audiolab is limited to 192kHz over coax and optical inputs. It is only via USB that it will accept up to a 384kHz signal and given the M Scaler doesn't have a USB output I don't think it is surprising the Audiolab went quiet when you tried to feed it 352.8kHz.

I also don't think this limitation over coax and optical is unique to the Audiolab. I think the majority of DACs have the same limitation, only accepting input inputs greater than 192kHz over USB.

So while Chord Electronics seem pretty relaxed that the M Scaler can be used with other DACs and improve them,



**Chord Electronics M Scaler "is an intriguing product" says Dave Oddie. But with other DACs "you are only going to be able to exploit what is half of the M Scaler's potential".**

I think the reality is you are only going to be able to exploit what is half of the M Scaler's potential when using non-Chord Electronics DACs given most DACs will only be able to accept a 4x rather than an 8x upscale with CD over coax or optical.

Whether this makes the M Scaler a cost effective upgrade will depend on the improvement heard with just the 4x upscale. I still intend to find out for myself if it is, but I suspect if I go for it I will then start hankering after the TT2 to hear the full potential. Which might just be a bit of an excellent marketing ploy

from Chord Electronics after all  
Regards,

**Dave Oddie**

Hi Dave. Yes, you are right that S/PDIF does not support much more than 192kHz and I should have said so – my apologies for this oversight. However, I did explain that Arcam's CDSS0 saw M Scaler's full 352.8kHz output, flagging it as a 44.1kHz stream, complicating the issue and raising a question I cannot answer. Audiolab's M-DAC+ fell silent but Arcam's CDSS0 did not. Fathom that!

On the matter of upscaling you are right that only x4 is available but I found subjectively M Scaler at x4 via M-DAC+ was obvious in its improvement. I suspect that the differences between x4 and x8 might not be so consequential. The signal is still processed through the WTA filter with its one million taps.

At the end of my column I said "I hope we get to hear more on all this very soon as it comes onto the open market" and so it is going to be. M Scaler raises a lot of issues that we can only resolve for you with our forthcoming – head scratching – experiences using it.

Do audition M Scaler with M-DAC+ – they work together and sound fabulous. Hugo TT2 sounds leaner, drier and more penetratingly analytical – especially when the DBNC connections are used for full upscaling. M-DAC+ has a linear power supply on-board, Hugo TT2 a switch-mode off-board and this may account for differences. It's a complex picture.

Please write in again to let us know what you found when "finding out for yourself". Have fun. **NK**

### M SCALER (No2)

Your review of the Chord Electronics Hugo M Scaler has got me very interested in this kit. Following Noel's review of the Audiolab M-DAC+ I purchased one and have been very happy with it between my Moon Super Nova CD player and my Moon 600i amp.

I would very much like to add an M Scaler to my set up but I don't know if the two can be connected (I do hope so) as the Super Nova has single digital outlets AES/EBU, currently used, or an SPDIF socket but the M Scaler has twin BNC input sockets and a SPDIF output but seems to also be a BNC. Can the two units be connected if so how?

**Anthony Rudd**  
**Tiverton**  
**Devon**

Hi Anthony. The SPDIF digital output via phono sockets of your Moon Super Nova CD player can be connected to the single BNC input of M Scaler with a phono-BNC digital cable, the latter being set to x4 or 176.4kHz up-sample (blue).

Using M Scaler with the Super Nova, the single BNC output of M Scaler can then be connected to its BNC input, the Source selector

setting it as a DAC accepting input from an external device. This is a loop through arrangement that should work, since the digital output of a CD player usually remains live at all times. However, I have not tried this and cannot guarantee it will work. Methinks you would be best advised to take your Moon CD player to a Chord Electronics dealer for a try out.

Presumably, however, you want to use M Scaler with your M-DAC+ and this works wonderfully well, as I explained in my review. It is a go-to combo for CD quality and one we will likely have to use at Hi-Fi World as part of our ever-evolving reference system. **NK**



**Moon Super Nova CD player. With Chord Electronics M Scaler "can the two units be connected?" asks Anthony Rudd.**

### BRISTOL HI-FI SHOW

Noel. Thank you for organising the Saturday talk by Guy Hayden and Miles Showell, Universal Music / Abbey Road Studios, at the Bristol Hi-Fi Show, initially supported by two of us only – surprising/disappointing turnout, although it left much more time for talking – so a benefit for us two! I would have thanked you personally on the day. However, you were taken by the Garner man at the conclusion of the talk

It was a fascinating insight into mainly The Beatles programme and also more widely into the world of archiving and remastering – something possibly for the magazine. Perhaps Miles could give you pictorial access to some of the machinery, if allowed by the Abbey Road hierarchy.

The talk did, for me at least, clear some of the mystery of what remastering (including half speed!) actually involves and who calls the shots – good to hear about The Beatles Panel of Four however – how did the earlier (poorer?) remasters pass that test?

I am really enjoying the magazine and signed up for another subscription – who could resist another FiiO (was much more attractive than a power

cable although AudioQuest did hook me later that day at the show). I am impressed by the mix of product and information given which will likely appear to a wide range of Hi-Fi enthusiasts, myself coming from a lowly level and, to be honest, there is much that I will likely never be able to own myself unless those numbers come in. That said, I strive to improve where I am ultimately to enjoy the underlying media even more.

Today's passing of Andre Previn reminds me that one day I must revisit what was my childhood draw – a Ferguson Studio Music Centre with touch tuning – as Andre used to advertise. A princely sum of £179 99 from our local Rumbelows around 1980 – from memory still at my mothers

and unlikely it has been powered up for 20+ years following my fathers demise. I would be interested in how it sounds, although do not expect too much – more a nostalgia trip to remind of many hours listening to it whilst revising for my O Levels

That's where vinyl got under my skin and planted its claws: there are songs where I still expect to hear that click or scratch even if listening via CD or streaming, Abba's My Love My Life being a particular example. Yes, I avoided much of the punk era, leaving that firmly to my older brother. The Sex Pistols Flogging a Dead Horse and The Clash London Calling LPs remain time-warped within the music centre's MFI unit. Keep up the informative work. With thanks

**Nigel Barnes**

Hi Nigel. Thanks for turning up! Yes, we encountered problems, needing clearance from Universal Music about what we could say to promote this talk – and time ran out. So few knew. Just as well, because the hotel bedroom allotted to us was too small to accommodate a large audience in any case, the hotel's conference rooms being occupied



**Above, Miles Showell alongside his cutting lathe at Abbey Road studios, and (right) Guy Hayden, manager of The Beatles catalogue at Universal Music, both of whom gave a talk at the Bristol Hi-Fi show.**



by exhibitors, but it still ended up packed (how many people can you get into a hotel bedroom?).

But what an amazing talk Guy and Miles gave. It was riveting to hear about what goes on at the high levels pursued by Universal – who own Abbey Road studios – and the effort that now goes into producing high quality vinyl, including half-speed mastering, as Miles explained. We will continue to cover all this in the magazine – and hopefully better organise future talks! **NK**

### CHICAGO '79

The review of the Icon Audio amp in the March issue brought back indelible memories of a late evening in May 1979 in Chicago at the CES Hi-Fi show. I was staying with my friend, Murray Zeligman who owned a company called Precedent Audio. He was showing two products, a really clever, modular 2 or 3 way transmission line speaker called the Mod 2 or Mod 3 using modified KEF drivers (you could buy the Mod 2 two way transmission line with a KEF B110 and KEF T27 and add a transmission line woofer with a large magnet B200). The other product was a hybrid pre amp designed by David Berning.

As an amp they used a BA150, a hybrid triode amp David also designed for another company, Audionics and putting out a very conservative 150 watts per channel utilizing a pair of EL509 output tubes. It was all tube except for the driver stage which was bipolar transistor

*needed to supply sufficient current to drive the screens of the output tube which was what converted the tube to triode operation. But what is relevant to your article was a variable negative feedback switch which allowed about 4 (or 5) levels of feedback from about 16 dB to zero dB.*

*That evening Murray and David demonstrated the affects of the feedback switch beginning with high feedback and ending with zero. Each time the feedback was reduced I heard reproduction that was more open, clearer, more dynamic, more alive, more 'real'. I knew by this time that there was little correlation between what we heard and the classic amplifier measurements used in advertising. But I also knew that each reduction in feedback resulted in increased harmonic distortion, increased IM distortion and less flat system response as the lowered damping factor interacted with the speaker impedance.*

*Intellectually this was disturbing. So I asked them if they ever found any measurements that correlated with what they heard and with what I was hearing, expecting both of them to reply no. But to my surprise they both said yes and both had the same answer, linearity. Simply if one volt input produced five volts output*

*then ideally two volts should result in ten volts output. The closer an amplifying device came to this the better it sounded. And this was what was occurring that night. Reducing the negative feedback was improving the linearity of the BA150.*

*Anyway, the memory of that night in May 1979 remains firmly in my mind, that and the huge steak that was larger than the plate it was on and the half head of lettuce with heavenly, creamy garlic dressing, at Morton's Steak House before it became a national chain.*

**Allen Edelstein  
New Jersey  
USA**

Hi Allen. Hmm... Feedback amps, especially ones with transistors, are deeply linear in the way Murray and David defined this property. That means every commercial hi-fi amplifier out there: they don't have hidden linearity problems. If they did someone would have said so by now.

Remove feedback altogether and you do find the sound becomes "open, clearer, more dynamic, more alive and more real" as you say, but also bass can be come quite obviously soggy. This happens with acoustically under-damped loudspeakers (floor standers with heavy bass) where the electrical damping is important to their sound balance. This is less obvious with smaller over-damped designs intended for near-wall mounting (or horns).

I once preferred no feedback but now feel that a bit of it (5dB-10dB) helps keep things in sonic order. David Shaw of Icon Audio feels likewise, hence the low feedback option on Stereo 300B. The zero-feedback option is there for those that can use it, according to what loudspeaker they own.

All the same it is fascinating that feedback affects sound quality – as you found – and perhaps it improves appetite for large steaks too! **NK**

### ENGINEERING UK

Noel. Your opinion piece in Feb 2019 and Ted Martin's comments on it the April edition raise important points about the shortage of engineering skills in this country and the impact on our hobby. The reasons are multifarious and complex and I will try to be brief. They boil down to decisions made about education and training, the industrial climate in this country, and our very problematic financial sector.

*My first job in education in 1970 was in a local technical college which*



**"Each time the feedback was reduced I heard reproduction that was more open, clearer, more dynamic, more alive, more real" says Allen Edelstein. Icon Audio's Stereo 300B (above) allows feedback to be turned off, just like the BA150 he heard way back in '79.**

served MG motors and a range of engineering industries on the periphery of Oxford. By far the largest section of our students were young men (and yes a very few women) on training apprenticeships to follow craft and technical engineering and construction courses designed very largely with employers both at national and local level. We also educated young people through ONC/D (O/A-level equivalent) and HNC/D (first and second year University degree equivalent) programmes which were a technical alternatives to an academic curriculum. The College turned out over 800 young people trained in engineering skills annually and many progressed from the lowest level to degree equivalent qualifications.

Much of this work was subsidised by a training levy through Industrial training boards. After the 1979 general election, under Margaret Thatcher, these were progressively abolished and training came to an abrupt halt. Engineering training in colleges progressively withered away and Further Education has remained the Cinderella sector.

At the same time successive governments have placed increasing reliance on the academic routes through GCSEs and A-levels and eventually University entrance. In this process technical institutions and opportunities at every level have been made more academic, isolating those who learn most by doing. The academic expectations placed upon young people have been raised to such an extent that they place undue anxiety on the most able and relegate many to failure.

After a spell in higher education I

became an HMI (pre-Ofsted) in 1989 and was surprised to see, when as part of my training I visited a rural primary school, that top primary children (year 6) were expected to learn probability concepts I first encountered in A-level Maths and Statistics. Currently these concepts have slipped down to even younger ages. Whether this ambition is correct or not is a moot point.

When I joined the higher education inspectorate in the mid 1990s, leading visits to engineering departments in Universities, admissions tutors were despairing that students came in with a half-understood facility for the content of the first year undergraduate course but lacked the essential underlying mathematical skills. This resulted in a remedial maths and re-learning curriculum being devised. I believe this has only got worse. There is a problem with our attitude to technical education which is I believe linked to the narrowly academic educational experiences of our political masters.

Growing up near Trafford Park in Manchester I was aware very early of the great engineering traditions in this country, English Electric, GEC, Simon Carves, Plessey, Ferranti, Massey Ferguson and many others. Unfortunately these great institutions were built on sand.

Firstly, there were very poor relations between aggressive managements and hostile workers and trades unions, unlike Germany which built collaborative workers council structures.

Secondly, there was widespread under-investment in plant and

machinery, a generic problem. I recently visited an industrial museum in Birmingham of a company which had traded into the late 1990s using 19th Century machinery before it inevitably closed. The under-investment came about not just because of short sighted managements, but when they became accountant led and shareholder investor pressure prioritised short term gain over long term investment. Again Germany was very different although it is now experiencing many of the same issues.

Losing market share in their core industries these firms tried to expand into consumer durables, often through acquisition and thus many hi-fi brands were incorporated into these failing conglomerates and into the Rank Film organisation. The reason that hi-fi companies sold out is due to the third issue for hi-fi in particular – finance.

Hi-fi companies in this country have tended to be led by visionary individual founders. Engineering training tends to teach the certainties of established knowledge rather than the scepticism of science, leading sometimes to black and white thinking. Let us say that many great hi-fi entrepreneurs have not been troubled by a lack of certainty. And from Gilbert Briggs and Peter Walker to Anthony Michaelson or Ivor Tiefenbrun companies have relied very much on their founders, raising both problems of succession and difficulties raising finance from risk averse institutions like banks. So companies from Wharfedale to Arcam or Musical Fidelity end up as the brands of some corporation or other when their founders retire, often to be



Gilbert Briggs

image: courtesy of I.A.G. / Wharfedale

**"Many great hi-fi entrepreneurs have not been troubled by a lack of certainty. And from Gilbert Briggs (Wharfedale) and Peter Walker (Quad) companies have relied much upon their founders" Dr John Hurley says.**

traded-on over time.

The alternative, as Audiolab did, is to raise funds for development from venture capitalists in return for shares, only to see the company sold on when profitable to new owners who trashed the products and sold the brand on again.

If you look at the accounts of many independent UK based and UK manufacturing hi-fi companies, especially mid-market ones, you can see the parlous state of the industry. There are some very successful exceptions but the expectation for most companies is to move from cottage industry to struggling small / medium enterprise. Such companies will find it impossible to train – and the shortage of engineering skills at every level does not help.

We have been able to draw in talented engineers educated in eastern Europe at state expense to bridge the gap currently, but Brexit will not help. Such companies will find it very difficult to move with the times in a changing and shrinking market.

Sadly though, whilst all my traditional hi-fi is excellently British made, the new technology elements inside are Far Eastern manufactured. As you point out, it looks like it is there the future lies.

**Dr John Hurley**  
**Research and project**  
**development for education**  
**Imperial College**  
**London**

Hi John. Thank you very much for taking the time to give us all the benefit of your knowledge and experience in education, with regard especially to engineering.

Your comment "There is a problem with our attitude to technical education which is I believe linked to the narrowly academic educational experiences of our political masters" is an intriguing one that bubbles under. Another being that wealth in the UK is tied up with land ownership, as it always has been, industry being a less certain investment and a less profitable one too. Oily hands and angry unions perhaps; there are easier ways to stay alive. But quite why Germany has always valued engineering remains obscure.

That the Thatcher government reduced support for industrial training schemes in the UK and they have never been replaced is interesting. Especially to me as I went through an engineering apprenticeship with the British Aircraft Corporation. My



**"After the 1979 general election, under Margaret Thatcher, Industrial Training Boards were progressively abolished and training came to an abrupt halt" says Dr John Hurley.**

son, however, who has just left school, received just about no technical input whilst there. No attempt was made to catch the attention of pupils by explaining even the simplest basic principles of electrical engineering. I was shocked. Primary school children in Hong Kong are introduced to the subject through all the many electronic toys produced in the Far East.

Even the notion that engineering is "hands on" where other topics are more academic is an unfortunate

misunderstanding that seems to exist and be used as a barrier definition. Hands-on is for labourers – and we don't want any of that!

What we do want is early vocational training I believe, where topics are covered at least in simple outline: how you build Crossrail, how you build and building (!) and – natch – how you build a valve amplifier, whilst remaining alive.

The world's largest companies are not in heavy engineering: they are in electronics, including the software that controls the hardware.

Whilst self driving cars are the visible and extreme frontier of all this, or more potently the fully automated take offs and landings of Space X craft wonderfully filmed for YouTube consumption,

hi-fi products are in the same fray. OK, there are no Merlin MID rocket engines in Cowon's Plenue D2 I review this month and it won't be knocking over pedestrians either, but its density of build and software content show what is creeping up on the world in both large and small form. Pity that we seem to be taking no steps in the UK to provide a strong and clear path for young people to participate in this future. Their mobile phones will forever be made somewhere else. **NK**



**We should embark on a tube rolling exercise with the KT150D (left rear) and KT150 (right rear), plus others, says David Batten.**

## TUBE ROLLING

The release of your March 2019 mag including the review of the Icon Audio 300MkII and subsequent article on the release of the KT 150s and EL34s David Shaw designed valves surely now gives you no excuse to not embark on a tube rolling exercise including the above but for fun maybe a Psvane EL34Ph or WE300B Gold Lion reissues of various hues – I could go on! Expecting identical run-in times, technical analysis and blind (no brand peeking) track sound reviews by Rafael Todes and others!

**David Batten**

**Arch Hill**

**Auckland**

**New Zealand**

Hi David. Yes, you are so right. Tubes have intriguingly different sounds – and most are beguiling. There are a few clonkers but I won't go there.

Tube rolling – listening to different makes of the same tube – is something we should cover but I fear many readers might object! And how we obtain some of the more spectacular NOS rarities that come at thousands of pounds I do not know or care to think about.

Don't you just love those stories about the valves that turn up in Egypt, I presume left there by the British forces after the North Africa campaign of WWII. Check out our picture of Mark Mainwaring-White with a Mullard 807 at the 2019 Bristol Hi-Fi show – from a recently discovered cache in Egypt – the legend grows. The boxes even had sand in them I was told. How more authentic can it get! **NK**

## LISTEN TO LINN

I read all the UK hi-fi mags and work in the industry. With regard to your Letter of the Month, February 2019 issue, titled *Move to Moving Coil*, surely someone with a Linn would be well advised to hear what they can do? A Technics is a totally different sound. To me lacking in timing integrity and musicality. And to say move out of yesterday with a modern turntable is rather obscure.

Kind Regards

**David Topliss**

**The Performance Consultancy**

Hi David. It's always good to hear the other side of the case, but you are frustratingly unspecific. What is it you like about the Linn that you feel makes it preferable? It would appear that in your view a



**"Surely someone with a Linn would be well advised to hear what they can do? A Technics is a totally different sound" says David Topliss.**

Technics lacks timing compared to a Linn, but technically the reverse is true, measurement shows. Technics latest turntables are a technological tour-de-force that shades belt drive for speed stability, ease of use, consistency over years of use – a move out of yesterday.

I understand and accept that turntables can sound very different – and am personally impressed by the sound of large acrylic platters on well machined and mechanically grounded bearing assemblies, such as those from Clearaudio. They sound different from a Technics that, by way of contrast, has a less organically deep quality. A Linn also sounds different again.

Belt drives do not have the same degree of temporal grip and this makes them less sterile. A nice sound and perhaps one with 'musicality', although that is a vague term open to individual interpretation.

Steve Thompson (next letter) is "very happy with the sound" from his system with a Linn, endorsing your view. **NK**

## ON OR OFF?

*My system includes a Naim NAC32 pre-amp, HICAP power supply and NAPI40 power amp (serviced within the last two years). The rest of the system is a Linn LP12 SE (Radikal), Linn Ekos SE arm, and Audio Technica ATF7 cartridge, and Spendor A3 speakers. I am very happy with the sound.*

*Following advice from my dealer in the distant past I have always left the amplifiers switched on, unless I am away from home for any length of time, or there are thunderstorms in the vicinity.*

*However, my concern was piqued by*

*a comment in a reply to a letter in the February 2019 edition, where you stated that this "was a daft practice that was frequently advised in the 1990s".*

*I would be interested to hear your writers' current views on this dilemma.*

*Many thanks*

**Steve Thompson**

**Croydon**

Hi Steve. The easy way to resolve this is listen to your system after it has been on for one day, and then later after it has been on for one minute – after being off for one day! If they sound different then there is an issue that you might try and hunt down.

Modern products become thermally stable and electrolytic capacitors fully formed after just minutes – around 10 of them. If your system sounds better after having been left on – as is likely – try giving it a 10 minute period of warm up. A Class A and A/B transistor amplifier warms up its heatsinks and this in turn affects thermally-driven bias diodes within the output transistors to give best performance. Sanken's widely used audio power transistors are an example. So a warm up period exists, but it is short.

The argument against leaving a hi-fi switched on permanently revolves around safety (fire hazard) and unnecessary energy consumption. Modern electronic products are intrinsically safe but best to switch off anyway. And this saves electricity too.

Best to switch off then. With transistors allow a 10 minute warm period, with valves 30 minutes. But judge for yourself according to sound quality. I hope this helps.

**NK**

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# Mains thing

Martin Pipe tries out an expensive mains conditioner from IsoTek.

**T**he Evo3 Nova is a heavy (15kg) and expensive (£5,595) box billed as 'twelve power conditioners in one' from IsoTek, a Winchester-based firm whose goal is to 'create a better solution to the problem of poor mains quality'. It's an imposing and solidly-built piece of equipment, as one has every right to expect given its price. The Evo3 Nova is supplied with spiked feet, which – if you're worried about scratching surfaces – can sit in machined velvet-backed pucks that IsoTek also includes in the package.

The ribbed aluminium front panel of the conditioner is dominated by a raised section, on which lives a blue numeric LCD screen able to display incoming RMS mains voltage or distortion levels (3.5% for most of the time, here in South East Essex); it can also be turned off altogether. Around the back are no fewer than twelve 13-amp power outlets arranged in colour-coded banks. One block of eight ('B') is rated at 10A a throw, while those in the other ('A') are claimed to cope with loads as high as 16A. The latter sockets, which incorporate 'IsoTek's Direct-Coupled

circuit to deliver low impedance power with a maximum continuous output of 3,680W', are designed for 'high-current electronics' like 'power amplifiers, active loudspeakers and subwoofers'.

Into the 'B' block that features IsoTek's 'Adaptive Gating' circuit – a system that 'auto-senses the connected electronics and provides the optimal level of conditioning required at a maximum 2,300W of continuous power' – would be plugged less power-hungry kit like CD players, DACs and turntables. Each of the outlets, as the IsoTek's description suggests, benefits from its own filter. The benefit of this, according to IsoTek, is 'the optimal isolation between each outlet' and elimination of 'differential mode cross-contamination'. Basically, the unit behaves as twelve independent conditioners that happen to share a common housing.

The Evo3 Nova is claimed to reduce RFI (radio frequency interference) by 75dB, eliminate mains noise, cancel any DC component (a frequent cause, they say, of transformer buzz) and 'fully re-balance' the sinusoidal mains waveform.

Also playing a protective role are three circuit breakers, which are accessible from the base of the Evo3 Nova. Each set of outlets has its own breaker, while the third looks after the combined load presented to your mains supply by all of the connected equipment – and for that matter the conditioner itself.

On which subject, getting power into the unit involves an enormous C19 IEC connector fitted to the rear panel – you'll also find this type of connector on big power amplifiers. An IsoTek Evo3 Premier cable connects this to an appropriate mains outlet.

A peek inside reveals a high standard of construction; some components have been sealed in a pitch-like material, presumably to damp vibrations. IsoTek has of course paid attention to the internal wiring interconnecting these elements. It has specified 'silver-plated OCC (Ohno Continuous Cast) Copper' cable, which incorporates its 'VAD – Virtual Air Dielectric – technology'.

## PERFORMANCE

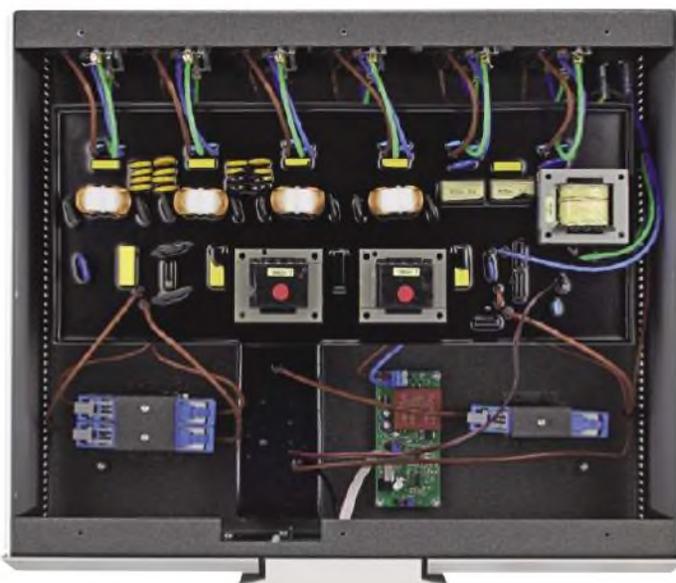
I partnered the Evo3 Nova with a system comprising Arcam A49 integrated amp, Quadral Aurum

Wotan VIII speakers, a Cambridge CXN streamer/Chord Qutest DAC fed from a music collection held on a NAS drive, plus a vinyl playback system comprising a Systemdek IIXE900 belt-drive turntable, Alphason Opal arm, Denon DL304 MC cart and Pro-Ject Phono Box S2 Ultra.

A turntable with MC cartridge was deliberately chosen as its tiny output requires a considerable amount of preamplification – the effects of clean power should be



**The outlets of the first B block of eight (black), rated at 10A, are intended for source equipment. Amplifiers and other hungry components plug into the A block (red), with four 16A sockets.**



**Each outlet has its own conditioner – there's an additional layer of filtering components not obvious in this photo. Note the use of pitch to damp vibrations.**

more evident. To deliberately dirty my mains, I installed a Devolo power networking kit

The Evo3 Nova definitely killed off the effects of the latter. A pristine 180g pressing of Mark Beazley's Stateless sounded noticeably quieter, space between the notes (and for that matter) the tracks of this minimalist work being endowed with an inky blackness that simply wasn't there before. The record has a notable low-end – well, Beazley is the bassist with ambient group Rothko – and I noted, contrary to expectations, that the bass elements of tracks like Three Twenty-Two were both deeper and tighter. Even with LPs in lesser condition (more surface noise) Isotek's conditioner seemed to have a positive effect when it came to bringing out the music.

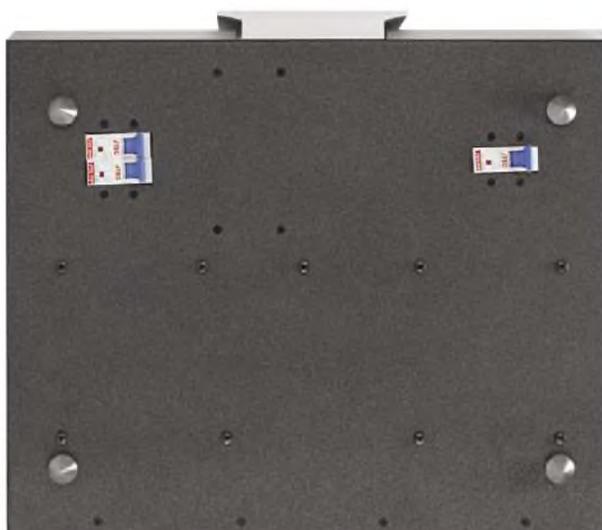
Analogue may demonstrate the biggest improvement, but there are benefits for digital sources too. David Bowie's 'Tis a Pity She Was a Whore (Blackstar, 24/96) benefitted in terms

of both excitement and instrumental focus. More detail was the benefit that the Evo3 Nova brought to

another hi-res favourite, Britten's War Requiem (LSO Live/Nosedá, 24-bit/48kHz). It was easier to define individual singers in the choirs, while the orchestra's brass instruments gained poise and attack. CD-quality material wasn't left behind, either. A lossless rip of Sibelius' Symphony No. 2 in D major, Op. 43 (Vienna Philharmonic/Leonard Bernstein, digital mid-1980s recording) sounded cleaner and more open.

**CONCLUSION**

It is undoubtedly expensive, but the Evo3 Nova had a positive effect when it came to the reproduction of music. In my system, deliberately assembled to be sensitive to mains condition, it was a great benefit. I'm left to wonder what audible benefits the Evo3 Nova would deliver to a £30,000 system...Vastly complex then, but equally capable it seemed to me. A unit you should consider auditioning if you own a top-end system.



**A trio of circuit breakers are located under the Evo3 Nova. Fiddly to access as the spiked feet provide little clearance.**

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Kerr Acoustic



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**Belt Drive Turntable  
Giglio**

- 33mm Sustainin® platter
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- Dust cover included
- Available in black, white & walnut

**£3,590** 24 Months Warranty

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- 2 separate inputs
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- 4 GAIN options
- For use with MM & MC cartridges

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**Power Supply  
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- Optional external power supply for Gold Note PH-10

**£864**

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Model 9000**

- Moving coil
- Elliptical stylus

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ON DEMO

**Shelter Cartridges  
Model 301 II**

- Moving coil
- Conical stylus

**£1,100** 12 Months Warranty



ON DEMO

PH-10 & PSU-10 also available in silver

# BRISTOL SHOW



**The Bristol Hi-Fi Show – as it is now known. We were there to catch the latest and greatest products.**

**B**ritain's major hi-fi show is held at Bristol, in the freezing month of February. But not this year – the sun came out, the wind was mild and exhibitors and visitors all poured in to what everyone

enjoys as a friendly show. It attracts most of the UK's manufacturers, so there were plenty of products and systems worth hearing. Here's a look at some of the more eye catching products we found.



**ASTIN TREW**

*Astin Trew were running a Teac A-3300SX open-reel tape recorder as a high quality analogue music source, alongside a PLAnalogue Prelude turntable and Sorane SA12 arm with Hana ML moving coil cartridge. Worth hearing for their smooth sound and as a refresher of what analogue sounds like in a digital world. <https://astintrew.co.uk/>*



**ATC**

*The ATC room was demo'ing their SCM40 loudspeakers, shown here. Reflecting their professional studio background, this model has a large midrange dome that both projects and disperses sound more potently than the cone used by most rivals. It gave a vivid sound. <http://atcloudspeakers.co.uk/>*

# REPORT 2019

## CHORD ELECTRONICS

The smart set-up in Chord Electronics demo room. At top is their new M Scaler, a million-tap digital filter that cleans up CD. Here it is feeding their new Hugo TT2 DAC and a TTOBY power amplifier driving elegant B&W 805 D3 Diamond loudspeakers. <https://chordelectronics.co.uk/>



## FYNE AUDIO

Fyne Audio, comprising ex-Tannoy employees including designer Dr Paul Mills, were showing their new F702 loudspeakers. Their top driver is a dual, with magnesium dome pressure driver loaded by a horn that fires out through the centre of the bass/mid cone, giving point-source characteristics. The lower unit works below 250Hz to augment bass output. <https://www.fyneaudio.com/>



## HARBETH

The Harbeth room was so brightly lit and colourful it was always packed with listeners. In this demo the company were showing their P3ESR Anniversary Edition stand-mount mini monitor loudspeaker. <https://www.harbeth.co.uk/>



## MALVERN AUDIO

Mark Manwaring-White, head of Malvern Audio Research, with a New Old Stock (NOS) 807 Mullard valve discovered as part of a batch, in Egypt. "There was sand in the boxes" he told me, but the valves had never been used. Very valuable. <http://www.malvern-audioresearch.co.uk/>





**MALVERN AUDIO RESEARCH**

A Teac 32-28 'Tascam-series' open-reel recorder alongside a Lampizator valve preamp and in the rear Polish Auto-Tech hORNS in the Malvern Audio Research room.

<http://www.malvernaudioresearch.co.uk/>



**TIMESTEP TECHNICS EVO-C**

Timestep were showing Technics new SL-1500C – a budget package version of their recent SL-1200GR Direct Drive turntable. The competitive price was blanked out to save sensibilities (Technics were at the show!) but it was usefully below £1000. This deck has three speeds, but no stroboscope, no speed adjustment, no cue light etc. The cartridge is an Ortofon 2M Red. <http://www.time-step.com/>



**NEAT EKSTRA**

Neat's complex Ekstra loudspeaker. At top a 50mm ribbon tweeter working in conjunction with a 134mm bass/mid-range unit. The bottom enclosure houses two 134mm drivers acting as bass units in an Isobarik arrangement, firing onto the floor.

<http://neatacoustics.com/ekstra/>



**PROAC**

ProAc's handsome K6 Signature loudspeakers, with ribbon tweeter, 3in dome midrange unit and Kevlar bass drivers. <https://www.proac-loudspeakers.com>



**AVID**

Avid were running their budget Ingenium turntable (right) when I was there. Fitted with a Rega arm and cartridge it was delivering a smooth and well defined sound.

<http://www.avidhifi.com/>



**WHARFEDALE**

Wharfedale were showing new and unannounced Elysian loudspeakers. Curiously, the tweeter is described as planar, but looks like an air motion transformer and is designated AMT1. Being large it will cover a wide frequency range, in this 'speaker handing over to a midrange unit situated below then a white coned bass unit – both with glass fibre matrix cones. <http://www.wharfedale.co.uk/>



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# Awards 2019

Hi-Fi World's Awards ceremony for best products of 2018, held at the Bristol Hi-Fi Show.



*Hi-Fi World publisher Noel Keywood (left) and presenter Richard Stevenson get ready!*



*The team from Technics – Matt Billing, Kevin Walker and Neil Lloyd-Meek enjoying a pre-awards drink at the reception.*



*Party time – Elite Audio's Mark and Connie Cargill with IAG's Steve McIntyre and Peter Woodard.*



*Charlie Henderson and Claire Newsome from Focal and Naim with Ketan Bharadia from What Hi-Fi (but ex-Hi-Fi World!) centre.*



**KEF marketing director Michael Johnson accepts the award for the best wireless loudspeaker for the company's LS50.**



**And the award for best turntable went to Matt Billing for the Technics SP-10R semi-pro Direct Drive.**



**Elite Audio owner Mark Cargill takes the coveted Hi-Fi World globe for best loudspeaker cable: the HiDiamond 7.**



**Mark Whiteman and Vince Wade from Cambridge Audio.**



**IAG designer Jan Ertner and colleague Rob Flain.**



**Charlie Henderson, managing director of Focal and Naim who saw the Focal Kanta No 2 loudspeakers and Naim Uniti Atom both named products of the year – the former best loudspeaker, the latter best network player.**



**Mark Williamson, director of Advanced Media Players, takes the award for best hi-res player – the Cowon Plenue V.**



**IAG's Jan Ertner is all smiles as he takes the award for best CD player for the Quad Artera Play+.**



**Expectation mounts as the packed audience awaits the announcement of the awards.**



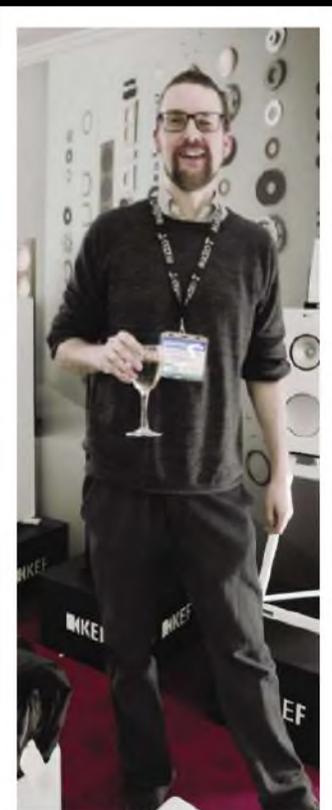
**Mark Whiteman, marketing director of Cambridge Audio, is delighted to receive the accolade of best phonostage for the Cambridge Audio Duo.**



**Hi-Fi World reviewer Jon Myles looks askance as Richard Stevenson imbibes a sneaky drink under the watchful eye of Noel Keywood.**



**KEF's Michael Johnson and PR guru Andy Napthine from Naphine & Porter practice their alien death stare for our photographer.**



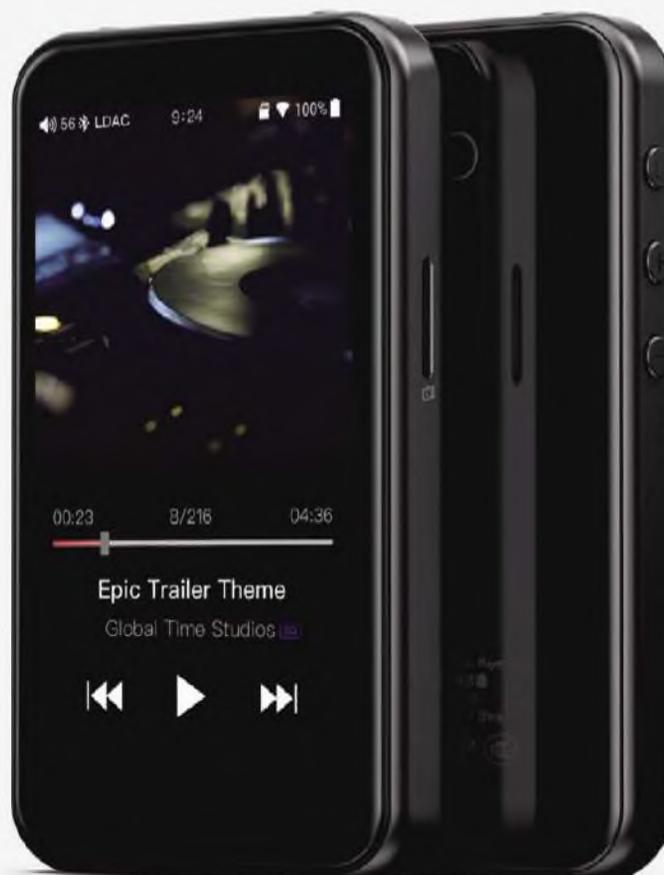
**Mark Williamson from Advanced Media Players celebrates his win for the Cowon Plenue V.**

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- FiiO Link
- 3.2 inch touch screen
- OTA Firmware Update
- 13 Hours Playback Time
- 26 Days Deep Sleep
- 2GB+2TB

Specifications			
USB DAC	Asynchronous 192kHz/32bit	Out put power 1	≥110mW (16Ω / THD+N<1%)
USB	TYPE C Two-way USB2.0	Output power 2	≥70mW (32Ω /THD+N<1%)
WiFi	2.4G, WiFi transmission supported	Frequency response	10Hz-80 kHz (-3dB)
Size	53.3mm × 92.5mm × 11.5mm	SNR	≥118dB (A-weighted)
Weight	About 83g	Output impedance	<2Ω
Charging time	<2.5h (DC5V/2A)	THD+N	<0.002% (1kHz/32Ω)
Battery life	3.5mm headphone output : >13h	Peak output voltage	4.245 Vp-p
Battery capacity	2350mAh Li-polymer battery	Noise floor	<3uV

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# Take Five

**Jon Myles takes a trip with Naim's new ND5 XS 2 streamer – an easy and affordable way to enjoy digital.**

It's fair to say Naim were one of the pioneers of the music streaming revolution. The ground breaking Uniti, for example, combined wireless (and wired) connection with a network attached storage device, CD player and an amplifier.

It proved a massive hit and turned many people onto the benefits of streaming their music collections - as well as giving the Naim brand a timely boost.

But what about those other Naim listeners – or just other listeners – who have a perfectly good CD player and amplifier and

just want to add streaming to their present system without duplicating products?

Enter the ND range of one box, full-size units – and now the new ND range, the first update to the platform in 12 years. Yes, true to the Naim ethos new products only emerge when they are measurably better than what's gone before.

There are three models – the NDX 2, the ND 555 and the ND5 XS 2. The former pair both feature colour screens on the front to display album artwork, plus other features and a natty remote control, coming in at £4999 and £12999 respectively.

The entry level NDS XS 2 priced at £2299 is a

completely different beast, however. It's slimmer than its partners on account of there being no colour screen – and Spartan to the point of anonymity. All you get at the front is the familiar green Naim logo, an unmarked USB-A port for connecting memory devices and a standby button. That's it. Oh and it comes in one colour - the usual Naim black.

There's also no remote control. Instead, everything is controlled by the - admittedly excellent – Naim app that's free for both iOS and Android and available for both mobile devices and tablets. This enables access to all functions such as source select,



volume, playlists, as well as displaying album artwork. It will also let you turn off unused inputs, but in practice I found this made little difference to sound quality.

I've been told Naim dropped the colour screen and remote to get the ND5 XS 2 down to a price that would attract more customers - and I can see the logic in such an approach.

So ND5 XS2 is a pretty basic streamer, one designed to slot into an existing system with the minimum of fuss. Once done it offers DLNA/UPnP for accessing music over a home network, internet radio, access to online music services from the likes of Spotify and Tidal, as well as Bluetooth wireless connection of iPhones and such like, as well as Apple AirPlay. Surprisingly perhaps, it is also Roon Ready, meaning it contains Roon end-point software, rather than just being Roon Tested (certified to work with Roon). That means it can act as a fully functional Roon Ready end-point DAC.

But it's inside the case that things get really interesting. The streaming section of the ND5 XS 2 uses the latest Naim network card - featuring low-noise, high-speed low-voltage differential signalling (LVDS) to route the digital audio signal.

The higher speed is capable of decoding all HD audio formats at up to 32 bits/384 kHz or DSD128. Rather than the source acting as the digital timing master, the new streaming board turns things around and allows Naim's DAC clock to control the flow of audio data.

The data is integer-over-sampled in a SHARC DSP to a 40-bit accuracy before it's fed to the PCM1791A Burr-Brown digital-to-analogue converter.

The circuit boards are also decoupled from the chassis to prevent vibration entering the system, while the unit comes with Naim's floating pin Power Line Lite mains cable.

On the rear, digital inputs include a second USB socket as well as two optical and two coaxial types - one on a single RCA socket and the other using Naim's favoured BNC connection.

Analogue outputs are on both RCAs and the usual Naim DIN (for which a cable is supplied), with a single BNC providing the digital output.

Two stubby aerials handle the wi-fi connection and there's a third for Bluetooth, plus an ethernet socket. Naim recommends using the unit wired but I had no trouble streaming

hi-res files wirelessly from a NAS drive situated some 12 feet away.

As ever with Naim there's an oversized toroidal transformer inside for a linear power supply, a small switch mode power supply taking over when the unit goes into standby mode.

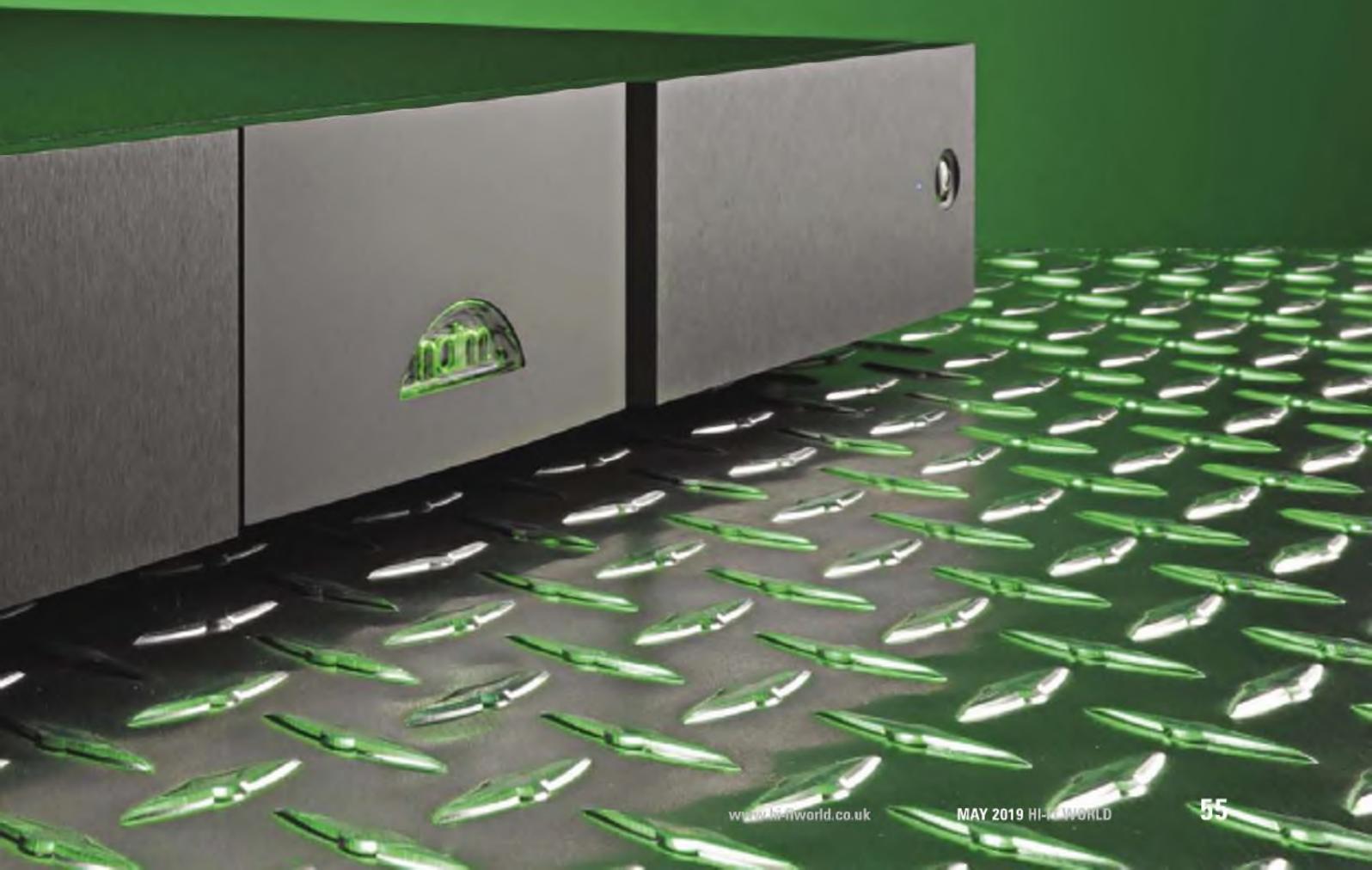
So, although the ND5 XS 2 may look rather prosaic there's plenty of technology packed into its strong metallic chassis. Measurements were 432mm wide, 301mm deep and 70mm high with a quoted weight of 6.6kg, reflecting sturdy build and very large internal power transformer.

## SOUND QUALITY

Naim products have always been known for their muscular and vibrant sound quality - but with a streamer that's more to do with the amplifier used than the streaming device.

The latter's job is to pull the most detail, rhythm and musical nuance out of a track then let the amp do its job.

And to the Naim's credit that's exactly what it does. Playing Sebastian Rochford and Pamela Kurstin's 'Ouch Evil Slow Hop' through a pair of Neat Iota's little Alpha floorstanding loudspeakers with their excellent ribbon tweeters and connected to a revealing Devialet Pro 220 amplifier

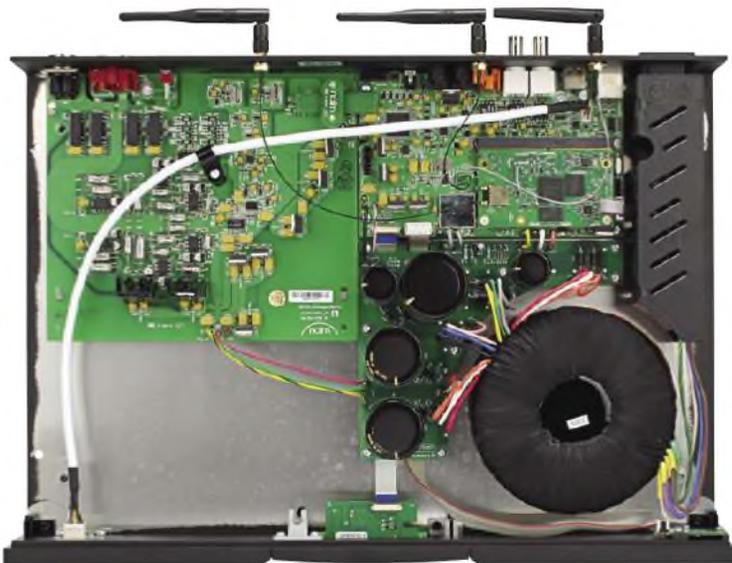


the sense of atmosphere was palpable.

There was even more separation between Rochford's pounding drums and Kurstin's eerie – and sometimes downright alien – Theremin figures. The whole album



The rear of the ND5 XS 2 has three aerials – two for wi-fi and one for Bluetooth, as well as digital inputs and analogue outputs.



Typical Naim neat interior with an oversized toroidal transformer in a linear power supply – no switched-mode here.

also had more atmosphere, making it sound so much more alive.

Also noticeable was the effortless way the Naim produces rich productions. Its sound flows in an organic way – as evidenced by the hi-res (24/192) rendition of The Eagles' 'Hotel California'. Little percussion embellishments came over crystal clear and the instrumental layers were cleanly separated but hung together as a whole.

It wasn't as though the ND5 XS 2 was getting in the way of the music – just playing it cleanly and as it should sound. So on The Smiths' 'The Queen Is Dead' I could clearly hear the layered guitars within the opening track, while on 'I Know It's Over' Johnny Marr's guitar was sweet and gentle – a perfect counterpoint to the vocals.

This is what the ND5 XS2 streamer does so well. Whatever music I played it refused to muddy or sully the sound – just playing it as it was meant to be.

With Spotify I could hear the drop in sound quality from hi-res but it was still listenable enough to be used as a source. Internet radio also pulled in all the stations I could wish

for and the app made it easy to sort through them in terms of country, genre etc. And the better the bit rate the better the Naim sounded with music.

**CONCLUSION**

This may well be the entry level model in the new range but it is still a very impressive beast. It has all the features you could need and, more importantly, sounds superb. If you can do without a screen and remote (and, frankly, who needs a remote when the app is so good) then it ranks as one of the best streamers you can buy at this price – and will also out-perform costlier models.

**MEASURED PERFORMANCE**

Frequency response of ND5 XS 2 reached a low 24kHz (-1dB) before rolling down fast, our analysis shows, affecting all sample rates above 48kHz. Naim have curtailed response in line with their design philosophy here, Naim amplifiers traditionally reaching no higher than 20kHz or so before a slow roll-down in the supersonic region.

The optical S/PDIF digital input worked reliably to 176.4kHz with 192kHz difficult to establish, depending on TOSLINK plug fit, whilst electrical reached 192kHz.

Fixed output (no volume control) gave 2.1V maximum (0dB FS) and 0.0006% distortion. At -60dB distortion from a 24bit, -60dB input measured 0.07% – low but not class leading. Our analysis shows mostly noise. Naim use a Burr Brown PCM1791A DAC chip.

Distortion with CD measured 0.22%, as always due to 16bit quantisation noise; CD cannot produce a better result.

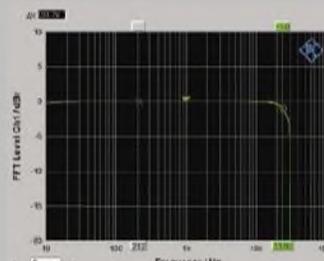
The important EIAJ Dynamic Range value with 24bit measured a mediocre 109dB, due mainly to noise our analysis showed; around 115dB is expected nowadays. With both CD and Bluetooth the value was a normal enough 100dB.

The ND5 XS measured well, but is behind results expected nowadays in terms of dynamic range with hi-res. A

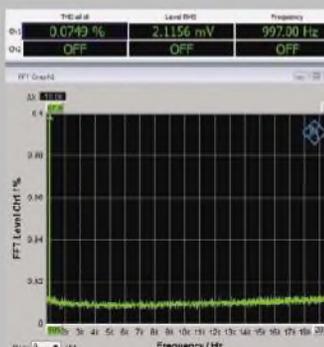
small amount of noise degraded both distortion and dynamic range values. **NK**

<b>Frequency response (-1dB)</b>	
<b>4Hz-23kHz</b>	
<b>Distortion (0dB)</b>	<b>0.0006%</b>
<b>Distortion (-60dB)</b>	<b>0.07%</b>
<b>Dynamic range (EIAJ)</b>	<b>109dB</b>
<b>Noise</b>	<b>-108dB</b>
<b>Output</b>	<b>2.1V</b>

**FREQUENCY RESPONSE**



**DISTORTION**



**NAIM ND5 XS 2**  
**£2299**



**OUTSTANDING - amongst the best.**

**VALUE - keenly priced**

**VERDICT**

A no-frills look but a thrilling sound. Perfect for those looking to add a streamer to their existing system.

**FOR**

- detailed sound
- build quality
- feature set
- Bluetooth

**AGAINST**

- no screen
- no remote

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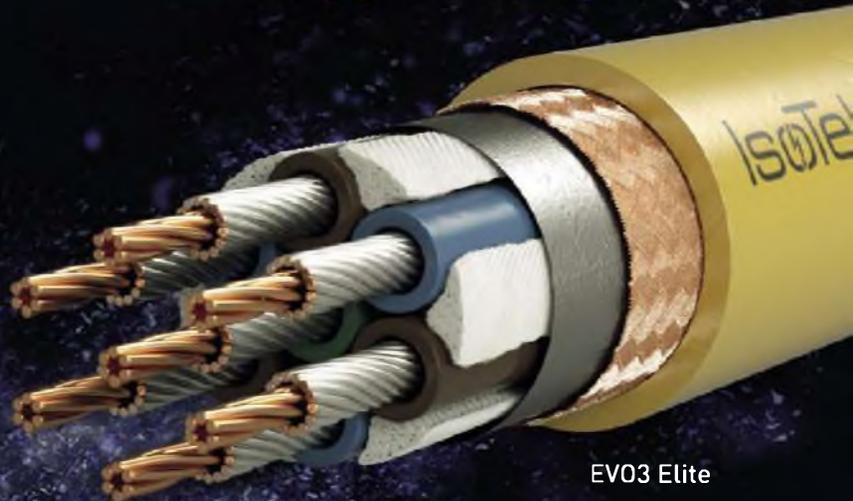
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# Joyful Jumbling

On February 17th, the first of 2019's two Tonbridge Audiojumbles took place. Martin Pipe is your guide.



**H**undreds of audiophiles from around the UK – and beyond – converged on Tonbridge's Audiojumble for one of the most enjoyable dates in the hi-fi calendar. This event proved to noticeably busier than the previous October one – as is usually the case. Could it be that our finances have recovered since Christmas, and we'd appreciate a diversion from the miserable weather? As it happens, though, the weather that Sunday was unseasonably pleasant. So too was the Audiojumble, buoyed by its usual advantages of accessibility (just off the A21, Tonbridge railway station not far away) and impressive amounts of free parking outside the Angel Centre

venue – a concept as rare nowadays as some of the goodies you could expect to find inside. Nakamichi 1000 ZXL, anyone?

There were indeed bargains to be had – but you had to be quick! A Technics SP10 went before I had a chance to grab my camera. This professional quartz-locked Direct Drive turntable sold for a mere £250, although it was not in the best physical condition and missing its power supply unit.

The 8.30am 'super early-bird' entry time, introduced last October, was repeated. Super early-birds pay £20 for the privilege of picking over the wares before anyone else, except maybe other traders. The majority of visitors opted to come in at 9.30am

(£12) or 10.30am (£6).

As ever, the overall atmosphere was one of friendliness based on a mutual enthusiasm and love for music, audio and the barely-remembered ephemera of a bygone era. It's telling that most visitors seem to be in their 50s or older – taking in those to whom high-quality listening at home was of paramount importance. The 1970s were the 'boom' years for hi-fi sales. This period of hi-fi history was well represented at the show, both in equipment and the music to play on it! The majority of stallholders were not professional traders, but enthusiasts looking to dispose of surplus gear.

As well as hi-fi there were electronic components, test gear, wind-up gramophones, musical instruments, vintage wireless, tape recorders, amateur radio, cameras, ex-broadcast/studio kit and music in every conceivable format. There was also plenty of broken gear for spares or repair – this tends to be cheap, and gets even cheaper as the event approaches its 4pm conclusion.

I ran a stall with my (very!) understanding partner in the main hall. Much of the kit I sold there were products – including my Armstrong 626 receiver and Meridian 207 two-box CD player – that I had previously featured in my regular *Olde Worlde* feature. Copies of *Hi-Fi World*, open on the relevant pages, proved to be a handy selling tool – although adjacent stallholders borrowed the mags to read when they had a quiet(ish) moment!

I hope the new owners of these cherished items derive as much pleasure from them as I did.

**The next Audiojumble takes place on Sunday 6th October 2019 at the Angel Leisure Centre, Tonbridge, Kent TN9 1SF. [www.audiojumble.co.uk](http://www.audiojumble.co.uk) Hope to see you there!**

*Words and pictures: Martin Pipe*





A Beocenter 3500, from Bang and Olufsen – a hybrid of the Beogram 3000 automatic turntable and 40 watts per channel Beomaster 3000 stereo receiver. This well-preserved example's tonearm is bereft of cartridge. B&O special cartridges are difficult (read: 'expensive') to obtain nowadays. Hence the modest £40 asking price...



This well-preserved wire recorder, made by Boosey and Hawkes subsidiary Wirek, was claimed to have been stripped from a Lancaster bomber. Its electronics are built around a CV491 double-triode, one of the earliest B9A valves. A piece of history, for £80.



In the late noughties, Icon Audio brought out the Stereo 25. This is an affordable integrated amp based around EL34s working in push-pull. It holds its value too; this Icon 25, which originally sold for £500, was being offered here for £400.



In the 1970s transcription turntables made by the U.S. Gates corporation were regular fixtures in broadcast studios around the world. This one is the CB77, which has a 12in. platter. The 'gearstick' speed change knob of this £400 specimen was removed to prevent it falling prey to the sticky-fingered.



West Bromwich-based Griffin made speakers in the seventies. The 'Type 25', a ported and 'mirror-paired' design with a KEF B200 woofer and Coles tweeter driven via an 8-element crossover. The excellent condition of these ones reflected their £125 asking price.



A well cared for U.S. Magnalab FT-101a VHF/FM tuner that could have been yours for £325. Good while FM lasts...



Launched in 2012 for £400, the Musical Fidelity M1 DAC was cutting-edge for the time with its 24/192 capability. This one, which looked practically unused and came with its original carton, was stickered at £150.



A tatty example of the imposing Pamphonic Reproducers Victor Senior loudspeaker from the mid-1950s. A 15in. woofer with enormous magnet and elliptically-coned tweeter. Yours for a tenner!



A professional Nagra 'D' four-channel 24-bit capable recorder that hitched quarter-inch tape running at a slowish speed to VCR-type helical scanning techniques. The guy from Music First Audio, who was using it as a demo source, told me he had one for sale for £4k...



A Nakamichi 1000 ZXL flagship 1981 'computing cassette deck' – regarded as one of the finest ever built. Regular models like this one are a rare sight. With a missing knob, it was expected to fetch £1000.



In the mid 1950s, Harold Leak commissioned fellow hi-fi pioneer George Wise to develop a ribbon tweeter. Pictured is the distinctive prototype of what Leak considered to be the "most faithful loudspeaker transducer until the advent of the electrostatic". Not for sale!



A compact 22-2 open-reel recorder from Tascam. Based on the TEAC X3, but with half-track format and higher tape speeds (15 as well as 7.5ips). Just 7in. spool capacity but an excellent introduction to the joys of analogue tape for a mere £60.

# MUSICAL FIDELITY



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TOO MUCH BOOZE/BAD HANGOVER

Drinking Songs Straight From the Jukejoint Round The Corner  
Koko Mojo

Part 1 and Part 2 of fruitfully inebriated ditties. There are fourteen tracks each here that span a host of suitable titles that range from, on Part 1, 'I'm a Wine Drinker', 'I Got Drunk', 'Give Me One More Shot' and 'Another Half A Pint' to, on Part 2, 'Wine Head', 'You Drink Too Much Booze', 'Fire Water' and 'I Got Loaded'.

I think you might agree that there's not too much hovering around the subject with these titles, these are songs that are direct and to the point and probably to the floor, face down too, I reckon.

There are two separate LPs that are individually sleeved, yet linked in terms of their sozzled theme.

Some generally famous names are on this series, such as Jimmy Rogers ('Sloppy Drunk'), Lightnin Hopkins ('Drinkin' Woman) – but many artists found here will

only be known to fans and the cognoscenti.

The songs are, in the main, a mix of blues, rhythm and blues and jazz, often with serious and possessive thoughts about their imbibing fluids. Take Dave Bartholomew with the song 'Who Drank My Beer While I Was In The Rear?' And its pointed lyrics "Who drank my beer while I was in the rear?/Who drank my beer while I was in the rear?/Somebody point me out that moocher/I'm gonna dislocate his future'.

Because this is a compilation, the quality does vary somewhat between tracks. Nevertheless, in term of mastering, I was happy to hear a clean and concise sound. These are vintage recordings so there is always a risk of hearing too much processing to remove pops, clicks and the rest but, on these releases, the dynamic space remained admirable in its presentation, retaining the energy.

AUDIOPHILE VINYL



BERNARD HERRMANN

Marnie  
Stylotone

'Marnie', a thriller by Alfred Hitchcock, was released in 1964. Based upon the novel by Winston Graham and starring Tippi Hedren and Sean Connery The best thing about the film is the music, to be honest. This was the last collaboration between Hitchcock and composer Bernard Herrmann – who also created the soundtracks for classics such as 'Psycho', 'Vertigo', 'Taxi Driver', 'Citizen Kane' and more.

The soundtrack, restored from the original music masters, has been re-created at Abbey Road Studios for vinyl but what you have here is over fifty-eight minutes of music in three formats: vinyl, CD and download.

Released in a translucent scarlet-coloured vinyl edition featuring a spot-varnished 320gsm tip-on gatefold sleeve, the package features

two vinyl discs to be played at 45rpm, an expanded 'vinyl-esque' replica CD housed in a scale-copy of the gatefold sleeve containing the complete score plus unused/alternate cues, a 2-track 7" vinyl single, exclusive to featuring singer, Nat King Cole's, rendition of the song 'Marnie', co-written by Bernard Herrmann.

You'll also find a 762mm x 1016mm newly commissioned British Quad poster, printed using original 1960s production processes - matching not only the poster weight of the time but also the correct machine folds. Finally, Bernard Herrmann's biographer, Steven C. Smith, offers an insight into this soundtrack with his own sleeve notes

A soundtrack full of neurosis, that reflects the on-set mental condition of the principle actress, Hedren.

**F**ormed in 1956, the BBC's Radiophonic Music was set up as an in-house music team, creating incidental and title music for a host of BBC productions over the years. It just so happens that much of it was innovative, imaginative, ground-breaking and influential. So, a useful bonus for Auntie then!

Based in Maida Vale from 1958, they hit the ground running with the superb 'Quatermass and the Pit', followed that up with the mammoth theme for Dr Who and proceeded to infect the entire BBC spectrum of programming with such incredible electronic music pieces that the entire team is now held with a mixture of awe and reverence by just about any electronic music star you might care to name.

Over the years, the team released a series of albums featuring their music which has been plundered by bands and artists. This is one of them, now

re-released on numbered limited-edition pink vinyl.

Originally released in 1968 on the BBC Radio Enterprises label, as a tenth anniversary album it includes remastered early electronic works of John Baker, David Cain and Delia Derbyshire, composed as introductions to various radio or television programmes. Often short and snappy, the music here is inventive, often humorous but always fascinating.

In mastering terms, apart from a touch of stridency from high frequencies during crescendos (there's nothing intrusive, mind you), the playback was very good – quiet and with a nice sense of 3D imagery around the central stereo image. The nature of the original pressing and the widespread use of analogue synths within the LP does give the impression of a slight high frequency roll-off but, if anything, the sound is swathed in a nostalgic glow and, I have to add, I wouldn't have it any other way.



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BBC Radiophonic Music  
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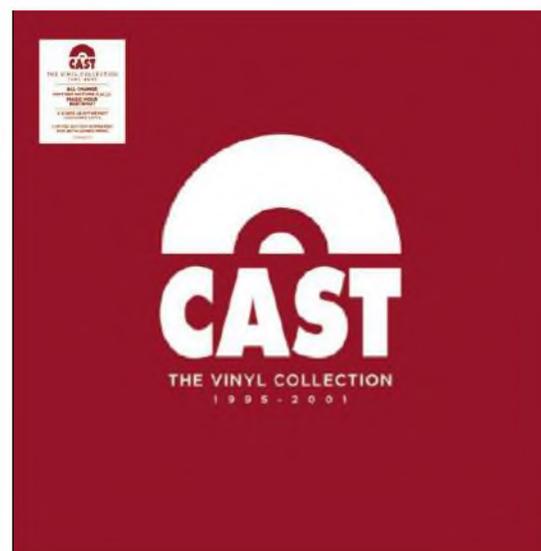
# AUDIOPHILE VINYL

**C**ast popped up along with a host of other bands during the Brit-pop era in the mid-nineties, although they had to fight their corner somewhat as fingers were pointed at the outfit, accusing them of being a 'me too' group with not much to offer. Which was and remains wholly unfair because Cast was a significant entry into the scene at the time and featured a wealth of talent. The front man was a prime example of that. John Power, who also played guitar, was also a man with a significant past. He was a member of the iconic Liverpool band, The La's. Power formed The La's with Lee Mavers. His formation of Cast in 1994 allowed Power to continue his hook-laden approach to music with a definite sixties affinity that greased the creative wheels and produced a series of chart hits to boot.

This box set features four albums by the band, held within a limited edition, numbered slipcase. You'll also find a signed photo print of the band.

The contents features 'All Change' (1995) on clear vinyl, 'Mother Nature Calls' (1997) on blue vinyl, 'Magic Hour' (1999) on yellow vinyl and 'Beetroot' on red vinyl (2001). I would have expected a sort of purplish colour for the latter, but never mind.

In terms of mastering performance, I wouldn't say that the pressings were especially insightful but then I was happy to hear a broad tonal neutrality and balance. Music never sounded forced or clinical, there was an even, low key presentation that allowed instruments to speak for themselves. During tests I never felt that I was listening to the master or tweaks made therein, the music just flowed through.



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# "Stones from the stone age last remarkably well"



Noel Keywood

**F**or most people the LP is an amusing anachronism – trying to be modern at a time when wiggles carved into a groove are Stone Age. Literally – because a polished stone, a diamond, reads the wiggles. Underneath you might find a tyrannosaur providing propulsion!

So I was taken aback to hear, at the Bristol Show this month, that nowadays the LP has become a de facto primary music record. Bizarre. Even more so when I tell you why. Enter the D word

This won't be a 'lets bash Digital column' – something I am prone to – so much as a rumination on what the hell is going on. So let's bash digital.

The LP may be Stone age but we remain able to use it. Digital storage media by way of contrast, when they get old, commonly become unusable we were told by Guy Hayden of Universal Music and senior cutting engineer at Abbey Road Studios, Miles Showell – especially if they used tape, meaning digital recorded to tape.

Digital storage has proven transient, formats like Sony's U-Matic and DAT coming and going, so music studios – whose job it is to record and store our collective music heritage – cannot now rely on any one digital format, as it will almost certainly become obsolete as technology moves ahead

Yes, they store old digital recorders at Abbey Road, as they also store massive professional analogue Studer open-reel machines, but once the time code gets lost, due to tape stretching and mechanical deterioration, there is nothing that can be done to retrieve music from a digital tape. Many early digital tape recordings made on Sony, Mitsubishi and other machines have proven all but unrecoverable as

a result.

Analogue tapes have deteriorated too of course, due mainly to oxide shedding. So, wonderful as analogue tape can sound, it has not proved durable either.

That leaves us with the Stone Age LP. Guy Hayden and Miles Showell told us that, by default, it has now become a reference source for historical archival purposes. Extraordinary – and a poke in the eye for much past 'wisdom'.

Music has traditionally been seen as commercial product; now it is being seen as cultural outpouring – or more coldly a 'cultural artefact'. Let's go UK street and the strictly non-commercial (at the time) The Who with songs like 'The kids are alright'. Not love songs designed for mom&pop radio consumption, nor US blues, but simple UK street. Guitar with crashing chords, accompanied by drums and bass. Not commercially aimed, as you could say much 'pop' of the time was, this song passed into our collective consciousness, becoming a phrase that's used today; by the New York Times recently for example.

Which neatly takes me to the U.S. Library of Congress that has steadfastly and clear sightedly rejected music records such as MP3s that, they have maintained, degrade musical heritage. Now digital itself is looking parlous in its ability to hold any data over long periods. And this is a problem.

If digital records decay then it isn't just music that becomes inaccessible: all your family photos, perhaps your entire family history can disappear. Poo! Up in a puff of digital smoke. It certainly makes me concerned.

Long time ago I bought a succession of tape based digital camcorders to record family events and stored all the recorders so as

to be able to read a library of tapes, knowing that memory cards were about to take over. But now what? Will the recorders ever work again and will the tapes be playable? They are all fading into a future that looks little assured – like everyone else's records, including those of UK music studios.

Commit music WAV files to Flash memory instead? Good idea. Or is it? I have a pile of dead USB Flash memory drives in front of me. Flash memory deteriorates with read/write operations – it's volatile as well, having limited life span. Not much is said about this because Flash memory is still commercially alive and effective, as all those old digital tape formats once were.

Hard Disc Drives (HDD) seem to spin forever but their mechanics will give out in the end – and then its 'hasta la vista' to data. So what about tomorrow?

Digital now looks more frail than analogue. The only effective strategy to defeat this problem is to constantly transfer a digital record to a new storage medium, insofar as this is possible. But that means libraries, studios and both you and I – worldwide – must constantly transfer to the next whizzy way of storing a digital signal. That is impractical to impossible: the effort and cost required to cope would be prodigious.

Against advanced digital technologies the LP is Stone Age – but durable and accessible. Add in good quality and we all end up with what is now becoming seen as a primary record. And you thought your old LPs were only fit for the skip!

There's more to the old LP than meets the eye. Stones from the stone age last remarkably well, unlike all the stuff we have devised ever since. ●

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# "Previously worthless and useless taped recordings now have a value"



Paul Rigby

**H**ave you noticed the sheer amount of live recordings that are being sold online, on eBay, via Amazon – in fact everywhere that can sell them? We are currently awash with the things. Most feature classic artists and are previously unknown and unique performances. A lot of the live releases are presented as physical formats, arriving from a strange and convoluted past. Some are legal while others are a bit on the dodgy side. Nevertheless, live recordings are currently 'in'. Just look at the CD and vinyl releases featuring David Bowie since he passed away, for example. So, what's going on?

Firstly, archive managers are suddenly realising what they've got. Previously worthless and useless taped recordings now have a value.

Quite a few radio stations in the USA have come and gone over the years. Way back when, many of them invited artists into the studio to perform – often for a small fee. This meant the stations owned the reel-to-reel tape of that performance. Then life carried on. Until they hit financial trouble years in the future, the station died a death and the administrator or future owner called into wind up the affairs, cleared the place out and dumped the station's contents in a warehouse somewhere until someone behind a desk suddenly said quietly to himself "Hang on a minute..."

Whereupon, that stash of tapes in the corner of the warehouse was sifted through. Legally, all the company needs is a one-sheet piece of paper to prove ownership and provenance and they can fend off future attacks from that artist's lawyer.

Now, I'm sure that these legal documents, on occasion, might not be as kosher as others or the source for the music itself might not be quite as steadfast, so some of these radio broadcast releases might very well be grey in legal terms. From what I can tell, radio and TV broadcasts from the USA, pre-1996 are seen as public domain if they were released by someone prior to the time when the law was changed. And European live radio and TV broadcasts, before 1967 are also seen as public domain. This means you can have a US radio recording that was broadcast up to 1995 offered for sale by European retailers. Bad for artists and their estates, as well as labels, but great for music fans and collectors of course.

The above is relatively well known but I wanted to add this: just because you see a live album on CD up for sale, don't assume that it has a dodgy past and don't assume that the quality might be on the low side. A lot of live releases that you may not have seen before are not only kosher but are presented in top quality sound.

Allow me to illustrate my point via a few CDs from the record label, Floating World ([floatingworldrecords.co.uk](http://floatingworldrecords.co.uk)). Take 'Best of The Doobie Brothers Live', which could be seen as suspicious but is actually an old Sony release, a selection of tracks from a live recording of two benefit concerts performed by the band for the Wildlife Conservation Society in the Spring of 1996.

Maybe live releases that flash a place and a date give the wrong impression. Take Laura Nyro's 'Spread Your Wings and Fly: Live at the Fillmore East May 30, 1971'. You look at that and think 'Hmmm...' Again, though, this is an ex-Sony release.

What might trigger the pointing of fingers is ex-The Band star Rick Danko's series of live releases. Here's a selection – the first with Richard Manuel and Garth Hudson 'Live At the Lonestar NYC, 1985', one with Rick Butterfield 'Live At Huntindon Beach 12.11.78' and a 2CD pack featuring 'Cubby Bear, Chicago, IL Dec 1989' plus 'Stephen Talkhouse, Amagansett, NY Oct. 1997'. Even the abbreviated titles add a slightly dodgy air, don't they? They read like bootlegger's notes.

Again, it just ain't so. The Danko releases are straight from Danko's manager and, hence, official.

When a band splits, in this case The Band, everyone within had to continue to pay their bills of course – and touring was (and remains) the best way to do that. What you will find is that now – and even back then – concerts were recorded in case future income could be derived from them and this is what happened with Danko.

With record labels like Floating World, you can be assured of sound quality and that the artist and the rights holders are being suitably recompensed. You can't be sure of that with some other productions out there.

But there hangs the moral dilemma and one that also exists with the honest (?) to goodness bootlegs too. The rights holders might be losing out and the pirates grabbing the cash – but these baddies are feeding consumer demand. If record labels and rights holders are able then, many will exclaim, why wait to be bootlegged? Many music fans would say "get the music onto the market, do it now, feed the fans and starve the pirates!" And earn cash in the process. ●

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**Hi Fi News said:**

Any great turntable gives you a certain frisson when you hear it. It's that old 'shivers down the spine' feeling, a sense of being let into a world to which you had previously not been privy. This is a remarkable turntable, and arguably the apex of vinyl playback. It's difficult to see how the SP-10R motor unit can be improved upon. It is a definitive statement of engineering prowess, and marks the return of direct drive to the top tier of turntables.

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“this certain gentleman is still enthusiastically blowing his beloved trombone”



Jon Myles

**W**hen I was growing up there were a few prerequisites for the bands I liked. First they had to write good songs (obviously). Secondly, a certain anti-establishment stance was preferable. Thirdly, their music should be thoroughly incomprehensible to my parents (the more they hated it the better!). And finally they should be young and rebellious – someone I wanted to be associated with!

For anyone over the age of – say 45 – it was in my eyes time to retire to the nightclub circuit crooning old Frank Sinatra standards. The Who summed it up with the line “Hope I die before I get old”, sung by the now 75-year-old Roger Daltrey.

But as Bob Dylan – a venerable 77 – wrote “The times they are a’changin’”. As I’ve now realised, age is no barrier to writing or playing good music anymore. After all Paul McCartney is 76 years old, Mick Jagger 75 and Bruce Springsteen 69. And then there’s Keith Richards – still going strong at the age of 75. Think about that; he was born while the Second World War was still raging and yet he is still prancing around stages across the world to massive crowds.

Tom Jones and Cliff Richard are both 78 and still making records (whatever you may think of their current output). By comparison Eric Clapton is a sprightly 73 years young.

Form a new band composed of musicians of those ages nowadays and it’s doubtful the youth of today would take much interest – nor would most record companies.

But topping them all is a musician

you may have never heard of – unless you are well versed in Classical music. Step forward Frank Mathison. “Who?” you may well ask.

Well, at the grand age of 90 this certain gentleman is still enthusiastically blowing his beloved trombone – and doing it rather well into the bargain. And this after a career that has brought him considerable acclaim and no little respect from his fellow musicians.

This is partly because he was, for 40-odd years, bass trombone player with The London Symphony Orchestra (LSO). He first picked up a brass instrument in his early teens when he was caught being mischievous outside of a band room.

After two years’ conscription with the army in which he played the trumpet in a military band, Frank returned to his native Huddersfield to live with his parents. He was by now playing the trombone and did a short season with the Huddersfield orchestra. That was in 1948, some 70 years ago. He then won a scholarship to Birmingham School of Music where he studied and achieved a music degree.

He was encouraged by his music professor Harry Greensmith to audition for the City of Birmingham Orchestra (CBSO) where he was offered the post of bass trombone. He stayed in Birmingham with the CBSO for 13 years until world famous conductor Jascha Horenstien recommended him to the LSO.

He stayed there for more than 30 years playing under many legendary conductors including Leonard Bernstein, Sir Adrian Bolt and Thomas Beecham.

Also during that time Frank

appeared on the John Williams-composed soundtracks to Star Wars (and its sequels), Superman and Raiders Of The Lost Ark along with the rest of the LSO. I can only imagine how much the individual musicians would have made if they’d been paid royalties!

Other highlights of Frank’s career include playing on the soundtrack to *An American Tail* – which tells the story of a Russian mouse trying to make it big in America – where his trombone can be clearly heard. Then there were concerts with John Barry, famous for his James Bond theme tunes.

Frank Mathison eventually retired from the London Symphony Orchestra in 1993 and moved up to Hebden Bridge in West Yorkshire where he had long maintained a holiday cottage. But, unlike many of his contemporaries, Frank’s music days are far from over. He still continues to play the trombone and is a member of the Huddersfield Philharmonic – which has awarded him an honorary lifetime membership – as well as the Halifax Symphony Orchestra.

And even in his 90th year he says he has no intention of hanging up his beloved instrument. Perhaps he’ll go on to 100, still playing and enjoying what he does best.

So move over Bob Dylan, Paul McCartney, Mick Jagger, Keith Richards and Bruce Springsteen, in terms of longevity a certain Frank Mathison beats you all by a good number of years.

Which just goes to show that age is no barrier to making music – despite what I thought in my earlier years! ●

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# "Sony DAT and Minidisc decks can be turned into decent 16bit ADCs"



Martin Pipe

In the 1980s and 1990s, reel-to-reel was the only way in which I could achieve long recording times – for concerts and long playback sessions (parties, bedtime music and so on). Sure, there were VCRs with so-called 'hi-fi' soundtracks – but the companding noise reduction essential to this clever (depth-multiplex narrowband FM) 'bolt-on' to domestic analogue video formats was quite heavy. Its effects were audible as unpleasant 'pumping', even with source material as innocuous as speech. Sometimes, head-switching noise was also evident. Hi-fi VCRs certainly had their place – recording TV programmes with Nicam stereo sound.

This was because the alternative (a hissy mono edgetrack) was awful. However, they left much to be desired in absolute hi-fi terms, despite the impressive specs I went through a large quantity of hi-fi VHS and S-VHS (high-band) VCRs – reviewing them for magazines like 'What Video' helped here – and the best-sounding one I could find was the Sony SLV-SE800, a modest Nicam VHS model. Its compander was less 'audible' than rivals.

I retained that Sony machine, so I can transfer audio from hi-fi VHS tapes into the digital domain. As well as the soundtracks of concerts, there is audio material that I did record with VCRs of this type – the timer was very useful for the unattended recording of radio programmes, sourced from a FM tuner connected to its audio inputs.

Eventually, I used a Sony PCM processor with a VCR for unattended recording. This unit, a 'domestic' version of the professional PCM-1630 system supplied by Sony to studios, converted analogue into a video 'representation' of 16bit digital

audio that could be recorded and subsequently played back with home VCRs. I covered this digital stopgap – DAT replaced it – in *Olde Worlde* a few years back.

That PCM-701ES converter is still in my possession, as are some VHS tapes containing recordings of various material. I could digitise its analogue outputs, but it would surely be better to keep my audio in the digital domain!

Last month, I discussed the Prism DA-1 studio DAC. This has SDIF (not to be confused with S/PDIF!) connectivity for compatibility with the aforementioned Sony PCM1630. I found the PCM-701ES service manual online. Modifying the PCM-701 with a handful of buffer and gating chips to obtain the separate master clock, left-channel and right-channel from signals already present inside the converter should be possible. The Prism can convert these into a standard S/PDIF signal that a computer audio device can understand.

And so to the devices bridging the gap between your source and a computer that can record, manipulate and convert its audio into the desired format (typically with software like Audacity). Most PCs accept analogue audio. They alas sound at best mediocre, although aftermarket 'plug-in' soundcards are more than respectable these days. Most have S/PDIF coaxial or optical digital inputs, which can be directly driven by an appropriate source.

Alternatively, Sony DAT and Minidisc decks can be turned into decent 16bit analogue-to-digital converters simply by engaging record with no media present ('AD-DA' will appear in the display). These converters will be built to audiophile standards, and will sound better than 16bit soundcard analogue chipper

because your delicate audio signals are kept away from the electrically-noisy computer circuitry.

If you have lots of cassettes in need of digitisation, consider seeking out a Philips DCC (digital compact cassette) deck. The thin-film heads of these do a surprisingly-good job at playing analogue cassettes. Better still, their audio is converted into digital and available on the deck's S/PDIF output – this can be routed to the digital input of a soundcard.

If you don't have a decent soundcard, consider using an external one designed to connect to your computer via USB – or, for some older (and cheaply available secondhand!) models – Firewire.

We musn't forget USB turntables either; some of these will also accept a line-level source like a tape deck or hi-fi VCR. I obtained excellent results from a sub-£100 device called the ART Phono Plus, a phono stage with line input and USB connectivity. The converters of this unit, and for that matter most USB turntables, are 16bit; I'm surprised we're not seeing more use of 24bit converters.

Once again, your delicate analogue signals are kept away from your PC innards. And the benefits of doing so show; I've had good results from USB soundcards made by Furutech, Roland/Edirol, Terratec and Akai. The latter three are aimed at musicians and small studios (I've seen them in BBC premises too), they are capable of capturing analogue audio with 24bit resolution and sample rates as high as 96kHz. Some go even as high as 192kHz. They also support MIDI, which is handy if you plan on using your computer as a sequencer or music workstation, and give you control over recording level. The vast majority also feature digital inputs. Next month, I'll discuss the recording process. ●

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"At 50 years old plus, you wouldn't really expect them to be cutting edge!"



Dave Tutt

I wonder how many of you have even heard of the Fane Ionic tweeter? To say it is rare is probably an understatement, but they do sometimes show up as a curiosity – as much as anything because people have no idea what they are.

This week I have two B&W P2H speakers from 1965 or thereabouts containing these tweeters. Now I should really warn you that they are not what I would call 'safe' by modern standards, even though everything is hidden inside a protective box.

Some of the issues with these units make me wonder. No on/off switches, Bulgin mains round-pin power sockets with a similar 2 pin socket for the audio. Metal grill over the tweeter compartment that is not earthed. I could go on but this is what to expect from equipment of this age.

The HT power supply is a treat. Old leaky capacitors acting as the reservoirs and a small 1.75amp 7 volt transformer with an overwinding to provide the HT and the AC supply for the valve heater, which is also coupled to the AC mains side of the transformer. I say "transformer" but here "fried" is probably a good description because of the 'speakers never having been turned off.

The transformers overwinding steps up the mains to some 300 volts. The tweeter driver is a 6dq6 valve which is configured as an oscillator at some 27MHz or so. Would you want to sit next to a RF transmitter like this all day? Would the EU allow it? The screening cans therefore are a must or just about everything else you have will be picking up that potentially disruptive RF signal.

The B&W P2H 'speakers were a nicely made if rather large ported cabinet over 1.5mtrs (5ft) high with

the tweeter in its own box and with a 13x8 driver below which, from what I can see, is very much like the EMI ones from the period.

Given that, from what I can tell the actual capsule that has the plasma discharge within or across it – depending on how you think it works – may have a very short life; I am of the opinion that the chances of these working again is pretty slim.

However, with the P2Hs and a whole box full of components I was finally getting somewhere in the repair process. An inserted 2 Amp transformer provided the valve heater current. As a temporary measure the incoming mains provided the HT at a lower voltage than originally specified, fed by a new low value fuse in a new holder. New HT capacitors replaced the ones that had leaked into the box. But sadly – still no go!

Moving to the second of the two units I found a letter from B&W dated 22/08/77 which basically states that although at that time the manufacturers had reworked the burner electrode, rather like a car spark plug the point of which is the source of the ionisation, it is unlikely that further help could be obtained via them and that a chat with Fane might be more appropriate. This would of course explain why B&W couldn't help and the reason there was no response from Fane.

So what to do? Realistically, the Fane driver is a no-go. To get one going would be pushing it – let alone two. And to get them to sound the same might be just about impossible.

The answer was a more modern solution that at least allows the P2H speakers to run. The Fane Ionic was removed, as well as its power supply, and a new baffle fitted to include – in this case – a soft dome tweeter as well as a horn piezo.

Why the horn piezo? It was

configured to act as a supertweeter, only working beyond 16kHz in an effort to provide extended frequency response – much as that from the original Fane Ionic driver. A piezo runs to around 40kHz – well beyond audible range.

Both tweeters were wired to be driven via the original switched attenuator, allowing for fine adjustment to suit surroundings. The original crossover was kept but with suitable modifications to work with the new drivers.

It is a shame that the bass drivers of this loudspeaker are getting on in years, running out of steam if pushed hard – but at 50 years old plus, you wouldn't really expect them to be cutting edge! From a modification stand point I would think these are ideal for further work, largely because of their size – but also because the cabinets are really well made. A twin 10inch woofer arrangement could easily be fitted and would be leaps above what is the current bass performance – relatively below par for their size but probably totally OK for most purposes – assuming you don't mind the size of the box.

That would also be a point to address: the space between the drivers on the baffle – excessive at over 30cm. Of course, I am as usual constrained by price, so where a great solution could be achieved, the likelihood is I will only break-even with what I have done. Doing more with this repair is just going to be a cost I can't justify.

With the benefit of the 5 position attenuator my modified B&W P2H 'speakers gave quite an acceptable sound, but the spacing of the drivers means a compromised vertical sound image. The 40mm recessed baffle has a similar detrimental effect on image width. But at least their new owners will survive the listening experience! ●

**HI-FI SERVICE & REPAIR**  
**Dave Tutt**  
 +44 (0)7759 105932  
 dave\_london@hotmail.com  
 www.tutt-technology.co.uk



# WORLD STANDARDS

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

## TURNTABLES

**AVID INGENIUM** £800  
Great bass response and upper midrange detail allied to clarity makes this a must-hear at its price-point



**CLEARAUDIO INNOVATION** £6400  
Expensive, but offers great results from a finely honed and beautifully finished belt drive turntable with servo control from the platter to keep a grip on tempo like few others. Can be fitted with a Clearaudio tangential arm, or any conventional design. Awesome.



**INSPIRE MONARCH** £4,350  
A rebuilt from the ground up Technics Direct Drive, having blistering pace and dynamics allied with smoothness, sophistication and purity of tone. A true reference



**LINN LP12SE** £3,600  
The UK's most iconic turntable, the legendary Sondek goes from strength to strength. New Keel sub-chassis and Radikal DC motor add precision and grip to one of the world's most musical disc spinners. Expensive though.

**MICHELL GYRO DEC** £1,700  
Wonderful styling coupled with great build and finish make this turntable a delight for friends and family. It has an attractive clear acrylic dust cover, and you can mount just about any arm. A current design standard.



**PRO-JECT ESSENTIAL DIGITAL** £300  
A budget turntable that turns in a great analogue performance, but also has a hi-res digital output. Send 24/96 across your lounge via optical cable to a DAC and get great audio quality. Or record LF to your laptop.



**REGA RP3** £550  
The first of the super-quality Regas, little compromised by price and featuring Rega's outstanding RB303 tonearm, suitable for MM and MC cartridges. A standard at the price point.

**TIMESTEP EVO** £2100  
The famous Technics SL-1210 MkII Direct Drive but with improved plinth, isolation, main bearing and power supply, plus an SME arm (add £1500). DD convenience, rock steady pitch and fab sound at a great price. Our in-house reference.



## TONEARMS

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

**HADCOCK GH-242 EXPORT** £810  
Consummately musical, lyrical sounding tonearm, but needs the right turntable.

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



**REGA RB303** £300  
A one piece tapered casting makes this arm's structure almost unrivalled. Great dynamics and superb imaging, for MM and MC. Reference quality for peanuts.

**SME 312S** £1,600  
Twelve inch magnesium alloy tapered arm tube plus SME V bearings. An insightful yet smooth and relaxed sound. Superlative build completes the package. Our Editor's steed.



**SME 309** £1500  
A one-piece tapered 9in arm finished like a camera and slick to use. Superlative SME quality and sound at affordable price.

**SME V** £3000  
Offers rapid fire timing and a sense of precision, plus rock solid dynamics. Top dollar for deep pockets.

## CARTRIDGES

**AUDIO TECHNICA AT-OC9 MLIII MC** £420  
A fine sounding MC with strong bass and super fine treble from a great stylus – yet inexpensive.



**AUDIO TECHNICA AT-F3/III MC** £150  
Great value entry level moving coil with detail and grip you just can't get from similarly priced moving magnets.

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

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

**DENON DL-103** £180  
A popular and much loved budget MC with big bass, smooth treble and deep sound stage. Fantastic value.



**LYRA TITAN I MC** £3,500  
Breathhtaking speed and dynamics from LP, helped by diamond coated, boron rod cantilever.



**ORTOFON 2M MONO SE MM** £80  
A mono cartridge purposed for The Beatles in Mono microgroove LPs. Fitted with a top quality Shibata tip. Fab for the four.



**ORTOFON 2M BLACK MM** £400  
As good as it gets from MM. Fabulous detail and insight from a Shibata stylus, good bass and excellent tracking.

**ORTOFON CADENZA BRONZE MC** £1,400  
A mid-price MC with a slightly livelier presentation than the super smooth Cadenza Black. High-end sound at midband price – great value.



**ORTOFON CADENZA BLACK MC** £1,800  
Ultra smooth and dimensional moving coil with bass and punch aplenty. Lovely stylus.

**ORTOFON A95 MC** £3,750  
Fast and extremely detailed, this is an MC cartridge that sets standards.

**REGA CARBON MM** £35  
Budget price for a competent cartridge with a fairly unflappable nature. Ideal for beginners.



**GOLDRING 1012GX MM** £250  
A glorious sounding cartridge with solid bass and strong dynamic punch, plus excellent treble from its Fritz Geiger stylus. Fun and affordable.



**SHURE M97XE** £80  
Big warm sound, but great tracking and bullet proof stylus protection from damped guard. A survivor.

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

**PHONO PREAMPS**

**CAMBRIDGE AUDIO 651P** £200  
Clean, concise sound from MM and MC cartridges at a very low price. A real bargain.

**ICON AUDIO PS3 MKII** £2,500  
All valve MM phono stage with MC transformer option, graced by big, spacious and relaxed sound.



**LUXMAN EQ-500 PHONOSTAGE** £4,495  
A fully-equipped phonostage from Japanese manufacturer Luxman that offers comprehensive cartridge matching allied to superb sound.



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



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



**QUAD QC24P** £995  
MM and MC, oodles of gain, a volume control – and valves! Looks superb and sounds even better: smooth, atmospheric and big bass.

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

**PREAMPLIFIERS**

**ICON AUDIO LA-4 MKIII** £1,400  
Uses early 6SN7 triodes for liquid sound. Has plenty of gain and a remote control into the bargain.



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

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



**INTEGRATED AMPLIFIERS**

**ARIAND PRO845SE** £1,499  
Pure single-ended valve magic. Low-powered but immediately gorgeous, easy-going yet forcefully dynamic at the same time.



**AUDIO RESEARCH VS160** £3,500  
Power house sound with enormous pace and punch from traditional U.S. muscle master Audio Research. Breathtaking, but expensive.



**CAMBRIDGE AUDIO AZUR 651A** £350  
Dual-mono construction and meaty toroidal power supply combine to produce a solid and sharp sound with sonics far beyond its price point.

**CREEK EVOLUTION 100A** £1,500  
Superb build and smooth confident sound make this powerful amplifier a benchmark.



**CYRUS 8DAC** £1,400  
Trademark shoebox-sized Cyrus integrated now offering 88Watts per channel, plus DAC. Svelte delivery from a dainty case that fits in anywhere – and isn't Class D!

**EXPOSURE 1010** £495  
Entry-level integrated from Exposure has excellent upper mid-performance with an almost valve-like sound.



**ICON AUDIO STEREO 60 MKIII** £2,800  
Excellent tube integrated with plenty of power and an expansive soundstage, plus KT150 tube option and bias meter for easy adjustment.



**NAIM NAIT 5Si** £925  
Naim's fabled entry-level integrated amplifier is updated to si status. Demos Naim's superbly muscular sound at entry level.

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



**POWER AMPLIFIERS**

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

**AUDIO RESEARCH VS115** £5,000  
Oodles of power with enormous punch. Rafael Todes said it provided "shock and awe" while retaining incredible smoothness and texture.

**ICON AUDIO MB845 MKII** £7,600  
With 120W from big 845 valves right down to low frequencies, this power amplifier has massive dynamics and bass swing, yet is easy on the ear.



**ICON AUDIO MB81PP** £15,000  
Big Russian transmitter valves deliver 200W from these massive monoblock amplifiers. Frightening in every sense.

**MCINTOSH MC-152** £4,995  
Stunningly insightful sound with enormous bass punch from a uniquely designed transistor amp. Amazing audio, a league up, if expensive.



**QUAD ELITE QMP MONOBLOCKS** £2400 PR  
The proverbial iron fist in a velvet glove. Plenty of power but delivered with an assured and confident nature. Smooth on top and easy on the ear but can rock out when needed.

**QUAD II-EIGHTY MONOBLOCKS** £6,000 PR  
Powerful and expansive sound from modern design monoblocks that also look lovely. Superb – used by us as a reference.



**LOUDSPEAKER FLOORSTANDER**

**B&W 803 D3** £12,500  
B&W's updated statement floorstanders deliver depth and definition with breathtaking speed and authority, aided by a diamond coated tweeter. Expensive – but enormously impressive.

**CASTLE AVON V** £1,600  
A big floorstander at a modest price that suits the average room. Refined ribbon treble and deep bass give it a great delivery.



**EMINENT TECHNOLOGY LFT-8B** £2,500  
Excellent U.S. planar magnetic loudspeaker at bargain price. Utterly superb - a must hear.

**EPOS K2** £1,000  
A fun sound that is tidy all round and very engaging, with solid bass. Music as you hope it to be.

**FOCAL ARIA 926** £1,400  
Simple, clean, neutral sound – easy going but well engineered and affordable.

**MARTIN LOGAN SUMMIT X** £16,698  
Matches Martin Logan's XStat electrostatic panel to a powerful subwoofer to provide extended, powerful bass. Dramatic sonic purity. Awesome – all but unmatched.



**MARTIN LOGAN ELECTROMOTION** £2,500  
Martin Logan's budget baby XStat hybrid electrostatic. Fits into any lounge to give electrostatic levels of clarity and imaging.



**QUADRAL CHROMIUM STYLE 8** £1,700  
A supremely smooth yet open sounding loudspeaker. Clean and detailed treble from a fine ribbon tweeter. Accurate yet informative and enjoyable. Pure class.

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



**Q ACOUSTICS 2050i** £480  
A large floorstander at a budget price. Offers high sensitivity and big sound and has very few flaws for the price.

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



**SPENDOR A3** £1,300  
Fine little floorstander with a smooth, natural midband and even tonal balance. Ideal for smaller rooms.

**TANNOY DEFINITION DC10 Ti** £6,000  
Enormous power with great projection. Glorious subsonics too. Need little power to go very loud and have superb finish into the bargain.



**TANNOY KENSINGTON** £9,950  
Big but not overpowering, punchy modern sound from classic cabinetry. Need little power to go very loud and suit a traditional home, or castle.



**LOUDSPEAKERS STANDMOUNT**

**ACOUSTIC ENERGY NEO 1 V2** £225  
Civilised sounding speaker with fast and tuneful bass.

**ACOUSTIC ENERGY AE1 CLASSIC** £845  
Brilliantly successful remake of an iconic design; not flawless, but surely one of the most musical loudspeakers ever made.



**ELAC BS243** £1,000  
More transparent and spacious than they've a right to be at this price, these refined mid-price standmounters represent top value.



**EMINENT TECHNOLOGY LFT-16A** £1,200  
U.S. planar magnetic bookshelf loudspeaker with unrivalled mid-band and treble. Hear it before all else.

**WHARFEDALE DIAMOND 220** £200  
Builds on the success of previous Diamond ranges with better bass, more detail and a greater sense of scale.



**KEF LS50** £800  
Supremely musical mini-monitors which sound much bigger than they look.



**MARTIN LOGAN MOTION 35** £1,300  
Folded Air-Motion tweeter gives a taste of Martin Logan's electrostatic sound in a standmount. Different from the standard mini-monitor and all the better for it.



**PMC TWENTY.21** £1,575  
Transmission line loaded standmount with a big box sound from a compact cabinet. Punches well above its weight.



**Q ACOUSTICS 2020i** £165  
Great little bargain-priced stand-mounts with a friendly, fun yet surprisingly refined sound. Hard to better for a pair of starter loudspeakers.

**WHARFEDALE DENTON** £500  
A beguiling mixture of retro looks with modern, high-technology drive units. The Denton has an easy-going, big-hearted sound with a touch of trad warmth that should appeal to many.



## HEADPHONE AMPLIFIERS

**CREEK OBH11** £150  
Designed specifically for low to medium impedance (30 Ohm – 300 Ohm) headphones the little Creek has a marvelously well-judged sound.

**CHORD MOJO** £399  
Class leading portable DAC and headphone amp with ability beyond all else. Big, open spacious sound.



**EPIPHANY EHP-02** £99  
PP3 battery-powered portable gives great sound quality at an almost giveaway price. Happy with the output from an iPod or CD player, the little epiphany is a true bargain.



**ICON AUDIO HP8 MKII** £650  
The HP8 MKII valve-based headphone amplifier brings the spacious sound of valves to headphones. And it matches 'em all.



**FIDELITY AUDIO HPA 100** £350  
Great little headphone amplifier with a lively yet refined and open sound.

**MUSIC FIRST PHONE BOX** £276  
Brings a big stage, plenty of detail and rich, deep colours to the sonic spectrum.



**OPPO HA-2** £250  
Remarkable performance and sound from ESS Sabre32 DAC in a slim portable package.



## CD PLAYERS

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



**CANOR CD2+** £3,100  
Musically coherent and tuneful valve-driven CD player from Slovakia. Lovely liquid sound.



**CAMBRIDGE AUDIO AZUR 651C** £410  
Snappy modern presentation from this budget CD player. Cracking audiophile entry point for any digital fan.

**CHORD RED REFERENCE MKIII** £16,000  
A unique and massive engineering exercise that could well be the best CD player available. Chord's Pulse Array DAC technology produces a musical experience like few others. A true reference player.



**ESOTERIC K-03** £9,495  
Superb high-end silver disc spinner that is beyond criticism. Devoid of its own character but has a flawless presentation.



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

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



**OPPO BDP-105D** £1200  
Universal player and DAC that makes CD and Blu-ray (+DVD) sound deep, spacious and full bodied. Reference quality that's affordable.



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



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

**TUNERS**

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



**CREEK DESTINY 2** £550  
Creek's tuner expertise shines through in the Destiny 2. This AM/FM receiver is wonderfully three-dimensional and smooth.



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



**DACS**

**AUDIOLAB M-DAC** £600  
Excellent sound from ESS Sabre32 DAC and impressive flexibility with a unique range of filter options make this a stand-out product. Low price is the icing on the cake



**AUDIOLAB Q-DAC** £250  
Stripped-down version of Audiolab's M-DAC loses some features but retains much of the sound, making it a veritable bargain.

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



**CHORD 2QUTE HD** £990  
Superb build quality and exceptional sound from this compact unit. Boasts the ability to handle DSD direct via USB and has an exceptional soundstage. One of the best DACs you can buy.



**DCS DEBUSSY** £8,000  
DCS's bespoke 'Ring DAC' circuit gives a beautifully-fluid, almost analogue sound that encourages long listening sessions. Not cheap but worth every penny.

**NORTHERN FIDELITY DAC** £650  
Packed full of features, including Bluetooth and USB, this ESS Sabre32 equipped DAC offers crisp, insightful sound at low price.



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

**NAIM DAC** £2,400  
Superb high-end digital converter with a probing, punchy and forensically-detailed sound.



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



**RESONESSENCE INVICTA MIRUS** £4,499  
One of the most highly spec'd DACs available, with a smooth yet entrancing presentation. Few approach it.



**NETWORK PLAYERS**

**CHORD DSX100** £7,500  
Chord's proprietary DAC circuit shines in their top-of-the-range streamer. Hear-through clarity with a sound rich in detail, dynamics and soundstage.



**CAMBRIDGE AUDIO NP30** £399  
Budget offering from Cambridge offers a great introduction to network streaming.

**CYRUS STREAM X** £1,400  
Gorgeous sound quality even from compressed digital music. New control app makes everyday operation a doddle.



**CONVERT TECHNOLOGIES PLATO** £2999.00  
A network player with amplifier that does it all, including turn LP to hi-resolution digital, and add cover artwork from the 'net.



**NAIM NDX** £2,995  
Clean, incisive and very detailed sound with Naim's traditional pace and timing make this one of the best network music players around.

**NAIM ND5XS** £2,175  
Great sound quality with traditional Naim heft. A wonderful DAC with full 24/192 handling. Only the display could be better.

**NAIM NAC-N172 XS** £1,650  
A pre-amp/DAC/streamer package provides a taught, rock-solid presentation with a tonally rich midband and a superior sense of rhythm.



**PRO-JECT STREAM BOX RS** £1,095  
Unusual valve-based streamer/preamp with variety of inputs and a lovely liquid sound. Not the most detailed but compensates with sheer musical verve.

**QUAD PLATINUM DMP** £2,500  
Combined CD/network player has all the usual Quad elements but with added zest and detail that brings life to everything you care to play.



## DIGITAL SOURCES

**ASTEEL&KERN AK100 MKII** £569  
Portable high-definition digital player with superb sound quality. Punchy and fast.



**FiiO X3** £150  
Fabulous value player with nice easy sound and full range of abilities. Small and light. For newbies.

**LOTOO PAW GOLD** £1,500  
Reference quality sound; it's like carrying your hi-fi in your pocket. Equivalently large too, but stunning headphone quality.



**NAIM HDX** £4,405  
Interesting one-box network-enabled hard-disk music system that gives superb sonics together with impressive ease of use.

**NAIM UNITILITE** £1,995  
A 50W amplifier with traditional Naim heft, a CD player and vhf/fm radio, plus network input and Bluetooth make this a great all-in-one.



## PORTABLE SPEAKERS

**BAYAN SOUNDBOOK** £149.99  
Superb design and great sound make for one of the best portable Bluetooth speaker/radios on the market. Not the cheapest – but worth every penny.



**IRIVER IBA-50** £69  
Big, warm sound with plenty of volume and clean at high levels. Muscular sound compared to many rivals.

## CABLES

**BLACK RHODIUM TWIST** £71/3M  
Twisted to fight off radio frequency, the Black Rhodium speaker cable is easy on the ear with a fine sense of clarity and focus. A remarkable performer at the price.



**MAINS CABLES R US NO.27** £95  
Offers a sprightly pace with a precise nature. Fast performance enhance frequencies and beautifully etched detail.



**CHORD SIGNATURE REFERENCE** £900  
Majors on timing, detail and openness. Capable of getting the best from most systems and a recommended upgrade.



**TELLURIUM Q BLACK** 280/3M  
A deep, dark, velvety performer that's nevertheless highly musical, it represents excellent value as mid-price cables go.

**TELLURIUM Q SILVER DIAMOND** £804/M  
An open, natural and transparent sound that is difficult to beat, from these great loudspeaker cables.



## HEADPHONES

**AUDEZE LCD-3** £1,725  
A planar magnetic 'phone that offers monitor quality. Strong sound with silky, dark quality that others struggle to match.



**B&W P3** £170  
Beautifully presented headphones from the loudspeaker specialists. Feed them a good quality source signal and they reward with excellent sound.

**JAYS V-JAYS** £49  
Wonderful little budget over-ear portable 'phones with a clean, clear sound to beat the best of the rest at the price.



**NOBLE K10 INC. FITTING** £1,279  
Custom fit in-ear phones with 10 drivers deliver a sound that is out of this world. Personal and perfect.



**OPPO PM-1** £950  
Planar magnetic phones with a warm, easy but big bodied sound that draws you in. Need a lot of drive, but deliver superb bass.



**SENNHEISER HD700** £599  
Tremendously fast with a strong, focussed, lower-frequency range and a firm bass punch.



**YAMAHA HPH-MT220** £150  
Purposed for indoor monitoring yet light and comfortable enough to be used on the move. Excellent sound quality marred only by a slight warmth to vocals.

# vinyl section

## contents

MAY 2019

[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk)

### MOBILE FIDELITY 83

Paul Rigby explains what lies behind Mobile Fidelity's famous master quality LPs – and Noel Keywood buys some.

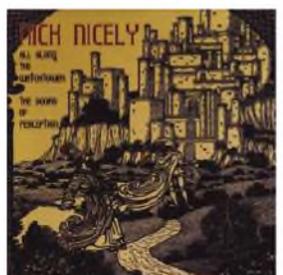
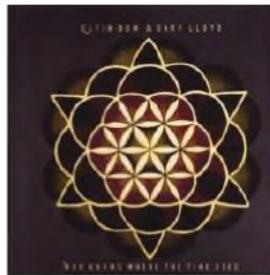
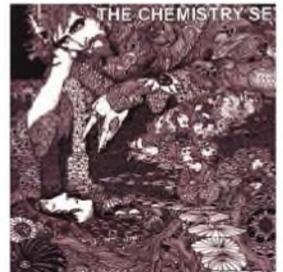
### SOUNDBITES

#### AUDIO TECHNICA DISC STABILIZER/ CARTRIDGE STYLUS CLEANER 89

Martin Pipe takes a look at recent gadgets for LP form experts Audio Technica.

### AUDIOPHILE BOOK REVIEW 91

Paul Rigby on Galactic Ramble – a massive tome on early UK Rock bands.



## news

### SEVENS FROM FRUITS

Fruits de Mer ([www.fruitsdemerrecords.com](http://www.fruitsdemerrecords.com)) has sent over a new batch of 7" discs.

Touch' 'We Feel Fine/Down at Circe's Place' is a psych/prog reissue from 1969. There's three tracks, one of which ('We Finally Met Today') appears on vinyl for the first time.

The Chemistry Set's new single, 'Firefly/Sail Away' is heavy psych personified. Includes a bonus CD.

Elfin Bow & Gary Lloyd's 'Who Knows where The Time Goes/The Wisdom', a new single with the A-side a cover of the Sandy Denny classic.

Also watch out for Nick Nicely's cover of Dylan/Hendrix's 'All Along The Watchtower' plus his own 'The Doors of Perception'.

### PURE PLEASURE

From tenor sax/clarinet man, Wendell Harrison and the hard bop avant jazz of 'An Evening With The Devil' (1972, originally on Tribe) featuring poetry via the Black Messengers. At times challenging but also reflective, varying tempos add colour and shade to an album that never fails to pique the interest.



### SIREENA

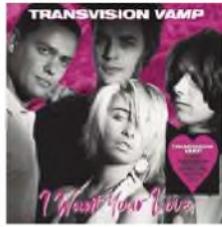
'Supper on the River Rhine', 10" 4-track EP from Big Brother & The Holding Company. Featuring the original Brothers with guest vocalist Michel Bastian, this is a reissue ([www.shackmedia.de](http://www.shackmedia.de)) of an original 200-only copy pressing from 1993.

Also look out for Pee Wee Bluesgang and '40 Bluesoul Years', a live album from a Rhythm & Blues band who've been at it since the late seventies.



### THIS MORTAL COIL

Classic 4AD fare from This Mortal Coil (4AD; [www.4ad.com](http://www.4ad.com)), a sort of label supergroup featuring band members from The Cocteau Twins, Colourbox, Dead Can Dance, Wolfgang Press and more. A band that represented the soul of the label and its ethereal dream pop pretensions. Now featuring beautifully presented editions in a gatefold format including: 'It'll End in Tears' (1984), 'Filigree & Shadow' (1986) and 'Blood' (1991).



## DEMON

A 3LP slipcase-based box set for fans of Transmission Vamp. 'I Want Your Love' features 'Pop Art' (1988), 'Velveten' (1989) and 'Little Magnets Vs the Bubble of Babble' (1991). Lots of pouting and poses struck. This is cartoon punk with a pink bobble on the top.

Speaking of boxes, the second volume of Leo Sayer's boxed series has arrived. 'The Hollywood Years' features 'Endless Flight' (1976), 'Thunder in My Heart' (1977) and 'Leo Sayer' (1978) are inserted into a slipcase. Singles galore include 'You Make me Feel Like Dancing', 'Thunder in My Heart' and 'When I Need You'.

Also look out for 'Soul Classics', a 2LP compilation featuring Al Green, Bill Withers and Erma Franklin. '12" 80s', a great idea that offers twenty-four extended 12" mixes from Propaganda, Scritti Politti, Herbie Hancock and The Pointer Sisters.



## ATLANTIC & RHINO

First time on vinyl is Rush's 'In Rio' (Atlantic), a whopping great four disc, multi gatefold affair. So that's twenty-nine songs from the Rio concert plus two extras: 'Between Sun & Moon' (2002) from Phoenix and 'Vital Signs' (2002) from



Quebec City. Despite the intrusive audience

- although the release does present the concert as part of a real 'occasion' - a glorious release.

Look out for Linda Ronstadt's 'Live in Hollywood' (Rhino), a HBO highlights package from 1980 (although nine of the songs here were never aired). Lots of classic songs here with a superb performance at its core.



## AVANT!

From the left side of the tracks comes Belp and 'Crocodile' (SVS), an experimental electronica outfit that has touches of classic Warp-esque melodies and tones. With added scary bits.

Mattin's 'Songbook #7' (Munster) - a warning from history! It tracks the first seven months of 1917 in revolutionary Russia. Improv that draws the attention of the rise of fascism in today's world.



## ...AND FINALLY

From Lubomyr Melnyk, 'Fallen Trees' (*Erased Tapes, erasedtapes.com*) is an ambient piano with minimal vocals production. Drama-packed, robust with a rolling piano groove.

Time Grove's 'More Than One Thing' (Wah Wah 45) offers low key, squashed percussion, electric piano and subdued brass in a cosy, cuddly, jazz frame. Nice.

William the Conqueror's 'Bleeding on the Soundtrack' (*Loose Music, loosemusic.com*) is warming, infused with melody and old fashioned soft rock grooves. Gets under your skin.

From Sigh and 'Heir to Despair' (Spine Farm (*spinfarmrecords.com*)). This is fascinating metal: experimental, layered, thoughtful, intelligent.

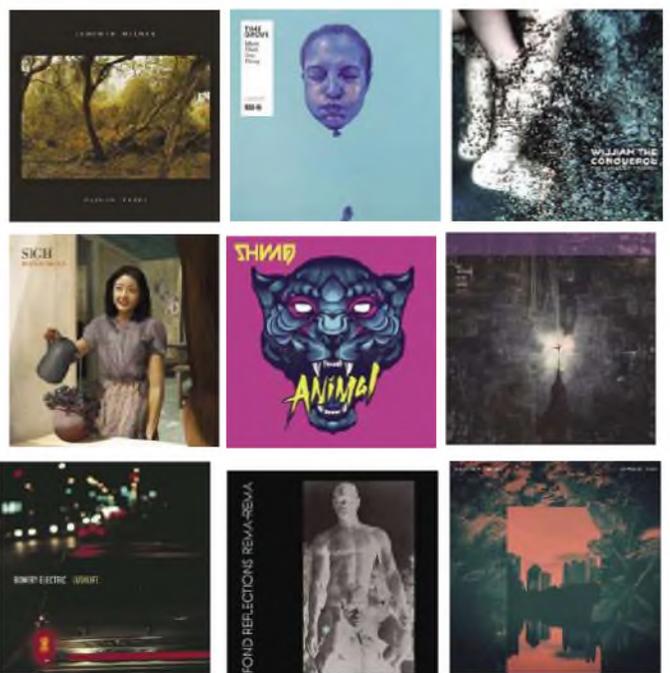
Norway's Shining's Animal (Spine Farm (*spinfarmrecords.com*)) take a rather mainstream approach to their metal aspirations but I like the melodic twists.

Mono's 'Nowhere Now Here' (*pelagic-records.com*) offers quite delicious, Japanese sourced, instrumental post rock. Grandeur over a broad horizon, complex arrangements, sublime musicianship.

Bowery Electric's classic 'Lushlife' (2000), a gem of vocal trip hop with more emphasis on vocalisations. An ideal entry point into the perfectly formed catalogue.

Featuring ex-members of The Models and Siouxsie and the Banshees, Rema-Rema released a 1980 EP, split up and never saw this LP, 'Fond Reflections' (*4AD; www.4ad.com*) because it's an archive compilation. What a debut may have looked like.

From Nubiyian Twist is 'Jungle Run' (Strut) provide jazz/soul-based vocals, turntablism, electronics, beats and a horn section. A right ol' mix then. It grooves, though. And in a funky way.



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# Mobile Fidelity Sound Lab

One of the leading lights in audiophile vinyl production, Paul Rigby looks a little closer at what Mobile Fidelity does and how it does it.

**M**obile Fidelity Sound Lab or, as most vinyl fans tend to refer to it, Mo-Fi, has been around since 1977. At the time, you may have shook your head and wagged a finger in the company's direction because Mo-Fi was launched just as vinyl was about to leave the stage as the prime, mass consumer physical music format. CD would enter the fray only five years later.

Yet, you have to hand it to founder, Brad Miller (who sadly passed away in 1998), he did take other formats on board such as CD and even tape. Many readers will be familiar with the company's CD releases, which are still on sale – but how many of you out there have an Original Master Recording or Ultra High Quality Record (UHQR) cassette? OMR cassettes were among the first commercial tapes to be duplicated in real time instead of via a mass production-type high speed bin-loop. High-end audio tape and proprietary cassette shells were also part of that package.

It's the other analogue platform, vinyl, that currently forms the company's prime format in terms of music reproduction. New releases are among the most expensive to buy on the market but many swear by them, they're seen as the gold standard.

After 1982, CD quickly dominated the market and it took some time for Mo-Fi to address vinyl once more but it did so in 1994 with the ANADISQ 200 LP series, which featured half-speed mastering with the GAIN System technology that was already in use in CD production, along with heavy 200gm virgin vinyl.

In the background, the company began work on the more advanced GAIN 2, which took that system a level upwards, integrating a custom tape head and hand-made electronics to expand the bandwidth as much as possible. In 2002, with the help of Tim de Paravicini and audio engineer, Stan Ricker, the GAIN 2 Ultra Analog

over two discs to be played at 45rpm. Why is that? Well, 12" discs played at 45rpm sound inherently superior. According to another fine mastering engineer, Kevin Grey, "In record mastering, the higher the recorded level and frequency, the greater the groove curvature. Curvature isn't usually a problem, per se, on the



*Dire Straits Brothers In Arms LP from Mobile Fidelity comes in a gatefold cover with two 45rpm discs. Mark Knopfler, lead man, is known for his interest in and attention to quality, making anything from the band, or himself as a solo artist, suitable as a hi-fi Rock demo.*

LP cutting system was launched.

The system features a Studer tape machine in which its internal electronics have been thoroughly tweaked and improved. Mo-Fi also uses a handcrafted cutting amp, driving an Ortofon cutting head on a restored Neumann VMS-70 lathe.

The resultant lacquers are then specially plated to, as the company stated, to "...protect transients in the musical signal".

Another point about Mobile Fidelity's releases is the fact that their vinyl packages are normally presented

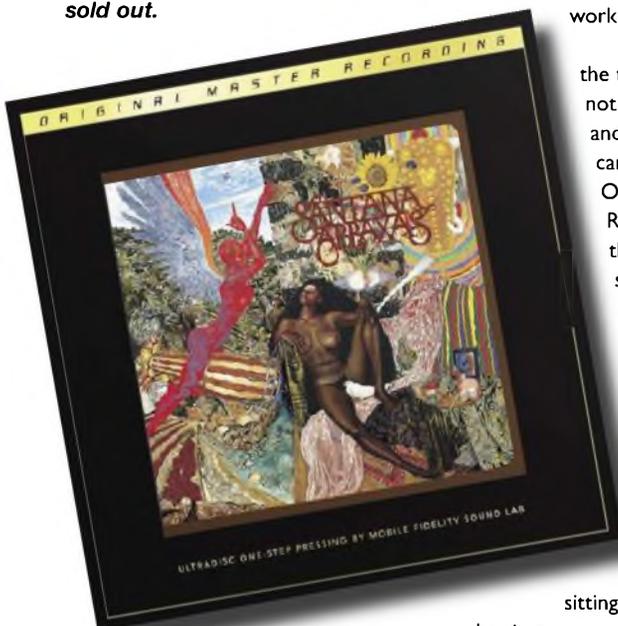
outside of a 12" 33 1/3 record, but as the groove moves toward the center, its relative speed slows down and curvature increases. Yes, it is still turning at 33 1/3 revolutions per minute, but consider: one revolution takes 1.8 seconds. That 1.8 seconds at a 12" diameter is covering a lot more territory than at the minimum 4.75" diameter. The result is actually a loss in high frequencies and increase in distortion as the groove moves to the center. The problems start when the curvature of the groove equals or exceeds the diameter of the



**The centre label of one disc from *Brothers in Arms* shows a side with just two tracks, since it spins at 45rpm to give top sound quality from the original analogue master tape.**

playback stylus. If we spin the disk at 45rpm we now have a 35% increase in groove velocity at any point on the disk. This is a huge advantage! Yes, the groove still slows down as it moves inward, but the effects are greatly

***Abraxus*, from Carlos Santana, was Mobile Fidelity's first one-step process LP. At \$100 it sold out.**



reduced. The only problem is that the amount of recorded time is now also reduced by 35%."

Now all of these hardware goodies wouldn't be worth a heap of spit if the source material wasn't up to scratch too. Hence, the company has a policy that - where possible - only first generation original master

recordings are used as sources. So, for example, Mo-Fi's John Lennon reissues were created using sources officially sanctioned by Yoko Ono while the Stevie Wonder LPs were created by tapes from Wonder's own archive. In fact, the man was so cautious about these crown jewels that he wouldn't send the tapes to Mobile Fidelity. The company had to come to him to do its work.

Sometimes the tapes are just not there, though, and Mobile Fidelity cannot place the Original Master Recording tag at the top of the sleeve. The Band's self-titled album was one of these. There was a master tape in existence but it was a copy of the original and it was

sitting in an EMI archive at the time.

The company is sometimes torn by the needs of the audiophile and the wishes of the artist. The artist will always win through, though, even if the audiophile might hold their hand up to protest.

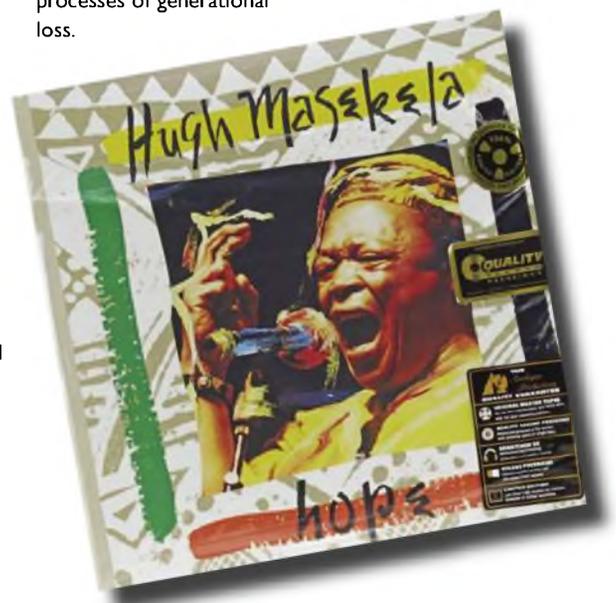
For example, I remember talking to the company when it was sending me a steady stream of albums from The Pixies. The reason I called

them was because I was just a little alarmed by the sound: it was a touch on the strident side. I couldn't quite believe my ears. If Mobile Fidelity is capable of issuing an offensively compressed album, I thought, then surely civilisation is on its last legs?

What they said in response to my shrill questions confirmed the priority the company has in serving the artist first. The Pixies' classic albums were all released in the eighties and early nineties and all used a digital recording system. An early form of what you might see today and, because of its early generational status, one that was - how can I put this - a little pinched? Mobile Fidelity were aware of this, having heard the original tapes and wondered if the band wanted something done to alleviate the issue? But no, surprisingly, the band actually liked the slightly strident sound and specifically ordered that Mobile Fidelity release the records as is or, rather, as was.

Hence, my Mobile Fidelity contact offered a slightly exasperated and defeated sigh. So, if you ever play the Mo-Fi Pixies LPs and wonder at the sound, don't blame the record label.

Of late, the company has moved into a rather more adventurous piece of vinyl mastering territory, One Step. That is, instead of utilising the industry-standard three-step lacquer process, Mobile Fidelity Sound Lab's UltraDisc One-Step (UDIS) uses only one step, bypassing two processes of generational loss.



**An impressive analogue recording on LP (33rpm) of *Hugh Masekela*, by Analogue Productions. Often used as a demo at shows it is worth hearing. Price around £60.**

"We compared the test pressing One Step recordings with the standard pressings", explained Senior Mastering Engineer, Shawn Britton. "We heard a better signal-to-noise ratio and the surface noise was lower. You hear more low level details. Reverb tails carry out better, there's a more pliable sound stage. It's pretty impressive. I thought that it might be a high frequency thing but we now think that the bass is more solid too".

The limited-edition One Step process, which also runs at 45rpm to further enhance sound quality, might produce superb sonics but it is hardly a common process. As Executive Vice President of Mo-Fi, John K Wood explained, "No-one has tried this process commercially before, it's too expensive. I know of no-one else who has done it before in the same way that we are doing it. There might have been a few small experiments out there. I know that Stereophile magazine tried to do it, for example, but they abandoned the project because it was too expensive. We can do it because we are charging \$100 per product".

Well, now the price has risen to \$125. The first release using the system was Santana's 'Abraxas' with others quickly following. They were Bill Evans' 'Sunday at The Village Vanguard', Donald Fagen's 'The Nightfly', Simon and Garfunkel's 'Bridge Over Troubled Water' and Marvin Gaye's 'What's Going On'.

**Another original master recording classic from Mobile Fidelity, Janis Joplin's 'Pearl', price £65. From old tapes arguably not of best quality, but still impressive.**

## HI-FI WORLD REVIEW LPS.

**Hi-Fi World has to buy LPs for review purposes. Noel Keywood explains how we choose them.**

Across the way, the man from Halifax stared at me. A mane of white hair and dense white Father Christmas beard made him stand out – on the stand. It was Nick Gorham of LongDog Audio on the MCRU stand opposite us at the Bristol Hi-Fi Show. When was I going to collect my Mobile Fidelity LPs he wanted to know? It was late Sunday and he wanted to go home: 'tis a long way to Halifax from Bristol..

During Thursday night set-up I had spotted a swathe of new Mobile Fidelity LPs being set out on the MCRU stand and – magpie like – grabbed a handful for review purposes. What we use when reviewing comes up often, so I'll explain why I grabbed what I grabbed.

For review purposes, what passes beneath the stylus must in itself be tonally accurate so as not to skew tonal balance, or add distortion and noise – not uncommon failings of vintage vinyl. Some of my old demo LPs, such as the Fisher Fidelity Standard, are these days not good enough for review use.

We cannot assess cartridge quality with substandard vinyl, so although the Mobile Fidelity LPs I had reserved at the start of the show – before they were snaffled by eager others! – were priced at around £60 each and may not represent common usage, Hi-Fi World must use LPs like this all the same. Genre wise they are mostly from popular main-stream artists readers are likely to know, not necessarily what I want to hear.

Example: Lyn Stanley's Moonlight Sessions: a one-step, limited edition disc, cost £200 to us – and strictly for quality assessment only, shall I say!

One necessary but disconcerting feature of Mobile Fidelity super-cut LPs is they



run at 45rpm, making track contents different to the original LP. In this case you do not in effect buy a new version of an old, much loved but likely worn out platter, but something entirely different – or so it seems. At the higher speed, running time is shorter so two 12in discs are needed, often packaged in a gatefold sleeve.

As a contrast to this approach, when Universal Music re-released The Beatles in Mono box set, its LPs had to mimic the originals, so the use of 45rpm was out. Instead Abbey Road ups quality by using half-speed mastering, another technique yet again – and a very complex one.

The big gatefold albums from Mobile Fidelity carrying twin 45s are heavy and thick: they eat up shelf space. Two discs instead of one means extra trips to player of course and you don't get 20 minutes per side, but 12-14 minutes. However, you do get fabulous sound quality.

On a slightly more technical note, a 45rpm disc has longer groove wavelengths than a 33rpm disc (LP), easing the problem of tracing high frequencies on inner grooves.

However, to assess the ability of today's Microline stylus shapes, designed to cope with short inner groove mechanical wavelengths, a 33rpm LP is necessary.

So whilst Mobile Fidelity 45s give fabulous sound quality, in a review we also use 33rpm LPs to assess inner groove tracing ability.

All of these releases have now sold out. At the time of writing, two new titles were available on pre-order, Stevie Ray Vaughan's 'Texas Flood' and Bill Evans Trio's 'Portrait in Jazz'.

"We wanted to present this sort of compelling stuff with the sound quality to match," added Wood.

Mobile Fidelity vinyl is priced high but there are solid,

audiophile reasons for that and this feature provides insight into those reasons. Most audiophile labels try to do the best they can in terms of mastering, cross their fingers during the pressing and then move onto the next project. Mobile Fidelity are proactive in terms of trying to move vinyl technology forwards. The One Step process is just the latest in a long line of examples. I, for one, am thankful that there is a company out there looking to push the envelope and, at the same time, wanting to retain a strict eye on quality.



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### Bronze.Cartridges

Featuring a superior body, the Bronze picks up even the highest frequency information for a rich, detailed and deep soundstage, and can be further upgraded with ease.



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### AUDIO-TECHNICA AT617A CARTRIDGE STYLUS CLEANER £29

For years, I have been using a very fine brush to dislodge the dust and crud that the styli of my cartridges excavate as they plough the grooves of my records. The Stanton cartridges I used in my DJing days would happily withstand a gentle finger rub...

But now, Audio-Technica have come up with something a little different – the 20-gram AT617a, a small circular (37.5 diameter x

17mm tall) pot containing a special type of polyurethane gel that never sets. Gently lower the stylus tip onto the gel's surface. Appropriate placement of the pot on your turntable's deckplate will allow you to safely perform this duty with the tonearm's cueing lever. On raising it out of the pot you'll find that the dust has magically disappeared, courtesy of the tacky nature of A-T's wonder substance. Very dirty tips might however need a repeat application.

Said gel can be periodically washed with water, and then left to dry naturally - don't use alcohol, or be tempted to skim the gunk off its surface with a cloth. It is claimed that the gel will remain tacky for years, provided that the pot's lid is conscientiously-replaced after use.

It's a clever idea, and one that works well. Even after playing records I thought were clean, it was amazing how much dirt had accumulated - the residue on the gel's surface

was a giveaway. After the stylus has been cleaned there's an obvious improvement in sound quality. The stereo image is better-defined, bass more solid and highs free of 'wooliness' and congestion. Yes, dirt-free discs are important – but so too is a spotless stylus. **MP**

[Audio-Technica Limited,  
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# SOUNDBITES



### AUDIO-TECHNICA AT618A PUCK £41

A turntable I once used on a regular basis, an Ariston RD80SL, had a useful feature – the central spindle was threaded, so that it could accommodate the disc clamp that the manufacturer provided as part of the package. This arrangement

proved particularly useful when playing warped records, as the clamp effectively flattened them! Warps are not good for your speakers, especially if your phono stage lacks subsonic filtering.

Another advantage of clamping is that coupling the record to the platter helps eliminate resonances in unsupported vinyl that will colour the music.

If your deck isn't built for clamps, like my Ariston, their advantages can be realised with a 'disc stabilizer' puck like this one from Audio-Technica. The AT618a is a machined 600-gram section of brass cylinder, attractively-finished with a protective rubber coating that is ribbed for ease of handling. Interestingly, the rubber coating stops short of the

puck's base. It is matt-black brass that comes into contact with the record's label.

The puck slips over the central spindle of the platter; a hole precision-drilled into its base has a depth of 25mm. The puck's fit is reasonable, being loose enough for ease of placement and removal.

The AT618a can't be used when playing 7in singles that don't have an adaptor (unless you have one of the plastic inserts that are flush with the record). With most of the LPs I played an improvement in stability and bass firmness (notably the bass synth of dance records) was evident. An undoubtedly-useful object to have to hand. **MP**

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**HI-FI WORLD**



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# Old Gold

Paul Rigby looks at a book that homes in on music from the 1960s and '70s. A mere 4.5kg there was a lot to read.

## GALACTIC RAMBLE

Richard Morton Jack (Editor)

Price: £100

(Privately Published)

**N**ewly released as a hardback, the good quality paper of Galactic Ramble packs over a million words and “several thousand” reviews of albums that span many genres including pop, rock, folk and jazz – from the UK and Ireland. It also includes releases from major and independent labels, private pressings and library music. There are plenty of rare and little known LP releases here, but no greatest hits albums, few label samplers, or film soundtracks – and just a limited selection of ska, easy listening, trad jazz and trad folk.

The time span for this investigation? Somewhere in and around 1963 to 1975. Quite a fruitful and treasure-filled time period, culturally speaking.

This expanded second edition, limited to just 500 copies, and spanning a hefty 31 x 25cm – or thereabouts – is over 5cm thick. It's a big book with 916 pages. Contributions come from Simon Crisp, Richard Falk, Giles Hamilton, Tony Higgins, Patrick Lundborg, Austin Matthews, Aaron Milenski, Richard Morton Jack, Julian Leigh Smith, Dominic Stinton, Harvey Williams and David Wells, so there's a multitude of views and writing styles.

A selection of colour plates sit in the centre of the book, with over 1,000 images scattered around the book's reviews.

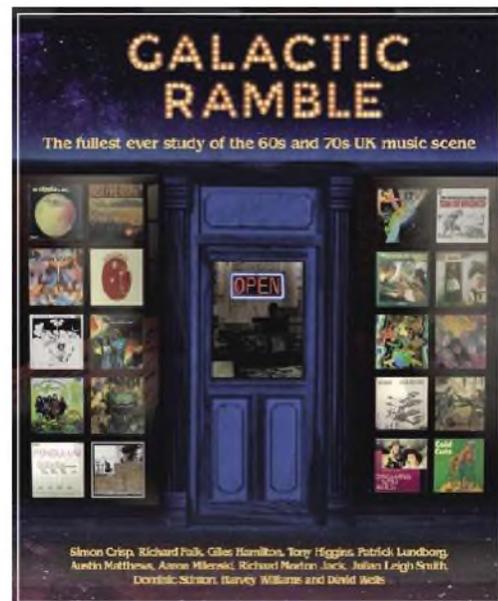
The book begins with an introduction from record producer David Hitchcock (he of Caravan, Mellow Candle and Genesis). As the publisher says, Hitchcock “... describes the British music industry in the period covered by the book,

and discusses that part of his career. It has been greatly expanded from the version in the first edition”. That includes sections on ‘How I Became a Record Producer’, ‘The Record Industry pre-1966’ and ‘Record Companies & the Underground’ and much more. All fascinating stuff from a man on the inside.

Listed alphabetically, the format of the reviews lists the band with the album name underneath. Under that is the label name, catalogue number with the release date listed under year but also the month, a nice addition.

What you will also see in many cases are a selection of contemporary reviews from a host of sources including Melody Maker, Record Mirror, Disc & Music Echo, Record Retailer, Record Review, Record Buyer and more. A useful resource because, as we all know, hindsight can do strange things and contemporary views may differ wildly from the critics of the time.

One of the book's current writers then does just that, offering a new review. The contrast can often be entertaining and enlightening. For example, for the prog outfit, Jonesy and their LP ‘No Alternative’, Listening & Record Collector (November 1972) declares that the album has “guts”. Which means what – powerful and meaty? A bit of a rocking work out? Yet book contributor Aaron Milenski highlights shades of grey and especially the, “...mellow, darker songs...” while adding in frustration that the band can also be, “annoying”. It's this blend of critique that gives you a broader and more thorough sense of the album under scrutiny.



Allied to the above, what I like about the reviews is that they do include actual opinion. I've seen books of this ilk before, movie-type collections for example, who seem to fear expressing a journalistic stance, fighting shy of a final judgement. I'm happy to see that emotion is a full part of the content of this tome. This is music, after all. An art based upon emotion. So hurrah for that.

And hurrah for this book. An amazing project that must have added several grey hairs to the skulls of all concerned. It is a fascinating book and, unlike some reference publications, one that – I very much fear – I'll have to read from cover to cover. See you in a year or two then.

If you wish to buy, UK postage is £12, EU is £16 with the rest of the world at £35. As the book weighs in at around 4.5kg, I can understand why.

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# It's A Shaw Thing

**Jon Myles tries out Chord Company's new Shawline X loudspeaker cable – and likes what he hears.**



**T**he Cord Company's Shawline X loudspeaker cables may be a new name but they have a rich heritage. For the Shawline X is based around the Chord Rumour cable – a best-seller for 20-plus years - but with some significant changes.

The conductors are still silver-plated, insulated with XLPE and arranged in a twisted pair configuration. But with the Shawline X Chord have taken the existing conductor layout and added a specially-chosen PVC internal jacket to reduce mechanical noise, before applying the same high density, dual-layer foil and braid shield that is used on the more expensive Chord Epic.

And while previously PTFE - Teflon - was the standard material for insulation, a new material known as XLPE (Cross-linked Polyethylene) has been used. This is said to bring a cleaner, crisper sound by reducing interference, allowing smoother signal flow.

## SOUND QUALITY

Swapping out a pair of basic loudspeaker cables and inserting the Shawline X between a Creek Evolution 100A integrated amplifier and a pair of Spondor A1 loudspeakers showed a clear improvement. The Chord cable is clearly engineered to be of a balanced nature. John Martyn's 'Solid Air' had added depth and dynamics.

The timbre of his guitar was more realistic, the fine details of his playing coming over with uncanny accuracy. It was as though I could hear deeper into the mix.

Also evident was the increase in micro-dynamics. On 'Debaser' by the Pixies the guitars often sound slurred – but not with the Shawline X. I could clearly hear two separate instruments and they timed together exactly as they should. Black Francis's vocals were clear and intelligible - even when he went into his barking-like phases. Bass was taut and firm without being overpowering – or dominating the track after its initial introductory passage.

Upper registers were also well served. Albert Ayler's saxophone on 'Spiritual Unity' - that can sound piercing through some loudspeaker cables - came across as melodious and fluent. Some of the higher notes were a little restrained but that added to the balanced sound on offer.

Those who like their cables to tune a system - by adding more bass or treble - may not find the Shawline X to their tastes. But the majority who require a cable that lets music flow relatively unimpeded will like what they hear.

As an experiment I plugged the

original — admittedly a little cheaper — cables back in and put on Arvo Part's 'Cantus in Memoriam Benjamin Britten'. It sounded good. But with the Shawline X cables in place there was more atmosphere and detail and a greater sense of presence. The reverberations of the final bell lasted longer, giving a more striking effect.

## CONCLUSION

The Shawline X cables are extremely balanced and enjoyable. The biggest compliment I can pay them is that they simply get out of the way and let the music come through, revealing details you may have never noticed before on many recordings. Definitely a worthwhile upgrade for many a system.

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### AGAINST

- nothing at the price

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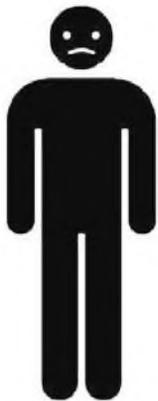
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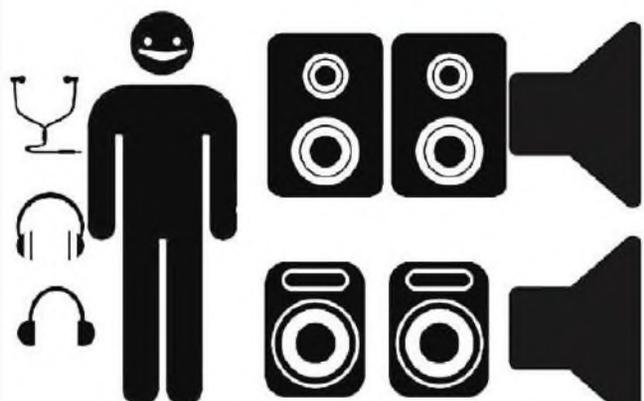
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# NEXT MONTH JUNE 2019 ISSUE

## QUAD VENA II

Quad's original Vena amplifier came with on-board digital inputs, including Bluetooth for streaming from mobile phones. That was back in 2014. Next month we look at how Quad have updated this popular all-in-one amplifier. Don't miss our in-depth assessment, backed by advanced measurement from Rohde&Schwarz.

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## ADVERTISERS INDEX

2nd Hand Hi-Fi	72
Absolute Sounds	OBC
Advanced MP3 players	92
Atlas Cables	90,92
Audiophile Club	92
Auralic	66
Billy Vee	94
Black Rhodium	68,86
Chord Electronics	26
Criterion	86
Decent Audio	30,33
Divine Audio	92
EnjoyTheMusic.Com	94
Exposure	30
FiiO	40,52,82
Hard To Find Hi-Fi	44,45
Henley Audio	20,48,60,64,84
Ian Harrison	86
Icon Audio	14
Infidelity	92
IsoTek	56
Jordan Acoustics	16,17
KEF	6
MCRU	70
Oxford Audio	92
Peak Hi-Fi	94
ProAc	42
SCV	28
SME	IBC
Sound Hi-Fi	68
Spendor	22
Tellurium Q	12
The Audio Barn	92
The Chord Company	IFC
The Right Note	92
Wave Hi-Fidelity	88

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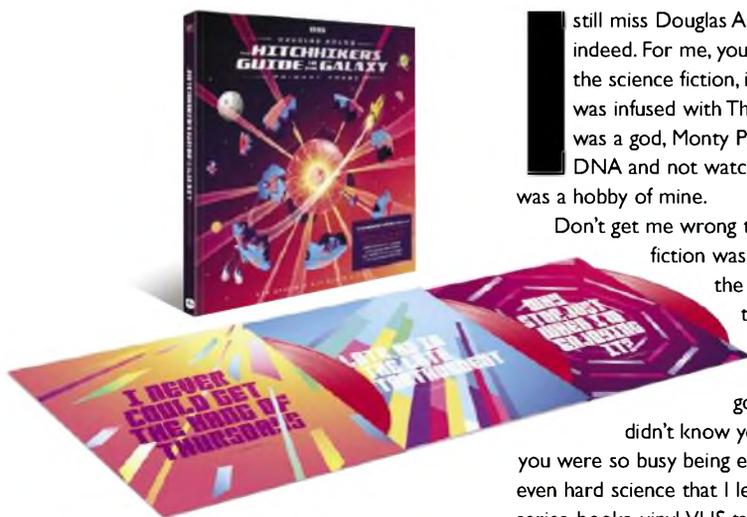
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# HITCHHIKER'S GUIDE TO THE GALAXY

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"Adams presented a whole range of 'what if' concepts at you. Enough to re-program your brain"

I still miss Douglas Adams very much indeed. For me, you see, it wasn't so much the science fiction, it was the comedy. I was infused with The Goons, Spike Milligan was a god, Monty Python was part of my DNA and not watching Bernard Manning was a hobby of mine.

Don't get me wrong though, Adams' science fiction was an attraction. Rather, the way Adams taught the listener about science was an attraction. Like all good teachers, you didn't know you're learning because you were so busy being entertained. It wasn't even hard science that I learned from his radio series, books, vinyl, VHS tapes, DVDs, CDs, stage show, spoken word cassettes, computer game, film, towel and biscuits: it was the notion of the 'concept'. Adams presented a whole range of 'what if' concepts at you. Enough to re-program your brain and, like a wind-up toy, to set it off down strange and unpredictable pathways.

I actually missed the initial BBC radio production. I came to the series with, you guessed it, vinyl. Initially the double album release, which I couldn't afford so borrowed from a school friend 'The Hitch-Hiker's Guide To The Galaxy' (Original, 1979) and then the single disc 'The Hitch-Hiker's Guide To The Galaxy Part Two: The Restaurant At The End Of The Universe' (Original, 1980). The duo followed the first four radio episodes. CD was also supported. I have the early 1988, 6CD box set here as I type this. Other sets have followed since then.

In short 'The Hitchhiker's Guide To The Galaxy' follows Earth's last surviving man (a lady also appears later), after Earth is demolished to build a galactic super-highway. He is rescued by a friendly alien, humanoid in shape, who is a freelance contributor to, of all things, 'The Hitchhiker's Guide To The Galaxy', a sort of interstellar travel guide. Adventures proceed from that point, basically.

The initial radio series featured future stars such as Simon Jones and Geoffrey McGovern while veteran radio star, Peter Jones was installed as the voice of The Book. Mainly because he had the most "Peter Jones-y" voice they could find, at the time.

The tone of the story can be reflected by Peter Jones himself who is, to my mind, the true (and now much missed) star of the entire radio and vinyl series. Here's the sort of thing he would babble about: "The Hitch-Hiker's Guide to the Galaxy is truly a remarkable book. The introduction starts like this: 'Space' it says 'is big. Really big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the street to the chemist, but that's just peanuts to space, listen... and so on".

After a while the style settles down a bit and it starts telling you things you actually need to know. Like the fact that the fabulously beautiful planet, Bethehellamin, is now so worried about the cumulative erosion caused by ten million visiting tourists a year, that any net imbalance between the amount you eat and the amount you excrete whilst on the planet, is surgically removed from your bodyweight when you leave. So every time you go to the lavatory there, it's vitally important to get a receipt.

The production itself was quite an advanced project at the time. The BBC's Radiophonic Workshop supplied award-winning music and sound effects while the series was the first radio comedy programme to be produced in stereo and one of the first to be recorded in Dolby Surround Sound.

Record label Demon has offered fans of the series an analogue present. For the first time ever on vinyl, the original three series of the BBC radio series has been released to celebrate the 40th anniversary of its original broadcast. With the fourth series now announced too.

The three beautifully presented 3LP sets are housed in a hardback book featuring newly commissioned sleeve notes and graphics. Each coloured vinyl disc is contained in a 'page' of the book with inner sleeves blazoned with quotes from the characters.

Mastering is relatively dry in tonal terms but neutral in approach and balanced to boot. As such, it is ideal for a primarily speech-driven release as the mastering enhances diction while adding contrast to the spot sound effects and music.

Beautifully presented, the Demon vinyl sets are a fine testament to a classic story. I just wish the author was still around to continue it. **PR**

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